REPORT

Chapter 1.0 Program Overview

2022 Milne Port Marine Environmental Effects Monitoring Program (MEEMP) and Non-Indigenous Species/Aquatic Invasive Species (NIS/AIS) Monitoring Program

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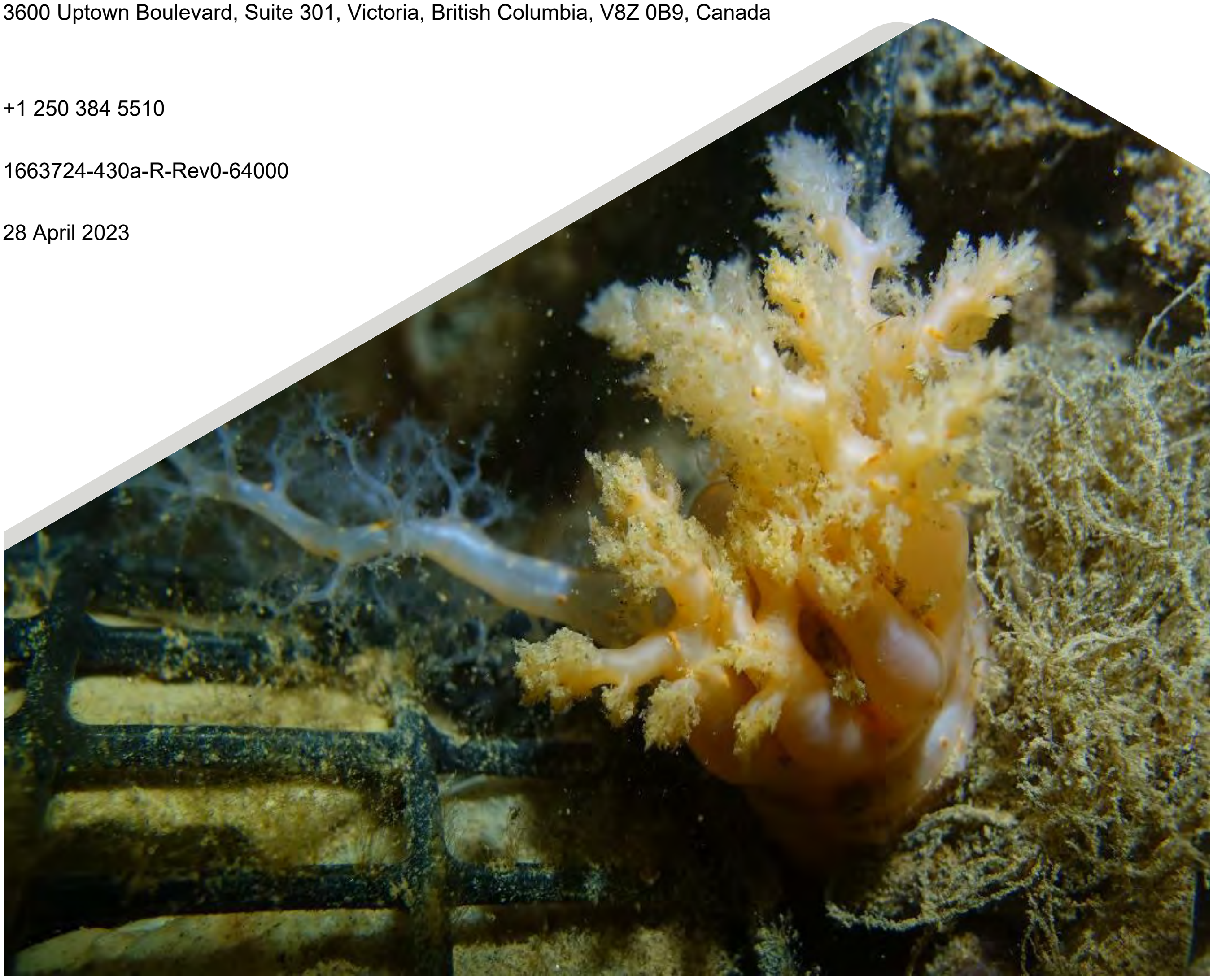

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Executive Summary

Baffinland Iron Mines Corporation (Baffinland) owns and operates an open pit iron ore mine (the Project) located in the Qikiqtani Region of North Baffin Island, Nunavut, in accordance with Terms and Conditions of its Project Certificate (PC) No. 005. Ore is transported to market during the open water season by chartered vessels that receive the ore in Milne Port, located at the head of Milne Inlet at the western end of Eclipse Sound. Shipping commenced in 2015 and is expected to continue for the life of the Project (20+ years).

As a part of regulatory commitments, Baffinland has developed and implemented a multi-disciplinary Marine Environmental Effects Monitoring Program (MEEMP). The MEEMP is designed to evaluate potential Project-related effects on the marine environment as predicted in the Final Environmental Impact Statement (FEIS; Baffinland 2012, 2013) and subsequent addenda. The MEEMP includes monitoring of marine water and sediment quality, marine invertebrates, marine vegetation, and fish and fish habitat. The sampling design is generally based on the Metal Mining Environmental Effects Monitoring (EEM) technical guidelines (Environment Canada 2012) and includes statistical approaches for detecting potential Project-induced impacts on the marine environment. Nonindigenous species/Aquatic Invasive Species (NIS/AIS) monitoring is an integral component of the MEEMP and is designed to address the potential risks of species introductions to the marine environment from ship ballast water and hull biofouling.

This report presents the results of the MEEMP and NIS/AIS monitoring programs conducted in Milne Inlet during the 2022 open-water season, the eighth consecutive year of monitoring. The results of tidal gauge monitoring of sea levels and storm surges are also presented.

MARINE WATER QUALITY (CHAPTER 2.0)

The marine water quality component of the Marine Environmental Effects Monitoring Program (MEEMP) involves monitoring water quality in the Milne Inlet receiving environment to satisfy PC Conditions No. 76, 83(a), 87, 89 and 99(a), and assess overall water quality near Type ‘A’ Water License discharge points. In 2022, water quality samples were collected at four sampling stations in Milne Inlet downstream from the primary discharge point (MP-05), as well as at four sampling stations downstream from a second discharge point (MP-06) at Milne Port. These receiving environment stations were distributed in a radial design up to approximately 250 m from each discharge point to monitor for potential changes in water quality due to site drainage and operational discharges, including iron ore stockpile run-off.

In 2022, reported analytical results for water quality parameters (i.e., major ions, nutrients, metals, hydrocarbons, and polycyclic aromatic hydrocarbons [PAHs]) were generally within ranges observed during previous MEEMP sampling programs (2015 to 2021). Consistent with previous programs, hydrocarbons and PAHs were not detected in the 2022 water samples. A substantial proportion of parameters analyzed in the water samples from Milne Inlet were not detected at all in downstream sampling stations and all parameters were found to be below relevant water quality guidelines [WQGs] (i.e., Canadian Council of Ministers of the Environment (CCME])). For chromium, all measured concentrations were below the applicable guideline except for a single measurement that was slightly above and within analytical variability; as such, this is not considered to represent a meaningful exceedance.

Collectively, measured concentrations of metals, nutrients and hydrocarbons were either not detected or were present at low concentrations, such that adverse impacts to the biota in the Milne Inlet receiving environment were unlikely to occur. Increased iron deposition in the marine environment as a result of Project activities is a primary interest for local Inuit. Given that CCME marine WQGs for iron have not been developed, 2022 data were compared to iron data collected during previous MEEMP programs (2017 to 2021) to evaluate whether increases in production at Milne Port have led to associated increases in iron concentrations. Total iron concentrations in marine water samples collected in 2022 remained within the range measured in previous years in the receiving environments of the MP-05 and MP-06 site discharges. While mean concentrations downstream of MP-05 remained fairly stable, higher variability was noted in the receiving environment, which was comparable to that observed in 2018. Dissolved iron concentrations were below detection limits in each of the samples collected in 2022, meaning the majority of detectable iron concentrations were driven by the particulate form, which is less bioavailable for uptake by aquatic biota. This comparison was also completed for total copper due to higher variability observed in 2022 relative to previous years. The observed variability in total copper did not appear to be associated with the MP-05 and MP-06 effluent discharges which were lower in concentration; further, dissolved copper concentrations were substantially lower and more stable.

Overall, results indicated that, to date, water quality parameter concentrations remained below thresholds of harm for marine biota. Moving forward, continued monitoring for water quality is recommended.

MARINE SEDIMENT QUALITY (CHAPTER 3.0)

Sediment sampling in Milne Inlet was conducted to satisfy PC Conditions No. 76, 83(a), 84, 85, 87 and 99(a). After three consecutive years of implementation, the joint radial benthic and sediment sampling program was not conducted in 2021 commensurate with the lack of directional trends observed to date in sediment quality indicators. Baffinland is committed to continued implementation of the full sampling program with an adjusted monitoring frequency of every three years, which is consistent with routine environmental effects monitoring (EEM. The next monitoring year for the full-scale joint radial benthic and sediment sampling program will be in 2023.

The 2022 sediment program focused on targeted sampling at four stations along the West transect between the Ore Dock and Phillips Creek. The focus on this area stemmed from anomalous patterns in sediment and benthic infaunal indicators documented in 2020 at station SW-2, relative to other stations along the West transect. Additional stations were sampled in 2022 to contextualize results reported from SW-2 in terms of spatial and temporal variability in grain size composition and, ultimately, better evaluate the magnitude and extent of potential Project-related effects (i.e., propeller wash generated by tug-assisted ore carrier movements).

Results from 2022 sampling indicated there was no evidence of Project-related impacts to sediment quality (i.e., concentrations of nutrients, metals, and hydrocarbons) at SW-2 and other West transect stations: concentrations in 2022 were below applicable CCME sediment quality guidelines or consistent with what was documented in previous sampling years. In terms of grain size composition, variability in fines content at stations SW-1, SW-2, and SW-3 may be indicative of effects of propeller wash, though natural factors such as ice movement and coastal sediment processes were also likely at play. Importantly, 2020 was the only instance where reduced fines content was accompanied by a substantial reduction in benthic density and diversity, and this appears to have been localized to station SW-2. At stations SW-1 and SW-3 (adjacent to SW-2), where some reduction in fines content was observed in 2022 relative to previous years—, an associated reduction in benthic invertebrate indicators was not observed.

Overall, monitoring results remained within predictions of the FEIS and subsequent addenda, which forecasted the potential for minor and localized sediment disturbance associated with propeller wash, with stabilization expected over time. We recommend continued sampling in 2023 as part of the full-scale joint radial benthic and sediment sampling program conducted every three years to further increase understanding of sediment grain size variability and to monitor for potential effects of Project activities on grain size distribution.

BENTHIC INFAUNA (CHAPTER 4.0)

Benthic infaunal sampling in Milne Inlet was conducted to satisfy PC Conditions 76, 87, 99(a) 99(c), and 126. After three consecutive years of implementation, the joint radial benthic and sediment sampling program was adjusted to a monitoring frequency of every three years, commensurate with the lack of directional trends observed to date in benthic infaunal community indicators. Baffinland is committed to continued implementation of the full sampling program with an adjusted monitoring frequency of every three years, which is more consistent with routine biological sampling for other mining effects monitoring programs (e.g., the federal EEM Program). The next monitoring year for the full-scale joint radial benthic and sediment sampling program will be in 2023.

Benthic infaunal performance indicators at stations SW-1 through SW-4 in 2022 were generally consistent with previous MEEMP years. However, based on the ecology and life history of infaunal species, the indicators have shown high spatial and temporal variability and heterogeneity across the four-year time series (2019-2022), as expected. With the exception of SW-2 in 2020, benthic community indicators remain within the same range across years and compared to adjacent stations, as well as within the range observed at all 15 stations sampled along the West transect in 2020.

Station SW-2 stood out as an anomaly in 2020 due to reductions in benthic infauna indicators and a coarser sediment composition relative to other coastal stations along the West transect. These results are thought to reflect a localized physical disturbance from propeller wash within the context of a naturally dynamic system that exhibits considerable fine-scale spatial variability. We note that 2020 was the only instance where reduced fines content was accompanied by a substantial reduction in benthic density and diversity. Benthic communities are known to be able to rapidly recover from localized disturbance effects, and monitoring data in 2021 showed increased total density (order of magnitude increase) and diversity (return to 2019 levels) and have remained stable in 2022. At stations SW-1 and SW-3 (adjacent to SW-2), where some reduction in fines content was observed in 2022 relative to previous years, an associated reduction in benthic invertebrate densities was not observed.

Monitoring results from 2022 remain within predictions of the FEIS and subsequent addenda, which forecasted the potential for minor and localized sediment disturbance associated with propeller wash and associated short-term effects on benthic infaunal invertebrate community indicators. Overall, benthic communities in Milne Port remain healthy, and diverse. Sampling will continue in 2023 as part of the full-scale joint radial benthic and sediment sampling program conducted every three years and will further increase understanding of benthic infauna community variability and monitor for potential effects of Project activities.

SUBSTRATE, MACROFLORA, AND BENTHIC EPIFAUNA (CHAPTER 5.0)

Sampling of substrate, macroflora, and benthic epifauna fulfills PC Condition No. 99(a) and (c) and is relevant to PC Conditions 76, 83(a), 84 and 87. To evaluate potential project-related effects on substrate, macroflora, and benthic epifauna, standardized underwater visual census methods were employed by SCUBA-based scientific divers to survey algae, invertebrate, and fish species and to record habitat type within a series of survey quadrats permanently installed on the seafloor in both an exposure area and a reference area. Specimens were opportunistically collected and sent to an accredited taxonomy laboratory (Biologica Environmental Services Ltd.) for taxonomic identification. Indicators include percent cover (%) of substrate type, benthic macroflora, and sessile benthic epifauna, density (counts) for motile epifauna, and diversity indices (i.e., taxa richness and Simpson's Diversity Index [SDI]) for macroflora and epifauna.

Quadrat sampling in 2022 indicated the benthic environment of Milne Port mainly consisted of soft substrate, primarily silt and sand. Similar macroflora and epifaunal taxa were observed in 2022 as in previous years (2018-2021). Community indicators (i.e., percent cover, density, taxa richness, and SDI) were variable among quadrats, but were not statistically significantly different between exposure and reference areas in 2022. Interannual differences were observed in sessile epifauna taxa richness and motile density between years with lower values in 2022 compared to 2021, but the trend was equivalent between both areas. As the lower values of 2022 indicators were observed in both the exposure and reference areas, there was no evidence that they were caused by Project-related impairment; they were attributed to addition of new quadrats influenced by freshwater outflows.

Bivalve mortalities were observed opportunistically near and within quadrats in both the exposure and reference area in 2022. The cause of the mortalities could not be determined but does not appear to be related to changes in water quality or sediment quality. The apparent widespread nature of the bivalve mortalities, which occurred across multiple species and in both areas, suggest some other factor or factors were affecting marine bivalves. It is possible that the cause was a naturally occurring event involving the release of supercooled high salinity brine from sea ice, flowing to the sea floor..

As was done in 2021, effect size was explored using a power analysis to estimate the sample size needed to detect Project-related change based on levels of observed variability among quadrats, and whether the increase in sample size (in total, 25 quadrats in 2022 compared to 16 quadrats in 2021) was adequate to detect change. Power analysis results, in combination with a taxa accumulation curve generated for this dataset, indicate that the current sample size remains insufficient to reliably detect a Project-induced change in community structure or fully characterize the epibenthic community. As such, the current statistical results should be interpreted with caution. The predicted sampling effort that would be required for this program to achieve statistical power to detect a 40% effect size with >0.8 power, as determined by power analysis, would be unattainable within the limited open-water sampling window (August/September). It is therefore recommended to maintain the current sampling methodology and sampling effort (i.e., detection of large-scale trends only), accepting the associated statistical limitations.

Overall, macrofloral and benthic epifaunal community assemblages were comparable between exposure and reference areas but varied interannually for some indicators, likely driven by regional environmental factors. Monitoring efforts to date revealed no evidence of overarching spatial or temporal trends that might be associated with Project-induced effects from construction or operation activities and Milne Port. Monitoring of macroflora and benthic epifauna assemblages is recommended to continue using the same sampling and statistical design.

Overall, while noting the statistical limitations of this component (i.e., low statistical power), the 2022 survey results indicate that Project activities to date have not resulted in adverse effects on macrofloral and epifaunal communities in Milne Port.

MARINE FISH COMMUNITY (CHAPTER 6.0)

To satisfy PC Condition No. 99(b)(ii), (c), 113, and 114, sampling was conducted to assess the relative abundance of Arctic Char (*Salvelinus alpinus*) and other fish species in the Milne Port area. Multiple sampling methodologies were employed to target different species and habitat types, including angling (jigging and trolling), gill net, Fukui trap, hoop net, and otter trawl sampling. Collected fish were identified to the lowest practicable taxonomic level (typically to species-level) before being released. Fish not identified to species-level in the field were retained for subsequent identification by an accredited taxonomic laboratory.

A total of 484 fish belonging to 11 known taxa were recorded in the DPF and IPF from 84 fishing efforts using a combination of methods during the 2022 open water survey season in Milne Port. Similar to previous sampling years, Arctic Char (*Salvelinus alpinus*), Fourhorn Sculpin (*Myoxocephalus quadricornis*) and Shorthorn Sculpin (*Myoxocephalus scorpius*) were the most abundant species. Other fish captured were Ribbed Sculpin (*Triglops pingelii*), Greenland Cod (*Gadus ogac*), Arctic Staghorn Sculpin (*Gymnocanthus tricuspis*), Arctic Sculpin (*Myoxocephalus scorpioides*), Polar Cod (*Boreogadus saida*), and Saddled Eelpout (*Lycodes mucosus).* Two taxa were recorded for the first time in Milne Port: Spatulate Sculpin (*Icelus spatulate*) and Halfbarred Pout (*Gymnelus hemifasciatus*); however these are Arctic species not considered to pose a risk as Nonindigenous Species.

Methods used included gillnetting, angling-jigging, angling-trolling, hoop nets, Fukui traps and trawling. Statistical comparison of catch per unit effort (CPUE) is not possible between methods, but as in previous years, it was observed that gill nets remained the most effective method for capturing Arctic Char.. Unlike in previous years where the majority of Fourhorn Sculpin were caught via angling-jigging, gill nets were were also successful in capturing Fourhorn Sculpin in 2022. Longline sampling, added as a trial in 2021 as Commitment No. 37 to the Marine Environment Working Group (MEWG; Appendix 1A in Golder 2021) in an attempt to target large-bodied demersal fish, was discontinued in 2022 as no fish were captured during the 2021 trial. Hoop nets, added to the MEEMP study design in 2019 as a three-year trial based on recommendations from the MEWG as a sampling method that could replace Fukui traps, and trawling, added to the MEEMP study design in 2020 to target rarely caught fish, were continued in 2022. However, 2022 represented the third year of trials to compare hoop net and Fukui trap capture efficiency; over the trial study period, hoop nets sampling events yielded twice as many captured fish (n = 151 from 2020 – 2022) compared to Fukui traps (n = 71 from 2020 – 2022), despite being deployed fewer than half the number of total efforts (i.e., sampling events) and half the number of total set hours.

Two distinct Fishing Areas were delineated in Milne Port in 2021 based on habitat features and their location relative to existing port infrastructure and operational activities. This included a Direct Project Footprint (DPF) area and an Indirect Project Footprint (IPF) area. The FAs are intended to help standardize sampling efforts and address variability in the catch data across Milne Port. Using 2020, 2021, and 2022 datasets, catch-per-unit-effort (CPUE) of each fishing method was compared across FAs and across years using an Analysis of Variance (ANOVA). While no statistically significant differences in CPUE were noted for any fishing method between the f and between years, CPUE was generally higher within the DPF, possibly due to the rocky habitat provided by marine infrastructure.

Measures recommended for the 2023 MEEMP sampling program include:

- Consider the removal of Fukui traps as a fishing method from the 2023 program due to low catch efficiency. Hoop nets are recommended as a replacement fishing method if removal of Fukui traps is deemed appropriate.
- The number of efforts (i.e., sampling events) per area of each fishing method (i.e., angling [jigging and trolling], gill nets, hoop nets, and trawling) should be increased in 2023 to achieve 40% effect size detection for fishing methods.

Overall, fishing methods were deemed effective in characterizing the marine fish community in terms of species presence and relative abundance. The program continues to improve its methodology with regard to efficiencies of capture and representation of the fish community, however, delineation of fishing areass and the standardization of measures of fishing effort time series that commenced in 2021 will continue to allow for ongoing assessments of interannual change in relative fish abundance and distribution at Milne Port.

FISH HEALTH AND TISSUE CHEMISTRY (CHAPTER 7.0)

To satisfy PC Condition No. 76, 83 (a), 99 (a), 99 (b) (ii), 99 (c), 113, and 114, sampling was conducted to assess fish health and tissue chemistry in the Milne Port area. Fish health endpoints were assessed in Fourhorn Sculpin (*Myoxocephalus quadricornis*), a marine fish, and wrinkled rock-borer (*Hiatella arctica*), a marine bivalve. Tissue chemistry was assessed in Fourhorn Sculpin, Arctic Char (*Salvelinus alpinus*), and *Hiatella arctica*. Fish health assessments included consideration of survival, growth, condition, and reproductive endpoints, and were considered separately for species and sexes, as relevant. Statistical comparisons of fish health endpoints were completed among recent sampling years (i.e., 2020, 2021, and 2022).

Fourhorn Sculpin were targeted using both active (i.e., angling, seine, trawling) and passive (i.e., Fukui traps, hoop nets, and gill netting) capture methods. Incidental mortalities of Arctic Char were retained for analysis of age, stomach contents, and tissue chemistry. *Hiatella arctica* were collected opportunistically from benthic infauna samples, with specimens being selected for processing if the shell was intact, greater than 15 mm in length, and had no indications of damage to the umbo or hinge area. Collected fish and *Hiatella arctica* were processed for fish health endpoints and tissues were collected for tissue chemistry analysis.

A total of 40 Fourhorn Sculpin were collected in 2022, comprising 20 adult females and 20 adult males. Captured females were longer and heavier, based on median total length and total weight, and had greater energy stores based on median liver somatic index (LSI), compared to captured males in 2022. The median age of both sexes was 7, with females ranging from 5 to 9 years and males ranging from 5 to 10 years. No difference in condition (i.e., weight-at-length) was observed between female and male Fourhorn Sculpin.

Differences in fish health endpoints were observed for female and male Fourhorn Sculpin among sampling years. Fourhorn Sculpin survival, as age, was statistically significantly greater in 2022 compared to previous years for both sexes. Growth of male and female Fourhorn Sculpin, examined as size-at-age, was statistically significantly different among years (i.e., it was lower in 2022 compared to 2021, but did not differ from 2020 for females, and it was significantly greater in 2022 compared to 2020, but did not differ from 2021 for males). Fish condition, as relative weight (i.e., total weight-at-total length), and relative liver weight (i.e., liver weight-at-total weight), differed among sampling years for both sexes. Female Fourhorn Sculpin relative weight was significantly greater in 2022 compared to 2020 and 2021, while relative liver weight did not differ among years. Male Fourhorn Sculpin relative weight was significantly greater in 2022 compared to 2020 but did not differ from 2021, while relative liver weight was significantly greater in 2022 compared to 2021. Reproductive investment, as relative gonad weight, was significantly lower in 2022 than in 2020 and 2021 for female Fourhorn Sculpin, while no difference in relative gonad weight was observed for male Fourhorn Sculpin.

A total of 40 *Hiatella arctica* were collected and processed for fish health endpoints in 2022. No differences in survival (as length-frequency distribution), growth (as whole animal wet weight), or condition (as whole animal wet weight-at-total length) were observed among sampling years (i.e., 2022, 2021 and 2020). Reproductive endpoints, as mantle weight-at-tissue weight (or mantle somatic index, MSI), were compared only between 2021 and 2022, as gonad tissue weights were not available from 2020. Significant differences were found for MSI between 2021 and 2022, and were dependent on size: smaller *Hiatella arctica* (i.e., lower weight) had significantly greater MSI in 2021 than 2022, while larger *Hiatella arctica* (i.e., higher weight) had significantly greater MSI in 2022 than 2021.

A total of 26 incidental mortalities of Arctic Char were retained in 2022, comprising 12 adult females, ten adult males, and four juveniles of unknown sex. Of these, 26 samples were submitted for tissue PAH analysis, and 8 samples were submitted for tissue metals analysis. A total of 24 tissue samples were submitted collectively in 2022 from Arctic Char, Fourhorn Sculpin, and *Hiatella arctica* for tissue chemistry metals analysis. Constituents of potential concern (COPCs) were identified based on the primary constituents of the Project iron ore (i.e., aluminum, magnesium, and iron), as well as metals with existing regulatory guidelines for fish tissue (i.e., mercury and selenium). Statistical comparisons of COPCs (i.e., aluminum, iron, magnesium, mercury, and selenium) were completed for each species, separately, among sampling years (i.e., 2018 to 2022), and other metals were considered qualitatively for general trends over time.

Concentrations of most metals were similar among years within each species, although some metals exhibited greater interannual variability (e.g., copper, nickel, tin). For Arctic Char, statistically significant differences in tissue concentrations of aluminum, magnesium, mercury, and selenium were observed; no differences were observed for iron. Interannual differences in COPC concentrations in Arctic Char showed no temporal trends (i.e., 6% to 124% relative percent difference [RPD] among years, with no consistent pattern over time). For Fourhorn Sculpin, statistically significant differences were observed among years for aluminum, iron, mercury, and selenium, but not magnesium. Interannual differences in COPC concentrations in Fourhorn Sculpin showed no temporal trends (i.e., 15% to 150% RPD among years, with no consistent pattern over time). Concentrations of most metals were greater for *Hiatella arctica* when compared to Arctic Char and Fourhorn Sculpin, reflecting interspecies differences in metals bioaccumulation and tissue types. For *Hiatella arctica*, significant differences were observed among years for aluminum, iron, magnesium, and selenium, but observed differences were relatively small (i.e., 12% to 55% RPD, with no consistent patterns over time). Mercury and selenium concentrations in all Arctic Char and Fourhorn Sculpin samples were below Health Canada's Maximum Levels for Chemical Contaminants in Foods mercury consumption guideline of 0.5 mg/kg wet weight [ww] (Health Canada 2015) and the BC Ministry of Environment selenium concentration guidelines of 4 mg/kg dry weight [dw] (BC MOE 2014), respectively. In *Hiatella arctica*, mercury concentrations were compared with the Health Canada consumption guideline in order to provide context, as this is not a common food shellfish species. Mercury concentrations in *Hiatella arctica* were below the Health Canada consumption guideline. Selenium concentrations in *Hiatella arctica* were below the BC Ministry of Environment and Climate Change Strategy (BC MOE) invertebrate tissue selenium concentration guideline of 4 mg/kg dw (BC MOE 2014).

A total of 26 Arctic Char samples, eight Fourhorn Sculpin samples, and four *Hiatella arctica* composite samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) in 2022. For Arctic Char, detection limits for PAHs were two to three orders of magnitude lower in 2022 than in previous years due to differing methodology used in 2022, resulting in detected concentrations of acenaphthene, fluoranthene, fluorene, methylnaphthalene, naphthalene, phenanthrene, and pyrene in eight samples. Therefore, it does not appear detectable concentrations of PAHs in 2022 represent an increase in concentrations, but rather an improvement in the analytical method resulting in improved detection. Overall, concentrations of all PAHs in all species were below reported detection limits from previous sampling years (<0.070 mg/kg ww).

Assessments of fish health and tissue chemistry in 2022 for Arctic Char, Fourhorn Sculpin, and *Hiatella arctica* indicated low magnitude differences in endpoints over time, suggesting inherent interannual variability in endpoints. Sample timing continued to be appropriate for the assessment of reproductive endpoints for Fourhorn Sculpin and *Hiatella arctica*. All results are within predictions of the FEIS and subsequent addenda, which indicated the potential for non-statistically significant, low magnitude effects on marine fish health and condition. There was no evidence for Project-related effects beyond the magnitude of these predictions on fish health or tissue chemistry in 2022.

NON-INDIGENOUS SPECIES AND AQUATIC INVASIVE SPECIES (NIS/AIS) MONITORING (CHAPTER 8.0)

Comprehensive sampling has been conducted in the Milne Inlet marine environment to monitor for the presence of non-indigenous species (NIS) and aquatic invasive species (AIS), fulfilling PC Conditions No. 87, 89, and 91. The program included both targeted (e.g., benthic grabs, settlement plates, and vertical and oblique zooplankton tows) and general (e.g., screening all species identified through MEEMP components, such as fish and macroflora surveys) sampling efforts. All species were compared to a taxonomic inventory for Milne Inlet, which has been developed over time (starting with pre-Project baseline) and is updated annually. Species composition in the region is relatively unknown and it is expected that each year this sampling program will detect taxa that were not previously recorded. Literature reviews were performed on any taxa that were not part of the inventory to determine if their range on record included North Atlantic, Arctic and/or Canadian Arctic waters; in addition, these taxa were cross-referenced against both global and domestic databases of known invasive taxa (e.g., Molnar et al. 2008). Taxa were also cross-referenced with the Program-specific Watch List comprised of taxa considered to be low-risk (i.e., not listed on AIS databases but accepted range on record does not include Canadian Arctic) or high-risk (i.e., listed on AIS databases and accepted range on record does not include Canadian Arctic). Species placed on the Watch List include low to high-risk species that have a confirmed presence in the Project area that is not directly attributable to the Project, in addition to those species that require more supportive data. Should high-risk taxa be identified that are considered potentially introduced via Project shipping activities, they would be added to the “Trigger List” (a list of species that “trigger”. responsive actions which will be species specific and proportional to the risk).

The 2022 surveys resulted in 29 new additions to the taxonomic inventory for Milne Inlet (i.e., had not been observed in previous surveys). Almost all new taxa had records of occurrence in the Canadian Arctic. Algal specimens identified as cf. *Punctaria latifolia* and cf. *Stictyosiphon soriferus* were flagged for further review due to no or limited records in the Canadian Arctic. The fish species Halfbarred Pout (*Gymnelus hemifasciatus*) lacks records for the Eastern Canadian Arctic but is known from Arctic waters and the range may have been obscured by similarities to other *Gymnelus* species. A new record of Bryophyta indet. was sent to an expert for further identification as it had only been identified to phylum; this group mainly occurs in freshwater or terrestrial habitats and there are hundreds of species with records from the Canadian Arctic.

Additionally, AIS/NIS sampling in 2022 recorded two taxa that were flagged in previous years due to uncertainties in their natural range or because they were listed in an existing AIS database (the polychaetes *Marenzelleria* sp. and *Hesperonoe* sp Specimens of. *Hesperonoe* sp. were sent to taxonomic experts for independent verification.

Taxonomists at Biologica Environmental Services Ltd. indicated that the *Marenzelleria* sp. specimens closely matched the description for *Marenzelleria wireni*, an Arctic species known to occur in Milne Port, however the features required to make a confident identification of species were damaged or missing. The identification was left at the genus level as a precaution. Due to the missing features, the specimens were not sent for independent review as it was unlikely to be further resolved.

Unidentified specimens from the superfamily Buguloidea were also collected. This superfamily includes multiple species with documented ranges that include the project area, however, it also contains the genus *Tricellaria*, which was flagged in 2021 due to the genus containing a high-risk invader to the Canadian Arctic. Due to previous concerns, the specimens were flagged for independent review to determine if the identification could be clarified. Results of independent review remain pending for all taxa.

Two taxa, *Punctaria latifolia* and *Stictyosiphon soriferus,* were added to the Watch List in 2022 as a precaution. There are still no species on the Trigger List.

The Baffinland NIS/AIS monitoring program represents the most comprehensive monitoring program for NIS/AIS conducted by a marine port in Canada. Approximately 880 taxa have been identified in Milne Inlet through monitoring to date, which included close to 400 unique macroflora, zooplankton, benthic invertebrates, and fish species. The identification and flagging of individual taxa out of the hundreds identified in Milne Inlet indicated this surveillance program was effective and functioning as intended. The vast majority of these taxa have been designated as “No Risk” and are not considered to be of concern.

TIDALGAUGE (CHAPTER 9.0)

The tidal gauge monitoring program was intended to satisfy requirements of the Mary River Project’s (the Project) Ecological Effects Monitoring (EEM) programs and address Project Certificate Terms and Conditions (PC) Nos. 1, 76 and 83 of Project Certificate No. 005. The tidal gauge was installed at Milne Port from 05 July 2022 to 16 October 2022 to measure water column depth, temperature, salinity, and conductivity. The data showed a distinct seasonal pattern for near-surface water in Milne Inlet which was consistent with measurements from previous years. From 05 July to early September (first period) the tidal gauge measured large fluctuations in temperature (between 0 and 13 ˚C) and salinity (between 0 and 33 PSU), most likely the result of freshwater runoff from Phillips Creek during the spring freshet and the melting of sea ice in Milne Inlet near Milne Port. These processes caused the surface layer to be warmer and less saline than the water column beneath the pycnocline. As the water level varies with the tidal cycle, the tidal gauge switched between being positioned in the warmer, fresher water of the surface layer and the colder, more saline water at greater depth.

From early September to the tidal gauge’s retrieval (second period) the temperature and salinity time series stabilized after the spring freshet ended. A small diurnal fluctuation was observed in the temperature and salinity data in September but mostly ceased beginning in October. It is likely that these diurnal fluctuations were driven by tidal forcing, upwelling/downwelling during wind events, and continued freshwater runoff. Overall, temperature was generally lower and salinity was generally higher in the second time period than in the first time period, likely influenced by the autumn weather conditions. Air temperature in Milne Port decreases and fall storms with high winds cause the surface layer of the water column to become well mixed with the layers below resulting in generally colder and more saline surface waters.

The water level data showed that tides in Milne Port follow a mixed semidiurnal tidal cycle. Seven neap tides and seven spring tides occurred during the tidal gauge deployment. The mean water level observed was -0.41 m Canadian Geodetic Vertical Datum (CGVD). The maximum water level observed was 0.74 m CGVD and the minimum water level observed was -1.61 m CGVD.

The objective of PC Condition No. 1 is to provide feedback on the impacts that climate change might be having on the port facilities. The condition states that the Proponent shall use GPS monitoring or a similar means of monitoring at both Steensby Port (not active phase) and Milne Port, with tidal gauges to monitor the relative sea levels and storm surges at these sites. However, with the multi-year dataset collected to date, it has become apparent that the current survey equipment used to quantify relative sea level change using Milne Port tidal data is not providing the level of accuracy and precision required to meet this condition. Changes in relative sea level are expected to be on the scale of fractions of a millimeter per year while the resolution of data collected using GPS surveys is on the order of centimetres, accompanied by large errors. For example, modelling of vertical land motion for Canada (Robin et al., 2020 cited in James et al., 2021) indicated uplift rates of approximately 5 mm/year for northern Baffin Island while results of GPS surveys in 2022 showed the elevation of the tidal gauge decreasing 0.354 m from 2021. It is well known that quantitative measurements within this degree of precision and accuracy are extremely difficult to obtain at northern latitudes (e.g., Ludwigsen and Andersen, 2020; Raj et al., 2020).

While Baffinland can explore alternative options for survey equipment that would increase the accuracy and precision of field measurements, the resolution of the data is still unlikely to meaningfully fulfill this Condition. This is because significant trends in relative sea level are likely too small to be measurable in the short term based on projections that indicate that relative sea level will either fall or be near neutral for northern Baffin Island (James et al, 2021). Hence, relative changes in sea level are likely to be very small differences between two small quantities, both with high uncertainty. Climate change impacts on the project are unlikely to show up in relative sea level changes, even if they could be measured accurately, and are more likely to impact features such as changes in sea ice cover, temperature regime, and hydrologic regime.

Based on the above, Baffinland proposes not moving forward with tidal gauge monitoring in 2023 in favour of exploring alternative options to meet this Condition using one or many alternative indicators other than sea level rise.

MEWG COMMENTS ON FINAL REPORT

Comments on the 2022 MEEMP and NIS/AIS Monitoring Program Report are anticipated to be received from the Marine Environmental Working Group (MEWG) in June of 2023. Baffinland’s responses to MEWG comments and recommendations on the final report will be circulated to the MEWG as a standalone document and included as Appendix A in the subsequent year’s NIRB Annual Report).

ᐊᐅᓚᑦᑎᔾᓂᖕᒫᖅᑐᖅ ᓇᐃᓈᖅᓯᔪᖅ

ᐸᕝᕙᓪᓚᖓ ᓴᕕᒃᓴᓂᒃ ᐅᔭᕆᓐᓂᐊᕐᕕᒃ ᑯᐊᐳᕇᓴᖓ (ᐸᕝᕙᓪᓚᖓ) ᓇᖕᒥᓂᕐᑲᖅᑐᑦ ᐊᒻᒪᓗ ᐊᐅᓚᑦᑎᔪᑦ ᐃᓂᖅᓴᓕᐅᕐᓗᑎᒃ ᐅᔭᕆᓐᓂᐊᖅᑐᑦ ᓴᕕᒃᓴᓂᒃ (ᐱᓕᕆᐊᖅ) ᕿᑭᖅᑖᓗᑉ ᐅᐊᖕᓇᖕᖓᓂ, ᓄᓇᕗᒻᒥᑦ, ᒪᓕᒡᓗᒋᑦ ᑕᐃᒎᓰᑦ ᐊᒻᒪᓗ ᒪᓕᒋᐊᓖᑦ ᐅᔭᕆᓐᓂᐊᕈᓐᓇᐅᑎᐅᑉ ᓈᓴᐅᑎᐊ 005. ᓴᕕᒃᓴᐃᑦ ᐊᐅᓪᓚᖅᑎᑕᐅᖃᑦᑕᖅᑐᑦ ᓂᐅᕐᕈᑎᒋᔭᐅᔪᓄᑦ ᓯᑯᖃᖕᒋᑎᓪᓗᒍ ᓵᑕᖅᑕᐅᓯᒪᔪᒃᑯᑦ ᐅᒥᐊᕐᔪᐊᓄᑦ ᓴᕕᒃᓴᖅᑖᖅᐸᒃᑐᓄᑦ ᕿᒪᒎᐊᓂᒍᑦ, ᕿᒪᒎᐊᓂᑑᖅ ᐱᓇᓐᓇᖅᐸᓯᐊᓂ ᑕᓯᐅᔭᕐᒥᑦ. ᐅᒥᐊᕐᔪᐊᕐᑲᕐᑲᑦᑕᕐᓂᖅ ᑲᔪᓯᐊᓚᐅᖅᑐᖅ 2015-ᒥ ᓂᕈᐅᒋᔭᐅᓪᓗᓂᓗ ᑲᔪᓯᓂᕐᑲᕐᓂᐊᖅᐳᓂ ᐱᓕᕆᐊᓂᓗᒃᑖᕐᒋᓐᓂᒃ ᐱᓕᕆᐊᒥ (ᐅᑭᐅᓄᑦ 20 ᐅᖓᑖᓄᓪᓗ).

ᐃᓚᒋᔭᐅᓪᓗᓂ ᒪᓕᒋᐊᓕᖕᓄᑦ ᐱᓂᐊᕐᓂᕋᕈᑎᓄᑦ, ᐸᕝᕙᓪᓚᖓᑯᑦ ᓴᖅᑭᑦᑎᓚᐅᖅᑐᑦ ᐊᑐᓕᖅᑎᑦᑎᓪᓗᑎᓪᓗ ᐊᔾᔨᒌᖕᒋᑦᑐᓂᒃ–ᐃᓂᖅᑎᓇᔾᔪᑎᓂᒃ ᑕᕆᐅᐸ ᐊᕙᑎᖓᓄᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᕐᒧᑦ (MEEMP). ᑖᓐᓇ ᑕᕆᐅᐸ ᐊᕙᑎᖓᓄᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᕕᔭᐅᔪᖅ ᐋᖅᑭᒃᓱᖅᑕᐅᓯᒪᔪᖅ ᖃᐅᔨᓴᕈᑕᐅᓂᐊᖅᐳᓂ ᐱᓕᕆᐊᒧᑦ–ᐊᒃᑐᐊᓂᓪᓕᕐᓄᑦ ᐊᒃᑐᐃᑐᐃᓐᓇᕕᐊᓪᓕᕐᓄᑦ ᑕᕆᐅᐸ ᐊᕙᑎᖓᓂᒃ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᓪᓗᑎᓪᓗ ᑭᖑᓪᓕᖅᐹᒥ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᐅᓂᒃᑳᖕᒋᓐᓂ (ᑭᖑᓪᓕᖅᐹᒥᑦ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᐅᓂᒃᑳᑦ; ᐸᕝᕙᓪᓚᖓᑯᑦ 2012, 2013) ᑭᖑᓂᐊᒍᑦ ᐅᐃᒎᓪᓗᑎᒃ. ᑕᕆᐅᐸ ᐊᕙᑎᖓᓄᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᖅ ᐃᓚᖃᖅᑐᖅ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒥᒃ ᑕᕆᐅᐸ ᐃᒪᖓᓂ ᐊᒻᒪᓗ ᐃᓱᕐᓂᐅᐸ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ, ᐃᒪᕐᒥᐅᑕᓂᒃ ᕿᒥᕐᓗᖃᖕᒋᑦᑐᓂᒃ, ᐃᒪᕐᒥᐅᑦᑕᑦ ᐱᕈᖅᑐᑦ, ᐃᖃᓗᖕᓂᓪᓗ ᐃᖃᓗᐃᓪᓗ ᓇᔪᖓᒋᓐᓂᒃ. ᖃᐅᔨᓴᖑᒃᓴᓕᐅᕐᓂᖅ ᐋᕿᒃᓯᒪᔭᖕᒋᑎᒍᑦ ᑐᖕᖓᕕᖃᖅᑐᖅ ᓴᕕᕆᔭᖕᓂᒃ ᐅᔭᖅᑕᕐᓂᖅ ᐊᕙᑎᒥᒃ ᐊᒃᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ ᐱᔭᓇᐊᑐᔪᑎᒎᑦ ᖃᐅᔨᒪᔾᔪᑕᐅᔪᑦ (ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᓇᑕᒥᑦ 2012) ᐊᒻᒪᓗ ᐱᖃᓯᐅᑎᓪᓗᒋᑦ ᓈᓴᐅᑎᑎᒎᑦ ᐊᑐᖅᑕᐅᓇᓱᐊᖅᑐᑦ ᖃᐅᔨᓂᕐᒧᑦ ᐱᓕᕆᐊᖅ-ᓴᖅᑭᑦᑎᑕᕐᒋᑦ ᐊᒃᑐᐃᓃᑦ ᑕᕆᐅᐸ ᐊᕙᑎᖓᓄᑦ. ᑕᒫᓂᕐᒥᐅᑕᐅᖕᒋᑦᑐᑦ ᐆᒪᔪᑦ/ᑎᑭᐸᒃᑐᑦ ᐆᒪᔪᕋᓛᓂᒃ (NIS/AIS) ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓇᕐᓂᖅ ᐃᓚᒋᔭᐅᓪᓚᑎᒃᐳᖅ ᑕᕆᐅᐸ ᐊᕙᑎᖓᓄᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ ᐊᒻᒪᓗ ᐋᖅᑭᒃᑕᐅᓯᒪᓪᓗᑎᒃ ᑲᒪᒋᔭᐅᕐᑯᓪᓗᒋᑦ ᐊᑦᑕᕐᓇᑐᐃᓐᓇᕕᐊᓖᑦ ᐆᒪᔪᑦ ᓴᖅᑭᑐᐃᓐᓇᕕᐊᓖᑦ ᑕᕆᐅᐸ ᐊᕙᑎᖕᒋᓐᓄᑦ ᐅᒥᐊᕐᔪᐊᒥ ᐃᒥᕐᒥᑦ ᐃᒃᑕᖅᑯᑕᐅᕙᒃᑐᒥᑦ ᐊᒻᒪᓗ ᐅᒥᐊᕐᔪᐊᐸ ᓯᕗᓂᐊᓂ ᓂᐱᖕᒐᕙᒃᑐᓂ.

ᐅᓇ ᐅᓂᒃᑳᖅ ᓴᖅᑭᑦᑎᕗᖅ ᖃᐅᔨᓴᕈᑎᕕᓂᕐᓂᒃ ᑕᕆᐅᐸ ᐊᕙᑎᖓᓄᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᕐᒧᑦ (MEEMP) ᐊᒻᒪᓗ ᑕᒫᓂᕐᒥᐅᑕᐅᖕᒋᑦᑐᑦ ᐆᒪᔪᑦ/ᑎᑭᐸᒃᑐᑦ ᐆᒪᔪᕋᓛᓄᑦ ᖃᐅᔨᖅᐸᓪᓕᐊᖕᒋᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᖑᓚᐅᖅᑐᓂᒃ ᕿᒪᒎᐊᓂ 2022–ᒥ ᓯᑯᖃᖕᒋᑎᓪᓗᒍ, ᑭᖑᓕᕇᓄᑦ ᐅᑭᐅᓄᑦ 8–ᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓇᕐᓂᕐᓂᒃ. ᖃᓄᐃᓕᖓᓕᕐᓂᕆᔭᖕᒋᑦ ᑎᓂᓐᓂᕐ ᐅᓚᓐᓂᕐ ᖃᐅᔨᓴᕈᑎᓂᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓇᕐᓃᑦ ᑕᕆᐅᐸ ᐃᒪᖅᑯᖅᑐᓂᖕᓄᑦ ᐊᒻᒪᓗ ᓯᓚᑐᓕᒃᑳᓪᓚᖃᑦᑕᖅᑐᒧᑦ ᓴᖅᑭᑕᐅᓯᒪᖕᒥᔪᑦ.

ᑕᕆᐅᐸ ᐃᒪᖓ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ (ᐊᑉᑯᖅᑐᖅᓯᒪᔪᑦ 2.0)

ᑕᕆᐅᐸ ᐃᒪᖓ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᑕᐃᒃᑯᓂ ᐃᒪᕐᒥᐅᑕᓄᑦ ᐊᕙᑎᐅᐸ ᐊᒃᑐᖅᑕᐅᓂᖓᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᖅ (MEEMP) ᐃᓚᐅᔾᔨᓯᒪᔪᖅ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒥᒃ ᐃᒪᐅᑉ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᕿᒪᒎᐊᓂ ᑯᕕᓯᕝᕕᐅᕙᒃᑐᑦ ᐊᕙᑎᖓ ᓈᒻᒪᕐᑯᓪᓗᒋᑦ ᐅᔭᕆᓐᓂᐊᕈᓐᓇᐅᑎᐅᑉ ᓈᓴᐅᑖ 76, 83(a), 87, 89 ᐊᒻᒪᓗ 99(a), ᖃᐅᔨᓴᕐᓗᒋᓪᓗ ᑕᒪᐃᓐᓄᑦ ᐃᒪᐅᑉ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᖃᓄᐃᑦᑑᓂᖓ 'A' ᐃᒪᕐᒧᑦ ᓚᐃᓴᓐᓯᒧᑦ ᑯᕕᓯᕝᕕᐅᕙᒃᑐᓄᑦ. 2022–ᒥ, ᐃᒪᐅᑉ ᖃᓄᐃᑦᑑᓂᖕᒋᓐᓄᑦ ᖃᐅᔨᓴᖑᒃᓴᑦ ᑲᑎᖅᓱᖅᑕᐅᓚᐅᖅᐳᑦ ᑎᓴᒪᓂᒃ ᖃᐅᔨᓴᖑᒃᓴᓕᐅᕐᕕᖕᓂ ᕿᒪᒎᐊᓂ ᑰᒃᕝᕕᑦ ᑯᕕᔾᔭᐅᓪᓗᐊᖅᑐᒥᒃ (MP-05), ᐊᒻᒪᓗᑦᑕᐅᖅ ᑎᓴᒪᓂᒃ ᖃᐅᔨᓴᖑᒃᓴᓕᐅᕐᕕᖕᓂ ᑰᒃᑯᓂ ᐊᐃᑉᐸᖑᓂ ᑯᕕᔾᔭᐅᔪᒥ (MP-06) ᑕᐃᒃᑯᓂ ᕿᒪᒎᐊᓂ. ᑖᒃᑯᐊ ᑯᕕᔾᔭᐅᔪᑦ ᐊᕙᑎᒥ ᑯᕕᓯᕝᕚᑦ ᐊᖕᒪᓗᖅᑐᒥᒃ ᐋᖅᑭᒃᓯᒪᓪᓗᑎᒃ 250 ᒦᑕᓂᒃ ᐊᑐᓂ ᑯᕕᔾᔭᐅᔪᓂᑦ ᖃᐅᔨᓴᖅᐸᔾᔪᐊᖕᒋᓇᕈᒪᓪᓗᑎᒃ ᐊᓯᔾᔨᑐᐃᓐᓇᕕᐊᓪᓕᕐᓂᒃ ᐃᒪᐅᑉ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᐱᔾᔪᑎᒋᓪᓗᒍ ᐃᓂᒥ ᑯᕕᔾᔭᐅᔪᒥ ᐊᒻᒪᓗ ᐊᐅᓚᑕᐅᔪᑦ ᑯᕕᑎᑦᑎᕖᑦ, ᐱᖃᓯᐅᑎᓪᓗᒋᑦ ᓴᕕᒃᓴᒃ ᑲᑎᑕᐅᔾᔭᐅᖕᒋᓂ ᑰᒃᐸᓪᓕᐊᔪᑦ.

2022–ᒥ, ᐅᖅᑲᐅᓯᐅᓚᐅᖅᑐᑦ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᑦ ᖃᓄᐃᓕᖓᓕᕐᓂᕆᔭᖕᒋᑦ ᐃᒪᐅᑉ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᑭᒡᓕᖕᒋᓐᓄᑦ (ᓲᕐᓗ, ᐱᑦᑲᓪᓚᕆᒃᑐᑦ ᒥᑭᑦᑐᕋᓛᑦ, ᐆᒪᓇᑦᑎᐊᕐᓇᖅᑐᑦ, ᓴᕕᕋᔭᑦ, ᐅᖅᓱᐊᓗᒃᓴᑦ, ᐊᒻᒪᓗ ᓱᐳᕐᓇᖅᑐᓖᑦ ᐅᖅᓱᐊᓗᒃᓴᑦ

[PAHs]) ᐃᓗᐊᓅᑦᑐᐃᓐᓇᐅᕈᔪᓚᐅᖅᑐᑦ ᐊᔾᔨᒌᙱᕈᓘᔭᖅᑐᓂ ᐅᔾᔨᕆᔭᐅᔪᓂ ᑭᖑᓂᑦᑎᓐᓂ ᑕᕆᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐊᑦᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᒧᑦ ᖃᐅᔨᓴᐅᑉᓴᓕᐅᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᓄᑦ (2015-ᒥ 2021-ᒧᑦ). ᒪᓕᒃᑐᑦ ᑭᖑᓂᑦᑎᓐᓂ ᐱᓕᕆᐊᖑᕌᖅᑐᓂᒃ, ᐅᖅᓱᐊᓗᒃᓴᑦ ᐊᒻᒪᓗ ᓱᕈᕐᓇᖅᑐᓖᑦ ᐅᖅᓱᐊᓗᒃᓴᑦ ᖃᐅᔮᔭᐅᓚᐅᙱᑦᑐᖅ 2022−ᒥ ᐃᒪᕐᒥᒃ ᖃᐅᔨᓴᐅᑉᓴᓂ. ᐊᖏᔪᒃᓪᓚᖕᒥᒃ ᑭᒡᓕᒋᔭᐅᔪᓂᒃ ᖃᐅᔨᓴᖅᑕᐅᔪᓂᒃ ᐃᒪᕐᒥᒃ ᖃᐅᔨᓴᐅᑉᓴᓕᐅᕐᓂᕐᓂᒃ ᕿᙳᐊᓂ ᖃᐅᔮᔭᐅᓚᐅᙱᓚᑦ ᑕᒪᐃᓐᓂ ᑰᒃᑯᓂ ᖃᐅᔨᓴᐅᑉᓴᓕᐅᕐᕕᖕᓂ ᑕᒪᕐᒥᑦᑎᐊᕐᓗ ᑭᒡᓕᒋᔭᐅᔪᑦ ᖃᐅᔮᔭᐅᓚᐅᖅᐳᑦ ᑐᖓᓃᓐᓂᖏᓐᓂᒃ ᐊᒃᑐᐊᓂᓕᖕᓄᑦ ᐃᒪᕐᒧᑦ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᖃᐅᔨᒪᔾᔪᑕᐅᔪᓄᑦ [WQGs] (ᓲᕐᓗ, ᑲᓇᑕᒥ ᑲᑎᒪᔾᔫᑦ ᒥᓂᔅᑕᓄᑦ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ (CCME]). ᐃᓚᐅᖅᑐᒐᕐᓄᑦ, ᐊᑕᖏᖅᓗᒋᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᓗᒃᑖᑦ ᐃᓚᐅᖅᑐᒐᖃᐅᖅᑐᑦ ᑐᖓᓃᓚᐅᖅᑐᑦ ᑖᒃᑯᓄᖓ ᐊᒃᑐᐊᔪᓄᑦ ᖃᐅᔨᒪᔾᔪᑕᐅᔪᓄᑦ ᑭᓯᐊᓂ ᐊᑕᐅᓲᖅ ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᖁᕝᕙᖕᓂᖅᓵᕐᔪᓚᐅᖅᑐᖅ ᐊᒻᒪᓗ ᐃᓗᐊᓅᒃᑲᓗᐊᖅᑎᓪᓗᒍ ᕿᒥᕐᕈᓂᐅᑉ ᐊᓯᔾᔨᖅᑕᕐᓂᖏᓐᓄᑦ; ᓲᕐᓗ, ᐃᓱᒪᒋᖃᓱᐅᔾᔭᐅᙱᑦᑐᖅ ᑐᑭᖃᓪᓚᑦᑖᖅᑐᒥᒃ ᖄᖏᐅᑎᓂᐅᓗᓂ.

ᑲᑎᕝᕙᒋᑦ, ᖃᐅᔨᓴᖅᑕᐅᓯᒪᔪᑦ ᑲᑎᑎᓯᒪᔪᑦ ᓴᕿᕋᔭᐃᑦ, ᐆᒪᓇᒃᑎᐊᕐᓇᖅᑐᑦ ᐊᒻᒪᓗ ᐅᖅᓱᐊᓗᒃᓴᑦ ᖃᐅᔮᔭᐅᓚᐅᙱᑦᑐᑦ ᐅᕝᕙᓘᓐᓃᑦ ᐱᑕᖃᓚᐅᖅᑐᑦ ᐊᑦᑎᒃᑐᒥᑦ ᑲᑎᑎᓯᒪᔪᓂᑦ, ᓲᕐᓗ ᐊᒃᑐᐃᓂᕐᓗᓐᓂᑦ ᐆᒪᓂᖃᖅᑐᓄᑦ ᕿᙳᐊᓂᑦ ᑯᕕᕝᕕᐅᔪᒥ ᐊᕙᑎᒥᑦ ᑕᐃᒪᐃᓐᓇᔭᓚᐅᙱᑦᑐᑦ. ᐊᖏᓪᓕᒋᐊᖅᓯᒪᔪᒥᒃ ᓴᕕᒃᓴᑦ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᔪᑦ ᑕᕆᐅᑉ ᐊᕙᑎᖓᓄᑦ ᓴᖅᑭᑦᑐᑦ ᐱᓕᕆᐊᒥᑦ ᐃᓱᒪᒋᔭᐅᓪᓗᐊᑕᖅᐳᖅ ᓄᓇᐊᖃᖅᑐᓂ ᐃᓄᖕᓂᑦ. ᐱᔾᔪᑎᒋᓪᓗᒍ ᑲᓇᑕᒥ ᑲᑎᒪᔾᔫᑦ ᒥᓂᔅᑕᓄᑦ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ ᐃᒪᕐᒧᑦ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᖃᐅᔨᒪᔾᔪᑕᐅᔪᓄᑦ ᓴᕕᒃᓴᓄᑦ ᐱᕙᓪᓕᐊᑎᑕᐅᓚᐅᙱᑦᑐᑦ, 2022-ᒥ ᖃᐅᔨᓴᕈᑎᕗᓃᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖔᑕ ᕿᒥᕐᕈᔭᐅᓚᐅᖅᑐᑦ ᓴᕕᒃᓴᓄᑦ ᖃᐅᔨᓴᕈᑎᕗᓃᑦ ᑲᑎᖅᓱᖅᑕᐅᓚᐅᖅᑐᑦ ᐃᒪᕐᒥᐅᑕᓄᑦ ᐊᕙᑎᐅᑉ ᐊᒃᑐᖅᑕᐅᓂᖓᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᒃᑯᑦ ᐱᓕᕆᐊᖏᓐᓂᒃ (2017-ᒥ 2021-ᒧᑦ) ᖃᐅᔨᓴᕈᒪᓪᓗᑎᒃ ᐅᓄᖅᓯᕚᓪᓕᖅᓯᒪᖕᒪᖔᑕ ᐅᔭᕋᖕᓂᐊᕆᐊᓪᓚᖕᓂᓄᑦ ᕿᙳᐊᓂ ᐊᒃᑐᐊᖕᒪᖔᑕ ᐅᓄᖅᓯᕚᓪᓕᖅᓯᒪᔪᓄᑦ ᓴᕕᒃᓴᒃ ᐱᑕᕐᑲᕐᕕᖕᒋᓐᓂ. ᑲᑎᕝᕙᒋᑦ ᓴᕕᒃᓴᑦ ᐱᑕᕐᑲᕐᖎᖕᒋᑦ ᐃᒪᕐᒥᐅᑕᓂᒃ ᖃᐅᔨᓴᐅᑉᓴᓂᒃ ᑲᑎᑕᐅᔪᓂ 2022−ᒥ ᐃᓗᐊᓅᖏᓐᓇᓚᐅᖅᐳᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᐊᓂᒍᖅᑐᓂᒃ ᐊᕐᕌᒍᓂ ᑯᕕᓯᕝᕕᐅᔪᓂ ᐊᕙᑎᒥ MP-05−ᒥ ᐊᒻᒪᓗ MP-06−ᒥ ᑯᕕᓯᕝᕕᖕᓂ. ᓈᓴᐅᑕᐅᒐᔪᒃᑐᑦ ᐱᑕᕐᑲᕐᕕᐅᔪᓂ ᑰᒃᑐᓂ MP-05−ᒥ ᓱᕐᕋᓗᐊᓚᐅᙱᑦᑐᑦ, ᐊᔾᔨᒌᙱᓐᓂᖅᑲᕐᓂᖅᓴᐅᔪᑦ ᓇᓗᓇᐃᖅᑕᐅᓚᐅᖅᐳᑦ ᑯᕕᓯᕝᕕᐅᔪᓂ ᐊᕙᑎᒥ, ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖔᑕ ᐅᔾᔨᕆᔭᐅᔪᓂ 2018−ᒥ. ᓄᖑᑦᑐᑦ ᓴᕕᒃᓴᑦ ᐱᑕᕐᑲᕐᕕᖕᒋᓐᓂ ᑐᖓᓃᓚᐅᖅᑐᑦ ᖃᐅᔮᔭᐅᓂᕐᒧᑦ ᑭᒡᓕᐅᔪᓂᑦ ᐊᑐᓂ ᖃᐅᔨᓴᐅᑉᓴᓂ ᑲᑎᑕᐅᔪᓂᑦ 2022-ᒥᑦ, ᑐᑭᖃᖅᖢᓂ ᐅᓄᕐᓂᖅᓴᑦ ᖃᐅᔮᔭᐅᔪᓐᓇᖅᑐᑦ ᓴᕕᒃᓴᑦ ᐱᑕᕐᑲᕐᖒᑦ ᐱᑕᕐᑲᕐᕕᐅᓕᖅᑎᑕᐅᓚᐅᖅᑐᑦ ᒥᑭᑦᑑᕋᓛᓄᑦ, ᓂᕐᔪᑎᓄᐊᕈᓐᓇᙱᓐᓂᖅᓴᐅᔪᑦ ᐃᒪᕐᒥᐅᑕᓄᑦ. ᑖᓐᓇ ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖏᓐᓄᑦ ᕿᒥᕐᕈᔭᐅᓂᖅ ᐱᔭᕇᖅᑕᐅᓚᐅᕐᒥᔪᖅ ᑲᑎᕝᕙᒋᑦ ᑲᓐᓄᔭᑦ ᐱᓪᓗᒍ ᐊᔾᔨᒌᖏᓐᓂᖅᓴᐅᕐᑲᑦᑕᙱᓐᓂᖏᓐᓄᑦ ᖃᐅᔮᔭᐅᔪᑦ 2022−ᒥ ᐊᔾᔨᒌᙱᕝᕙᓂᐅᒃ ᑭᖑᓂᑦᑎᓐᓂ ᐊᕐᕌᒍᓂ. ᐅᔾᔨᕆᔭᐅᔪᑦ ᐊᔾᔨᒌᖏᓐᓂᖏᑦ ᑲᑎᕝᕙᒋᑦ ᑲᓐᓄᔭᑦ ᐊᒃᑐᐊᓂᖅᖁᔨᓚᐅᙱᑦᑐᖅ MP-05-ᒧᑦ ᐊᒻᒪᓗ MP-06-ᒧᑦ ᓴᓗᒪᖅᓴᖅᑕᐅᓯᒪᔪᑦ ᐃᒦᑦ ᑯᕕᔭᐅᓂᖏᓐᓄᑦ ᐊᑎᖕᓂᖅᓴᐅᓚᐅᖅᑐᑦ ᐱᑕᕐᑲᕐᓂᖏᑦ; ᓯᓕᒃᑲᓐᓂᖅ, ᓄᖑᓯᒪᔪᑦ ᑲᓐᓄᔭᐃᑦ ᐱᑕᕐᑲᕐᕕᐅᔪᓂ ᐊᑎᓂᖅᓴᐅᓚᐅᖅᑐᑦ ᐊᒻᒪᓗ ᓱᕐᕋᓗᐊᖏᕐᒍᑎᒃ.

ᑕᒪᐃᓐᓄ, ᖃᐅᔨᓴᕈᑎᕗᓃᑦ ᓇᓗᓇᐃᕐᓯᓚᐅᖅᑐᑦ, ᐅᓪᓗᒥᒧᑦ, ᐃᒪᐅᑉ ᖃᓄᐃᓕᖓᓂᖓᑕ ᑭᒡᓕᖏᑦ ᐱᑕᕐᑲᕐᑯᐅᔪᓂ ᑐᖓᐅᑦᑎᓯᒪᐃᓐᓇᓚᐅᖅᑐᑦ ᖃᓄᐃᓪᓕᔪᖅᑲᖅᑳᖅᑎᓐᓇᒍ ᑭᒡᓕᐅᔪᓂᒃ ᐋᓐᓂᕈᑕᐅᔪᓐᓇᖅᑐᓄᑦ ᐃᒪᕐᒥᐅᑕᓄᑦ ᐆᒪᔪᓄᑦ. ᓯᕗᒧᐊᖓᓱᒃᑎᓪᓗᑕ, ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᓇᕐᓂᖅ ᐃᒪᐅᑉ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᐊᑐᓕᕐᑯᔭᐅᓯᒪᔪᖅ.

ᐃᒫᓂ ᐃᓱᕐᓃᑦ ᖃᓄᐃᑦᑑᓂᖏᑦ (ᐊᓪᒍᖅᑐᖅᓯᒪᔪᑦ 3.0)

ᐃᓱᕐᓂᕐᒥᒃ ᖃᐅᔨᓴᐅᑉᓴᓕᐅᕐᓂᖅ ᕿᙳᐊᓂᑦ ᐱᓕᕆᐊᖑᒐᓚᐅᖅᑐᖅ ᓈᒻᒪᒋᔭᐅᓕᕐᑯᓪᓗᒋᑦ ᐅᔭᕋᖕᓂᐊᕈᓐᓇᐅᑎᒥ ᒪᓕᒋᐊᓖᑦ ᓈᓴᐅᑎᖏᑦ 76, 83(a), 84, 85, 87 ᐊᒻᒪ 99(a). ᐱᔭᕇᖅᑕᐅᓚᐅᖅᑎᓪᓗᒋᑦ ᑭᖑᓕᕇᑦ ᐊᕐᕋᒍᑦ ᐱᖓᓱᑦ ᐊᑐᓕᖅᑎᑦᑎᓂᕐᒥᒃ, ᐊᒻᒪᓗᖅᓯᓯᒪᔪᓂ ᐃᖅᑲᖓᓂ ᐊᒻᒪᓗ ᐃᓱᕐᓂᕐᒥᒃ ᖃᐅᔨᓴᐅᑉᓴᓕᐅᕐᓃᑦ ᐱᓕᕆᐊᖑᓚᐅᖏᑦᑐᖅ 2021−ᒥ ᐊᖏᓂᖏᑦ ᑐᑭᒧᐊᕈᑎᒃᓴᖃᑦᑎᐊᖏᓐᓂᖏᓐᓄᑦ ᖃᓄᐃᓕᕙᓪᓕᐊᓂᕆᔭᐅᔪᑦ ᐅᔾᔨᕆᔭᐅᔪᑦ ᐅᓪᓗᒥᒧᑦ ᐃᓱᕐᓂᐅᑉ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᓇᓗᓇᐃᖅᓯᔾᔪᑏᑦ. ᐹᕙᓖᓐᑯᑦ ᐱᓂᐊᕐᓂᕋᖅᓯᒪᔪᑦ ᐊᑐᓕᖅᑎᑦᑎᕙᓪᓕᐊᖏᓐᓇᕐᓗᑎᒃ ᐊᑕᖑᔪᒥᒃ ᖃᐅᔨᓴᐅᑉᓴᓕᐅᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᒥᒃ ᐋᖅᑭᒋᐊᖅᑕᐅᓯᒪᔪᒥᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᓇᕐᓂᕐᒧᑦ ᐊᑯᓚᐃᓐᓂᖏᑦ ᐱᖓᓱᑦ ᐊᕐᕋᒍᑦ ᐊᓂᒍᕋᖓᑦ, ᒪᓕᒃᑯᑦ ᐊᑐᖅᑕᐅᕙᔪᒃᑐᒥᒃ ᐊᕙᑎᐅᑉ ᐊᒃᑐᖅᑕᐅᓂᖏᓐᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᓇᕈᑎᓄᑦ (ᐊᕙᑎᐅᑉ ᐊᒃᑐᖅᑕᐅᓂᖏᓐᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᓇᕐᓂᖅ ᑭᖑᓪᓕᕐᒥ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᓇᕐᓃᑦ ᐊᑕᖑᔪᓄᑦ ᐱᓕᕆᖃᑎᒋᒍᑕᐅᔪᓄᑦ ᐊᖓᓗᖅᓯᓯᒪᔪᓄᑦ ᐃᖅᑲᖓᓂ ᐊᒻᒪᓗ ᐃᓱᕐᓂᕐᒧᑦ ᖃᐅᔨᓴᐅᑉᓴᓕᐅᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᓄᑦ 2023−ᒥᐅᓛᖅᑐᖅ.

2022–ᒥ ᐃᓱᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᑦ ᑐᕌᒐᖅᑲᖅᑐᑦ ᖃᐅᔨᓴᒐᒃᓴᓕᐅᕐᓂᕐᓂᒃ ᑎᓴᒪᓂᒃ ᖃᐅᔨᓴᕐᕕᖕᓂᒃ ᑕᐅᕘᓇ ᐱᓇᖕᓇᖕᒐᓂ ᑐᑭᓕᓃᑦ ᑐᑭᓕᐊᖅᑐᑦ ᐊᑯᓐᓂᖕᒋᓐᓂ ᓴᕕᒃᓴᓂᒃ ᐅᓯᓕᖅᓯᐃᙯᕕᐅᑉ ᐊᒻᒪᓗ ᕿᓪᓚᐊᑕ ᑰᖕᒐᓂ. ᑐᕌᒐᐅᔪᑦ ᑖᒃᑯᓇᓂ ᓴᖅᑭᓯᒪᔪᓂᒃ ᓴᓂᖅᑰᑦᑎᓯᒪᔪᓂ ᑕᐃᒪᐃᓕᖕᒐᓂᐅᕙᒃᑐᓂ ᐃᓱᕐᓂᕐᒧᑦ ᐊᒻᒪᓗ ᐃᖅᑲᖕᒐᓂ ᐱᕈᖅᑐᓂᑦ ᓇᑐᓇᐃᒃᑯᑕᐅᔪᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ 2020–ᒥ ᖃᐅᔨᓴᕐᕕᒥ SW-2, ᐊᒃᑐᐊᔪᑦ ᐊᓯᖕᒋᑦ ᖃᐅᔨᓴᕐᕕᐅᔪᑦ ᐱᓇᖕᓇᖕᓂᖕᒐᓂ ᑐᑭᓕᓃᑦ ᑐᑭᓕᐊᖅᑐᓂ. ᖃᐅᔨᓴᒃᑲᓂᕐᕖᑦ ᖃᐅᔨᓴᒐᒃᓴᓕᐊᕚᓚᐅᖅᑐᑦ 2022–ᒥ ᐃᑯᓕᖅᑕᖕᒋᑦ ᖃᐅᔨᔭᐅᔪᑦ ᐅᖃᐅᓯᐅᔪᑦ SW-2–ᒥ ᐱᔾᔪᑎᒋᓪᓗᒋᑦ ᓯᐊᒻᒪᕝᕕᐅᓯᒪᔫᒃ ᐊᖏᓂᖕᒐ ᐊᒻᒪ ᒫᓐᓇᓚᐅᑲᒃ ᐊᔾᔨᒌᙱᓐᓂᖕᒋᑦ ᐊᖏᓂᖕᒋᓪᓗᑦ ᐋᖅᑭᒃᓯᒪᓂᖕᒋᑦ ᐊᒻᒪᓗ, ᑭᖑᓂᐊᒍᓪᓗ, ᖃᐅᔨᓴᑦᑎᐊᕐᓂᖅᓴᐅᓗᑎᒃ ᐊᖏᓂᖕᒐᓂᒃ ᐊᒻᒪᓗ ᖃᓄᖅ ᐊᖏᑎᒋᔪᒥᒃ ᐱᓕᕆᐊᒧᑦ–ᐊᒃᑐᐊᔪᑦ ᐊᒃᑐᐃᓃᑦ (ᓲᕐᓗ, ᐊᖑᑎᓂ ᐊᐅᓚᑕᐅᓪᓗᑎᒃ ᓯᑲᐅᓂᒃ-ᐃᑲᔪᖅᑕᐅᑎᓪᓗᒋᑦ ᓴᕕᒃᓴᓂᒃ ᐅᓯᔪᒃᓴᑦ ᓅᑕᐅᑎᓪᓗᒋᑎ).

ᖃᐅᔨᓴᕈᑎᕖᑦ 2022–ᒥᑦ ᓇᓗᓇᐃᖅᓯᓚᐅᖅᑐᑦ ᓇᓗᓇᐃᕈᑎᑕᖅᑲᙱᓐᓂᖕᒐᓂᒃ ᐱᓕᕆᐊᒧᑦ–ᐊᒃᑐᐊᔪᓂᑦ ᐊᒃᑐᐃᓂᕐᓂᒃ ᐃᓱᕐᓂᐅᑉ ᖃᓄᐃᑦᑑᓂᖕᒐᓄᑦ (ᓲᕐᓗ ᓂᕿᑦᑎᐊᕙᐃᑦ, ᓴᕕᕋᔭᑦ, ᐅᖅᓯᐊᓗᒃᓴᓪᓗ) SW-2–ᒥᑦ ᐊᓯᖕᒋᓐᓂᒡᓗ ᐱᓇᖕᓇᖕᒐᓂ ᑐᑭᓕᓃᑦ ᖃᐅᔨᓴᕐᕕᐅᔪᓂ: ᐱᑕᖃᕐᕕᐅᔪᑦ 2022–ᒥᑦ ᑐᖕᓚᓃᓚᐅᖅᑐᑦ ᐊᒃᑐᐊᒧᑦ ᑲᓇᑕᒥᑦ ᑲᑎᒪᔩᑦ ᒥᓂᔅᑕᓄᑦ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ ᐃᓱᕐᓂᐅᑉ ᖃᓄᐃᑦᑑᓂᖕᒐᓄᑦ ᖃᐅᔨᒪᔾᔪᑕᐅᔪᑦ ᐅᕝᕙᓘᓐᓃᑦ ᒪᓕᒃᑐᑦ ᑎᑎᕋᖅᑕᐅᓚᐅᖅᑐᓂᒃ ᑭᖑᓂᖕᒐᑦᑎᓐᓂ ᖃᐅᔨᓴᒐᒃᓴᓕᐅᕐᓂᐅᓚᐅᖅᑐᓂ ᐊᕐᕌᒍᓂᑦ. ᐱᔾᔪᑎᒋᓪᓗᒋᑦ ᐊᖏᓂᖕᒋᑦᑕ ᐋᖅᑭᒃᓯᒪᓂᖕᒋᑦ, ᐊᔾᔨᒌᖕᑲᑦᑕᙱᓐᓂᖕᒋᓐᓄᑦ ᒥᑭᑦᑑᓃᑦ ᐃᓗᓕᓴᔪᑦ ᖃᐅᔨᓴᕐᕕᖕᓂ SW-1, SW-2, ᐊᒻᒪᓗ SW-3 ᓇᓗᓇᐃᖅᓱᑐᐃᓐᓇᓕᐊᓖᑦ ᐊᑦᑐᐃᓂᐅᔪᓂᒃ ᐊᖑᑎᖕᒋᑦ ᐃᖕᒋᕐᕋᓂᖕᒋᓐᓄᑦ ᑎᒃᑕᐅᑎᑦᑎᔪᑦ, ᐊᑐᖅᓘᑎᒃ ᑕᐃᒪᐃᑐᐃᓐᓇᖅᑐᑦ ᐱᔾᔪᑕᐅᔪᑦ ᓲᕐᓗ ᓯᑯᐃᑦ ᓅᓐᓂᖕᒋᑦ ᐊᒻᒪᓗ ᓯᓪᔭᒥ ᐃᓱᕐᓃᑦ ᑲᔪᓯᓂᕙᒃᑕᖕᒋᑦ ᐱᔾᔪᑕᐅᖃᑕᐅᑐᐃᓐᓇᓕᐊᖃᓚᐅᖅᑐᑦ. ᐱᒪᕆᐅᓂᖅᓴᐅᓪᓗᓂ, 2020–ᒥ ᑖᓐᓇᑐᐊᖑᓚᐅᖅᐳᖅ ᐱᑕᖃᓗᐊᙱᖁᑎᒃ ᒥᑭᑦᑑᑎᕋᓛᑦ ᐃᓗᓕᓴᔪᑦ ᒪᓕᒃᑕᐅᓪᓗᑎᒃ ᐊᖏᔪᒥᒃ ᐅᓄᕈᓐᓃᖅᐹᓪᓕᕐᓂᖕᒋᑦ ᐃᖅᑲᖕᒐᓂ ᐱᑕᖃᕐᓂᓪᓚᓃᑦ ᐊᒻᒪᓗ ᐊᔾᔨᒌᙱᕈᑑᔭᕐᓂᖕᒋᑦ, ᑕᒪᓇᓗ ᓴᖅᑮᔭᖅᑎᑦᑎᖅᑰᔩᓪᓗᓂ ᓄᓇᖕᒐᓂᑐᐊᖅ ᖃᐅᔨᓴᕐᕕᖕᒥ SW-2-ᒥ. ᖃᐅᔨᓴᕐᕕᐅᔪᓂᑦ SW-1 ᐊᒻᒪᓗ SW-3 (ᓴᓂᑦᑎᐊᖕᒐᓂ SW-2), ᐃᓚᖕᒋᑦ ᐅᓄᕈᓐᓂᕙᖅᓯᒪᔪᑦ ᒥᑭᑦᑑᑎᕋᓛᑦ ᐃᑯᓕᖕᒋᑦ ᐅᔾᔨᕙᔭᐅᔪᑦ 2022-ᒥ ᐊᕐᕌᒍᕆᓵᖅᑕᑦᑎᓐᓂ ᐱᔾᔪᑎᒋᓪᓗᒍ—, ᐊᒃᑐᐊᓂᓕᒃ ᐅᓄᕈᓐᓂᕙᕐᓂᖕᒋᑦ ᕿᒥᕐᓗᖅᑲᙱᑦᑐᓄᑦ ᓇᓗᓇᐃᖅᓯᔾᔪᑎᑦ ᖃᐅᔨᔭᐅᓚᐅᙱᑦᑐᑦ.

ᑕᒪᐃᓐᓄ, ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓐᓇᕐᓂᕐᒧᑦ ᖃᐅᔨᔭᐅᔪᑦ ᐃᓗᐊᓐᓂᖕᒋᓐᓇᓚᐅᖅᑐᑦ ᓇᓚᐅᑦᑖᕈᑕᐅᔪᑦ ᑭᖑᓪᓕᖅᐹᒥᑦ ᐊᕝᕙᑎᒥᒃ ᐊᒃᑐᐃᓂᕐᓄᑦ ᐅᓂᒃᑳᖕᒋᓂ ᑭᖑᓂᐊᒍᓪᓗ ᐅᐃᖕᒍᕐᒧᑦ, ᓇᓚᐅᑦᑖᕈᑕᐅᓚᐅᖅᑐᖅ ᐱᕐᔪᐊᖑᙱᑦᑐᐃᓐᓇᓕᐊᓖᑦ ᐊᒻᒪᓗ ᓄᓇᖕᒐᓂ ᐃᓱᕐᓃᑦ ᐊᖑᑎᖕᒋᑕ ᐃᖕᒋᕐᕋᓂᖕᒋᓐᓄᑦ, ᓱᕐᖄᓗᐊᕐᓂᐊᕋᓱᒋᔭᐅᙱᕐᕗᓂ ᖃᖕᒪᙳᖅᐸᓪᓕᐊᑎᓪᓗᒍ. ᐊᑐᓕᕐᑯᐃᓯᒪᓕᖅᑐᒍᑦ, ᖃᐅᔨᓴᒐᒃᓴᓕᐅᖕᒋᓐᓇᕐᓗᑎᒃ 2023-ᒥ ᐃᓚᒋᔭᐅᓗᓂ ᐊᑕᖕᒌᔪᒥᒃ ᑲᑐᔾᔭᐅᓗᓂ ᐊᖕᒪᓗᖅᓯᓯᒪᔪᓂ ᐃᖅᑲᖕᒐᓂ ᐊᒻᒪᓗ ᐃᓱᕐᓂᕐᓂᒃ ᖃᐅᔨᓴᒐᒃᓴᓄᑦ ᐱᓕᕆᐊᖑᕙᒃᑐᓄᑦ ᐊᕐᕌᒍᐃᑦ ᐱᖕᒐᓱᑦ ᐊᓂᒍᑐᐊᕌᖕᒐᑕ ᑐᑭᓯᐅᒪᓂᕐᒥᒃ ᑐᑭᓯᒃᑲᓂᐅᔭᕐᑯᓪᓗᒋᑦ ᐃᓱᕐᓃᑦ ᐊᖏᓂᖕᒋᑦ ᐋᔾᔨᒌᙱᓐᓂᖕᒋᓐᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓐᓇᕐᑯᓪᓗᖕᒋᑦᓚ ᐊᒃᑐᐃᓂᐅᑐᐃᓐᓇᓕᐊᓕᖕᓄᑦ ᐱᓕᕆᐊᒥ ᐃᓕᓇᓂᕐᓂ ᐊᖏᓕᓃᖕᓂᖕᒋᓐᓄᑦ.

ᐃᖅᑲᖕᒐᓂ ᐱᕈᖅᑐᑦ (ᐊᒡᒍᖅᑐᖅᓯᒪᔪᑦ 4.0)

ᐃᖅᑲᖕᒐᓂ ᐱᕈᖅᑐᑦ ᖃᐅᔨᓴᒐᒃᓴᓕᐅᖅᑕᐅᔪᑦ ᕿᓐᖑᐊᓂᑦ ᐱᓕᕆᐊᖑᓚᐅᖅᑐᑦ ᓈᒪᒃᓯᕐᑯᓪᓗᒋᑦ ᐅᔭᕋᖕᓂᐊᕈᓇᐅᑎᒥ ᒪᓕᒋᐊᓖᑦ 76, 87, 99(a) 99(c), ᐊᒻᒪᓗ 126. ᐊᕐᕌᒍᑦ ᐱᖕᒐᓱᑦ ᑭᖑᓕᕇᓂ ᐊᑐᓕᖅᑎᑕᐅᓚᐅᖅᑎᓪᓗᒍ, ᐊᒃᑐᐊᖃᑎᒌᑦ ᐊᖕᒪᓗᖅᓯᓯᒪᔪᑦ ᐃᖅᑲᖕᒐᓂ ᐊᒻᒪᓗ ᐃᓱᕐᓂᕐᒧᑦ ᖃᐅᔨᓴᒐᒃᓴᓕᐅᕐᓂᕐᒥ ᐱᓕᕆᐊᖅ ᐋᖅᑭᒋᐊᖅᑕᐅᓚᐅᖅᑐᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓐᓇᕐᓂᕐᒧᑦ ᐊᑯᓚᐃᓐᓂᖕᒋᑦ ᐊᕐᕌᒍᑦ ᐱᖕᒐᓱᑦ ᐊᓂᒍᕌᒍᒧᑦ, ᒪᓕᒡᓗᑎᒡᓗ ᑐᑭᒧᐊᒍᑎᒃᓴᖅᑕᖃᑦᑎᐊᖕᒋᓐᓂᖕᒐᓄᑦ ᖃᓄᐃᓕᐅᕐᓕᐊᓂᖕᒋᓐᓄᑦ ᐅᔾᔨᕈᓱᐊᔪᓂ ᒫᓐᓇᒧᑦ ᑎᑭᖕᒍᒍ ᐃᖅᑲᖕᒐᓂ ᐱᕈᖅᑐᑦ ᓇᓗᓇᖅᓯᔾᔪᑎᖕᒋᑦ. ᐹᕝᕙᖏᓐᖓᒃᑯᑦ ᐊᖕᒋᖅᓯᒪᔪᑦ ᐊᑐᓕᖅᑎᑦᑎᕝᕕᓕᐊᖕᒋᓇᓂᕐᒥᑦ ᐊᑕᖕᒌᔪᒥᒃ ᖃᐅᔨᓴᒐᒃᓴᓕᐅᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᒧᑦ ᐋᖅᑭᒋᐊᖅᑕᐅᓯᒪᔪᒥᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓐᓇᕐᓃᑦ ᐊᕐᕌᒍᐃᑦ ᐱᖕᒐᓱᑦ ᐊᓂᒍᕈᖕᒐᑕ, ᒪᓕᖕᓂᖅᓴᐅᓪᓗᓂ ᐊᑐᖅᑕᐅᓚᔪᒃᑐᒥᒃ ᐆᒪᔪᓂᑦ ᖃᐅᔨᓴᒐᒃᓴᓕᐅᕐᓂᕐᓂᒃ ᐊᓯᖕᒋᓐᓄᑦ ᐅᔭᕋᖕᓂᐊᓂᕐᒥᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᒧᑦ (ᓲᕐᓗ, ᓚᕝᒪᑐᖅᑲᒃᑯᑦ ᐊᕝᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᕐᒧᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᖅ). ᑭᖑᓪᓕᕐᒥ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓇᕈᑏᑦ ᐊᕐᕌᒍᓕᒫᒧᖕᒐᔪᑦ ᐊᑕᖕᒋᕐᓗᒍ ᐊᒃᑐᐊᖅᑎᑏᒃᑯᑦ ᐊᖕᒪᓗᖅᓯᓯᒪᔪᑦ ᐊᒻᒪᓗ ᐃᓱᕐᓂᕐᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓐᓇᕐᓂᕐᒧᑦ 2023–ᒥᐅᓛᖅᑐᖅ.

ᐃᖅᑲᖓᓂ ᐱᕈᖅᑐᑦ ᖃᓄᐃᐸᕝᕚᓕᐊᓂᖏᓐᓄᑦ ᓇᓗᓇᐃᖅᓯᓯᒪᔪᑦ ᖃᐅᔨᓴᕐᕕᖓᓂ SW-1−ᒥ ᑎᑭᖕᒍᒧ SW-4-ᒧ 2022−ᒥ ᒪᓕᑐᐃᓐᓇᓚᐅᖅᑐᑦ ᑭᖑᓂᖓᕐᑎᓐᓂ ᑕᕆᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᒧᑦ ᐊᕐᕌᒍᓚᐅᖅᑐᓄᑦ. ᑭᓯᐊᓂ, ᑐᙵᕕᒋᓪᓗᒋᑦ ᐆᒪᔪᑦ ᓇᔪᖓᒋᑕ ᓯᓚᑎᖏᑕᓗ ᖃᓄᐃᑦᑑᖃᑦᑕᖅᓯᒪᓂᖏᑦ ᐊᒻᒪᓗ ᐃᓅᓯᖏᓐᓂ ᖃᓄᐃᓕᐅᖃᑦᑕᖅᓯᒪᓂᖏᑦ ᐆᒪᔪᐃᑦ ᐊᕐᕆᕐᖏᐊᕐᔪᒃᑐᓄᑦ, ᓇᓗᓇᐃᖅᓯᔾᔪᑏᑦ ᑕᑯᒃᓴᐅᑎᑦᑎᔪᑦ ᐊᖏᔫᕐᔪᐊᒥᒃ ᐊᒻᒪᓗ ᒫᓐᓇᓚᐅᑲᒃ ᐊᔾᔨᕐᖏᕐᕈᓘᔅᖅᑐᖃᕐᓂᖓᒍᓂᒃ ᐊᕐᕌᒍᓄᑦ ᑎᓴᒪᓄᑦ ᐋᖅᑭᒃᓯᒪᔪᓂ (2019-2022), ᓂᕆᐅᒋᔭᐅᓪᓗᑎᒡᓗ. ᑭᑭᑕᐅᓪᓗᓂ SW-2−ᒥ 2020−ᒥ, ᐃᖅᑲᖓᓂ ᓇᓗᓇᐃᒃᑯᑕᐃᑦ ᐊᔾᔨᓐᓇᖅᐸᕆᑦ ᐊᔾᔨᕐᒋᑦᑐᓄᑦ ᐊᕐᕌᒍᓄᑦ ᐊᒻᒪ ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖕᒑᑕ ᕿᒥᕿᐳᓪᓗᒋᑦ ᖃᓂᒋᔮᓂ ᖃᐅᔨᓴᕐᕖᑦ, ᐊᒻᒪᓗᑦᑕᐅᖅ ᖃᓂᒋᔭᕐᒋᓐᓂ ᐅᔾᔨᕆᔭᐅᔪᑦ 15−ᓂᒃ ᖃᐅᔨᓴᕋᒃᓴᓕᐅᕐᕕᖓᓂ ᑕᐅᕗᓇ ᐱᓇᓐᓇᖖᒑᖓᒍᑦ ᑐᑭᓕᕆᑎᒍᑦ 2020-ᒥ.

ᖃᐅᔨᓴᕐᕕᐅᔪᖅ SW-2 ᐅᔾᔨᕐᓇᓚᐅᖅᑐᖅ ᑕᐃᒪᐃᒪᔫᒃᑐᔪᓂ ᕿᒪᐃᓪᓗᓂ 2020−ᒥ ᐱᔾᔪᑕᐅᓪᓗᑎᒃ ᐅᓄᕈᓐᓃᖅᐸᕝᕙᓕᕐᓂᖓᓐᓄᑦ ᐃᖅᑲᖓᓂ ᐱᕈᖅᑐᓄᑦ ᓇᓗᓇᐃᒃᑯᑦᑕ ᐃᒫᓂᓗ ᐃᓱᕐᓃᑦ ᐊᕐᕆᕐᑕᐅᓂᖅᓴᐅᓂᖓᓐᓄᑦ ᖃᓄᐃᓕᖓᓂᖏᑦ ᐊᒃᑐᐊᓂᓖᑦ ᐊᓯᖏᓐᓄᑦ ᓯᒃᓴᖅᐸᓯᖕᓄᑦ ᖃᐅᔨᓴᕐᕕᐅᔪᓂ ᐱᓇᖕᓇᖖᒑᖓᓂ ᑐᑭᓕᕇᑦ. ᑖᒃᑯᐊ ᖃᓄᐃᓕᖓᓂᐅᔪᑦ ᐃᓱᒪᒋᔭᐅᔪᑦ ᓴᖅᑮᔭᖅᑎᑦᑎᓇᓱᒋᔭᐅᓪᓗᑎᒃ ᓄᓇᖓᓂ ᐊᒃᑐᖅᑕᐅᔪᓐᓇᖅᑐᑦ ᐸᖁᓵᒃᑕᐅᓂᕐᒋᓂᒃ ᐊᖀᑎᑦ ᐃᕐᒋᕐᕋᑎᑕᐅᓂᕐᒋᓐᓄᑦ ᐃᓗᐊᓃᓪᓗᑎᒃ ᑕᐃᒪᐃᓕᖓᐃᓐᓇᖅᑐᑦ ᐱᐅᓯᐅᕙᒃᑐᑦ ᓴᖅᑮᔭᖅᑎᑦᑎᔪᑦ ᐊᕐᕆᔪᒪᓇᕐᒥᒃ ᒥᑭᑦᑑᑕᐅᓂᖅᓴᑎᒍᑦ ᐊᔾᔨᕐᒃᑲᑦᑕᙱᑦᑐᑦ. ᓇᓗᓇᐃᖅᓯᓯᒪᔪᒍᑦ 2020-ᒥᑐᐊᖅ ᐅᓄᙱᓐᓂᖅᓴᐅᓚᐅᕐᓂᕐᒋᓐᓂᒃ ᒥᑭᔫᑕᐅᓂᖅᓴᑦ ᒪᓕᒃᑕᐅᓪᓗᑎᒃ ᐱᑕᖃᕈᐊᕈᓐᓃᖅᑰᑎᒃ ᐃᖅᑲᖓᓂ ᐱᑕᖃᖅᕕᐅᔪᓂ ᐊᒻᒪᓗ ᐊᔾᔨᕐᙱᓐᓂᕐᒋᓐᓂᒃ. ᐃᖅᑲᖓᓃᑦᑐᑦ ᖃᐅᔨᒪᔭᐅᔪᑦ ᐅᑎᖅᐸᕝᕙᓕᐊᑲᐅᖅᑐᕈᓐᓇᖅᑐᑦ ᓄᓇᖓᓂ ᐸᒡᕕᓭᒃᑕᐅᓂᕐᒧᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ, ᐊᒻᒪᓗ ᖃᐅᔨᓴᖅᐸᕝᕙᓕᐊᕐᒋᓐᓇᕐᓃᑦ ᖃᐅᔨᓴᕈᑎᕕᓃᑦ 2021-ᒥ ᓴᖅᑮᔭᖅᑎᑦᑎᔪᑦ ᑲᑎᕐᒍᒋᑦ ᐱᑕᖃᖅᕕᐅᓂᕐᒋᑦ (ᒪᓕᒃᕐᒍᒋᑦ ᐊᕐᒋᓂᖓᓄᑦ ᐅᓄᖅᓯᕙᓪᓕᐊᔪᑦ) ᐊᒻᒪᓗᓗ ᐊᔾᔨᕐᙱᕈᓘᔅᖅᓂᕐᒋᑦ (ᐅᑎᖅᑐᑦ 2019-ᒥᑎᑐᑦ ᖃᓄᐃᓕᖓᓂᐅᓚᐅᖅᑐᓄᑦ) ᐊᒻᒪᓗ ᓱᕐᕋᕐᕿᓐᓇᖅᕐᒍᑎᒃ 2022-ᒥ. ᖃᐅᔨᓴᕐᕕᐅᔪᖅ SW-1 ᐊᒻᒪᓗ SW-3 (ᖃᓂᒋᔮᓂ SW-2), ᐃᓚᕐᒋᑦ ᐱᑕᖃᕈᐊᕈᓐᓃᖅᑐᑦ ᒥᑭᑦᑑᑕᐅᓂᖅᓴᑦ ᐅᔾᔨᕆᔭᐅᓚᐅᖅᑐᑦ 2022-ᒥ ᐊᒃᑐᐊᓪᓗᑎᒃ ᑭᖑᓂᖓᕐᑎᓐᓄᑦ ᐊᕐᕌᒍᓄᑦ, ᐊᒃᑐᐊᓂᓖᑦ ᐃᑕᖃᕈᐊᕈᓐᓃᖅᑰᑎᒃ ᐃᖅᑲᖓᓂ ᕿᒥᕐᕈᖅᑲᙳᕐᑐᑦ ᐱᑕᖃᕐᓂᖓᓄᑦ ᐅᔾᔨᕆᔭᐅᓚᐅᙳᕐᑐᑦ.

ᖃᐅᔨᓴᖅᐸᕝᕙᓕᐊᕐᓇᕐᓂᕐᒥ ᖃᐅᔨᔭᐅᔪᑦ 2022-ᒥᑦ ᐃᓗᐊᓃᕐᓇᓚᐅᖅᑐᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᔪᓄᑦ ᑭᖑᓪᓕᖅᐹᒥ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᐊᓂᐊᖅᑐᑦ ᐅᓂᒃᑳᕐᒥᑦ ᑭᖑᓂᐊᒍᓪᓗ ᐅᐃᒍᒥ, ᓇᓚᐅᑦᑖᕈᑕᐅᓚᐅᖅᑐᖅ ᒥᑭᑦᑐᒥᒃ ᐊᒻᒪᓗ ᓄᓇᖓᑐᐊᖅ ᐃᓱᕐᓃᑦ ᐸᒡᕕᓭᒃᑕᐅᓂᖏᑦ ᐊᒃᑐᐊᔪᑦ ᐊᖀᑎᑦ ᐃᕐᒋᕐᕋᒃᑕᕐᓂᖓᓄᑦ ᐊᒻᒪᓗ ᐊᒃᑐᐊᔪᑦ ᒫᓐᓇᓚᐅᑲᒃ ᐊᒃᑐᐃᓂᕐᓄᑦ ᐃᖅᑲᖓᓂ ᐱᕈᖅᑐᓄᑦ ᕿᒥᕐᕈᖅᑲᙳᕐᑐᓄᑦ ᓇᓗᓇᐃᒃᑯᑦᑐᕐᓂᓄᑦ. ᑕᒪᐃᓐᓄ ᐃᖅᑲᖓᓂ ᕿᙳᐊᓃᑦᑐᑦ ᓱᓕ ᖃᓄᐃᙳᕐᑐᑦ ᐊᒻᒪᓗ ᐊᔾᔨᕐᙱᕈᓘᔅᖅᑐᑦ. ᖃᔨᐅᓴᕐᒃᓴᓕᐅᕐᓂᖅ ᑲᔪᓰᓐᓇᕐᓂᐊᖅᑐᑦ 2023-ᒥ ᐃᓚᒋᔭᐅᓗᓂ ᐊᑕᕐᒌᓯᒪᔪᒥᒃ ᐊᒃᑐᐊᖃᑎᖐᒃᑐᓂ ᐊᖓᓗᖅᓯᓯᒪᔪᓂ ᐃᖅᑲᖓᓂ ᐊᒻᒪᓗ ᐃᓱᕐᓂᕐᒧᑦ ᖃᐅᔨᓴᕐᕕᒃᓴᓕᐅᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᒧᑦ ᐱᓕᕆᐊᕐᒍᖅᑲᑦᑕᖅᑐᑦ ᐊᓂᒍᕐᕈᓐᖓᑕ ᐱᖓᓱᑦ ᐊᕐᕌᒍᑦ ᐊᒻᒪᓗ ᑐᑭᓯᑎᑦᑎᒃᑲᓐᓂᕐᓂᐊᖅᖢᓂᓗ ᐃᖅᑲᖓᓂ ᐱᕈᖅᑐᑦ ᐊᔾᔨᕐᙱᕐᓂᕐᒋᓂᒃ ᖃᐅᔨᓴᖅᐸᕝᕙᓕᐊᕐᓇᕐᓗᑎᒡᓗ ᐊᒃᑐᐃᓂᐅᑐᐃᓐᓇᕆᐊᓖᑦ ᐱᓕᕆᐊᒥ ᐱᓕᕆᓂᕐᒋᐅᖅᑐᓂᒃ.

ᐱᕈᕐᕕᐅᕙᒃᑐᑦ, ᐱᖁᖅᑐᕋᓛᑦ ᐊᒻᒪᓗ ᐃᖅᑲᕐᒥᐅᑕᑦ (ᐊᒡᒍᖅᑐᖅᓯᒪᔪᑦ 5.0)

ᖃᐅᔨᓴᕐᕕᒃᓴᓕᐅᕐᓃᑦ ᐱᕈᕐᕕᐳᕙᒃᑐᑦ, ᐱᕈᖅᑐᕋᓛᑦ, ᐊᒻᒪᓗ ᐃᖅᑲᕐᒥᐅᑕᑦ ᐱᕈᖅᑐᕋᓛᑦ ᒪᓕᒃᑐᑦ ᐅᔭᕋᓂᐊᕈᓐᓇᐅᑎᒥ ᒪᓕᒃᑕᐅᔭᕆᐊᓕᒃ ᓈᓴᐅᑎᓕᒃ 99(a) ᐊᒻᒪᓗ (c) ᐊᒃᑐᐊᔪᑦ ᐅᔭᕋᓂᐊᕈᓐᓇᐅᑎᒥ ᒪᓕᒋᐊᓕᖕᓄᑦ 76, 83(a), 84 ᐊᒻᒪ 87. ᖃᐅᔨᓴᕐᓗᒋᑦ ᐱᓕᕆᐊᒥᖕᒑᕈᑎᐃᓐᓇᕆᐊᓖᑦ ᐊᒃᑐᐃᓃᑦ ᐱᕈᕐᕕᐅᕙᒃᑐᒥ, ᐱᕈᖅᑐᕋᓛᑦ, ᐊᒻᒪ ᐃᖅᑲᕐᒥᐅᑕᑦ, ᐊᑐᖅᑕᐅᓚᐅᖅᑐᑦ ᐃᒫᓂ ᓈᓴᖅᑕᐅᔾᔭᔪᑦ ᐊᑐᖅᑕᐅᓚᐅᖅᑐᑦ ᐊᖅᑲᐅᒪᓪᓗᓂᒃ ᑭᒡᓕᓯᓂᐊᕈᔾᔨᑦ ᐊᖅᑲᐅᒪᔾᔨᑦ ᖃᐅᔨᓴᖅᖢᑎᒃ ᐊᖅᑲᔭᓄᑦ, ᕿᒥᕐᕈᖅᑲᙳᕐᑐᓂᒃ, ᐊᒻᒪᓗ ᐃᖃᓗᐃᑦ ᐆᒪᔪᑦ ᐊᔾᔨᕐᙱᕐᒋᐊᕐᔪᒃᑕᕐᑕᐅᔪᑦ ᑎᑎᕋᖅᐸᕝᕙᓕᐊᓗᒋᓪᓗ ᓇᔪᖓᒋᑦ ᖃᓄᐃᑦᑑᓂᖓᓐᓄᑦ ᐃᓗᐊᓂ ᐋᖅᑭᒃᓱᖅᑕᐅᓯᒪᒧᑦ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᑭᐸᙵᒃᑐᑦ ᐋᖅᑭᕙᒃᑕᐅᓯᒪᔪᑦ ᐃᖅᑲᖓᓂ ᑕᒪᕐᒥᙵᓂᒃ ᐅᑉᐸᒃᑕᐅᓯᒪᕗᑐᓂ ᐊᒻᒪᓗ ᖃᐅᔨᕆᐊᕐᕕᐅᔪᓐᓇᖅᑐᓂ ᐃᓂᓂ. ᖃᐅᔨᓴᕐᒃᓴᖏᑦ ᐱᔪᓐᓇᖅᑕᐅᓂᖓᓐᓄᑦ ᑲᑎᑕᐅᓚᐅᖅᑐᑦ ᐊᒻᒪᓗ ᓇᒃᓯᐅᔾᔨᐅᓪᓗᑎᒃ ᐃᓕᓴᕆᔨᐅᓯᒪᔪᓄᑦ ᐆᒪᔪᑦ ᐊᕕᒃᑐᖅᑕᐅᓯᒪᓂᖓᓐᓄᑦ ᖃᐅᔨᓴᕐᕕᖓᓄᑦ (ᐸᐊᒑᔾᔮᒃ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ ᐱᕗᑦᑎᖅᑎᑦ) ᐆᒪᔪᑦ ᐊᕕᒃᑐᖅᑕᐅᓯᒪᓂᖏᓐᓄᑦ ᓇᓗᓇᐃᔭᖅᑕᐅᕐᑯᓪᓗᒋᑦ. ᓇᓗᓇᐃᖅᓯᔾᔪᑏᑦ ᐱᖃᓯᐅᔾᔨᔪᑦ ᐳᓴᓐᑎᖓᓂᒃ (%) ᐱᕈᕐᕕᐅᕙᒃᑐᑦ ᖃᓄᐃᑦᑑᓂᖓᓂᒃ, ᐃᖅᑲᖓᓂ ᐱᕈᖅᑐᕋᓛᑦ, ᐊᒻᒪᓗ ᓂᒪᑦᑐᓇᖅᑐᑦ ᐃᖅᑲᖓᓂ ᐆᒪᔪᕋᓛᑦ, ᐱᑕᖃᕐᓂᖏᑦ (ᓈᓴᖅᑕᐅᓂᖏᑦ) ᓂᒪᑦᑐᓇᖅᑐᑦ ᐆᒪᔪᕋᓛᑦ ᐊᒻᒪᓗ ᐊᔾᔨᕐᙱᓐᓂᖏᓐᓄᑦ ᓇᓗᓇᐃᕈᑏᑦ (ᓱᕐᓗ ᐆᒪᔪᑦ ᐊᕕᒃᑐᖅᑕᐅᓯᒪᔪᑦ

ᐱᑕᖃᕐᔪᐊᕐᓂᖅᑎᑦ ᐊᒻᒪᓗ ᓯᒻᓴᓐ ᐊᔾᔨᒌᙱᕆᕈᑑᔭᖅᑐᓄᑦ ᓇᓗᓇᐃᖅᓯᔾᔪᑏᑦ) ᑕᒃᑯᓄᖓ ᐱᕈᖅᑐᕋᓛᓄᑦ ᐊᒻᒪᓗ ᐃᖅᑲᕐᒥᐅᑕᓄᑦ.

ᑭᑉᐹᓇᒃᑐᓂᖅᑖᖅᓯᒪᔪᑦ ᖃᐅᔨᓴᒐᒃᓴᑦ 2022–ᒥ ᓇᓗᓇᐃᖅᓯᓚᐅᖅᑐᑦ ᐃᖅᑲᖕᒐᑕ ᐊᕙᑎᐊᓂ ᕿᙳᐊᓂ ᑐᓚᒃᑕᕐᕕᐅᑉ ᐊᕐᑭᓐᓂᖅᑲᓄᑦ ᐱᕈᕐᕕᐅᔪᓐᓇᖅᑐᖅ, ᐃᓱᓪᓗᐊᑕᖅᑐᑦ ᐊᒻᒪᓗ ᓯᐅᕋᕐᒥᒃ. ᐊᔾᔨᐸᓗᖅᑎᑦ ᐱᕈᖅᑐᕋᓛᑦ ᐊᒻᒪᓗ ᐃᖅᑲᕐᒥᐅᑕᑦ ᐆᒪᔪᑦ ᐊᕙᒃᑐᖅᓯᒪᓂᖅᑎᑦ ᖃᐅᔨᔭᐅᓚᐅᖅᑐᑦ 2022–ᒥ ᐊᕐᕌᒍᓂ ᐊᓂᒍᖅᑐᓂᒃ (2018-2021). ᓄᓇᖓᓂ ᓇᓗᓇᐃᖅᓯᔾᔪᑎᑦ (ᓲᕐᓗ, ᐳᓴᓐᑎᑦ, ᐅᓄᕐᓂᖅᑎᑦ, ᐆᒪᔪᑦ ᐊᕙᒃᑐᖅᓯᒪᔪᑦ ᐱᑕᖃᑦᑎᐊᕐᓂᖅᑎᑦ, ᐊᒻᒪ ᓯᒻᓴᓐ ᐊᔾᔨᒌᙱᕆᕈᑑᔭᖅᑐᓄᑦ ᓇᓗᓇᐃᖅᓯᔾᔪᑏᑦ) ᐊᔾᔩᓚᐅᙱᒻᒪᑕ ᑭᑉᐹᓇᒃᑑᑎᓂ, ᑭᓯᐊᓂ ᓈᓴᐅᑎᑎᒍᑦ ᐅᔾᔨᕐᓇᖅᑐᒥᒃ ᐊᔾᔨᙱᕐᔪᐊᓚᐅᖅᑯᑎᒃ ᓴᖅᑮᔭᕐᕕᐅᔪᑦ ᐊᒻᒪ ᖃᐅᔨᕆᐊᕐᕕᐅᔪᓇᖅᑐᑦ 2022–ᒥ. ᐊᕐᕋᒍᓂ ᐊᔾᔨᖕᒋᓐᓂᖅᑎᑦ ᖃᐅᔨᔭᐅᓚᐅᖅᑐᑦ ᓂᒪᑦᑐᓐᓇᙱᑦᑐᑦ ᐃᖅᑲᕐᒥᐅᑕᑦ ᐆᒪᔪᑦ ᐊᕙᒃᑐᖅᑕᐅᓯᒪᔪᑦ ᐊᒻᒪᓗ ᓂᒪᑦᑐᓐᓇᖅᑐᑦ ᐅᓄᕐᓂᖅᑎᑦ ᐊᑯᓐᓂᖅᑎᓐᓂ ᐊᕐᕋᒍᑦ ᐅᓄᙱᓐᓂᖅᓴᐅᓚᐅᖅᑐᑦ 2022–ᒥ ᖃᓄᐃᓐᓂᖅᓴᐅᓂᖅᑎᑦ ᕿᒥᕐᕈᔭᐅᑦᑐᑎᒃ 2021–ᒥ, ᑭᓯᐊᓂ ᖃᓄᐃᑉᐸᓪᓕᐊᓂᖓ ᐊᔾᔨᑦᑐᓂᐅᒃ ᑕᒻᒦᓄᑦ ᐃᓅᖓᓄᑦ. ᐅᓄᙱᓐᓂᖅᓴᑦ ᓈᓴᐅᑎᖏᑦ 2022–ᒥ ᓇᓗᓇᐃᖅᓯᔾᔪᑎᓂᒃ ᖃᐅᔨᔭᐅᓚᐅᖅᐳᑦ ᑕᒪᐃᓐᓂᒃ ᓴᖅᑮᔭᕐᕕᐅᔪᓂᒃ ᐊᒻᒪ ᖃᐅᔨᕆᐊᕐᕕᐅᔪᓇᖅᑐᓂ, ᓇᓗᓇᐃᖅᓯᔾᔪᑎᑦᑲᓚᐅᙱᑦᑐᖅ ᐱᔾᔪᑕᐅᓂᖏᓐᓂᒃ ᐱᓕᕆᐊᒧᑦ–ᐊᒃᑐᐊᔪᓂᑦ ᐊᔾᔨᕚᓐᓂᖅᑎᑦᑎᓐᑦ; ᐱᔾᔪᑕᐅᓚᐅᖅᐳᑦ ᓄᑖᓂᒃ ᑭᑉᐹᓇᒃᑯᑦ ᐃᒪᕐᓂᒃ ᐊᒃᑐᖅᑕᐅᓯᒪᓂᖏᓐᓄᑦ ᐃᒪᑦᑎᐊᕙᖕᒥᑦ ᑰᒃᑐᓂᑦ.

ᑯᑭᐅᔭᑦ ᑐᕐᑯᓂᖅᑎᑦ ᐅᔾᔨᕆᔭᐅᓚᐅᖅᑐᑦ ᑕᑯᔭᐅᔪᓐᓇᕈᓐᔭᖅᐳᑎᒃ ᖃᓂᒋᔭᖏᓐᓂᒃ ᐃᓂᐅᔪᓂᒃ ᐃᓗᐊᓂᓗ ᑭᑉᐹᓇᒃᑐᑦ ᑕᒪᐃᓐᓄ ᖃᐅᔨᓴᕐᕕᖕᓂᑦ ᖃᐅᔨᕆᐊᕐᕕᐅᔪᓇᖅᑐᓂᓗ ᐃᓂᐅᔪᓂ 2022-ᒥ. ᑐᕐᑯᔾᔪᑎᖏᑦ ᓇᓗᓇᐃᖅᑕᐅᔪᓇᓚᐅᙱᑦᑐᑦ ᑭᓯᐊᓂ ᐊᒃᑐᐊᓂᖅᑲᖅᑯᔾᔫᙱᑦᑐᖅ ᐊᓯᔾᔨᖅᐸᓪᓚᐊᔪᓄᑦ ᐃᒪᐅᑉ ᖃᓄᐃᑦᑑᓂᖓᓄᑦ ᐅᕝᕙᓘᓐᓃᑦ ᐃᓱᕐᓂᕐᒥ ᖃᓄᐃᓪᓕᖓᓂᖓᓄᑦ. ᓇᓗᓐᖏᑦᑐᑦ ᐊᖏᓂᖓᓄᑦ ᑕᐃᒪᐃᑐᐃᓐᓇᖅᑐᑦ ᑯᑭᐅᔭᑦ ᑐᕐᑯᕙᓪᓕᐊᓂᖏᑦ, ᐊᑐᓚᐅᖅᑐᖅ ᐅᓄᖅᑐᓂ ᐆᒪᔪᑦ ᐊᔾᔨᙱᖏᐊᕐᔪᒃᑯᓂ ᑕᒃᐱᖕᓂᓗ ᐃᓂᓂ, ᖃᐅᔨᑎᑦᑎᓪᓗᓂ ᐊᓯᖕᒋᓐᓂᒃ ᐱᔪᑎᒥᒃ ᐱᔪᑎᓂᒡᔫᓐᓃᑦ ᐊᒃᑐᐃᔪᓂᒃ ᑕᕆᐅᒥ ᑯᑭᐅᔭᓂᒃ. ᐱᔪᑕᐅᑐᐃᓐᓇᕆᐊᖦᖢᑦ ᑕᐃᒪᐃᑎᑦᑎᔪᑦ ᑕᒪᓇᐃᑐᐃᓐᓇᖅᑲᑦᑕᕐᓂᖅᑎᓐᓄᑦ ᐃᖅᑲᓯᐅᑎᓪᓗᑎᑦ ᑰᒃᑯᑦ ᓂᓪᓚᓯᓗᐊᙱᑦᑐᑦ ᑕᕆᐅᖑᓗᐊᖅᑐᑦ ᑕᕆᐅᒥ ᓯᑯᓂᑦ, ᑰᒃᑐᑦ ᐃᖅᑲᖓᓄᑦ.

ᐱᓕᕆᐊᖑᓚᐅᖅᑐᖅ 2021–ᒥᑦ, ᐊᒃᑐᐃᓂᖕᒧᑦ ᐊᖏᓂᖓ ᕿᒥᕐᕈᔭᐅᓚᐅᖅᑐᖅ ᐊᑐᕐᓗᑎᒃ ᕿᒥᕐᕈᔭᐅᕙᓪᓕᐊᓪᓗᑎᒃ ᓇᓚᐅᑦᑖᕐᓱᒡᓗᑎᒃ ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᐊᖏᓂᖏᓐᓂᑦ ᖃᐅᔨᓂᐊᕐᓗᑎᒃ ᐱᓕᕆᐊᓄᑦ–ᑐᑦᕋᖓᔪᓂᑦ ᐊᓯᔾᔨᖅᑐᓂᑦ ᒪᓕᒃᓗᑎᒃ ᐊᔾᔨᒌᙱᑦᑑᑎᓂᑦ ᖃᐅᔨᓴᕐᕕᖕᓂᑦ ᐊᖏᓂᖏᓐᓂᑦ (ᑲᑎᕐᓗᒋᑦ, 25 2022–ᒥᑦ ᐊᔾᔨᙱᕐᓗᓂᐅᒃ 16–ᓂᑦ 2021–ᒥᑦ) ᓈᒻᒪᑕᐅᖕᒪᖖᑦ ᖃᐅᔨᓇᓯᕆᐊᒃᓴᖅ ᐊᓯᔾᔨᖅᑐᓂᑦ. ᕿᒥᕐᕈᕙᓪᓕᐊᓪᓗᑎᒃ ᖃᐅᔨᓴᕈᑎᕗᓐᑦ, ᐃᓚᖃᖅᑐᓂ ᐆᒪᔪᑦ ᐊᕙᒃᑐᖅᓯᒪᔪᓂ ᓄᐊᑕᓂᑦ ᐃᓕᔭᐅᔪᑦ ᐆᒧᖓ ᑎᑎᖅᑲᓄᑦ, ᓇᓗᓇᐃᕐᓯᔾᔨᑦ ᓖᓐᓇ ᖃᐅᔨᓴᖅᑲᒃᓴᑦ ᐊᖏᓂᖏᑦ ᓈᒻᒪᙱᒻᒪᑕ ᖃᐅᔨᓇᓯᕆᐊᒃᓴᖅ ᐱᓕᕆᐊᒃᓴᒥᑦ–ᓴᖅᑭᑐᒥᒃ ᐊᓯᔾᔨᖅᑐᒥᑦ ᓄᓇᓕᖕᓂᑦ ᐋᖅᑭᒪᓂᖓᓂ ᐅᕝᕙᓘᓐᓃᑦ ᓇᓗᓇᐃᔭᐃᑦᑎᐊᕐᐸᒃᓗᑎᒃ ᓄᓇᓕᖕᓂᑦ. ᑕᐃᒪᐃᓐᓂᖓᓄᑦ, ᓖᓐᓇᐅᔪᖅ ᓈᓴᐅᑏᑦ ᖃᓄᐃᓕᖓᓂᖓᓂᑦ ᑐᑭᓕᐅᖅᑕᐅᔭᕆᐊᖃᖅᑐᑦ ᐅᔾᔨᖅᓯᑎᐊᕐᓗᑎᒃ. ᖃᐅᔨᓴᕋᖅᓴᓂᑦ ᐱᓇᓱᐊᕆᐊᖃᕋᔭᖅᑐᑦ ᑖᓱᒧᖓ ᐱᓕᕆᐊᒧᑦ ᑎᑭᐅᑎᔾᔭᓇᕐᑐᓗᑎᑦ ᑭᓪᓕᖃᖅᑐᒥᑦ ᐃᒪᕐᒥᑦ ᖃᐅᔨᓴᓂᕐᒥᑦ ᐊᖏᓂᖓᓂᑦ >0.8 ᕿᒥᕐᕈᓪᓗᑎᒃ, ᓇᓗᓇᐃᖅᑕᐅᔪᖅ ᐆᒻᒪᖅᑯᑎᓂᑦ ᖃᐅᔨᓴᓂᕐᒥᑦ, ᓈᒻᒪᓯᔭᖅᑎᑦᑐᖅ ᑭᓪᓕᖃᖅᑐᒥᑦ ᓯᑯᖃᖅᑎᑎᓪᓗᒍᑦ–ᐃᒪᕐᒥᑦ ᖃᐅᔨᓴᓂᕐᒥᑦ ᐃᓚᒌᒥᑦ (ᐋᓐᑏᓯ/ᓯᑎᐱᓇ). ᑕᐃᒪᐃᒻᒪᑦ ᑲᔪᓯᑎᑦᑎᕐᑯᔭᐅᕚᑦ ᓖᓐᓇ ᖃᐅᔨᓴᖃᖕᓴᕐᓂᑦ ᐊᒻᒪᓗ ᖃᐅᔨᓴᕐᓂᖅᑲᕐᓂᐊᕐᓗᑎᒃ (ᓲᕐᓗ, ᖃᐅᔨᓗᑎᒃ ᐊᖏᔪᓂᒃ ᖃᓄᐃᓕᖁᓪᓚᐊᓂᓇᔭᐅᔪᓂᒃ), ᐊᖏᕈᑎᒥᓗᒍᑦ ᐊᒃᑐᐊᓂᓕᖅᓂᒃ ᓈᓴᖅᑕᐅᓯᒪᔪᑦ ᑭᓪᓕᒥᑎᑕᐅᔪᓂᒃ.

ᑕᐃᒪᓐᓄ, ᐱᕈᖅᑐᕋᓛᑦ ᐊᒻᒪᓗ ᐃᖅᑲᕐᒥᐅᑕᑦ ᐱᑕᖃᕐᑯᖅᑎᑦ ᐋᖅᑭᒃᓯᒪᓂᖅᑎᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖖᑦ ᕿᒥᕐᕈᔭᐅᔪᓐᓇᓚᐅᖅᑐᑦ ᑖᒃᑯᓇᓂ ᓴᖅᑮᔭᖅᑐᒥ ᐊᒻᒪᓗ ᖃᐅᔨᕆᐊᕐᕕᐅᔪᓐᓇᖅᑐᓂ ᑭᓯᐊᓂ ᐊᔾᔩᖅᑲᑦᑕᖅᑎᑦᑐᑦ ᐊᕐᕋᒍᓂᑦ ᐃᓚᖕᒋᓐᓄᑦ ᓇᓗᓇᐃᕈᑎᓄᑦ, ᐊᐅᓚᑕᐅᑐᐃᓐᓇᖅᑲᑦᑕᕐᓂᖅᑎᑦ ᐊᕙᒃᑐᖅᓯᒪᔪᓂᑦ ᐊᕙᑎᒥ ᐱᔪᑕᐅᔪᓂᒃ. ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓐᓇᕐᓱᒌᑦ ᓖᓐᓇᒧᑦ ᑎᑭᕐᓗᒍ ᓴᖅᑮᓚᐅᙱᑦᑐᑦ ᓇᓗᓇᐃᖅᓯᔾᔪᑎᓂᒃ ᐊᑦᕌᖏᒥᒃ ᐃᓂᒥᒃ ᐅᕙᓐᓂᓐᓂᑦ ᓖᓐᓇᓚᐅᑉ ᖃᓄᐃᓕᕙᓪᓕᐊᓂᖁᔭᐅᔪᓂᒃ ᐊᒃᑐᐊᓂᖃᑐᐃᓐᓇᖁᓂᒃ ᐱᓕᕆᐊᒧᑦ–ᓴᖅᑭᑎᑕᐅᔪᓄᑦ ᐊᒃᑐᖅᓯᓂᐅᕙᑐᓄᑦ ᓴᓇᔭᐅᓂᖏᓐᓄᑦ ᐅᕙᓐᓂᓐᓂᑦ ᐊᐅᓚᓂᖏᓐᓄᑦ ᐱᓕᕆᐊᒥ ᐊᒻᒪᓗ ᕿᓚᒧᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ. ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓇᕐᓂᖅ ᐱᕈᖅᑐᕋᓂᒃ ᐊᒻᒪᓗ ᐃᖅᑲᕐᒥᐅᑕᓂᒃ ᐋᖅᑭᒃᓯᒪᓂᖏᓐᓂᒃ ᐊᑐᓕᖁᔭᐅᖖ ᐊᑐᐃᓐᓇᖁᔭᐅᓪᓗᑎᒃ ᑖᒃᑯᓂᖓᑦᑕᐃᓐᓇᖅ ᖃᐅᔨᓴᖃᖕᓴᓂᒃ ᐊᒻᒪᓗ ᓈᓴᐅᓯᕆᓂᕐᒧᑦ ᐋᖅᑭᒃᓯᒪᓂᕐᓄᑦ.

ᑕᒪᐃᓐᓄᑦ, ᓇᓗᓇᐃᖅᓯᓐᓈᕐᓗᒍ ᓈᓴᐅᑎᑎᒍᑦ ᑭᒡᓕᐅᔪᑦ ᑕᒪᑐᒧᙵ ᐃᓗᓕᓇᔭᐅᔫᓄᑦ (ᓲᕐᓗ ᐊᒃᐸᓯᒃᑐᑦ ᓈᓴᐅᑎᑎᒍᑦ ᑭᒡᓕᖏᑦ), 2022-ᒥᑦ ᖃᐅᔨᓴᕈᑎᕙᓂᕐᓂᑦ ᖃᐅᔨᔭᐅᔪᑦ ᓇᓗᓇᐃᖅᓯᔪᑦ ᑕᒪᓐᓇ ᐱᓕᕆᐊᒥ ᐱᓕᕆᓃᑦ ᐅᓪᓗᒥᒧᑦ ᓴᖅᑮᓯᒪᙱᑦᑐᑦ ᐊᒃᑐᐃᓂᕐᓗᙵᓂᕐᓂᒃ ᐱᕈᖅᑐᕋᓛᓄᑦ ᐊᒻᒪᓗ ᐃᖅᑲᕐᒥᐅᑕᓄᑦ ᕿᓚᒻᒧᐊᓂ ᑐᓚᒃᑕᕐᕙᖕᒥ.

ᑕᕆᐅᒥ ᐃᖃᓗᐃᑦ ᐱᑕᖃᕐᕕᖏᑦ (ᐊᙳᖅᑐᖅᓯᒪᔪᑦ 6.0)

ᓈᒻᒪᒃᓯᕐᑯᓪᓗᒍ ᐅᔾᕋᖕᓂᐊᕈᓐᓇᐅᑎᒥ ᒪᓕᒋᐊᓕᒃ ᓈᓴᐅᑎᖓ 99(b)(ii), (c), 113, ᐊᒻᒪᓗ 114, ᖃᐅᔨᓴᐅᒃᓴᑦ ᖃᐅᔨᓴᖅᑕᐅᕐᑯᓪᓗᒋᑦ ᐊᒃᑐᐊᓂᓖᑦ ᑕᕆᐅᕐᒥᐅᑕᑦ ᐃᖃᓗᐃᑦ ᐊᒥᓲᓂᖏᓐᓄᑦ (*Salvelinus alpinus*) ᐊᓯᖏᓪᓗ ᐃᖃᓗᐃᑦ ᐃᒪᕐᒥᐅᑕᐃᑦ ᕿᙳᐊᓂᕈᔪᒃ. ᐊᒥᓱᑦ ᖃᐅᔨᓴᐅᒃᓴᓕᐅᕈᓱᑦ ᐊᑐᖅᑕᐅᓚᐅᖅᑐᑦ ᑐᕌᒐᖃᕐᑯᓪᓗᒋᑦ ᐊᔾᔨᒌᖏᑦᑐᓂᑦ ᐆᒪᔪᓂᑦ ᐊᒻᒪᓗ ᓇᔪᒐᖏᑦ ᖃᓄᐃᑦᑑᓂᖏᓐᓄᑦ, ᐱᖃᓯᐅᔾᔨᓪᓗᑎᒃ ᐊᐅᓚᓴᕐᓂᕐᒥᒃ (ᐊᐅᓚᓴᕐᓂᖅ ᐊᒻᒪᓗ ᑲᓕᑲᑦᑕᖏᓐᓂᖅ), ᒪᑎᑦᑕᐅᑏᑦ, ᐃᓯᕙᐅᔪᓐᓇᖅᑐᑦ, ᐃᓗᖃᖅᑐᑦ ᒪᑎᑦᑕᐅᑏᑦ, ᐊᒻᒪᓗ ᑲᑎᑲᑕᒃᑲᑎᒃ ᖃᐅᔨᓴᐅᒃᓴᖅᑖᕈᑏᑦ. ᑲᑎᑕᐅᔪᑦ ᐃᖃᓗᐃᑦ ᓇᓗᓇᐃᔭᖅᑕᐅᓚᐅᖅᑐᑦ ᐊᒃᐸᓯᓵᖑᓂᙵᓂᒃ ᐊᑐᖅᑕᐅᔪᓐᓇᖅᑐᑦ ᐆᒪᔪᑦ ᐊᙳᖅᑐᖅᓯᒪᔪᑦ ᖃᓄᐃᓕᙵᓂᖏᓐᓄᑦ (ᐃᒪᐃᑦᑑᓚᔪᒃᑯᑦ ᐆᒪᔪᑦ ᐊᔾᔨᖏᙱᐊᕐᔪᒃᑐᑦ-ᖃᓄᐃᓕᙵᓂᖏᑦ) ᐅᑎᖅᑎᑕᐅᓚᐅᖅᑎᓐᓇᒋᑦ. ᐃᖃᓗᐃᑦ ᓇᓗᓇᐃᖅᑕᐅᔪᓐᓇᙱᑦᑐᑦ ᐆᒪᔪᑦ ᐊᔾᔨᖏᙱᐊᕐᔪᖏᓂᖏᓐᓄᑦ-ᖃᓄᐃᓕᙵᓂᕐᓄᑦ ᓄᓇᒥ ᐱᔭᐅᓚᐅᖅᑐᑦ ᑭᖑᓂᖓᒍᑦ ᓇᓗᓇᐃᔭᐃᓂᕐᒥ ᐃᓕᓴᖅᑐᐅᓯᒪᔪᓂ ᐆᒪᔫᓄᑦ ᐊᕙᒃᑐᖅᓯᒪᓂᖏᓐᓄᑦ ᖃᐅᔨᓴᕐᕕᖓᓂ.

ᑲᑎᕝᓗᒋᑦ 484–ᓂᒃ ᐃᖃᓗᐃᑦ ᐃᓂᖃᖅᑎᑕᐅᔪᑦ 11-ᓄᑦ ᖃᐅᔨᒪᔭᐅᔫᓄᑦ ᐆᒪᔪᑦ ᐊᕙᒃᑐᖅᓯᒪᔪᑦ ᑎᑎᕋᖅᑕᐅᒪᔪᑦ DPF ᐊᒻᒪᓗ IPF ᑕᐃᒃᑯᓇᙶᑦ 84-ᓂᑦ ᐃᖃᓗᓴᓱᕐᓂᐅᓚᐅᖅᑐᓂ ᐊᑐᖅᑲᓗᑎᒃ ᑲᑎᕝᓗᒋᑦ ᐱᓕᕆᔾᔪᓯᑦ 2022-ᒥ ᓯᑯᖃᙱᑎᓪᓗᒍ ᖃᐅᔨᓴᕐᓇᒥ ᕿᙳᐊᓂ. ᐊᔾᔮᐸᓗᒋᓪᓗᓂᐅᒃ ᑭᖑᓂᖓᒋᓐᓂᓐᓂ ᖃᐅᔨᓴᐅᒃᓴᓕᐅᕐᓂᐅᕙᓚᐅᖅᑐᓂ, ᑕᕆᐅᕐᒥᐅᑕᑦ ᐃᖃᓗᐃᑦ (*Salvelinus alpinus*), ᑎᓴᒪᓂᒃ ᓇᒡᔪᖓᑦ ᑲᓇᔪᑦ (Myoxocephalus quadricornis) ᐊᒻᒪᓗ ᓇᒡᔪᑭᑦᑐᑦ ᑲᓇᔪᑦ (Myoxocephalus scorpius) ᐅᓄᓖᙳᓚᐅᖅᑐᑦ ᐆᒪᔪᓂ ᐊᔾᔨᖏᙱᐊᕐᔪᒃᑐᓂ. ᐊᓯᖏᑦ ᐃᖃᓗᒃᑕᐅᓚᐅᖅᑐᑦ ᑲᓇᔪᑦ (Triglops pingelii), ᐆᒐᑦ (Gadus ogac), ᐅᑭᐅᖅᑕᖅᑐᒥ ᑲᓇᔪᑦ (Gymnocanthus tricuspis), ᐅᑭᐅᖅᑕᖅᑐᒥᐅᑕᑦ ᑲᓇᔪᑦ (Myoxocephalus scorpioides), ᐅᑭᐅᖅᑕᖅᑐᒥᐅᑕᑦ ᐆᒐᑦ (Boreogadus saida), ᐊᒻᒪᓗ ᐃᖃᓗᕋᓛᑦ (Lycodes mucosus). ᒪᕐᕉᒃ ᐆᒪᔪᑦ ᐊᕙᒃᑐᖅᓯᒪᔪᓂ ᑎᑎᕋᖅᑕᐅᓚᐅᖅᑐᑦ ᓯᕗᓪᓕᖅᐹᒥ ᕿᙳᐊᓂ ᑐᓚᒃᑕᕐᕙᖕᒥ: ᐊᔾᔨᑎᐊᕐᔪᒃᑕᖏᑦ ᑲᓇᔪᑦ (Icelus spatulate) ᐊᒻᒪᓗ ᐃᖃᓗᕋᓛᑦ (Gymnelus hemifasciatus); ᑭᓯᐊᓂᓕ ᒡᑕᒃᑯᐊ ᐅᑭᐅᖅᑕᖅᑐᒥᐅ ᐆᒪᔪᑦ ᐊᔾᔨᖏᙱᐊᕐᔪᒃᑐᑦ ᐃᓱᒪᒋᔭᐅᕐᑲᓯᐅᑎᙱᑦᑐᑦ ᕐᑯᐊᖅᓵᕐᓇᕋᓱᒋᔭᐅᓇᑎᒃ ᑖᒥᓂᕐᒥᐅᑕᐅᙱᖕᒍᑎᒃ ᐆᒪᔪᑦ ᐊᔾᔨᖏᙱᐊᕐᔪᒃᑐᓄᑦ.

ᐱᓕᕆᔾᔪᓯᑦ ᐊᑐᖅᑕᐅᔪᑦ ᐱᖃᓯᐅᔾᔭᓚᐅᖅᑐᑦ ᒪᑎᑦᑕᕐᓂᕐᒥᒃ, ᐃᖅᑲᑦᑕᕐᓂᕐᒥᒃ, ᑲᓕᑲᑦᑕᕐᓂᕐᒥᒃ, ᐃᓗᓖᑦ ᒪᑎᑦᑕᐅᑏᑦ, ᐃᓯᖅᑕᐅᔪᓐᓇᖅᑐᓂᒃ ᐊᒻᒪ ᑲᓕᑲᑦᑕᕐᓂᕐᓂᒃ. ᓈᓴᐅᑎᑎᒍᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᙱᙵᑕ ᕿᒥᕈᓃᑦ ᐊᙳᔭᐅᔪᑦ ᐊᑕᐅᓯᕐᒧᑦ ᐱᓕᕆᐊᙳᔪᒧᑦ (CPUE) ᐊᔪᕐᓇᖅᓚᐅᖅᑐᑦ ᐱᓕᕆᔾᔪᓯᖅᑎᒍᑦ, ᑭᓯᐊᓂ ᐊᕐᕌᒍᓂ ᐊᓂᒍᖅᑐᓂᒃ, ᖃᐅᔨᔭᐅᓚᐅᖅᐳᖅ ᒪᑎᑦᑕᐅᑏᑦ ᐊᑑᑎᖃᑦᑎᐊᓛᙳᓂᖏᓐᓂᒃ ᐱᓕᕆᔾᔪᓯᐅᓪᓗᑎᒃ ᐃᖃᓗᖃᑦᑕᕐᓂᕐᒧᑦ.. ᐊᔾᔨᙱᕝᓗᓂᐅᒃ ᑭᖑᓂᖓᒋᓐᓂᓐᓂ ᐊᕐᕌᒍᓂ ᐅᓄᖏᙳᔪᑦ ᑲᓇᔪᑦ ᐱᔭᐅᓚᐅᖅᑐᑦ ᐃᖅᑲᑦᑕᕐᓂᒃᑯᒃ-ᐊᐅᓚᓴᕐᓂᒃᑯᑦ, ᒪᑎᑦᑕᐅᑏᑦᑕᐅᖅ ᐱᔪᓐᓇᑦᑎᐊᓚᐅᖅᑐᑦ ᑲᓇᔪᕐᓂᒃ 2022-ᒥ. ᐊᒃᓗᓇᐅᔭᑯᑖᒥᒃ ᓂᖏᖅᑎᑦᑎᓯᒪᓪᓗᑎᒃ ᖃᐅᔨᓴᐅᒃᓴᓕᐅᕐᓃᑦ, ᐃᓚᔭᐅᓚᐅᖅᑐᑦ ᖃᐅᔨᓴᖅᑕᐅᓪᓗᑎᒃ 2021-ᒥ ᐱᓂᐊᕐᓂᕋᕈᑎ ᓈᓴᐅᑖ 37 ᑖᒃᑯᓄᖓ ᑕᕆᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᕆᖃᑎᒌᓂᑦ (ᑕᕆᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᕆᖃᑎᒌᑦ; ᐅᐃᒍᖅ 1ᐃ ᒎᑐᒃᑯᑦ 2021) ᐱᓕᕆᐊᖃᕋᓱᐊᖅᑲᓗᑎᒃ ᑐᕌᒐᐅᔪᓂᒃ ᐊᖏᔪᓂᑎᓂᒃ ᐃᖅᑲᖓᓂᕐᒥᐅᑕᓂᒃ ᐃᖃᓗᖕᓂᒃ, ᑲᔪᓯᑎᑕᐅᔪᓐᓃᓚᐅᖅᑐᑦ 2022-ᒥ ᐃᖃᓗᒃᑐᖃᓚᐅᙱᓐᓂᖓᓄᑦ 2021-ᒥ ᖃᐅᔨᓴᖅᑎᓪᓗᖏᑦ. ᐃᒃᐱᐊᕐᕚᔮᓪᓚᑦ ᒪᑎᑦᑕᐅᑏᑦ, ᐃᓚᔭᐅᓚᐅᖅᑐᑦ ᑕᕆᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᕐᒥ ᖃᐅᔨᓴᕈᑏᑦ ᐋᖅᑭᒃᓯᒪᓂᖏᓐᓄᑦ 2019-ᒥ ᐱᖓᓲᓄᑦ-ᐊᕐᕌᒍᓄᑦ ᑐᙵᕕᖅᑲᕝᓗᑎᒃ ᐊᑐᓕᕐᑯᔭᐅᔪᓂᒃ ᑕᕆᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᕆᖅᑲᖏᓐᓂᒃ ᖃᐅᔨᓴᐅᒃᓴᓕᐅᕐᓂᕐᒧᑦ ᐱᓕᕆᔾᔪᓯᐅᓗᑎᒃ ᑭᖑᕝᕕᓂᐊᖅᑐᑦ ᐃᓯᕙᐅᔪᓐᓇᖅᑐᓂᒃ, ᐊᒻᒪᓗ ᑲᓕᑲᕐᓂᕐᒧᑦ, ᐃᓚᓕᐅᔾᔭᐅᓪᓗᑎᒃ ᑕᕆᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᒧᑦ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᐋᖅᑭᒃᓯᒪᓂᖏᓐᓄᑦ ᑐᕌᒐᖅᑲᓂᐊᖅᑲᓗᑎᒃ ᐃᖃᓗᒃᑕᐅᓚᔪᓗᐊᙱᑦᑐᓄᑦ, ᑲᔪᓯᐊᖅᑕᐅᓚᐅᖅᑐᑦ 2022-ᒥ. ᑭᓯᐊᓂᓕ, 2022 ᓴᖅᑭᔮᖅᑎᑦᑎᔪᖅ ᐱᖓᔪᕆᓕᖅᑕᖓᓂ ᐊᕐᕌᒍᓗᓂ ᖃᐅᔨᓴᕐᓂᐅᔪᖅ ᖃᓄᐃᓐᓂᖅᓴᐅᙱᙵᑕ ᐃᒃᐱᐊᕐᕚᔮᓪᓚᑦ ᒪᑎᑦᑕᐅᑏᑦ ᐊᒻᒪᓗ ᐃᓯᕙᐅᔪᓐᓇᖅᑐᑦ ᐊᖑᓂᑦᑎᐊᖃᑦᑕᕋᓗᐊᕐᒪᙱᑕ, ᖄᒃᑲᓐᓂᐊᒍᑦ ᖃᐅᔨᓴᕐᓇᖅᑎᓪᓗᒍ, ᐃᒃᐱᐊᕐᕚᔮᓪᓚᑦ ᒪᑎᑦᑕᐅᑎᓂᒃ ᖃᐅᔨᓴᐅᒃᓴᓕᐅᕐᓂᑦ ᒪᕈᐊᖅᑎᓪᓗᐊᖅ ᐃᖃᓗᖃᑦᑕᓚᐅᖅᑐᑦ (n= 151 2020-ᒥ - 2022–ᒧᑦ) ᖃᓄᐃᓐᓂᖅᓴᐅᙱᙵᑕ ᕿᒥᕈᓪᓗᒋᑦ ᐃᓯᕙᐅᔪᓐᓇᖅᑐᑦ (n = 71 2020-ᒥᑦ 2022-ᒧᑦ), ᐋᖅᑭᒃᑕᐅᓯᒪᔪᑦ ᐅᓄᙱᓐᓂᖅᓴᐅᓚᐅᕋᓗᐊᖅᑎᓗᖏᑦ ᓇᐸᐸᓗᖏᓐᓂ ᑲᑎᕝᓗᒋᑦ ᐱᓕᕆᓇᓯᐊᕐᓂᕐᓂ (ᓲᕐᓗ ᖃᐅᔨᓴᐅᒃᓴᓕᐅᕐᓂᕐᓂ) ᐊᒻᒪᓗ ᓇᐸᐸᓗᐊᖏᑦ ᑲᑎᕝᓗᒋᑦ ᐋᖅᑭᓱᖅᑕᐅᓂᖏᓐᓄᑦ ᐃᑲᕐᕋᑦ.

ᒪᕐᕉᒃ ᐊᔾᔨᒌᙱᑦᑐᑦ ᐃᖃᓗᒐᓱᖕᕕᐅᔫᒃ ᖃᓂᒋᔭᖓᓂᐅᓚᐅᖅᑐᑦ ᕿᙳᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ 2021-ᒥ ᑐᙵᕕᒋᓪᓗᒋᑦ ᓇᔪᖅᑕᐅᕚᒃᑯᑦ ᐅᔾᔨᕐᓇᐅᑎᖏᑦ ᐊᒻᒪᓗ ᓇᓃᓐᓂᖏᑦ ᐊᒃᑐᐊᒍᑦ ᒦᓐᓇ ᑐᓚᒃᑕᕐᕕᖕᒥ ᐱᕐᑯᑎᕐᔪᐊᓄᑦ ᐊᐅᓚᓂᐅᔪᓪᓗ ᐱᓕᕆᓃᑦ. ᑕᒪᓐᓇ ᐱᖃᓯᐅᔾᔨᔪᖅ ᑕᕝᕙᙶᓪᓚᑦᑕᖅᑐᑦ ᐱᓕᕆᐊᑉ ᐃᓂᖏᓐᓂ ᐊᒻᒪᓗ ᑕᕝᕙᙶᓪᓚᑦᑖᖏᑦᑐᑦ ᐱᓕᕆᐊᑉ ᐃᓂᖏᓐᓂ. ᐃᖃᓗᒐᓱᖕᕖᑦ ᑐᑭᖃᖅᑎᑕᐅᓇᓱᐊᓚᐅᖅᑑᒐᓗᐊᑦ ᐃᑲᔪᕐᓂᐊᖅᖢᑎᒃ ᐊᑐᖅᑕᐅᒐᔪᓕᖅᑐᓂ ᖃᐅᔨᓴᒐᒃᓴᓕᐅᕈᓯᐅᓇᓱᒃᑯᓄᒃ ᐊᒻᒪᓗ ᑲᒪᒋᔭᐅᖢᑎᒃ ᐊᔾᔨᒋᕐᑲᑦᑕᙱᖏᓐᓄᑦ ᐃᖃᓗᒃᑕᐅᔪᑦ ᑎᑎᖅᑲᕐᑯᓂᖏᑦ ᕿᙳᐊᓂ ᑕᓚᒃᑕᕐᕕᖕᒥᑐᒃᑖᖅ. ᐊᑐᖅᖢᑎᒃ 2020, 2021, ᐊᒻᒪᓗ 2022 ᑎᑎᖅᑲᕐᑯᑎᖏᓐᓂᒃ, ᐊᖑᓂᒃᑕᐅᔪᑦ-ᐊᑐᓂ-ᐃᖃᓗᓯᐊᕐᓂᕐᓂᒃ ᐊᑐᓂ ᐃᖃᓗᓯᒍᓯᕐᓄᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖔᑕ ᕿᒥᕐᕈᔭᐅᓚᐅᖅᑐᑦ ᑕᐃᕘᓇᓗᒃᑖᖅ ᐃᖃᓗᓯᖕᕕᐅᔪᓗᒃᑖᒥ ᐊᕐᕌᒍᓂᓪᓗ ᐊᑐᖅᖢᑎᒃ ᕿᒥᕐᕈᓂᕐᒥᒃ ᐊᔾᔨᒌᕐᑲᑦᑕᙱᑦᑐᓄᑦ. ᓈᓴᐅᑎᑎᒍᑦ ᐊᔾᔨᒌᙱᕐᔪᐊᕈᑎᑕᖅᑲᙱᖅᑲᓗᐊᖅᑎᓪᓗᒍ ᐊᖑᓂᒃᑕᐅᔪᑦ-ᐊᑐᓂ-ᐃᖃᓗᓯᐊᕐᓂᕐᓂᒃ ᓇᓗᓇᐃᖅᑕᐅᓚᐅᖅᑐᑦ ᓇᓕᐊᖕᓄᑐᐃᓐᓇᖅ ᐃᖃᓗᓯᖕᓂᕐᒧᑦ ᑖᒃᑯᓇᓂ ᐊᕐᕌᒎᔪᓂ, ᐊᖑᓂᒃᑕᐅᔪᑦ-ᐊᑐᓂ-ᐃᖃᓗᓯᐊᕐᓂᕐᓂᒃ ᐅᓄᕐᓂᖅᓴᐅᓚᐅᖅᑐᑦ ᐃᓗᐊᓂ ᑕᕝᕙᙶᓪᓚᑦᑕᖅᑐᑦ ᐱᓕᕆᐊᑉ ᐃᓂᖏᓐᓂ, ᐱᔾᔪᑕᐅᔪᒃᓴᐅᔪᑦ ᐅᔭᕋᓱᒡᔪᒪᓛᖑᓂᖏᓐᓄᑦ ᑕᕆᐅᑉ ᐱᕐᑯᑎᕐᔪᐊᙱᓂᙴᖅᑐᑦ.

ᖃᐅᔨᓴᕈᑎᑦ ᐊᑐᓕᕐᑯᔭᐅᔪᑦ 2023 ᐊᕙᑎᒍᑦ ᐊᒃᑐᐃᓂᕐᒧᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ ᖃᐅᔨᓴᒐᒃᓴᓄᑦ ᐅᑯᐊ ᐱᖃᓯᐅᑎᓪᓗᒋᑦ:

- ᐃᓱᒪᒋᓗᒋᑦ ᐲᔭᖅᑕᐅᓂᖏᑦ ᐃᓯᕙᐅᔪᓐᓇᖅᑐᑦ ᐃᖃᓗᓯᔪᑦ 2023–ᒥᑦ ᐱᓕᕆᐊᒥᑦ ᐊᖑᓂᒍᑕᐅᑦᑎᐊᖅᑲᑦᑕᙱᖏᓐᓂᖏᓐᓄᑦ. ᒪᑦᑎᑦᑕᐅᑎᑦ ᐊᑐᖅᑕᐅᕐᑯᔭᐅᕗᑦ ᐃᓇᖏᔾᔪᑕᐅᓗᑎᒃ ᐃᖃᓗᓯᖕᓂᕐᒧᑦ ᐊᑐᖅᑕᐅᔪᓐᓃᖅᐸᑕ ᐃᓯᕙᐅᔪᓐᓇᖅᑐᑦ ᓈᒻᒪᒐᓱᒋᔭᐅᒍᑎᒃ.

- ᖃᔅᓯᐅᓂᖏᑦ ᐱᓕᕆᐊᖑᓇᓱᒃᑐᑦ (ᓲᕐᓗ, ᖃᐅᔨᓴᒐᒃᓴᓕᐅᕐᓃᑦ) ᐊᑐᓂ ᐃᖃᓪᓚᐊᕐᕕᐅᓲᑦ ᐃᖃᓗᓯᒍᓯᕐᓂ (ᓲᕐᓗ, [ᐊᐅᓚᓴᕐᓂᖅ ᐊᒻᒪᓗ ᑲᓚᑲᑕᖕᓂᖅ], ᒪᑦᑎᑦᑕᐅᑎᑦ, ᐃᒋᑕᑦᑖᑦ ᒪᑦᑎᑦᑕᐅᑎ, ᐊᒻᒪᓗ ᑲᓚᑲᑕᖕᓃᑦ) ᐅᓄᖅᓯᒋᐊᖅᑕᐅᔭᕆᐊᖃᖅᐳᑦ 2023–ᒥ 40%–ᒥ ᐊᒃᑐᐃᓂᐅᔪᓂᒃ ᖃᖏᓂᖏᓐᓂᒃ ᖃᐅᔾᓇᓯᖕᓂᕐᒧᑦ ᐃᖃᓗᓯᒍᓯᕐᓄᑦ.

ᑕᒪᐃᓐᓄ, ᐃᖃᓗᓯᒍᒌᑦ ᐊᑑᑎᕐᑲᕆᔭᐅᓚᐅᖅᑐᑦ ᓇᓗᓇᐃᕋᓱᐊᕐᓗᒋᑦ ᐃᒪᖕᒥᐅᑕᑦ ᐃᖃᓗᐃᑦ ᓄᓇᓕᖕᓂᑦ ᐆᒪᔪᐃᑦ ᐊᔾᔨᒋᖕᓂᖏᓐᓂᑦ ᐱᑕᖅᑲᖕᓂᖏᓐᓄᑦ ᖃᓄᖅ ᐊᒥᓲᓂᖏᓐᓂᑦ. ᐱᓕᕆᐊᖅ ᐱᐅᓯᕙᓪᓚᐊᑎᑦᑏᓐᓇᖅᐳᖅ ᐱᓕᕆᔾᔪᓯᖏᓐᓂᒃ ᐱᔾᔪᑎᒋᓪᓗᒋᑦ ᐃᖏᕐᕋᑦᑎᐊᕐᓂᖏᑦ ᐱᔭᐅᕙᒃᑐᑦ ᐊᒻᒪ ᐅᓂᒃᑲᐅᓯᐅᔪᑦ ᐃᖃᓗᖕᓂ ᓄᓇᓕᖕᓂ, ᑭᓯᐊᓂ, ᓇᓗᓇᐃᖅᑕᐅᓂᖏᑦ ᐃᖃᓗᓚᑎᕝᕕᐅᔪᑦ ᐊᒻᒪᓗ ᐊᔾᔨᒌᓕᖅᑎᑕᐅᔪᑦ ᐃᖃᓗᓯᖕᕕᐅᓲᑦ ᐱᒋᐊᖅᑕᐅᓚᐅᖅᑐᑦ 2021–ᒥ ᖃᐅᔨᓴᖅᑕᐅᖏᓐᓇᖅᑕᐃᓐᓇᕐᓂᐊᖅᐳᑦ ᐊᓯᔾᔨᖅᐸᒃᑐᑦ ᐊᒃᑐᐊᓂᑖᑦ ᐃᖃᓗᐃᑦ ᐅᓄᕐᓂᖏᑦ ᐊᒻᒪ ᓇᓃᐸᖕᓂᖏᑦ ᕿᙳᐊᓂ.

ᐃᖃᓗᐃᑦ ᖃᓄᐃᙱᑦᑎᐊᕐᓂᖕᒥ ᐊᒻᒪᓗ ᓂᕿᓐᓂ ᐃᓚᐅᕈᑎᒃᓴᓕᕆᓂᖅ (ᐊᒡᒍᖅᑐᖅᓯᒪᔪᑦ 7.0)

ᓈᒻᒪᒃᓯᕐᑯᓪᓗᒍ ᐅᔭᕐᓂᐊᕈᓇᐅᑎᒥ ᒪᓕᒋᐊᓕᒃ ᓈᓴᐅᑎᖏᑦ 76, 83 (a), 99 (a), 99 (b) (ii), 99 (c), 113, ᐊᒻᒪᓗ 114, ᖃᐅᔨᓴᒐᒃᓴᓕᐅᕐᓃᑦ ᐱᓕᕆᐊᖑᓚᐅᖅᑐᑦ ᖃᐅᔨᓴᖅᑕᐅᕐᑯᓪᓗᒋᑦ ᐃᖃᓗᐃᑦ ᖃᓄᐃᙱᑦᑎᐊᕐᓂᖏᑦ ᐊᒻᒪᓗ ᓂᕿᖏᓐᓂ ᐃᓚᐅᕈᑎᑦ ᕿᙳᐊᓂ ᑐᓚᒃᑕᕐᕕᐅᑉ ᐃᓂᐊᓂ. ᐃᖃᓗᐃᑦ ᖃᓄᐃᙱᑦᑎᐊᕐᓂᖏᓐᓄᑦ ᐃᓱᖅᑲᕕᖕᑦ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᑦ ᑲᓇᔪᕐᓄᑦ (*Myoxocephalus quadricornis*), ᑕᕆᐅᒥ ᐃᖃᓗᐃᑦ, ᐊᒻᒨᒪᔪᑦ (*Hiatella arctica*), ᑕᕆᐅᒥ ᑯᑭᐅᓴᑦ. ᓂᕿᖏᓐᓂ ᐃᓚᐅᕈᑎᑦ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᑦ ᑲᓚᔪᕐᓂ, ᑕᕆᐅᑉᒥᐅᑕᓂ ᐃᖃᓗᖕᓂᒃ (*Salvelinus alpinus*), ᐊᒻᒪᓗ ᐊᒻᒨᒪᔪᓂ. ᐃᖃᓗᐃᑦ ᖃᓄᐃᙱᑦᑎᐊᕐᓂᖏᓐᓄᑦ ᖃᐅᔨᓴᕈᑏᑦ ᐱᖃᓯᔾᔨᓯᒪᔪᑦ ᐃᓱᒪᒋᕐᑲᓯᔾᔨᔭᐅᓂᖏᓐᓄᑦ ᐊᓐᓇᐅᒪᔪᓐᓇᕐᓂᖏᑦ, ᐱᕈᖅᐸᓪᓕᐊᓂᖏᑦ, ᖃᓄᐃᓕᖓᓂᖏᑦ, ᐊᒻᒪᓗ ᐃᓯᓂᐅᑭᓇᓯᕐᒧᑦ ᐃᓱᓕᑦᑕᕐᑯᑦ, ᐃᓱᒪᒋᕐᑲᓯᐅᔾᔨᓯᒪᓪᓗᑎᒡᓗ ᐃᓛᒃᑯᖅᑐᑦ ᐆᒪᔪᑦ ᐊᔾᔨᒌᙱᕐᐊᔪᑉᑯᑦ ᐊᒻᒪᓗ ᐊᕐᓇᐃᑦ ᐊᖑᑎᑦ, ᐊᒃᑐᐊᓂᖏᓐᓄᑦ. ᓈᓴᐅᑎᑎᒍᑦ ᖃᓄᐃᓐᓂᖅᓴᐅᖕᒪᖔᑕ ᖃᐅᔨᓴᕈᑏᑦ ᐃᖃᓗᐃᑦ ᖃᓄᐃᙱᑦᑎᐊᕐᓂᖏᓐᓄᑦ ᐱᔭᕇᖅᑕᐅᓚᐅᖅᑐᑦ ᒦᓐᓇᕈᑉ ᖃᐅᔨᓴᒐᒃᓴᓕᐅᕐᓂᖏᑦ ᐊᕐᕌᒍᓂ (ᓲᕐᓗ 2020, 2021, ᐊᒻᒪᓗ 2022).

ᑲᓇᔪᑦ ᑐᖄᒐᓇᔭᐅᓚᐅᖅᑐᑦ ᑕᒪᐃᓐᓂᒃ ᐆᒪᓇᒃᑐᓂᒃ ᐊᑐᖅᖢᑎᒃ (ᓲᕐᓗ, ᐊᐅᓚᓴᕐᓂᕐᓂᒃ, ᐃᑎᓂᕐᒪᓄᑦ ᓇᓚᒧᑦᑐᑦ ᒪᑦᑎᑦᑕᐅᑏᑦ, ᑲᓚᖅᑲᑦᑕᕐᓃᑦ) ᐊᒻᒪᓗ ᐊᓂᒍᐃᓪᓗᑎᒃ (ᓲᕐᓗ, ᐃᓯᖅᑕᐅᔪᐊᓐᓴᖅᑐᑦ, ᐃᒋᑎᓪᓗᓂ ᒪᑦᑎᑕᐅᑎᒥᒃ ᐊᒻᒪᓗ ᒪᑦᑎᑦᑕᕐᓃᑦ) ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᐊᑐᖅᑕᐅᔪᑦ. ᑐᕐᑯᕚᓪᓚᐊᓂᖏᑦ ᐃᖃᓗᐃᑦ ᐱᔭᐅᓚᐅᖅᑐᑦ ᖃᐅᔨᓴᖅᑕᐅᓪᓗᑎᒃ ᐅᑭᐅᖏᑦ,

ᓈᖓᑕ ᐃᓗᓕᖕᒋᑦ, ᐊᒻᒪᓗ ᓂᕿᓕᐊᒃᓴᖅ ᐃᓚᐅᕈᑎᒃᓴᓕᕆᓂᖅ. ᐊᒻᒨᒪᔪᑦ ᑲᑎᖅᓱᐃᓚᐅᖅᐳᑦ ᐱᕕᒃᓴᐅᑎᑕᐅᔪᓂᒃ ᓂᕿᑦ ᖃᐅᔨᓴᒐᒃᓴᖕᒋᓐᓂᒃ, ᖃᐅᔨᓴᒐᒃᓴᓂᒃ ᓂᕈᐊᖅᑕᐅᔪᖃᖅᑐᓂ ᐱᓕᕆᐊᖑᓂᐊᖅᑐᓂᒃ ᖁᓕᕈᐊᖓ ᓈᒻᒪᒃᐸᑦ, 15 ᒥᓚᑑᑕᓂᒃ ᑕᑯᓂᖃᕐᓂᖅᓴᐅᒃᐸᑦ, ᐊᒻᒪ ᓇᓗᓇᐃᖅᓯᓚᐅᙱᕐᔪᓂ ᓱᕋᒃᑎᖅᓯᒪᖕᒪᖕᒫᑦ ᕿᓕᖅᓯᓇᕐᒧᑦ ᐅᕝᕙᓘᓐᓃᑦ ᐊᓗᒡᕕᖕᒧᑦ. ᑲᑎᑕᐅᔪᑦ ᐃᖃᓗᐃᑦ ᐊᒻᒪᓗ ᐊᒻᒨᒪᔪᑦ ᐱᓕᕆᐊᖑᓚᐅᖅᐳᑦ ᐃᖃᓗᐃᑦ ᖃᓄᐃᙱᑦᑎᐊᕐᓂᖕᒋᓐᓂᒃ ᐊᒻᒪᓗ ᑕᖕᒋᖕᒋᓐᓂᒃ ᑲᑎᖅᓱᐃᓪᓗᑎᒃ ᐃᓚᐅᕈᑎᒃᓴᓂᒃ ᖃᐅᔨᓴᖅᑐᑎᒃ.

ᑲᑎᕝᕈᑎᑦ 40 ᑲᓇᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᑦ 2022-ᒥ, 20-ᐅᓪᓗᑎᒃ ᐃᓐᓇᐃᑦ ᐊᕐᓇᐃᑦ ᐊᒻᒪ 20-ᐅᓪᓗᑎᒃ ᐃᓐᓇᐃᑦ ᐊᖑᓯᓪᓗᐃᑦ. ᐱᔭᐅᔪᑦ ᐊᕐᓇᐃᑦ ᑕᑯᓂᖅᓴᐅᓚᐅᖅᐳᑦ ᐊᒻᒪ ᐅᕿᙵᕐᓂᖅᓴᐅᓪᓗᑎᒃ, ᑲᑎᕝᕈᑎᑦ ᑕᑯᓂᖕᒋᑦ ᑲᑎᕝᕈᑎᑦ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ ᑲᑎᕝᕈᑎᑦ, ᐊᒻᒪᓗ ᐊᖕᒋᓂᖅᓴᓂᒃ ᐆᒪᖅᑯᑎᑐᕈᓯᖃᕐᓂᖅᓴᐅᓪᓗᑎᒃ ᑎᖑᒃᑯᑦ (LSI), ᒥᒃᓴᐅᕝᕈᑎᑦ ᐱᔭᐅᓚᐅᖅᑐᑦ ᐊᖑᑎᑦ 2022-ᒥ. ᐊᑯᓪᓕᖅᐹᖅ ᐅᑭᐅᖕᒋᑦ ᑕᒪᕐᒥᒃ ᐊᕐᓇᐅᓂᖕᒋᑦ ᐊᖑᑕᐅᓂᖕᒋᑦ 7-ᖑᓚᐅᖅᑐᑦ, ᐊᕐᓇᐃᑦ 5-ᒥᑦ 9-ᒧᑦ ᐅᑭᐅᓖᑦ ᐊᒻᒪᓗ ᐊᖑᑏᑦ 5-ᒥᑦ 10-ᒧᑦ ᐅᑭᐅᓖᑦ. ᐊᔾᔨᒌᖕᒋᓐᓂᖅᑲᖕᒋᑦᑐᖅ ᖃᓄᐃᓐᓂᖓ (ᓲᕐᓗ ᐅᖁᒪᐃᓐᓂᖓ) ᖃᐅᔨᔭᐅᓚᐅᖅᑐᖅ ᐊᑯᓐᓂᖕᒋᓐᓂ ᐊᕐᓇᐃᑦ ᐊᒻᒪᓗ ᐊᖑᑎ ᑲᓇᔪᑦ.

ᐊᔾᔨᒌᖕᒋᓐᓂᖕᒋᑦ ᐃᖃᓗᐃᑦ ᖃᓄᐃᙱᑦᑎᐊᕐᓂᖕᒋᑦ ᖃᐅᔨᔭᐅᓚᐅᖅᑐᑦ ᐊᕐᓇᓪᓗᖕᓄᑦ ᐊᖑᑎᓄᓪᓗ ᑲᓇᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᐊᕿᒍᓄᑦ. ᑲᓇᔪᑦ ᐆᒪᔪᓐᓇᕐᓂᕆᔭᖓ, ᐅᑭᐅᖓ, ᓈᓴᖅᑕᐅᓂᒃᑯᑦ ᐊᖕᒋᓂᖅᓴᐅᓚᐅᖅᑐᖅ 2022–ᒥ ᒥᒃᓴᐅᓴᖅᑐᕆᑦ ᑭᖑᓂᖕᒫᑦᑎᓐᓂ ᐊᕿᒍᓂ ᑕᒪᐃᓐᓄᑦ ᐊᕐᓇᓄᑦ/ᐊᖑᑎᓄᑦ. ᐱᕈᖅᐸᓪᓕᐊᓂᖕᒋᑦ ᐊᖑᑎᑦ ᐊᕐᓇᐃᓪᓗ ᑲᓇᔪᑦ 2021–ᒥ, ᖃᐅᔨᓴᖅᑕᐅᓪᓗᑎᒃ ᐊᖕᒋᓂᖕᒋᑦ, ᓈᓴᖅᑕᐅᓯᒪᔪᑦ ᐅᔾᔨᕐᓇᖅᑐᒥᒃ ᐊᔾᔨᒌᙱᖕᒋᔪᐊᓚᐅᖅᐳᑦ ᐊᕿᒍᓂ (ᓲᕐᓗ, ᐊᑎᖕᓂᖅᓴᐅᓚᐅᖅᐸᖅ 2022–ᒥ ᒥᒃᓴᐅᕝᕈᑎᑦ 2021–ᒥ, ᑭᓯᐊᓂ ᐊᔾᔨᒋᓚᐅᙱᕝᕈᑎᒃ 2020–ᒥ ᐊᕐᓇᓄᑦ, ᐅᔾᔨᕐᓇᖅᑐᒥᓗ 2022–ᒥ ᒥ ᒥᒃᓴᐅᕝᕈᑎᑦ 2020–ᒥ, ᑭᓯᐊᓂ 2021–ᒥ ᐊᖑᑎᓄᑦ ᐊᔾᔨᒋᓚᐅᙱᕝᕈᑎᒃ). ᐃᖃᓗᐃᑦ ᖃᓄᐃᓐᓂᖕᒋᑦ, ᐅᖁᒪᐃᓐᓂᖕᒋᑦ (ᓲᕐᓗ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ ᑲᑎᑦᑐᒍ ᑕᑯᓂᖕᒋᑦ), ᐊᒻᒪ ᑎᖑᖓᑕ ᐅᖁᒪᐃᓐᓂᖓ (ᒪᑯᓂᖓ, ᑎᖑᐃᑦ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ ᑲᑎᑦᑐᒍ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ), ᐊᔾᔨᒌᖅᑲᑦᑕᖕᒋᑦᑐᑦ ᖃᐅᔨᓴᕋᖅᓴᓂᑦ ᐊᕿᒍᓂᑦ ᑕᒪᒃᑮᓐᓄ ᐊᕐᓇᐅᓂᖕᒋᓐᓄᑦ ᐊᖑᑕᐅᓂᖕᒋᓐᓄᑦ. ᐊᕐᓇᖅ ᑎᓴᒪᓂᒃ ᐅᕿᙵᕐᓂᓕᒃ ᐅᖁᒪᐃᓐᓂᖓ ᐊᖕᒋᓂᖅᓴᐅᓚᐅᖅᑐᖅ 2022–ᒥ ᐊᔾᔨᒌᙱᕝᕈᓂᐅᒃ 2020 ᐊᒻᒪ 2021, ᐃᓚᖓ ᑎᖑᒃ ᐅᖁᒪᐃᓐᓂᖓ ᐊᔾᔨᒌᙱᕝᕈᓂᐅᒃ ᐊᕿᒍᒐᓴᖕᓄᑦ. ᐊᖑᑎ ᑲᓇᔪᑦ ᐅᖁᒪᐃᓐᓂᖓ ᐊᖕᒋᓂᖅᓴᐅᓚᐅᖅᑐᖅ 2022–ᒥ ᒥᒃᓴᐅᕝᕈᑎᑦ 2020–ᒥ ᑭᓯᐊᓂ ᐊᔾᔨᒌᙱᕝᕈᓂᐅᒃ 2021–ᒥ, ᑎᖑᐃᑦ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ ᐅᓄᕐᓂᖅᓴᐅᓚᐅᖅᑐᑎᒃ 2022–ᒥ ᒥᒃᓴᐅᕝᕈᑎᑦ 2021–ᒥ. ᕿᑐᕐᖕᒋᐅᕐᓂᕐᒧᑦ ᑮᓇᐅᔭᓕᐅᕈᑕᐅᓇᓱᒃᑐᑦ, ᐃᓚᒋᔭᐅᓪᓗᓂ ᐅᖁᒪᐃᓐᓂᖓ, ᐅᔾᔨᕐᓇᖅᑐᒥᒃ ᐊᑎᖕᓂᖅᓴᐅᓚᐅᖅᐸᖅ 2022–ᒥ 2020–ᒥ ᐊᒻᒪ 2021–ᒥ ᐊᕐᓇᓄᑦ ᑎᓴᒪᓄᑦ ᐃᖅᑭᓕᖕᓄᑦ, ᐊᔾᔨᒌᙱᓐᓂᖅᑲᙱᕝᕈᓂ ᐊᒃᑐᐊᓂᖅᑲᖅᑐᓂᒃ ᒫᓇᑦ ᐅᖁᒪᐃᓐᓂᖓᓂᒃ ᖃᐅᔨᔭᐅᓚᐅᖅᐸᖅ ᐊᖑᑎᓄᑦ ᑲᓇᔪᑦ.

ᑲᑎᕝᕈᑎᑦ 40 ᐊᒻᒨᒪᔪᑦ ᑲᑎᑕᐅᓚᐅᖅᑐᑦ ᐱᓕᕆᐊᖑᓪᓗᑎᒡᓗ ᐃᖃᓗᖕᓂ ᖃᓄᐃᙱᑦᑎᐊᕈᓯᕐᒧᑦ 2022–ᒥ. ᐊᔾᔨᒌᙱᓐᓂᖅᑲᙱᑦᑐᑦ ᐊᓐᓇᐅᒪᓂᖕᒋᑦ (ᐊᑯᓂᐅᓂᖕᒋᑦᑕ ᓇᒦᓐᓂᖕᒋᑦ), ᐱᕈᖅᐸᓪᓕᐊᓂᖕᒋᑦ (ᓂᕐᔪᑎᓕᒫᑦ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ), ᖃᓄᐃᓕᖓᓂᖓᓘᓐᓃᑦ (ᑕᒪᐃᓐᓂᓕᒫᖅ ᓂᕐᔪᑎᑦ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ) ᑕᑯᔭᐅᓚᐅᖅᑐᑦ ᖃᐅᔨᓴᒐᒃᓴᓂᑦ ᐊᕿᒍᓂᑦ (ᓲᕐᓗ, 2022, 2021 ᐊᒻᒪ 2020). ᐃᖅᓂᐅᖅᓂᖕᒋᑦ, ᐅᖁᒪᐃᓐᓂᖕᒋᑦ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ (ᐅᕝᕙᓘᓐᓃᑦ ᓂᕿᑦ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ, MSI), ᐊᔾᔨᒌᓐᖑᐊᖅᑎᑕᐅᑐᐃᓐᓇᓚᐅᖅᑐᑦ 2021 ᐊᒻᒪ 2022 ᐊᑯᓐᓂᖓᓂ, ᑕᖕᒋᖕᒋᑦ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ ᐊᑐᐃᓐᓇᐅᓚᐅᙱᒻᒪᑕ 2020ᒥᑦ. ᐊᔾᔨᒌᖕᒋᓐᓂᖕᒋᑦ ᖃᐅᔨᔭᐅᓚᐅᖅᑐᑦ ᓂᕿᑦ ᐅᖁᒪᐃᓐᓂᕐᒧᑦ ᐊᑯᓐᓂᖕᒋᓐᓂ 2021 ᐊᒻᒪ 2022, ᐊᒻᒪᓗ ᐊᖕᒋᓂᖕᒋᓐᓂᓪᓗ: ᒥᑭᓐᓂᖅᓴᐃᑦ ᐊᒻᒨᒪᔪᑦ (ᓲᕐᓗ, ᓴᓗᑦᑎᓂᖅᓴᐅᓚᐅᖅᑐᑦ ᓂᕿᑦ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ 2021–ᒥ 2022–ᒥ, ᐊᖕᒋᓂᖅᓴᐅᓪᓗᑎ ᐊᒻᒨᒪᔪᑦ (ᓲᕐᓗ, ᐅᖁᒪᐃᓐᓂᖅᓴᒥᑦ) ᐊᖕᒋᓂᖅᓴᒻᒪᕆᐅᓚᐅᖅᑐᑦ ᓂᕿᑦ ᐅᖁᒪᐃᓐᓂᖕᒋᑦ 2022–ᒥ ᐊᒻᒪᓗ 2021–ᒥ.

ᑲᑎᕝᕈᑎᑦ 26-ᖑᓪᓚᐅᖅᑐᑦ ᑐᖁᖓᔪᑦ ᐃᖃᓗᐃᑦ 2022-ᒥ, 12-ᖑᓪᓗᑎᒃ ᐃᓐᓇᐃᑦ ᐊᕐᓇᐃᑦ, ᖁᓕᑦ ᐃᓐᓇᐃᑦ ᐊᖑᓯᓪᓗᐃᑦ, ᐊᒻᒪᓗ ᑎᓴᒪᑦ ᐱᕈᓐᖅᓯᒪᙱᑦᑐᑦ ᖃᐅᔨᒪᔭᐅᙱᑦᑐᑦ ᑭᓲᓂᖕᒋᓐᓂᒃ. ᑖᒃᑯᓇᙵᑦ, 26–ᓂᒃ ᖃᐅᔨᓴᒐᒃᓴᓂᒃ ᑐᓂᓯᔪᖅᑲᓚᐅᖅᑐᖅ ᖃᐅᔨᓴᒐᒃᓴᓂᒃ ᓄᑭᕈᕕᐊᓂᑦ PAH–ᒧᑦ ᖃᐅᔨᓴᖅᑕᐅᖁᓪᓗᑎᑦ, 8–ᓂᒡᓗ ᖃᐅᔨᓴᒐᒃᓴᓂᒃ ᑐᓂᓯᔪᖅᑲᓚᐅᖅᓱᓂ ᑲᒃᑭᐅᑎᒃᓴᓂᒃ ᓴᕕᕋᔭᖕᓂᒃ ᖃᐅᔨᓴᖅᓯᓂᕐᒧᑦ. ᑲᑎᕝᕈᑎᑦ 24-ᓂᒃ ᖃᐅᔨᓴᒐᒃᓴᓂᒃ ᑐᓂᓯᓚᐅᖅᐳᑦ ᑲᑎᕝᕈᑎᑦ 2022-ᒥ ᐃᖃᓗᖕᓂ, ᑲᓇᔪᕐᓂᒃ ᐊᒻᒪᓗ ᐊᒻᒨᒪᔪᑦ ᐃᓚᐅᕈᑎᒃᓴᓂᒃ ᓴᕕᕋᔭᖕᓂᒃ ᖃᐅᔨᓴᖅᑕᐅᔪᓂᒃ. ᐃᓱᒫᑑᑕᐅᑐᐃᓐᓇᕆᐊᓖᑦ (COPCs) ᓇᓗᓇᐃᖅᑕᐅᓚᐅᖅᑐᑦ ᑐᙵᕕᖅᑲᖅᓱᑎᒃ ᓂᕈᐊᖅᑎᓪᓗᐊᑕᕐᓂᑦ ᐱᓕᕆᐊᒥᑦ ᓴᕕᒃᓴᒥᑦ (ᓲᕐᓗ ᓴᕕᒃᓴ, ᒪᒡᓂᓯᐊᒻ ᐊᒻᒪᓗ ᐊᐅᒋᐊᑦ), ᓴᕕᕋᔭᐃᓪᓗ ᐱᑕᖃᙱᖅᑐᓂᑦ ᒪᓕᒐᕐᓂᑦ ᖃᐅᔨᒪᔾᔪᑎᓂᑦ ᐃᖃᓗᐃᑦ ᓂᕿᖓᓂᑦ (ᓲᕐᓗ, ᐊᕿᕿᕆᔭᖅ ᐊᒻᒪᓗ ᓯᓕᓂᐊᒻ). ᓈᓴᖅᑕᐅᓯᒪᔪᑦ ᐊᔾᔨᒌᙱᓐᓂᖕᒋᑦ ᐃᓚᐅᕈᑎᒃᓴᓂᒃ ᓴᕕᕋᔭᖕᓂᒃ ᖃᐅᔨᓴᖅᑕᐅᔪᓂᒃ.

ᐃᓱᒫᓘᑕᐅᑐᐃᓐᓇᓇᐊᓖᑦ (ᓱᕐᓗ, ᓴᕙᒃᓴ, ᐊᐅᒥᐊᑦ, ᒪᒡᓂᓯᐊᒻ, ᐊᕐᕿᕐᕉᔭᖅ, ᐊᒻᒪᓗ ᓯᓕᓂᐊᒻ) ᐱᕐᑲᓯᐅᑎᑦᓗᒍ ᓴᕙᕋᔭᒃ ᑕᒪᐃᓐᓄᑦ ᐆᒪᔪᓄᑦ, ᐊᕙᒃᑐᖅᓯᒪᑦᓗᑎᒃ, ᖃᐅᔨᓴᐅᒃᓴᓄᑦ ᐊᕐᕌᒍᓄᑦ (ᓱᕐᓗ, 2018-ᒥ 2022-ᒧᑦ), ᐊᓯᖏᑦᓗ ᓴᕙᕋᔭᐃᑦ ᐃᓱᒪᒋᔭᐅᓚᐅᖅᐳᑦ ᐱᐅᓂᖏᓐᓂᒃ ᑕᒪᐃᓐᓄᑦ ᖃᓄᐃᓕᖏᑦᓕᐊᓂᖃᔭᐅᔪᓄᑦ ᖃᖓᙳᖅᐸᑦᓕᐊᑎᑦᓗᒍ.

ᐱᑕᕐᑲᕐᓂᖏᑦ ᓴᕙᕋᔭᐃᑦ ᐊᔾᔨᐸᓘᓚᐅᖅᑐᑦ ᐊᕐᕌᒍᓂᑦ ᐊᑐᓂ ᐆᒪᔪᐃᑦ ᐊᔾᔨᒋᓐᓂᖏᑦ, ᐃᓚᖏᑦ ᓴᕙᕋᔭᐃᑦ ᑕᑯᔅᓴᐅᑎᑦᑎᔪᑦ ᐊᔾᔨᒌᖏᓐᓂᕐᑲᕐᓂᖅᓴᐅᑦᓗᑎ (ᓱᕐᓗ, ᑲᓐᓄᔭᖅ, ᑮᓇᐅᔭᒃᓴᖅ, ᑎᓐ). ᐃᕐᑲᓗᖕᓄᑦ, ᓈᓴᖅᑕᐅᓯᒪᔪᑦ ᐅᔾᔨᕐᓇᖅᑐᒥᒃ ᐊᔾᔨᒌᙱᓐᓂᖏᑦ ᑕᖏᖏᑦ ᐱᑕᕐᑲᕐᓂᖏᑦ ᓴᕙᕋᔭᔅᓴᐃᑦ, ᒪᒡᓂᓯᐊᒻ, ᐊᕐᕿᕐᕉᔭᖅ ᐊᒻᒪᓗ ᓯᓕᓂᐊᒻ ᑕᑯᔭᐅᓚᐅᖅᑐᑦ; ᐊᔾᔨᒌᙱᓐᓂᖏᓐᓂᒃ ᖃᐅᔨᔭᐅᔪᕐᑲᓚᐅᙱᑦᑐᖅ ᐊᐅᒃᓯᐅᑎᒧᑦ. ᐊᑯᓐᓈᕿᔪᑦ ᐊᔾᔨᒋᖏᓐᓂᖏᑦ COPC ᑲᑎᓯᒪᓂᖏᑦ ᐅᑭᐅᖅᑕᖅᑐᒥᑦ ᐃᕐᑲᓗᓐᓂᑦ ᑕᑯᔅᓴᐅᑎᑦᑎᔪᑦ ᐊᓯᔾᔨᑕᕐᓂᖏᑦ (ᓱᕐᓗ, 6% ᑎᑭᑉᓗᒍ 124% ᐳᓴᑦᑎᖏᑦ ᐊᔾᔨᒋᖏᑕᖓ (RPD] ᐊᕐᕌᒍᓚᓐᓂᑦ, ᑕᐃᒪᐃᑦᑕᐃᓇᓕᓂᕐᑲᕋᓂ ᖃᖓᑐᐃᓐᓇᒃᑯᑦ). ᑎᓴᒪᓄᑦ ᐃᓯᒐᐅᔭᕐᓄᑦ, ᓈᓴᖅᑕᐅᓯᒪᔪᑦ ᐅᔾᔨᕐᓇᖅᑐᑦ ᐊᔾᔨᒌᙱᓐᓂᖏᑦ ᖃᐅᔨᔭᐅᓚᐅᖅᐳᑦ ᐊᕐᕌᒍᓂ ᓴᕙᒃᓴᓂ, ᒪᒡᓂᓯᐊᒻ, ᐊᕐᕿᕐᕉᔭᖅ ᐊᒻᒪᓗ ᓯᓕᓂᐊᒻᓂᒃ, ᑭᓯᐊᓂ ᒪᒡᓂᓯᐊᒻᒥᐅᙱᑦᑐᖅ ᐃᓗᐊᓂ ᐊᔾᔨᒌᙱᓐᓂᖏᑦ ᐃᓚᐅᕆᑎᒃᓴᓂᒃ ᓴᕙᕋᔭᖕᓂᒃ ᖃᐅᔨᓴᖅᑕᐅᔪᓂᒃ. ᐃᓱᒫᓘᑕᐅᑐᐃᓐᓇᓇᐊᓖᖏᑦ ᑲᑎᓯᒪᓂᖏᑦ ᑲᓇᔪᕐᓂ ᓴᖅᑭᑎᑦᑎᓚᐅᖅᐳᑦ ᖃᖓᙳᖅᐸᑦᓕᐊᓂᖃᔭᐅᔪᓂᒃ (ᓱᕐᓗ ᐃᒪᓐᓇ, 15%–ᒥᑦ 150%–ᒧᑦ ᐳᓴᑦᑎᖏᑦ ᐊᔾᔨᒋᖏᓐᓂᕐᒧᑦ ᐊᕐᕌᒍᓂ, ᐊᑕᐅᔫᓐᓇᓕᔪᒥᒃ ᐱᑕᕐᑲᙳᕐᓗᓂ ᖃᖓᙳᖅᐸᑦᓕᐊᓂᖓᓄᑦ). ᐱᑕᕐᑲᕐᓂᖏᑦ ᓴᕙᒃᓴᐃᑦ ᐊᖏᓂᖅᓴᐅᓚᐅᖅᑐᑦ ᐊᒻᒨᒪᔪᑦ ᑕᐅᑐᙳᖅᓗᒋᑦ ᐃᕐᑲᓗᐃᑦ ᐊᒻᒪ ᑎᓴᒪᑦ ᐅᔭᖅᑲᑦ, ᑕᑯᒃᓴᐅᑎᑦᑎᑦᓗᑎᒃ ᐊᔾᔨᒌᙱᓐᓂᖏᓐᓂᒃ ᓴᕙᕋᔭᐃᑦ ᐆᒪᔪᑦ ᐊᒻᒪ ᑕᖏᖏᑦ ᖃᓄᐃᑦᑑᓂᖏᑦ. ᐊᒻᒨᒪᔪᑦ, ᐅᔾᔨᕐᓇᖅᑐᑦ ᐊᔾᔨᒌᙱᓐᓂᓇᔭᖏᑦ ᖃᐅᔨᔭᐅᓚᐅᖅᐳᑦ ᐊᕐᕌᒍᓂ ᓴᕙᒃᓴᕐᒥᒃ, ᐊᐅᒥᐊᖅ, ᒪᒡᓂᓯᐊᒻ, ᐊᒻᒪᓗ ᓯᓕᓂᐊᒻᒥᒃ , ᑭᓯᐊᓂ ᖃᐅᔨᔭᐅᓚᐅᖅᑐᑦ ᐊᔾᔨᒌᙱᓐᓂᖏᑦ ᐅᓄᙱᑦᑐᑯᓘᓚᐅᖅᐳᑦ (ᓱᕐᓗ, 12% 55%–ᒧᑦ ᐳᓴᑦᑎᖏᑦ ᐊᔾᔨᒋᖏᓐᓂᕐᒧᑦ, ᐊᔾᔨᒋᖏᓐᓇᕐᓂᒃ ᐋᖅᑭᒃᓯᒪᓂᕐᑲᙱᑉᓗᑎᒃ ᖃᑯᙳᖅᐸᑦᓕᐊᑎᑦᓗᒍ). ᐊᕐᕿᕐᕉᔭᖅ ᐊᒻᒪ ᓯᓕᓂᐊᒻ ᐱᑕᕐᑲᕐᓂᖏᑦ ᑕᒪᐃᓐᓂᒃ ᐃᕐᑲᓗᖕᓂ ᐊᒻᒪᓗ ᐅᕐᑯᒪᐃᓐᓂᖓᓄᑦ (ww] (ᐋᓐᓂᐊᕐᑲᕐᓇᙱᑦᑐᓕᕆᔾᔪᑦ ᑲᓇᑕᒥ ᐊᖏᓛᖓᓂ ᓱᑭᕐᓇᖅᑐᓄᑦ ᓂᕿᓂᒃ ᐊᕐᕿᕐᕉᔭᓂᒃ ᐊᑐᖅᐸᒃᑐᑦ ᖃᐅᔨᒪᔾᔪᑎᖏᑦ 0.5 mg/kg ᖃᐅᓯᖅᑐᑦ ᐅᕐᑯᒪᐃᓐᓂᖏᑦ [ww] (ᐋᓐᓂᐊᕐᑲᕐᓇᙱᑦᑐᓕᕆᔾᔪᑦ ᑲᓇᑕᒥ 2015) ᐊᒻᒪ ᐲᓰ ᒥᓂᔅᑕᖏᑦ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ ᓯᓕᓂᐊᒻᒧᑦ ᐱᑕᕐᑲᕐᓂᖏᑦ ᖃᐅᔨᒪᔾᔪᑎᒃᓴᑦ 4 ᒥᓕᒍᕌᒻ/ᑭᓗᒍᕌᒻᒧᑦ ᐅᕐᑯᒪᐃᓐᓂᑦᓚᑦᑕᖏᑦ [dw] (BC MOE 2014), ᐊᑐᓂ. ᐊᒻᒨᒪᔪᑦ, ᐊᕐᕿᕐᕉᔭᕐᑲᕐᓂᖏᑦ ᐊᔾᔨᒌᖕᒪᖓᑕ ᐊᔾᔨᒌᓐᓂᖏᓐᓂᓪᓘᓐᓃᑦ ᖃᐅᔨᓴᓚᐅᖅᑐᑦ ᐋᓐᓂᐊᕐᑲᕐᓇᙱᑦᑐᓕᕆᔾᔪᑦ ᑲᓇᑕᒥ ᓂᓇᖅᑲᑦᑕᕐᓂᕐᒧᑦ ᖃᐅᔨᒪᔾᔪᑎᖏᓐᓂᑦ ᐊᑐᐃᓐᓇᐅᑎᑦᓯᓂᕐᒧᑦ ᐃᓗᓕᖏᓐᓂᑦ, ᑖᓐᓇ ᓂᕿᐅᕙᔪᖏᓪᓚᑦ ᐃᒪᕐᒥᐅᑕᓂᑦ. ᐊᕐᕿᕐᕉᔭᕐᑲᕐᓂᖏᑦ ᐊᒻᒨᒪᔪᑦ ᐊᑖᓃᓚᐅᖅᑐᑦ ᐋᓐᓂᐊᕐᑲᕐᓇᙱᑦᑐᓕᕆᔾᔪᑦ ᑲᓇᑕᒥ ᐊᑐᖅᑲᑦᑕᕐᓂᕐᒧᑦ ᖃᐅᔨᒪᔾᔪᑎᖏᓐᓂᒃ. ᓯᓕᓂᐊᒻ ᐱᑕᕐᑲᕐᓂᖏᑦ ᐊᒻᒨᒪᔪᑦ ᐊᑖᓃᓚᐅᖅᐳᑦ ᐳᓇᑎᔅ ᑲᓚᒃᐱᐊ ᐊᕙᑎᓕᕆᔾᔪᑦ ᒥᓂᔅᑕᖓᑕ ᐊᕙᑎᓕᕆᔾᔪᓐᓂ ᐊᒻᒪᓗ ᓯᓚᐅᑉ ᐊᓯᔾᔨᖅᐸᑦᓕᐊᓂᖓᓄᑦ ᖃᓄᐃᓕᐅᕈᑕᐅᔪᒪᔪᓂᒃ (BC MOE) ᕿᒥᕐᓗᕐᑲᙱᑦᑐᓂᒃ ᑕᖏᕐᑲᙱᑦᑐᓂᒃ 4 ᒥᓕᒍᕌᒻ/ᑭᓗᒍᕌᒻᒧᑦ dw (BC MOE 2014).

ᑲᑎᕐᓗᒋᑦ 26-ᖑᔪᑦ ᐃᕐᑲᓗᖕᓂ ᖃᐅᔨᓴᒃᓴᑦ, 84-ᓂᒃ ᐃᓯᒐᐅᔭᕐᓂᒃ ᖃᐅᔨᓴᒃᓴᓂᒃ, ᐊᒻᒪᓗ ᑎᓴᒪᓂᒃ ᐊᒻᒨᒪᔪᑦ ᖃᐅᔨᓴᒃᓴᓕᐊᖑᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᐳᑦ ᐅᖅᓯᐊᓗᒃᓴᑦ (PAHs) 2022-ᒥ. ᐃᕐᑲᓗᖕᓄᑦ, ᖃᐅᔨᓇᓱᖕᓂᕐᒧᑦ ᑭᒡᓕᐅᔪᑦ PAHs-ᓄᑦ ᒪᕐᕉᒃ ᐱᖓᓱᓄᓪᓘᓐᓃᑦ ᑎᑭᓴᖅᑕᐅᔪᑦ ᐊᑦᑎᖕᓂᖅᓴᐅᓚᐅᖅᐳᑦ 2022-ᒥ ᐊᕐᕌᒎᓴᖅᑐᓂ ᐊᔾᔨᒌᙱᓐᓂᖏᓐᓄᑦ ᐱᓕᕆᔾᔪᓯᑦ ᐊᑐᖅᑕᐅᔪᑦ 2022-ᒥ, ᖃᐅᔨᔭᐅᑦᓗᑎᒃ ᑲᑎᓯᒪᓂᖏᑦ ᐊᓯᓇᑉᑖᓐ, ᕗᓗᕆᓐᑏᑦ, ᕝᓘᕆᓐ, ᒥᑐᓇᑉᑖᓐ, ᓇᑉᑖᓐ, ᕙᓐᑐᕆᓐ, ᐊᒻᒪᓗ ᐸᐃᕆᓐ 8-ᓂᒃ ᖃᐅᔨᓴᒃᓴᓂᒃ. ᑕᐃᒪᐃᒻᒪᑦ, ᖃᐅᔨᔭᐅᔪᓐᓇᖅᑰᔨᙱᑦᑐᖅ ᐅᖅᓯᐊᓗᒃᓴᓂ 2022–ᒥ ᐱᑕᕐᑲᕐᓂᖅᓴᐅᕗᖅ ᑲᑎᑎᓯᒪᔪᓂᒃ, ᑭᓯᐊᓂ ᐱᐅᓯᕚᑦᓕᖅᓯᒪᖅᑰᔨᑦᓗᓂ ᖃᐅᔨᓴᕈᑕᐅᔪᖅ ᐱᐅᓯᕚᑦᓕᕈᑕᐅᑦᓗᓂ ᖃᐅᔨᔭᐅᔪᓄᑦ. ᑕᒪᒃᑭᕐᓗᒋᑦ,ᑎᓯᖏᑦ ᐅᖅᓯᐊᓗᒃᓴᓕᒫᑦ ᐆᒪᔪᓕᒫᑦ ᑐᖖᓃᓚᐅᖅᑐᑦ ᖃᐅᔨᔭᐅᔪᓄᑦ ᑭᒡᓕᐅᔪᓂᑦ ᑭᖑᓂᑦᑎᓐᓂ ᖃᐅᔨᓴᒃᓴᓂᑦ ᐊᕐᕌᒍᓂᑦ (<0.070 ᒥᓗᒍᕌᒻ/ᑭᓗᒍᕌᒻᒧᑦ ww).

ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᐃᕐᑲᓗᐃᑦ ᖃᓄᐃᙱᑦᑎᐊᕐᓂᖏᓐᓂᒃ ᐊᒻᒪ ᑕᖏᖏᓐᓂᒃ ᐃᓚᐅᕈᑎᒃᓴᓂᒃ 2022-ᒥ ᐃᕐᑲᓗᖕᓂ, ᑲᓇᔪᑦ, ᐊᒻᒪᓗ ᐊᒻᒨᒪᔪᑦ ᓇᓗᓇᐃᖅᓯᓚᐅᖅᐳᑦ ᐊᔾᔨᒌᙱᓐᓂᖏᓐᓂᒃ ᖃᑯᙳᖅᐸᑦᓕᐊᑎᑦᓗᒍ, ᐃᒪᓐᓇᐅᕐᑯᓯᑦᓗᓂ ᐊᑯᓐᓂᖅᓯᖅᓗᑎᒃ ᐊᔾᔨᒌᙱᓐᓂᖏᓐᓂᒃ. ᖃᐅᔨᓴᒃᓴᑦ ᐱᕙᒃᓴᖓ ᓈᒻᒪᐃᓐᓇᓚᐅᖅᐳᖅ ᖃᐅᔨᓴᖅᑕᐅᔪᓄᑦ ᐃᕐᓂᐅᕈᓯᕐᓄᑦ ᑎᓴᒪᓄᑦ ᑲᓇᔪᑦ ᐊᒻᒪ ᐊᒻᒨᒪᔪᑦ. ᖃᐅᔨᓴᕈᑎᓕᒫᑦ ᓇᓚᐅᑦᑖᕈᑕᐅᓯᒪᔪᑦ ᑭᖑᓪᓕᖅᐹᒥᑦ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᐊᓂᐊᖅᑐᑦ ᐅᓂᒃᑳᒧᑦ ᑭᖑᓂᐊᒍᓪᓗ ᐃᓚᔭᐅᓪᓗᓂ, ᓇᓗᓇᐃᖅᓯᓪᓗᓂ ᐱᑐᐃᓐᓇᓇᐊᕐᑲᕐᓂᖓᓂᒃ ᑭᒡᓕᓯᓂᐊᖅᑕᐅᓯᒪᙱᑦᑐᓂᒃ ᐅᔾᔨᕐᓇᖅᑐᓂᒃ, ᐊᑦᑎᒃᑐᒥ ᐊᒃᑐᐃᓂᕆᔭᐅᔪᓂᒃ ᐃᒪᕐᒥᐅᑕᑦ ᐃᕐᑲᓗᐃᑦ ᖃᓄᐃᙱᑦᑎᐊᕈᓯᖏᓐᓄᑦ ᐊᒻᒪᓗ ᖃᓄᐃᓕᖓᓂᖓᓄᑦ. ᓇᓗᓇᐃᕈᑎᒃᓴᖅᑕᖅᑲᓚᐅᙱᑦᑐᖅ ᐱᓕᕆᐊᒧᑦ-ᐊᒃᑐᐃᓂᓖᑦ

ᐊᒃᑐᐃᔾᔪᑎᑦ ᐊᖏᓂᖏᑦᑕ ᐅᖓᑖᓄᑦ ᑖᒃᑯᐊ ᓇᓚᐅᑦᑖᖅᑕᐅᔪᑦ ᐃᖅᑲᓗᐃᑦ ᖃᓄᐃᙱᑦᑎᐊᕈᓯᖏᓐᓄᑦ ᐅᑦᑰᓘᓐᓃᑦ ᑕᖏᖏᑦ ᐃᓚᐅᕈᑎᒃᓂᑦ 2022-ᒥ.

ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᑦ ᐆᒪᔪᑦ/ᑎᑭᑉᐸᒃᑐᑦ ᐆᒪᔪᕋᓖᑦ (NIS/AIS) ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖏᓐᓇᕐᓂᖅ (ᐃᓚᐅᕈᑎᒃᓴᓕᓇᓂᖅ 8.0)

ᐊᑕᖏᑦᑎᐊᖅᑐᓂᑦ ᖃᐅᔨᓴᖅᓯᒪᓕᖅᑐᑦ ᕿᙵᐊᓂ ᐃᒪᕐᒥᐅᑕᐃᑦ ᐊᕙᑎᖏᓐᓂᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᓪᓗᑎᒃ ᐱᑕᖃᕐᓂᖓᓂ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᑦ ᐆᒪᔪᑦ (NIS) ᐊᒻᒪᓗ ᑎᑭᑉᐸᒃᑐᑦ ᐆᒪᔪᕋᓖᑦ (AIS), ᒪᓕᒃᑐᖅ ᐱᓕᕆᐊᑉ ᓇᓗᐃᒃᑯᑕᕐᒥᒃ ᒪᓕᒋᐊᓕᖕᓂᒃ ᓈᓴᐅᑎᖓ 87, 89, ᐊᒻᒪᓗ 91. ᑖᓐᓇ ᐱᓕᕆᐊᖑᔪᖅ ᐃᓚᖃᓚᐅᖅᐳᖅ ᑕᒪᐃᓐᓂᒃ ᑐᑲᕐᕕᐅᔪᓂᒃ (ᓲᕐᓗ ᐃᒪᓐᓇ, ᐃᓗᑐᔪᓂᒃ ᑎᒍᓯᓂᖅ, ᓄᓇᓕᖕᓂ ᐸᓕᐊᓂᒃ, ᐊᒻᒪᓗ ᑐᑭᓕᐊᖅᑐᓂᒃ ᐊᒻᒪᓗ ᖁᐱᕐᕈᕋᓛᓂᒃ) ᑕᒪᐃᓐᓄᓪᓗ (ᓲᕐᓗ ᐃᒪᓐᓇ, ᖃᐅᔨᓴᖅᓯᓂᖅ ᑕᒪᐃᓐᓂᑦᑎᐊᖅ ᓂᕐᔪᑎᓂᒃ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᓂᒃ ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᕐᒧᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ P-ᒧᑦ ᐃᓗᓕᖏᓐᓂᒃ, ᓲᕐᓗ ᐃᖅᑲᓗᖕᓂᒃ ᐊᒻᒪᓗ ᐱᕈᖅᑐᕋᓖᓄᑦ ᖃᐅᔨᓴᕐᓂᕆᔭᐅᔪᓂᒃ) ᖃᐅᔨᓴᖅᑐᖅᑲᕋᓱᒃᑎᓪᓗᒍ. ᐆᒪᔪᓕᒫᑦ ᐊᔾᔨᒌᓐᓂᖏᓐᓂᓪᓘᓐᓃᑦ ᖃᐅᔨᓴᓚᐅᖅᑐᑦ ᑕᓪᓗᕈᑎᐅᑉ ᐃᓗᐊᓂ ᕿᙵᐊᓂᑦ, ᐱᕙᓪᓕᐊᑎᑕᐅᓯᒪᔪᖅ ᖃᖓᙳᖅᐸᓪᓕᐊᑎᓪᓗᒍ (ᐱᒋᐊᕐᓂᖅᑲᖅᑐᓂ ᓯᕗᓂᐊᒍᑦ-ᐱᓕᕆᐊᔅᓴᐅᑉ ᐱᒋᐊᖅᕕᖓᓂᑦ) ᐊᒻᒪ ᓄᑖᕈᓇᐊᖅᑕᐅᖅᑦᑕᖅᑐᖅ ᐊᕐᕌᒍᑕᒫᑦ. ᐆᒪᔪᐃᑦ ᐊᔾᔨᖏᖏᑦᑐᐊᕐᔪᓐᓂᖏᑦ ᓄᓇᓕᖕᓂ ᐊᕕᒃᑐᖅᓯᒪᓂᐅᔪᓂ ᖃᐅᔨᒪᔾᔪᑎᒋᙱᑦᑐᑦ ᓂᕆᐅᒋᔭᐅᓪᓗᓂᓗ ᐊᕐᕌᒍᑕᒫᑦ ᑖᓐᓇ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᖅ ᐱᓕᕆᐊᒃᓴᖅ ᖃᐅᔨᓂᐊᖅᑐᖅ ᐆᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᓂ ᑎᑎᕋᖅᑕᐅᓚᐅᙱᑦᑐᓂᑦ. ᑎᑎᕋᖅᓯᒪᔪᓂᒃ ᕿᒥᕐᕈᓚᐅᖅᑐᑦ ᐆᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᓂ ᐃᓚᒋᔭᐅᓚᐅᙱᑦᑐᓂᒃ ᓈᓴᖅᑕᐅᔪᓄᑦ ᑐᑭᓯᓇᖁᒃᓗᑎᒃ ᓇᓃᓐᓂᖏᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᐃᓚᓕᐅᔾᔭᐅᑦᓗᑎᒃ ᐊᑦᓛᑎᒃᒥ, ᐅᑭᐅᖅᑕᖅᑐᒥᒃ ᐊᒻᒪ/ᐅᑰᓘᓐᓃᑦ ᑲᓇᑕᐅᑉ ᐅᑭᐅᖅᑕᖅᑐᖓᓂ; ᐊᒻᒪ ᓱᓕ, ᑖᒃᑯᐊ ᐆᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᑦ ᓇᕿᙲᕈᔫᔭᓚᐅᖅᐳᑦ ᑕᒪᐃᓐᓄᑦ ᓄᓇᕐᔪᐊᕐᒥ ᐊᒻᒪᓗ ᓄᓇᓕᖕᓂ ᖃᕋᓴᐅᔭᒃᑯᑦ ᑎᑎᕋᖅᓯᒪᔪᓂᒃ ᖃᐅᔨᒪᔭᐅᔪᓂᒃ ᐸᒡᕙᓇᖅᑐᓂᒃ ᐆᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᓂ (ᓲᕐᓗ, ᒧᓪᓄ ᐊᑕᖏᖅᓗᑎᒃ. 2008). ᐆᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᑦ ᓇᓗᓇᐃᖅᑕᐅᓚᐅᕐᒥᔪᑦ ᐱᓕᕆᐊᒃᓴᒧᑦ-ᑐᕌᖓᔪᓄᑦ ᑕᐅᑐᒍᑎᓄᑦ ᑎᑎᕋᖅᓯᒪᔪᑦ ᐃᓗᓕᖅᑲᖅᑐᑦ ᐆᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᓂ ᐃᓱᒪᒋᔭᐅᔪᓂ ᐊᑦᑕᕐᓇᓗᐊᕋᓱᒋᔭᐅᙱᖅᓗᑎᒃ (ᓲᕐᓗ, ᑎᑎᕋᖅᑕᐅᓯᒪᙱᑦᑐᑦ ᑎᑭᑉᐸᒃᑐᑦ ᐆᒪᔪᕋᓖᑦ ᖃᕋᓴᐅᔭᒃᑯᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᓂ ᑭᓯᐊᓂ ᐊᖏᖅᑕᐅᓯᒪᔪᑦ ᓇᓃᓐᓂᖏᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᓂ ᐃᓚᐅᑎᑦᑎᙱᑦᑐᑦ ᑲᓇᑕᐅᑉ ᐅᑭᐅᖅᑕᖅᑐᖓᓂ) ᐅᑰᓘᓐᓃᑦ ᐊᑦᑕᕐᓇᖅᑐᕕᔪᐊᖅᑐᑦ (ᓲᕐᓗ, ᑎᑎᕋᖅᓯᒪᔪᑦ ᑎᑭᑉᐸᒃᑐᑦ ᐆᒪᔪᕋᓖᑦ ᖃᕋᓴᐅᔭᒃᑯᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᐊᒻᒪᓗ ᐊᖏᖅᑕᐅᓯᒪᔪᑦ ᓇᓃᓐᓂᖏᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᓂ ᐃᓚᐅᑎᑦᑎᙱᑦᑐᑦ ᑲᓇᑕᒥ ᐅᑭᐅᖅᑕᖅᑐᒥ ᐅᑭᐅᖅᑕᖅᑐᒥ). ᐆᒪᔪᐃᑦ ᐊᔾᔨᖏᖏᑦᑐᐊᕐᔪᓐᓂᖏᑦ ᐃᓕᔭᐅᔪᑦ ᓇᐅᑦᑎᖅᓱᕐᓂᕐᒧᑦ ᑎᑎᕋᖅᓯᒪᔪᓂ ᐃᓚᐅᑎᑦᑎᔪᑦ ᐊᑦᑎᒃᑐᒥ ᐊᑦᑕᕐᓇᖅᑐᕕᔪᐊᖅᑐᓄᑦ ᐆᒪᔪᓄᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᓄᑦ ᐱᑕᖅᑲᖅᑐᓄᑦ ᐱᓕᕆᐊᒃᓴᒥ ᑐᕌᖓᑦᑎᐊᙱᑦᑐᒥᒃ ᐱᓕᕆᐊᒃᓴᒧᑦ, ᐊᒻᒪᓗᑦᑕᐅᖅ ᑕᐃᒃᑯᓄᖓ ᐆᒪᔪᓄᑦ ᐱᔭᕆᐊᖅᑲᖅᑐᓄᑦ ᐃᑲᔪᖅᓱᐃᓂᖅᓴᐅᔪᓂᒃ ᑲᑎᖅᓱᖅᓯᒪᔪᓂ. ᐊᑦᑕᕐᓇᕐᔪᐊᖅᑐᑦ ᐆᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᓂ ᖃᐅᔾᔭᐅᒃᐸᑕ ᐃᓱᒪᒋᔭᐅᓗᑎᒃ ᓴᖅᑭᑕᐅᑐᐃᓐᓇᕆᐊᖃᕐᓗᑎᒃ ᐱᓕᕆᐊᒃᓴᑎᒍᑦ ᐊᐅᓪᓚᖅᑎᑦᑎᓂᕐᒧᑦ ᖃᓄᐃᓕᐅᕈᑎᒃᑯᑦ, ᐃᓚᓕᐅᔾᔭᐅᓇᔾᔭᖅᑐᑦ "ᐱᔪᒪᔪᓄᑦ ᑎᑎᕋᖅᓯᒪᔪᓄᑦ" (ᑎᑎᕋᖅᓯᒪᔪᑦ ᐆᒪᔪᑦ "ᐱᑦᑕᐃᓕᔾᔪᑎᑦ". ᓇᓗᓇᐃᖅᓯᓂᖓᓄᑦ ᖃᓄᐃᓕᐅᕈᑎᑦ ᐆᒪᔪᑦ ᐊᔾᔨᖏᖏᑦᑐᐊᕐᔪᓐᓂᖏᑦ ᑐᑭᖓᓗᑎᒃ ᐃᓚᖓᓗ ᐊᑦᑕᕐᓇᖅᑐᖅ).

2022-ᒥ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᑦ 29-ᓂᒃ ᓄᑖᓂᒃ ᐃᓚᔭᐅᔪᓂ ᐆᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᑦ ᓈᓴᖅᑕᐅᓂᖏᓐᓄᑦ ᕿᙵᐊᓂ (ᓲᕐᓗ, ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᓯᒪᙱᑦᑐᑦ ᑭᖑᓂᖒᑦᑎᓐᓂ ᖃᐅᔨᓴᖅᑕᐅᖅᑦᑕᓚᐅᖅᑐᓂᒃ). ᑕᒪᕐᒥᒃᓴᑦᑎᐊᖅ ᓄᑖᑦ ᐆᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᑦ ᑎᑎᕋᖅᓯᒪᓚᐅᖅᐳᑦ ᐱᑕᖅᑲᖏᓐᓂᒃ ᑲᓇᑕᐅᑉ ᐅᑭᐅᖅᑕᖅᑐᖓᓂ. ᐊᖅᑳᔾᔫᑦ ᖃᐅᔨᓴᒐᒃᓴᐃᑦ ᓇᓗᓇᐃᖅᑕᓚᐅᖅᐳᑦ ᕿᖅᑯᐊᒃᓴᔭᐅᓪᓗᑎᒃ (cf. *Punctaria latifolia*) ᐊᒻᒪ ᕿᖅᑯᐊᕈᔾᔫᓪᓗᑎᒃ (cf. *Stictyosiphon soriferus*) ᓇᓗᓇᐃᖅᑕᓚᐅᖅᐳᑦ ᕿᒥᕐᕈᔭᐅᒃᑲᓐᓂᖁᔭᐅᓪᓗᑎᒃ ᑎᑎᖅᑲᖁᑎᖃᙱᓐᓂᖏᓐᓄᑦ ᐅᑰᓘᓐᓃᑦ ᑎᑎᕋᖅᑕᐅᑎᑦᑎᐊᖅᓯᒪᙱᓐᓂᖏᓐᓄᑦ ᑲᓇᑕᐅᑉ ᐅᑭᐅᖅᑕᖅᑐᖓᓂ. ᐃᖅᑲᓗᐃᑦ ᐊᔾᔨᙱᑦᑐᑦ ᐃᖅᑲᓗᕋᓖᑦᑐ (*Gymnelus hemifasciatus*) ᑎᑎᖅᑲᖁᑎᖃᑦᑎᐊᙱᒻᒪᑕ ᑲᓇᑕᐅᑉ ᑲᓇᖕᓇᖓᓂ ᑲᓇᑕᐅᑉ ᐅᑭᐅᖅᑕᖅᑐᖓᓂ ᑭᓯᐊᓂ ᖃᐅᔨᒪᔭᐅᔪᑦ ᐅᑭᐅᖅᑕᖅᑑᑉ ᐃᒪᖏᓐᓂ ᐊᒻᒪᓗ ᓇᓃᖃᑦᑕᕐᓂᖏᑦ ᐊᔾᔨᐸᓗᒋᔭᒃᓴᖏᑦ ᐊᓯᖏᓐᓄᑦ ᐃᖅᑲᓗᕋᓖᑦ ᐆᒪᔪᑦ ᐊᔾᔨᙱᖏᑦᑐᐊᕐᔪᒃᑐᓄᑦ. ᓄᑖᖅ ᑎᑎᖅᑲᖅ ᐱᕈᖅᑐᕋᓖᑦ ᓇᒃᓯᐅᔾᔭᐅᓚᐅᖅᑐᑦ ᖃᐅᔨᒪᔨᑕᒻᒪᕆᖕᓄᑦ ᓇᓗᓇᐃᖅᑕᐅᒃᑲᓂᖁᔭᐅᓪᓗᑎᒃ ᓇᓗᓇᐃᔭᖅᑕᐅᓂᖏᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᑐᐃᓐᓇᕐᓂᖏᓐᓄᑦ ᐊᒡᒍᖅᑐᖅᓯᒪᔪᓂ; ᑖᓐᓇ ᐊᕕᒃᑐᖅᓯᒪᔪᖅ ᐱᑕᖃᓪᓗᐊᑕᓲᑦ ᐃᒪᑦᑎᐊᕙᖕᓂ ᐅᑰᓘᓐᓃᑦ ᓄᓇᒥ ᓇᔪᒐᕐᓂ ᐊᒻᒪᓗ Hᐋᓐᓚᖏᓐᓃᕐᓗᑎᒃ ᐊᔾᔨᙱᑦᑐᐊᕐᔪᒃᑐᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᑲᓇᑕᐅᑉ ᐅᑭᐅᖅᑕᖅᑐᖓᓂ.

ᐅᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᓂᖕᒋᓐᓄᑦ ᐱᓕᕆᕐᒪᕆᑦ ᑕᐃᑲᓂ ᐅᒪᔪ ᐊᕙᑎᕐᓐᓄᑦ ᐱᕐᑦᑎᕋᖅᑎᒃᑯᓐᓂ ᓇᓄᓇᐃᖅᓯᓚᐅᖅᐳᑦ ᖁᐱᕆᖁᑖᑦ ᖃᐅᔨᓴᐅᒃᓴᑦ ᐊᔾᔨᖃᑦᑎᐊᓚᐅᖅᐳᑦ ᓇᓄᓇᐃᔭᖅᑕᐅᔾᔪᑎᖕᒋᓐᓂᒃ ᖁᐱᕆᖁᑖᓄᑦ, ᐅᑭᐅᖅᑕᖅᑐᒥ ᐅᒪᔪᖅ ᖃᐅᔨᒪᔭᐅᔪᖅ ᐱᑕᖃᕐᓂᖕᒐᓂᒃ ᕿᙵᐊᓂ ᑐᓚᒃᑕᕝᕕᖕᒥ, ᑭᓯᐊᓂᓕ ᐅᔾᔨᕐᓇᐅᑏᑦ ᐃᑕᖃᕆᐊᓖᑦ ᓇᓄᓇᕈᓐᓂᖅᑎᑦᑕᐅᑎᐊᕐᑯᓪᓗᒋᑦ ᓇᓄᓇᐃᔭᖅᑕᐅᔾᔪᑎᖕᒋᑦ ᐅᒪᔪᓂ ᓱᕋᖅᑕᐅᓯᒪᓂᖕᒋᓐᓂᒃ ᐅᕝᕙᓗᓐᓃᑦ ᐃᓚᑰᓂᖕᒋᓐᓂᒃ. ᓇᓄᓇᐃᔭᐃᓂᖅ ᑐᓂᔭᐅᓚᐅᖅᑐᑦ ᐅᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᓂᖕᒋᑦ ᓇᓃᓐᓂᖕᒋᓐᓄᑦ ᐅᔾᔨᖅᓯᕈᑕᐅᑐᐃᓐᓇᖅᓗᓂ ᐱᑕᖃᙱᓐᓂᖕᒋᓐᓄᑦ ᐅᔾᔨᕐᓇᐅᑏᑦ, ᖃᐅᔨᓴᕐᒃᓴᑦ ᓇᒃᓯᐅᔾᔭᐅᓚᐅᙱᑦᑐᑦ ᐃᓚᒃᑯᖅᑐᓄᑦ ᕿᒥᕈᔭᐅᓂᐊᕐᓗᑎᒃ ᖃᐅᔨᔭᐅᒃᑲᓂᕈᓇᖁᔾᔨᖕᒋᑦᑐᑦ.

ᓇᓄᓇᐃᖅᑕᐅᓯᒪᙱᑦᑐᑦ ᖃᐅᔨᓴᖅᑕᐅᓯᒪᔪᑦ ᐃᓚᑦᓚᕆᖕᒋᓐᓂᒃ ᐱᕈᑦᑐᑦ (Buguloidea) ᑲᑎᖅᓱᖅᑕᐅᓚᐅᕐᒥᔪᑦ. ᑖᓐᓇ ᐃᓚᒋᔭᐅᔪᖅ ᐊᒥᓱᓂᑦ ᐅᒪᔪᐃᑦ ᐊᔾᔨᒌᖕᒋᐊᕐᔪᒃᑯᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᓇᒦᓐᓂᖕᒋᑦ ᐃᓚᕐᑲᖅᑐᑦ ᐱᓕᕆᕝᕕᐅᔪᒥ, ᑭᓯᐊᓂ, ᐃᓄᓕᕐᑲᕐᒥᔪᖅ ᕿᖅᑯᐊᓂᒃ (genus *Tricellaria)*, ᓇᓄᓇᐃᖅᑕᐅᓚᐅᖅᑐᖅ 2021-ᒥ ᐱᔾᔪᑕᐅᓪᓗᑎᒃ ᐃᓚᕐᑲᐅᖅᑐᑦ ᕿᖅᑯᐊᑦ (genus) ᐊᑦᑕᕐᓇᓪᓚᕆᑦᑐᒥᑦ ᓯᐊᒻᒪᒃᐸᓪᓕᐊᓂᖕᒋᓐᓄᑦ ᑲᓇᑕᐅᑉ ᐅᑭᐅᖅᑕᖅᑐᖓᓂ. ᐃᓱᒫᓘᑕᐅᓚᐅᖅᑐᑦ ᐱᔾᔪᑎᒋᓪᓗᒋᑦ, ᖃᐅᔨᓴᕐᒃᓴᑦ ᓇᓄᓇᐃᖅᑕᐅᓚᐅᖅᐳᑦ ᐃᓚᒃᑰᖅᓗᑎᒃ ᕿᒥᕈᔭᐅᖁᔭᐅᓪᓗᑎᒃ ᓇᓄᓇᐃᖅᑕᐅᖁᓪᓗᖕᒋᑦ ᓇᓄᓇᐃᔭᐅᑎᖕᒋᑦ ᓇᓄᓇᕈᓐᓃᖅᑎᑕᐅᑎᐊᖁᓪᓗᖕᒋᑦ. ᓴᖅᑭᑦᑐᑦ ᐃᒻᒥᒃᑰᖅᑐᒥᑦ ᕿᒥᕈᓂᕐᒥᑦ ᓯᓚ ᐅᑕᖅᑭᔭᐅᔪᑦ ᑕᒪᐃᓐᓄᑦ ᐅᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᓂᖕᒋᓐᓄᑦ.

ᒪᕿᒃ ᐅᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᑦ, ᕿᕐᑯᐊᑦ (*Punctaria latifolia)* ᐊᒻᒪᓗ ᕿᖅᑯᐊᕋᔭᑦ (Stictyosiphon soriferus), ᐃᓚᓕᐅᔾᔭᐅᓚᐅᖅᑐᑦ ᓇᐅᑦᑎᖅᓱᖅᑕᐅᔪᓄᑦ 2022–ᒥ ᐅᔾᔨᖅᓱᕋᓱᒡᓗᑎᒃ. ᑎᑎᕋᖅᓯᒪᔪᓂᒃ ᐅᒪᔪᑦ ᐊᔾᔨᒌᙱᖕᒋᐊᕐᔪᒃᑐᓄᑦ ᐱᒋᐊᕈᑎᒍᐊᖅᑕᐅᔪᕐᑲᖅᓯᒪᙱᑦᑐᖅ ᓱᓕ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᓂᒃ.

ᐹᕙᓈᓐᑯᑦ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᑦ ᐅᒪᔪᓂᒃ ᐊᒻᒪᓗ ᑎᑭᐸᒃᑐᑦ ᐅᒪᔪᕋᓛᓂᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᖕᒋᑦ ᓴᖅᑮᔭᖅᑎᑦᑎᔪᑦ ᐊᑕᖕᒌᓖᒥᒃ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓐᓇᕐᓂᕐᓂᒃ ᐱᓕᕆᐊᓂᒃ ᑕᒫᓂᕐᒥᐅᑕᐅᙱᑦᑐᑦ ᐅᒪᔪᑦ / ᑎᑭᐸᒃᑐᑦ ᐅᒪᔪᕋᓛᓄᑦ ᐱᓕᕆᐊᖑᔪᑦ ᑕᕆᐅᒥ ᑐᓚᒃᑕᕐᕕᖕᓂ ᑲᓇᑕᒥ. 880-ᐸᓗᐃᑦ ᐅᒪᔪᑦ ᐊᕕᒃᑐᖅᑕᐅᓯᒪᔪᑦ ᓇᓄᓇᐃᖅᑕᐅᓯᒪᓕᖅᑐᑦ ᕿᙵᐊᓂ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᖕᒋᓐᓇᕐᓂᖅᑎᒍᑦ ᒫᓐᓇᒧᑦ ᑎᑭᕐᓗᒍ, ᐃᓚᖅᑲᓚᐅᖅᑐᑦ 400-ᐸᓗᖕᓂ ᐊᔾᔨᒋᔭᐅᙱᑦᑐᓂᒃ ᐱᕈᖅᑐᕋᓛᑦ, ᖁᐱᕆᕋᓛᑦ, ᐃᖅᑲᖕᒪᓂ ᕿᒥᕐᓗᖅᑲᙱᑦᑐᑦ, ᐊᒻᒪᓗ ᐃᖅᑲᓗᐃᑦ ᐊᔾᔨᙱᑦᑐᑦ. ᓇᓄᓇᐃᖅᑕᐅᓂᖕᒋᑦ ᐊᒻᒪᓗ ᓇᓄᓇᐃᒃᑯᑦᑎᖅᑕᐅᓂᖕᒋᑦ ᐃᓛᒃᑯᑦ ᐅᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᑦ ᑖᒃᑯᓇᓂ 100-ᖕᒋᓐᓅᑦᑐᓂᑦ ᓇᓄᓇᐃᖅᑕᐅᓯᒪᔪᑦ ᕿᙵᐊᓂ ᑖᓯᔫᓇ ᓇᐅᑦᑎᖅᓱᕐᓂᕐᒧᑦ ᐱᓕᕿᐊᒧᑦ ᐊᑑᑎᖃᑦᑎᐊᕐᓂᖕᒪᓂ ᐊᒻᒪ ᐊᐅᓚᓂᖃᑦᑎᐊᕐᓂᖕᒪᓂᒃ ᑕᐃᒪᐃᑦᑕᕆᐊᖃᕐᓂᖕᒪᓄᑦ. ᐅᓄᕐᓂᖅᓴᐃᑦ ᐅᒪᔪᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᑦ ᑕᐃᔭᐅᓯᒪᔪᑦ "ᐊᑦᑕᕐᓇᙱᑦᑐᑦ" ᐃᓱᒪᒋᔭᐅᙱᕐᓗᑎᒡᓗ ᐃᓱᒫᓘᑕᐅᓂᖕᒋᓐᓂᒃ.

ᑎᓂᑦᑕᕐᓂᖓᓂᒃ ᐅᓕᑦᑕᕐᓂᖓᓂᒃ ᖃᐅᔨᓯᕗᑦ (ᐃᓚᐅᕈᑎᒃᓴᓕᕆᓂᖅ 9.0)

ᑎᓂᑦᑕᕐᓂᖓᓄᑦ ᖃᐅᔨᓴᓂᕐᒧᑦ ᐱᓕᕆᐊᖅ ᑐᕋᒐᖅᑲᓚᐅᖅᑐᖅ ᓈᒻᒪᒋᔭᐅᓗᓂ ᐱᔭᕆᐊᖅᑲᕐᓂᐅᔪᓄᑦ ᓄᓗᔾᔪᓂ ᐱᓕᕆᐊᖑᔪᒧᑦ (ᐱᓕᕆᐊᖅ) ᓄᓇᒥᑦ ᐊᒃᑐᖅᓯᓂᕐᒧᑦ (ᐊᕙᑎᒧᑦ ᐊᒃᑐᐃᓂᕐᒧᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ) ᑐᕋᖑᔪᑦ ᐊᒻᒪᓗ ᐱᓕᕆᐊᕆᓗᒋᑦ ᓇᓄᓇᐃᒃᑕᖅᑖᕐᓂᕐᒧᑦ ᐊᑐᕆᐊᓖᑦ ᒪᓕᒋᐊᓖᓪᓗ (PC) ᓈᓴᐅᑎᖓ 1, 76 ᐊᒻᒪᓗ 83 ᐅᔭᕋᖕᓂᐊᕈᓇᐅᑎᒥ ᓈᓴᐅᑎᖓ 005. ᑎᓂᓐᓂᖓ ᐃᓕᔭᐅᓚᐅᖅᑐᖅ ᕿᙵᐊᓂ ᔪᓚᐃ 05, 2022–ᒥᑦ 16–ᒧᑦ ᐅᑐᐱᕆ 2022–ᒧᑦ ᖃᐅᔨᓴᕋᓱᒃᓗᑎᒃ ᐃᒪᐅᑉ ᐃᑎᓂᖓ, ᐆᓇᕐᓂᖓ, ᓂᒡᓚᕐᓂᖓ, ᐊᒻᒪ ᐃᖕᒋᕋᓂᖓ. ᓈᓴᐅᑏᑦ/ᑎᑎᖅᑲᐃᑦ ᑕᑯᒃᓴᐅᑎᑦᑎᔪᑦ ᐊᔾᔨᐅᖕᒋᑦᑐᒥᒃ ᐅᑭᐅᑉ ᐃᓄᐊᓂᑦ ᐃᒪᐅᑉ ᖃᖓᓂᑦ ᖃᐸᓕᐅᔭᕐᒥᑦ ᕿᙵᐊᓂᑦ ᐊᔾᔨᖃᓚᐅᖅᑐᖅ ᐆᒃᑐᕋᐃᓂᕐᒧᑦ ᐅᑭᐅᓂᑦ ᖄᖕᒋᖅᑐᓂᑦ. ᔪᓚᐃ 05-ᒥᑦ ᓯᑎᐱᕆᐅᑉ ᐱᒋᐊᕐᓂᖓᓂ (ᓯᑉᑎᓕᖅ) ᑎᓂᑦᑕᕐᓂᖓ ᖃᐅᔨᓴᓚᐅᖅᐳᖅ ᐊᓯᔾᔨᕐᔪᐊᕐᓂᖓᓂ ᐆᓇᕐᓂᖓᓂ (0 ᐊᒻᒪᓗ 13 °C) ᐊᒻᒪ ᑕᕆᐅᖅ (0 ᐊᒻᒪᓗ 33 PSU), ᐱᔾᔪᑕᐅᓪᓗᐊᑕᖅᑐᖅ ᐃᒪᑦᑎᐊᕙᖕᒥᑦ ᑯᕕᔪᒥᑦ ᐱᓕᐸ ᑯᓇᒃᒥᑦ ᐅᐱᖕᓘᒃᑯᑦ ᐊᐅᒃᐸᓪᓕᐊᑎᓪᓗᒍ ᓯᑯᖃᓐᓅᖅᐸᓪᓕᐊᑎᓪᓗᒍ ᕿᙵᐊᓂ ᒥᓚᐅᑉ ᖃᓂᒋᔾᔨᓂ. ᑖᒃᑯᐊ ᐱᕙᓪᓕᐊᓂᐅᔪᑦ ᐱᑎᑦᑎᓪᓗᑎᒃ ᖃᖓᑕ ᖃᖓᑕ ᖄᖓᓂᒃ ᐆᓇᕐᓂᖅᓴᐅᓪᓗᓂ ᐊᒻᒪ ᓴᙾᓐᓂᖅᓴᐅᓪᓗᓂ ᐃᒪᐅᑉ ᖄᖓᓂ ᖄᖓᓂ. ᐃᒪᐅᑉ ᖁᑦᑎᖕᓂᖓ ᐊᔾᔨᒃᐸᙱᖕᓂᖓᓄᑦ ᐅᓕᑉᐸᖕᓂᐅᑉ ᐃᖕᒋᕋᓂᖓ, ᑎᓂᑦᑕᕐᓂᖓ ᐊᓯᔾᔨᓚᐅᖅᑐᖅ ᐆᓇᕐᓂᖅᓴᐅᔪᒧᑦ, ᐃᒪᑦᑎᐊᕙᐅᓂᖅᓴᒧᑦ ᖄᖓᓂᑦ ᐊᒻᒪᓗ ᓂᒡᓚᓇᕐᓂᖅᓴᐅᓪᓗᓂ, ᐃᒪᖅᑲᕐᓂᖅᓴᐅᓪᓗᓂ ᐃᑎᓂᖅᓴᒥᑦ.

ᓯᑎᐱᕆ ᐱᒋᐋᓵᖅᑎᓪᓗᒍ ᑎᓂᑦᑕᕐᓂᖓᓄᑦ (ᐊᐃᑉᐸᖓᓂ) ᐆᓇᕐᓂᖓ ᐊᒻᒪᓗ ᓂᒡᓚᕐᓇᕐᓂᖓ ᓱᕐᕋᓗᐊᙳᕆᑦᑐᖅ ᐅᐱᕐᙲᒃᑯᑦ ᐊᐅᒃᐸᓪᓚᐊᓚᖅᑎᓪᓗᒍ. ᒥᑭᑦᑐᒥᒃ ᖃᐅᓯᖅᑐᒥᒃ ᐊᓯᔾᔨᖅᐸᖕᓂᖓᓂᒃ ᖃᐅᔨᔭᐅᔪᕐᑲᓚᐅᖅᐳᖅ ᐆᓇᕐᓂᖓᓄᑦ ᐊᒻᒪᓗ ᓂᕿᑦ/ᓂᒡᓚᓇᕐᓂᖏᓐᓄᑦ ᑎᑎᕋᖅᓯᒪᔪᑦ ᓯᑎᐱᕆᒥ ᑭᓯᐊᓂ ᑕᒪᓐᓇ ᓄᖅᑲᖅᑎᑕᐅᓪᓗᐊᑕᓚᐅᖅᐳᖅ ᐅᑐᐱᕆᒥ. ᐃᒪᓐᓇᐅᔪᒃᓴᐅᕗᖅ ᑕᒪᒃᑯᐊ ᖃᐅᓯᖅᑐᑦ ᐊᓯᔾᔨᖅᐸᖕᓂᖏᑦ ᑲᔪᓯᑎᑕᐅᓚᐅᖅᐳᑦ ᐅᓚᑉᐸᖕᓂᕐᒥ ᑎᓂᑦᑕᕐᓂᖓᓄᑦ, ᐳᖅᑐᔪᒧᑦ/ᐅᕐᑯᒥᐊᕐᓂᕐᒧᑦ ᐊᖏᕋᕆᔭᐅᙱᒃᑑᑉ ᐊᓄᕆᑎᓪᓗᒍ, ᑲᔪᓱᓐᓇᖅᑐᒥᒡᓗ ᐃᒪᑦᑎᐊᙵᒥᒃ ᑯᕕᔪᕐᑲᕐᓂᖓᓄᑦ. ᐃᓗᐃᑦᑐᒥᓚ, ᐆᓇᕐᓂᖓ ᐊᑦᑎᖕᓂᖅᓴᐅᓚᔪᓚᐅᖅᑐᖅ ᐊᒻᒪᓗ ᓴᙱᓐᓂᖅᓴᐅᓪᓗᓂ ᑭᖑᓪᓚᖓᓂ ᓯᕗᓪᓚᖅᐹᒥ, ᑕᐃᒪᐃᔾᔪᑎᕐᑲᖅᑐᒃᓴᐅᓪᓗᓂ ᓯᓚᖓᓄᑦ. ᓯᓚᐅᑉ ᐆᓇᕐᓂᖓ ᕿᙳᐊᓂ–ᒥ ᐊᑦᑎᒃᓯᕖᓪᓚᖅᐸᒃᐳᖅ ᑲᑉᐸᓪᓚᐊᕚᓂᓗ ᐊᓄᕆᕐᔪᐊᖅᑎᓪᓗᒍ ᐃᒪᐅᑉ ᕼᖓᓂᑦ ᐃᓚᖅᑲᓚᖅᐸᒃᐳᖅ ᖃᓚᕇᓂᒃ ᐊᑖᓂ ᓴᖅᑭᑎᑦᑎᓚᖅᐸᒃᐳᖅ ᓂᒡᓚᓱᖕᓂᕐᓴᒥᒃ ᐊᒻᒪᓗ ᐃᒪᐅᑉ ᕼᖓᓃᓐᓂᖅᓴᐅᓪᓗᓂ.

ᐃᒪᐅᑉ ᐃᒪᖅᑯᖅᑐᓚᕇᖕᓂᖏᓐᓄᑦ ᖃᐅᔨᓴᕈᑎᕕᓂᖏᑦ ᑕᑯᒃᓴᐅᑎᑦᑎᔪᑦ ᑎᓂᓐᓂᐅᔪᑦ ᐅᓚᓐᓂᐅᔪᑦ ᕿᙳᐊᓂ ᒪᓚᒃᑐᑦ ᐊᔾᔨᙵᕆᑦᑐᓂᒃ ᑎᓂᑦᑕᕐᓂᐅᔪᓂᒃ ᐅᓚᑦᑕᕐᓂᐅᔪᑦ ᐃᓚᖅᑯᓯᕆᕚᒃᑕᖏᓐᓂᒃ. 7-ᖑᔪᑦ ᑎᓂᑦᑕᖅᑐᑦ ᐅᓚᑦᑕᖅᑐᑦ ᐊᒻᒪᓗ 7-ᖑᔪᑦ ᐅᐱᕐᙲᒃᑯᑦ ᑎᓂᓐᓂᐅᔪᑦ ᐅᓚᓐᓂᐅᔪᑦ ᐱᓚᕆᐊᖑᑎᓪᓗᒋᑦ ᑎᓂᓐᓂᕐᒧᑦ ᐅᓚᓐᓂᕐᒧᑦ ᖃᐅᔨᓴᕐᓃᑦ ᐋᖅᑭᒃᓱᖅᑕᐅᑎᓪᓗᖏᑦ. ᐃᒪᖅᑯᖅᑐᓂᐅᒪᔾᔭᖅᑐᖅ ᐅᔾᔨᕆᔭᐅᔪᖅ -0.41 ᒦᑕᑦ ᑲᓇᑕᒥ ᑎᓐᓂᕐᒧᑦ ᐅᓚᓐᓂᕐᒧᑦ ᖃᐅᔨᓴᕐᕕᖕᒥ (CGVD). ᐃᒪᖅᑯᖅᑐᓂᐅᑖᖅ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᖅ 0.74 ᒦᑕᑦ ᑲᓇᑕᒥ ᑎᓐᓂᕐᒧᑦ ᐅᓚᓐᓂᕐᒧᑦ ᖃᐅᔨᓴᕐᕕᖕᒥ ᐊᒻᒪᓗ ᐃᒪᑭᑖᖅ ᖃᐅᔨᔭᐅᓚᐅᖅᑐᖅ -1.61 ᒦᑕᑦ ᑲᓇᑕᒥ ᑎᓐᓂᕐᒧᑦ ᐅᓚᓐᓂᕐᒧᑦ ᖃᐅᔨᓴᕐᕕᖕᒥ (CGVD).

ᑎᑭᑕᐅᓇᓱᒃᑐᖅ ᐅᔭᕋᖕᓂᐊᕈᓐᓇᐅᑎᒥ ᒪᓕᒋᐊᓕᒃ ᓈᓴᐅᑖ 1–ᒥᑦ ᑐᓴᖅᑎᑦᑎᔪᒪᓪᓗᑎᒃ ᐊᒃᑐᐃᓂᐅᓇᔭᖅᑐᓂᑦ ᓯᓚᐅᑉ ᐊᓯᔾᔨᖅᐸᒡᓚᐊᓂᖓᓂᑦ ᑐᓚᒃᑕᕐᕕᖕᓂᑦ. ᖃᓄᐃᓕᖓᓂᖓ ᐅᖃᖅᓯᒪᖓᒪᑦ ᐱᓇᔾᔪᒃᓯᒪᔪᖅ ᐊᑐᖃᑦᑕᕆᐊᖃᕐᓂᖓᓂᒃ ᑕᒻᒪᕇᒃᑯᑎᓂᒃ ᖃᐅᔨᓴᕈᑎᓂᒃ ᐅᕝᕙᓘᓐᓃᑦ ᐊᔾᔮᐸᓗᖏᓐᓂᒃ ᖃᐅᔨᓴᕈᑎᓂᒃ ᑕᒪᐃᓐᓂᒃ ᐃᒃᐱᑭᑦᑐᕐᔪᐊᓂ ᑐᓚᒃᑕᕐᕕᖕᒥ (ᐊᐅᓚᙳᕆᑦᑐᖅ) ᐊᒻᒪᓗ ᕿᙳᐊᓂ, ᑎᓂᑦᑕᖅᑐᓂᒃ ᖃᐅᔨᓴᕈᑎᖃᕐᓗᑎᒃ ᐃᒪᕕᐅᑉ ᑭᒡᓚᖏᓐᓂᒃ ᐊᒻ ᓯᓚᓗᒃᑎᓪᓗᒍ ᑖᒃᑯᓇᓂ ᐃᓂᐅᔪᓂᒃ. ᑭᓯᐊᓂ, ᐊᕐᕌᒍᓄᑦ ᐅᓄᖅᑐᓄᑦ ᑎᑎᕋᖅᓯᒪᔪᑦ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᓚᖅᑐᑦ ᒫᓇᒧᑦ ᑎᑭᕐᒐᓗᒍ, ᓇᓗᓇᐳᓐᓂᖅᓯᒪᕗᖅ ᒫᓐᓇ ᖃᐅᔨᓴᕈᑎᑦ ᐊᑐᖅᑕᐅᔪᑦ ᓇᓗᓇᐃᖅᓯᔾᔪᑕᐅᓪᓗᑎᒃ ᑕᕆᐅᑉ ᐊᓯᔾᔨᖅᐸᓪᓚᐊᓂᖓᓂᒃ ᕿᙳᐊᓂ ᑎᓂᑦᑕᕐᓂᐊ ᑎᑎᕋᖅᓯᒪᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᑯᑦ ᑕᒻᒪᖅᓯᒪᙳᕆᕐᒐᓗᑎᒃ ᐊᒻᒪᓗ ᓱᓕᑦᑎᐊᕐᒪᖔᑕ ᓈᒻᒪᒃᓯᓚᕈᑕᐅᔪᓐᓇᙳᕆᕐᒐᓗᑎᒃ. ᐊᓯᔾᔨᕐᓂᖏᑦ ᐊᒃᑐᐊᓃᑦ ᑕᕆᐅᑉ ᑭᒡᓚᖏᓐᓂ ᓂᕆᐅᒋᔭᐅᙳᑦ ᐊᖏᓂᕆᓇᔭᖅᑕᖏᓐᓂ ᒥᓚᒥᑕᒥᑦ ᐊᕐᕌᒍᒥᑦ ᐋᖅᑭᒃᓯᓂᐅᔪᑦ ᑎᑎᕋᖅᓯᒪᔪᓂ ᖃᐅᔨᓴᖅᑕᐅᓂᑯᓂᑦ ᓄᐊᑕᐅᔪᓂ ᐊᑐᕐᓗᑎᒃ ᑕᒪᓅᒃᑯᑎᓂᑦ ᖃᐅᔨᓴᕐᓂᕐᓂ ᑎᑭᓴᖅᑕᐅᔪᓂ 1000-ᖏᓐᓂ, ᐃᓚᖅᑲᕐᓗᓂ ᑕᒪᕐᔪᐊᖅᑐᓂ. ᐆᒃᑑᑎᒋᓗᒍ, ᓄᓇᐅᑉ ᐃᖏᕋᓂᖓᓂ ᐱᕐᑯᔨᕗᖓᕈᑎ ᑲᓇᑕᒥ (ᕌᐱᓐ ᐊᑕᖏᖅᑰᑎᒃ., 2020–ᒥ ᐅᖃᐅᓯᐅᓚᐅᖅᑐᖅ ᔭᐃᔅ ᐊᑕᖏᖅᑰᑎᒃ, 2021) ᓇᓗᓇᐃᖅᓯᓚᐅᖅᐳᖅ ᕐᑯᕝᕙᕆᐊᕐᓂᖏᓐᓂᒃ 5 ᒥᓕᒦᑕᑦ/ᐊᕐᕋᒍ ᐊᑕᐅᓯᖅ ᕿᑭᖅᑖᕈᑉ ᐅᐊᖕᓇᖓᓂ ᖃᐅᔨᓴᕈᑎᕕᓃᑦ 2022–ᒥ ᑕᑯᒃᓴᐅᓚᐅᖅᐳᑦ ᑎᓂᑦᑕᕐᓂᖓ 0.354 m–ᒥ 2021–ᒥ. ᖃᐅᔨᒪᔭᐅᑦᓯᐊᖅᑐᖅ ᐊᒥᓲᓂᖏᑦ ᐆᑦᑐᕋᐃᑦ ᐃᓗᐊᓂ ᑕᐃᒪᐃᓚᕆᑦᑐᑦ ᑕᒻᒪᖅᓯᒪᖏᑦᑐᓪᓗ ᐱᔭᕆᐊᑐᔪᓘᔪᐃᑦ ᐅᑭᐅᖅᑕᖅᑐᒥ ᓴᓂᕐᓂᑦ (ᓲᕐᓗ, ᓗᑦᐅᐃᓴᓐ ᐊᒻᒪᓗ ᐋᓐᑐᓴᓐ, 2020; ᕌᔾ ᐊᑕᖏᖅᑰᑎᒃ 2020).

ᕙᓐᓃᓐᑯᑦ ᖃᐅᔨᓇᓱᒍᓐᓇᕋᓗᐊᖅᑰᑎᒃ ᐊᓯᐊᒎᕈᑎᒃᓴᓂᑦ ᖃᐅᔨᓴᕈᑎᒃᓴᓂᑦ ᑕᒻᒪᖅᓯᒪᙱᓐᓂᕐᓴᐅᓇᔭᖅᑐᓂᑦ ᓱᓕᔪᓂᒡᓗ ᓄᓇᒥᑦ ᖃᐅᔨᓴᖕᓂᖕᓂᑦ, ᐋᖅᑭᒃᑕᐅᓂᖏᑦ ᑎᑎᖅᑲᐃᑦ ᓱᓚ ᐊᑑᑎᖃᓗᐊᕐᔭᙳᕆᑦᑐᖅ ᑕᒪᓐᓇ ᐊᑐᕐᑕᐅᓗᓂ. ᑕᒪᓐᓇ ᑕᐃᒪᐃᔾᔪᑎᖃᖅᐳᖅ ᐅᔾᔨᕐᓇᖅᑐᓂᒃ ᖃᓄᐃᓚᕙᓪᓚᐊᓂᕆᔭᐅᔪᓂᒃ ᐊᒃᑐᐊᓂᓚᖕᓂᒃ ᐃᒪᕕᖕᒥ ᒥᑭᓗᐊᖅᑐᒃᓴᐅᕗᑦ ᐆᒃᑐᕋᓚᒃᓴᐅᔭᕆᐊᒃᓴᖅ ᒪᐅᖓᑦᑎᐊᖅ ᑐᙵᕕᖅᑲᖅᑎᑕᐅᓪᓗᑎᒃ ᖃᓅᓂᐊᕋᓱᕆᔭᐅᔪᓄᑦ ᓇᓗᓇᐃᖅᓯᔪᓄᑦ ᑕᒪᓐᓇ ᐊᒃᑐᐊᓂᓚᒃ ᑕᕆᐅᑉ ᓇᓃᑎᑕᐅᓂᖓ ᑲᑕᒋᐊᕐᓂᐊᕐᓂᖓᓂᒃ ᖃᓂᒋᔭᖓᓄᓪᓘᓐᓃᑦ ᐊᑭᕋᖅᑐᓚᕋᔭᕐᓂᖓᓂᒃ ᐅᐊᖕᓇᖅᐸᓯᐊᓂ ᕿᑭᖅᑖᕈᑉ (ᔭᐃᒥᔅ ᐊᑕᖏᖅᑰᑎᒃ, 2021). ᑕᐃᒪᐃᓐᓂᖓᓄᑦ, ᑕᕆᐅᖅ ᐊᓯᔾᔨᕐᓂᖓ ᒥᑭᑦᑐᑯᓘᔪᒃᓴᐅᕗᖅ ᐊᔾᔨᕖᙳᕆᓐᓂᖏᑦ ᒪᕐᕉᒃ ᒥᑭᑦᑑᒃ, ᑕᒪᕐᒥᒃ ᓇᓗᓇᖅᑐᒦᕐᒐᓗᑎᒃ. ᓯᓚᐅᑉ ᐊᓯᔾᔨᖅᐸᓪᓚᐊᓂᖓᓄᑦ ᐊᒃᑐᐃᓂᐅᕙᒃᑐᑦ ᐱᓚᕆᐊᒧᑦ ᓴᖅᑭᓐᓇᔭᙳᕆᑦᑐᑦ ᑕᕆᐅᖅ ᐊᓯᔾᔨᕐᐸᓪᓚᐊᑎᓪᓗᒍ, ᖃᐅᔨᓴᖅᑕᐅᑦᑎᐊᕈᓐᓇᕋᓗᐊᕈᑎᒃ, ᐊᒃᑐᐃᓂᖃᕈᓐᓇᖕᓂᖅᓴᐅᓪᓗᑎᒡᓗ ᓲᕐᓗ ᐊᓯᔾᔨᖅᑐᓂᑦ ᓯᑯᒥᑦ, ᐆᓇᖕᓂᖓᓂᑦ, ᐃᒪᕐᒧᓪᓗ.

ᑐᙱᕕᕆᓪᓗᒋᑦ ᖁᓛᓅᑦᑐᑦ, ᐹᖕᓛᖕᑯᑦ ᑐᒃᓯᕋᖅᑐᑦ ᓯᕗᒻᒧᐊᖁᔨᙱᑦᓴᕐᓗᑎᒃ ᑎᓂᑉᐸᕐᓂᐅᑉ ᐅᓕᑉᐸᕐᓂᐅᑉ ᖃᐅᔨᓴᕈᑎᓄᑦ ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᒋᓐᓇᕐᓂᕐᒧᑦ 2023-ᒥ ᐃᑲᔪᖅᑐᐃᓪᓗᑎᒃ ᕿᓂᕐᓂᕐᒥᒃ ᐊᑐᖅᑕᐅᕙᑦᑕᓐᓇᖅᑐᓂᒃ ᓈᒻᒪᒃᓯᓕᕈᑎᒃᓴᓂᒃ ᑖᔅᓯᒧᙵ ᒪᓕᒃᑕᐅᔭᕆᐊᓕᖕᒧᑦ ᐊᑐᕐᓗᑎᒃ ᐊᑕᐅᓯᕐᒥᒃ ᐊᒥᓱᓂᒡᓘᓐᓃᑦ ᐊᑐᖅᑕᐅᕙᑦᑕᓐᓇᖅᑐᓂᒃ ᓇᓗᓇᐃᖅᓯᔾᔪᑎᓂᒃ ᑕᓇᐅᑉ ᐃᒪᖅᑯᖅᑐᓕᖅᑲᑦᑕᓂᕐᒋᓐᓄᑎᐊᖑᙱᑦᑐᖅ.

ᑕᓇᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᕆᖅᑲᑎᒌᑦ ᐅᖅᑲᐅᓯᒃᓴᖏᑦ ᑭᖑᓪᓕᖅᐹᖅᓯᐅᑎᓄᑦ ᐅᓂᒃᑳᓄᑦ

ᐅᖅᑲᐅᓯᒃᓴᑦ 2022–ᒥ ᑕᓇᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐊᒃᑐᐃᓂᕐᓄᑦ ᖃᐅᔨᓴᐃᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᒧᑦ ᑕᓛᓂᕐᒥᐅᑕᐅᙱᑦᑐᑦ ᐆᒪᔪᑦ (NIS) ᐊᒻᒪᓗ ᑎᑭᑉᐸᒃᑐᑦ ᐆᒪᔪᕋᓛᒧᑦ (AIS) ᖃᐅᔨᓴᖅᐸᓪᓕᐊᕐᒋᓐᓇᕐᓂᕐᒧᑦ ᐱᓕᕆᐊᖑᔪᒧᑦ ᐅᓂᒃᑲᑦ ᓂᕆᐅᒋᔭᐅᔪᑦ ᐱᔭᐅᓛᕋᓱᒋᔭᐅᓪᓗᑎᒃ ᑕᓇᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᕆᖅᑲᑎᒌᓂ ᔫᓂ 2023–ᒥ. ᐹᖕᓛᖕᑯᑦ ᑭᐅᔾᔪᑎᖏᑦ ᑕᓇᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᕆᖅᑲᑎᒌᓄᑦ ᐅᖅᑲᐅᓯᐅᔪᓄᑦ ᐊᒻᒪ ᐊᑐᓕᖁᔭᐅᔪᓄᑦ ᑭᖑᓪᓕᖅᐹᒥ ᐅᓂᒃᑳᒧᑦ ᑐᓂᐅᖅᑲᖅᑕᐅᓂᐊᖅᑐᑦ ᑕᓇᐅᑉ ᐊᕙᑎᖓᓄᑦ ᐱᓕᕆᖅᑲᑎᒌᓄᑦ ᐃᓛᒃᑯᖅᓗᓂ ᑎᑎᕋᖅᑕᐅᓯᒪᓗᓂ ᐊᒻᒪᓗ ᐱᖅᑲᓯᐅᔾᔭᐅᓗᓂ ᐅᐃᒍᖓ A ᐊᕐᕌᒍᒃᑲᓐᓂᕐᒥ ᓄᓇᕗᒻᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑦ ᐊᕐᕌᒍᑕᓖᖅᓯᐅᑎᒥ ᐅᓂᒃᑳᒥ).

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ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Definition
AIS	Aquatic Invasive Species
ANOVA	Analysis of Variance
BACI	Before/After Control/Impact
Baffinland	Baffinland Iron Mines Corporation
BC	British Columbia
BC MOE	BC Ministry of Environment and Climate Change Strategy
BOD	Biological Oxygen Demand
CCME	Canadian Council of Ministers of the Environment
CGVD	Canadian Geodetic Vertical Datum
CPUE	Catch-per-uniteffort
DFO	Fisheries and Oceans Canada
DL	Detection Limit
DPF	Direct Project Footprint
EEM	Environmental Effects Monitoring
FEIS	Final Environmental Impact Statement
GPS	Global Positioning System
Indet.	Indeterminate
IPF	Indirect Project Footprint
LSA	Local Study Area
LSI	Liver Somatic Index
m	Metres
MDMER	Metal and Diamond Mining Effluent Regulations
MEEMP	Marine Environmental Effects Monitoring Program
MEWG	Marine Environment Working Group
mg/kg dw	Milligrams per Kilogram Dry Weight
mg/kg ww	Milligrams per Kilogram Wet Weight
mm	Millimetre
MSI	Mantle Somatic Index
mtpa	million tonnes per annum
N/A	Not Applicable
NIRB	Nunavut Impact Review Board

Acronym or Abbreviation	Definition
NIS	Non-Indigenous Species
NIS/AIS	Non-Indigenous Species / Aquatic Invasive Species
No.	Number
Nos.	Numbers
PAHs	Polycyclic Aromatic Hydrocarbons
PC	Project Certificate
PSU	Practical Salinity Units
ROV	Remotely Operated Vehicle
SCUBA	Self Contained Underwater Breathing Apparatus
SDI	Simpson’s Diversity Index
SEM	Sikumiut Environmental Management Ltd.
sp.	Species
TSS	Total Suspended Solids
VEC	Valued Ecosystem Components
WQG	Water Quality Guideline

1.0 INTRODUCTION

Baffinland Iron Mines Corporation (Baffinland) completed its eighth consecutive year of the marine environmental effects monitoring program (MEEMP) and non-indigenous/aquatic invasive species (NIS/AIS) monitoring program for the Mary River Project (the Project). This report presents the results for the 2022 field programs conducted in Milne Inlet during the open-water season. Both the MEEMP and NIS/AIS programs were originally developed in 2015 following completion of marine baseline studies in Milne Port during 2013 and 2014 and are intended to provide a primary means to identify and quantify potential Project-related changes in the marine environment. Where such changes occur, the programs assist in identifying appropriate modifications to, or mitigation of, Project operational activities to avoid and/or minimize potential adverse effects on the marine environment. Results from the MEEMP and NIS/AIS monitoring programs also provide information to the Nunavut Impact Review Board (NIRB) to support its annual review of the Mary River Project.

1.1 Project Context

The Project is an operating open pit iron ore mine owned by Baffinland and located in the Qikiqtani Region of North Baffin Island, Nunavut (Figure 1-1). The operating mine site is connected to Milne Port, located at the head of Milne Inlet, via the 100 km long Milne Inlet Tote Road. An approved but yet-undeveloped component of the Project includes a South Railway connecting the Mine Site to an undeveloped port at Steensby Inlet (Steenbsy Port).

To date, Baffinland has been operating in the Early Revenue Phase (ERP) of the Project and is authorized to transport 4.2 Mtpa of ore by truck to Milne Port for shipping through the Northern Shipping Route using chartered ore carrier vessels. A production increase to ship 6.0 Mtpa from Milne Port was approved for 2018–2022 Shipping is expected to continue for the life of the Project (20+ years). During the first year of ERP operations in 2015, Baffinland shipped ~918,000 tonnes of iron ore from Milne Port involving 13 return ore carrier voyages. In 2016, the total volume of ore shipped out of Milne Port reached 2.6 million tonnes involving 37 return ore carrier voyages. In 2017, the total volume of ore shipped out of Milne Port reached 4.1 million tonnes involving 58 return ore carrier voyages. Following approval to increase production to 6.0 Mtpa, a total of 5.1 Mtpa of ore was shipped via 71 return voyages in 2018, 5.9 Mtpa of ore was shipped via 81 return voyages in 2019, 5.5 Mtpa was shipped via 72 return voyages in 2020, and 5.6 Mtpa via 73 return voyages (a 74th vessel returned unloaded) in 2021. In 2022, a total of 4.7 Mtpa of iron ore was shipped via 62 return voyages with the first inbound transit of the season occurring on 30 July and the last outbound transit of the season occurring on 13 October 2022.

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LEGEND

- MINE SITE
- PROJECT LOCATION
- MILNE INLET TOTE ROAD
- SHIPPING ROUTE
- WATERCOURSE
- INFRASTRUCTURE
- ORE DOCK
- INAC FORESHORE LEASE
- LOCAL STUDY AREA
- NUNAVUT SETTLEMENT AREA
- PDA / QIA COMMERCIAL LEASE
- WATERBODY

0 5 10

1:250,000 KILOMETRES

REFERENCE(S)

LOCAL STUDY AREA BOUNDARY DIGITIZED FROM THE MARY RIVER PROJECT FINAL ENVIRONMENTAL IMPACT STATEMENT (FEBRUARY 2012). FREIGHT DOCK DATA PROVIDED BY CLIENT, MAY 21, 2020. ADDITIONAL MILNE PORT INFRASTRUCTURE PROVIDED BY CLIENT, MAY 28, 2018 AND PROVIDED BY HATCH, JANUARY 25, 2017, RETRIEVED FROM KNIGHT PIESOLD LTD. FULCRUM DATA MANAGEMENT SITE MAY 19, 2017. HYDROGRAPHY AND TOPOGRAPHY DATA BY EAGLE MAPPING (2005), RETRIEVED FROM KNIGHT PIESOLD LTD. FULCRUM DATA MANAGEMENT SITE, MAY 2017. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 17 DATUM: NAD 83

CLIENT
BAFFINLAND IRON MINES CORPORATION

PROJECT
MARY RIVER PROJECT

TITLE
PROJECT LOCATION

CONSULTANT

wsp

YYYY-MM-DD	2023-04-27
DESIGNED	CB
PREPARED	AA
REVIEWED	AL
APPROVED	AL

PROJECT NO.	CONTROL	REV.	FIGURE
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1.2 Background

As a part of regulatory commitments, Baffinland has developed and implemented a multi-disciplinary Marine Environmental Effects Monitoring Program (MEEMP). The MEEMP is designed to evaluate potential Project-related effects on the marine environment as predicted in the Final Environmental Impact Statement (FEIS; Baffinland 2012, 2013) and subsequent addenda; predictions, associated mitigation measures, and current status are presented in Table 1-1 below.

The MEEMP includes monitoring of marine water and sediment quality, marine invertebrates, marine vegetation, and fish and fish habitat. The MEEMP sampling design is generally based on the Metal Mining Environmental Effects Monitoring technical guidelines (Environment Canada 2012) and includes statistical approaches for detecting potential Project-induced impacts on the marine environment. NIS/AIS monitoring is an integral component of the MEEMP and is designed to address the potential risks of species introductions to the marine environment from ship ballast water and hull biofouling.

Sikumiut Environmental Management Ltd. (SEM) was originally retained by Baffinland to design and implement the MEEMP. The MEEMP program was first implemented in 2015, at which time monitoring efforts focused primarily on further characterization of baseline conditions in Milne Port prior to commencement of Project operations in 2015 (SEM 2015). Environmental effects monitoring was completed by SEM in 2015 and 2016. Golder Associates Ltd. (now known as WSP Canada Inc.) completed environmental effects monitoring from 2017 through 2022, which included modifications to the 2015-2016 MEEMP and NIS/AIS sampling design to better address the objectives of the programs. Modifications to the program since 2015 are summarized in Table 1-5.

1.3 Objectives

This report presents the results of the MEEMP and NIS/AIS monitoring programs conducted in Milne Inlet during the 2022 open-water season. The GPS/tidal gauge component for the monitoring of sea levels and storm surges is also presented (Chapter 9.0).

In accordance with existing Terms and Conditions of Project Certificate (PC) No. 005, Baffinland is responsible for the establishment and implementation of the MEEMP, which comprises monitoring studies that are conducted over a defined time period with the following objectives:

- Assess the accuracy of effects predictions in the FEIS (Baffinland 2012) and subsequent addenda.
- Assess the effectiveness of Project mitigation measures.
- Verify compliance of the Project with regulatory requirements, permits, standards, and policies.
- Identify unforeseen adverse effects and provide early warnings of undesirable changes in the environment.
- Improve understanding of local environmental processes and potential Project-related cause-and-effect relationships.
- Provide feedback to the applicable regulators (e.g., NIRB) and advisory bodies (e.g., Marine Environmental Working Group [MEWG]) with respect to the following:
  - Potential adjustments to existing monitoring protocols or monitoring framework to allow for the most scientifically defensible synthesis, analysis, and interpretation of data.
  - Considerations for the modification of operational practices where and when necessary.

Table 1-1: Summary of Predictions from FEIS and subsequent addenda for Milne Port, Associated Mitigation Measures, and Current Status

Predictions				Relevant MEEMP Section	Current Status
VEC[1]	**Activity**	**Impact/Significance**	**Associated Mitigation Measures**		
Water and Sediment Quality	Barge and ship traffic to/from Milne Inlet	Negligible effects to total suspended solids (TSS), nutrient, or metal concentrations in the water or sediment due to resuspension of substrates from propeller currents; expected that the new equilibrium state will be reached early within the operation phase of the Project.	▪ Environmental Monitoring and Mitigation Plan outlines measures such as use of silt curtains and drainage ditches, as well as treatment and testing of effluent/run-off prior to discharge, to mitigate potential effects to water and sediment quality. ▪ Emergency Response and Spill Contingency Plan outlines measures to mitigate potential fuel spills. ▪ Shipping and Marine Wildlife Management and Ballast Water Management plans outlines measures to mitigate potential effects associated with vessel traffic such as a mandatory mid-ocean ballast water exchange and compliance with Anti-Fouling Systems Convention.	Chapter 2.0 Chapter 3.0 Chapter 5.0	No indications of impacted marine water or sediment quality. Measured metals concentrations are low, typically below applicable guidelines, and generally consistent with previous years. No observance of ore dust deposition in substrate. Grain size composition analysis indicates high spatial and temporal variability in fines content, driven by natural factors, as well potential influences of vessel propeller wash, which is expected to stabilize over time. To date, 2020 was the only instance where reduced fines content was accompanied by a substantial reduction in benthic density, richness and diversity; effects are temporary and localized.
		No anticipated increases in hydrocarbon concentrations in water or sediments through normal vessel operations.			
	Discharge of ballast water	Open-water season: no anticipated effects to water or sediment quality.			
		Ice-cover season: increases in temperature and nitrate concentrations in the water; increases in nitrogen concentrations in the sediment; no anticipated changes in the concentrations of metals or other nutrients in water or sediment.			
	Dispersion and deposition of dust from the ore stockpile	Increases in concentrations of TSS and metals (primarily iron) in the water.			
		Increases in concentrations of metals (primarily iron) in the sediment.			
	Discharge of wastewater and site run-off	Increases in biological oxygen demand (BOD) and concentrations of TSS, nutrients, metals, and hydrocarbons in the water.			
		Increases in concentrations of nutrients, metals, and hydrocarbons in the sediment.			

Predictions				Relevant MEEMP Section	Current Status
VEC[1]	Activity	Impact/Significance	Associated Mitigation Measures		
Marine Fish Habitat	Habitat Alteration (Sediment introduction and resuspension)	Wastewater discharge and site runoff may introduce TSS into the water column, increasing the amount of fine-grained sediments in the immediate vicinity of the discharge point.	▪ Environmental Monitoring and Mitigation Plan outlines measures such as use of silt curtains and drainage ditches, as well as treatment and testing of effluent/run-off prior to discharge, to mitigate potential effects to water and sediment quality. ▪ Emergency Response and Spill Contingency Plan outlines measures to mitigate potential fuel spills ▪ Shipping and Marine Wildlife Management and Ballast Water Management plans outlines measures to mitigate potential effects associated with vessel traffic such as a mandatory mid-ocean ballast water exchange and compliance with Anti-Fouling Systems Convention. ▪ Minimize vessel operations to the extent possible. ▪ Mitigation by design and through compliance of Fisheries and Oceans Canada's (DFO) no net loss habitat policy.	Chapter 2.0 Chapter 3.0 Chapter 4.0 Chapter 5.0 Chapter 8.0	No indications of impacted marine sediment quality. Measured metals concentrations were low, typically below applicable guidelines, and/or generally consistent with previous years. No observance of ore dust deposition in substrate Generally, no evidence of altered benthic infauna, epifauna, or macroflora community composition or productivity. In 2020, one station, SW-2, showed signs of propeller wash effects (i.e., lower density and diversity metrics, accompanied by reduced fines content), conditions in 2021 and 2022 rebounded substantially; effects are temporary and localized.
		Potential increases in concentrations of TSS in the water column and accumulation of fines in the sediments could alter the nearshore habitat, although tidal fluxes are expected to disperse the effluents and minimize effects on habitat.			
	Habitat Alteration (Substrate alteration)	Sediment resuspension due to occasional (<1 per year) vessels and propeller-generated currents expected to lessen as fine-grained sediments on seabed are removed and seabed sediment composition stabilizes.			
		Removal of fine-grained sediments may alter benthic community composition.			
	Habitat Alteration (Noise disturbance)	Intermittent noise disturbance due to occasional vessel operations and loading activities.			
	Habitat Alteration (Fugitive ore dust deposition)	Fugitive ore dust deposition to marine environment.			
		Possible change to water and sediment chemistry and seabed grain size composition.			
		Possible change to benthic productivity.			

Predictions				Relevant MEEMP Section	Current Status
VEC[1]	**Activity**	**Impact/Significance**	**Associated Mitigation Measures**		
Arctic Char (*Salvelinus alpinus*) Health	Sediment Resuspension	Increases in concentrations of TSS, nutrients, and metals in the water column as a result of sediment disturbance from propeller currents are expected infrequently during operation. Short-term exposure of Arctic Char to these conditions has minimum potential to affect fish health.	▪ Environmental Monitoring and Mitigation Plan outlines measures such as use of silt curtains and drainage ditches, as well as treatment and testing of effluent/run-off prior to discharge, to mitigate potential effects to water and sediment quality. ▪ Emergency Response and Spill Contingency Plan outlines measures to mitigate potential fuel spills. ▪ Shipping and Marine Wildlife Management Plan outlines measures to mitigate potential effects associated with vessel traffic such as a mandatory mid-ocean ballast water exchange and compliance with Anti-Fouling Systems Convention.	Chapter 6.0 Chapter 7.0	No indications of changes in relative abundances of Arctic Char and other fish species. No notable trends observed in tissue concentrations of constituents of potential concern (e.g., aluminum, iron, magnesium, mercury, and selenium) over time.
		The redistribution of sediments near the docks is not expected to directly affect fish health or condition.			
		Slight reductions in nutrient concentrations and short-term, localized increases water temperature in Milne Inlet are expected to have negligible effects on fish health and condition.			
		Metal concentrations in water and fish tissues are not expected to change.			
		Potential increases in metal and hydrocarbon concentrations in fish tissues and reductions in fish health and condition are possible as a result of release of site drainage (with elevated BOD and concentrations of TSS, nutrients, metals, and hydrocarbons) to the marine environment.			
		Combined effluents will be tested to ensure that they are not acutely toxic.			

[1] VEC = Valued Ecosystem Component

The MEEMP was developed in consideration of the anticipated and potential Project-related impacts to the marine environment as identified in the 2012 FEIS and subsequent addenda as well as monitoring requirements outlined in several PC Terms and Conditions; relevant PC conditions are listed in Table 1-2, along with a description of how the conditions are addressed through the MEEMP/NIS/AIS program.

Table 1-2: PC Conditions Relevant to MEEMP Surveys

PC Condition	Description	Relevant MEEMP Chapter(s)
76	The Proponent shall develop a comprehensive Environmental Effects Monitoring Program to address concerns and identify potential impacts of the Project on the marine environment.	Chapter 2.0 Chapter 3.0 Chapter 4.0 Chapter 5.0 Chapter 6.0 Chapter 7.0 Chapter 8.0
1 and 83	GPS/tidal gauge monitoring of sea levels and storm surges. Install tidal gauges at Steensby and Milne Port to monitor seas levels and storm surges.	Chapter 9.0
83(a)	The Proponent shall conduct hydrodynamic modelling in the Milne Inlet Port area to determine the potential impacts arising from disturbance to sediments including re-suspension and subsequent transport and deposition of sediment. The modelling results shall be used to update the marine water and sediment quality monitoring and mitigation program to include activities associated with the construction and operation of the Milne Inlet Port. The monitoring program shall include an ongoing assessment of the potential introduction of metals that bio-accumulate in the marine food chain.	Chapter 2.0 Chapter 3.0 Chapter 5.0 Chapter 7.0
84	The Proponent shall update its sediment redistribution modeling once ship design has been completed and sampling should be undertaken to validate the model and to inform sampling sites and the monitoring plan.	Chapter 3.0 Chapter 5.0
85	The Proponent shall develop a monitoring plan to verify its impact predictions associated with sediment redistribution resulting from propeller wash in shallow water locations along the shipping route. If monitoring detects negative impacts from sediment redistribution, additional mitigation measures will need to be developed and implemented.	Chapter 3.0
86	Prior to commercial shipping or iron ore, use more detailed bathymetry collected from Steensby and Milne Inlets to model anticipated ballast water discharges from ore carriers. This information should be used to update ballast water discharge impact predictions and sampling should be conducted to validate the model.	N/A
87	The Proponent shall develop a detailed monitoring program at a number of sites over the long term to evaluate changes to marine habitat and organisms and to monitor for non-native introductions resulting from Project-related shipping. This program needs to be able to detect changes that may have biological consequences and should be initiated several years prior to any ballast water discharge into Steensby Inlet and Milne Inlet to collect sufficient baseline data and should continue over the life of the Project.	Chapter 2.0 Chapter 3.0 Chapter 4.0 Chapter 5.0 Chapter 6.0 Chapter 7.0 Chapter 8.0

PC Condition	Description	Relevant MEEMP Chapter(s)
89	The Proponent shall develop and implement an effective ballast water management program that may include the treatment and monitoring of ballast water discharges in a manner consistent with applicable regulations and/or exceed those regulations if they are determined to be ineffective for providing the desired and predicted results. The ballast water management program shall include, without limitation, a provision that requires ship owners to test their ballast water to confirm that it meets the salinity requirements of the applicable regulations prior to discharge at the Milne Port, and a requirement noting that the Proponent, in choosing shipping contractors will, whenever feasible, give preference to contractors that use ballast water treatment in addition to ballast water exchange.	Chapter 2.0 Chapter 8.0
91	The Proponent shall develop a detailed monitoring plan for Steensby Inlet and Milne Inlet for fouling that complies with all applicable regulatory requirements and guidelines as issued by Transport Canada, and includes sampling areas on ships where antifouling treatment is not applied such as the areas where non-native species are most likely to occur.	Chapter 8.0
99(a)	Establish shipping season, inter-annual baseline in Steensby Inlet and Milne Inlet that enables effective monitoring of physical and chemical effects of ballast water releases, sewage outfall, and bottom scour by ship props, particularly downslope and downstream from the docks. This shall include the selection and identification of physical, chemical, and biological community/indicator components. The biological indicators shall include both pelagic and benthic species but with emphasis on relatively sedentary benthic species (e.g., sculpins).	Chapter 2.0 Chapter 3.0 Chapter 4.0 Chapter 5.0 Chapter 6.0 Chapter 7.0 Chapter 8.0
99(b)(ii)	The collection of additional baseline data in Milne Inlet on narwhal (*Monodon monoceros*), bowhead whale (*Balaena mysticetus*) and anadromous Arctic Char abundance, distribution ecology and habitat use.	Chapter 6.0 Chapter 7.0
99(c)	Enhance baseline data on marine wildlife (fish, invertebrates, birds, mammals, etc.) and to provide more details on species abundance and distribution found in the Project area.	Chapter 4.0 Chapter 5.0 Chapter 6.0 Chapter 7.0 Chapter 8.0
113	The Proponent shall conduct monitoring of marine fish and fish habitat, which includes but is not limited to, monitoring for Arctic Char stock size and health condition in Steensby Inlet and Milne Inlet, as recommended by the MEWG.	Chapter 6.0 Chapter 7.0
114	In the event of the development of a commercial fishery in the Steensby Inlet area or Milne Inlet-Eclipse Sound areas, the Proponent, in conjunction with the Marine Environment Working Group, shall update its monitoring program for marine fish and fish habitat to ensure that the ability to identify Arctic Char stock(s) potentially affected by Project activities and monitor for changes in stock size and structure of affected stocks and fish health (condition, taste) is maintained to address any additional monitoring issues identified by the MEWG relating to the commercial fishery.	Chapter 6.0 Chapter 7.0
126	The Proponent shall design monitoring programs to ensure that local users of the marine area in communities along the shipping route have opportunity to be engaged throughout the life of the Project in assisting with monitoring and evaluating potential Project-induced impacts and changes in marine mammal distributions.	Chapter 4.0 Chapter 6.0

1.4 VECs and Indicators

1.4.1 VECs and Criteria for Magnitude Determination

The original MEEMP design was based on indicators and thresholds as presented in the FEIS, centred around three Valued Ecosystem Components (VECs): Marine Water and Sediment Quality, Marine Fish Habitat and Arctic Char Health.

Indicators used to determine the magnitude thresholds were based on guidelines, where available (Table 1-1). A reduction in productive capacity (measured as a proportion of lost or altered habitat to the total area of the Local Study Area[1], or LSA) was used as an indicator for the Marine Fish Habitat VEC (Baffinland 2012 and 2013). Thresholds were established based on degree of exceedance relative to guidelines. For certain parameters where no guidelines or quality criteria exist, the MEEMP used a significance criterion of two standard deviations of the baseline year as a threshold (Baffinland 2016).

The assessment predicted that Project activities may result in localized changes above threshold values for VECs, confined within the LSA. It was predicted that changes would not exceed thresholds for the Marine Fish Habitat VEC. All predicted residual environmental effects were rated as “Not Significant” since they were localized within the LSA (Table 1-1, Baffinland 2012 and 2013).

1.4.2 Indicators and Thresholds Currently Used for the MEEMP

Since 2016, the MEEMP and NIS/AIS program study design has evolved through consultation with regulatory agencies and Inuit organizations, as well as in response to recommendations made in previous survey years. Modifications to study designs are discussed in Sections 1.5.3.1 and 1.5.4.1. Changes to the program have also included updates or additions to the indicators and thresholds used to determine potential Project-related impacts to the environment in Milne Port. Sampling parameters and indicators used in 2022 are summarized in Table 1-3.

Table 1-3: Sampling Parameters and Indicators for the 2022 MEEMP and NIS/AIS Monitoring Program

MEEMP Component	Indicator	Context
Marine Water Quality	Metals Total Suspended Solids Nutrients Hydrocarbons	Temporal
Marine Sediment Quality	Percent Fines Nutrients Metals Hydrocarbons	Spatial Temporal
Benthic Invertebrates	Total Density Taxa Richness Simpson’s Diversity Index Simpson’s Evenness Index	Spatial Temporal
Substrate, Macroflora, and Epifauna	Percent Cover/Density Taxa Richness Simpson’s Diversity Index	Spatial Temporal

[1] The LSA includes all marine waters where there exists a reasonable potential for direct measurable effects from Project activities on the marine environment.

MEEMP Component	Indicator	Context
Fish Population	Taxa Richness Relative Abundance Arctic Char Abundance Catch Per Unit Effort (CPUE)	Qualitative Temporal
Fish Health	Survival Growth Condition Reproduction	Temporal
Fish Tissue Chemistry	Total Metals Total Polycyclic Aromatic Hydrocarbons (PAHs)	Temporal
NIS/AIS	Presence of NIS or AIS	No Context

1.5 Study Design

1.5.1 Study Area

Consistent with previous years, the 2022 MEEMP and NIS/AIS field surveys were conducted primarily within the LSA for the Marine Environment as defined in the FEIS and Addendum 1 (Baffinland 2012; 2013). The LSA includes all of Milne Port (Assomption Harbour) and extends north up to 4 km from the existing terminal (spanning the full width of Milne Inlet at the northern boundary; Figure 1-2). The southeast boundary of the LSA ends at the mouth of Phillips Creek.

In 2019, following feedback provided from MEWG members and the community during 2016 community workshops, additional NIS/AIS and physical oceanographic monitoring was conducted north of the LSA boundary extending to Ragged Island and Eclipse Sound (Figure 1-1). No sampling was conducted at Ragged Island in 2022.

1.5.2 Inuit Participation

Inuit personnel have been integral to the overall success and safe execution of Baffinland’s monitoring programs to date. The success of the MEEMP is greatly reliant on local expertise/knowledge and the continued participation of Inuit stakeholders with respect to study design, program implementation, and field logistics. For the 2022 MEEMP program, Inuit participation included field technicians, equipment operators, and boat operators supporting sampling and processing for the various components.

1.5.3 MEEMP

The MEEMP was initially designed in 2014 to evaluate potential Project-related impacts on the marine environment as predicted in the FEIS and subsequent addenda (Baffinland 2013). The original sampling design for the MEEMP (Baffinland 2016; SEM 2015) was based on a radial gradient transect design extending out from the ore dock (Figure 1-2), which represented a potential point source for contaminants (e.g., ore dust, hydrocarbon release, wastewater, and site runoff) and physical perturbations (e.g., sediment re-suspension and transportation). The radial pattern was designed to detect potential Project-related effects based on a gradient of key components with numerical indicators (e.g., metal concentrations in sediment) along a series of transects with increasing distance from the point source.

The initial MEEMP design (excluding NIS/AIS monitoring) comprised the following study components:

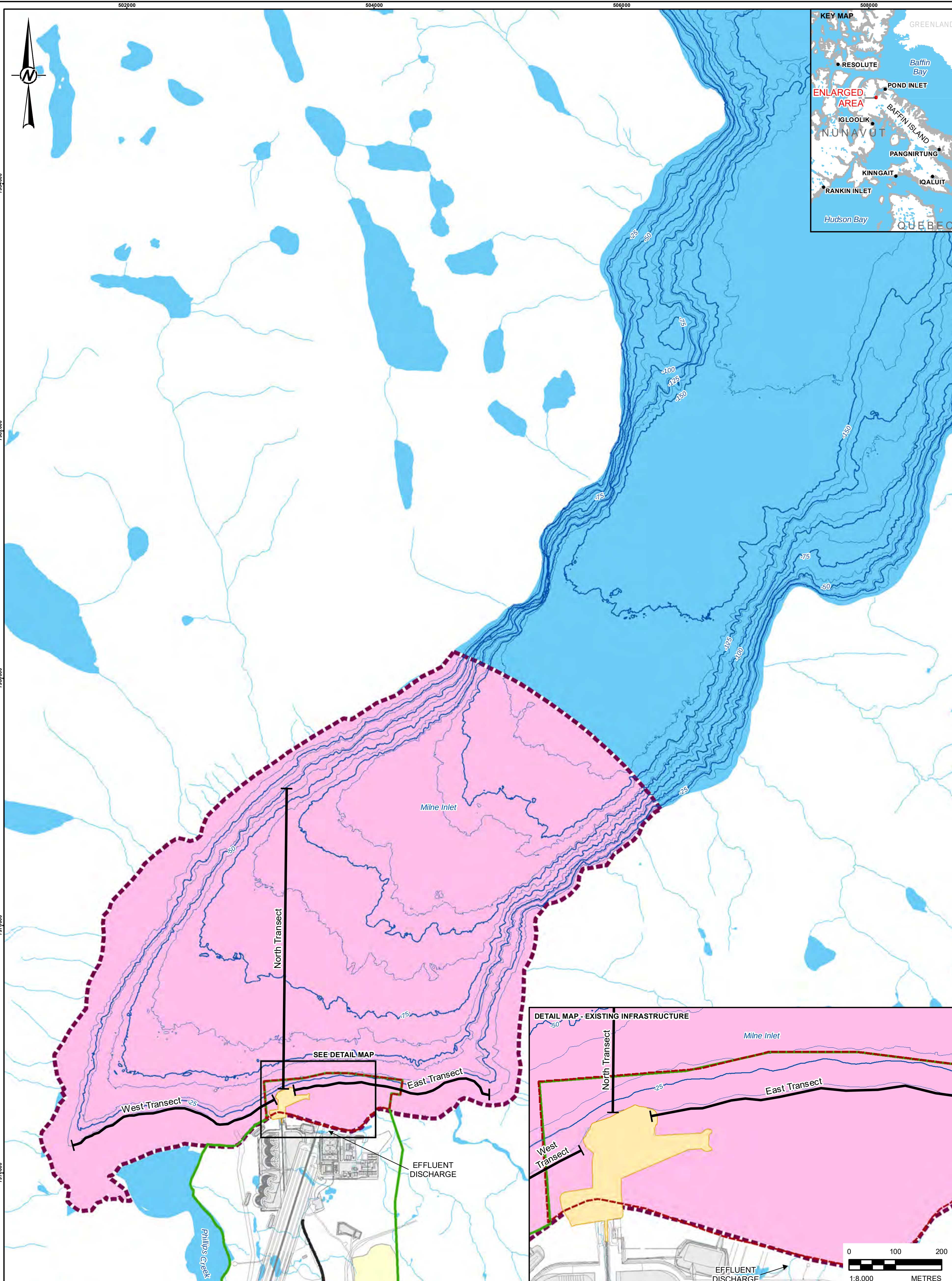
- Marine sediment quality
- Benthic epifauna and epiflora dive surveys
- Fish

While the original radial gradient design has remained since 2014, the program has been updated to include more components and changes have been made to sampling methodologies and frequencies. Modifications to the MEEMP are summarized below in Section 1.5.3.1. Sampling efforts for the MEEMP in 2022 are summarized in Table 1-4.

Table 1-4: Summary of Sampling Efforts Performed in Milne Port for MEEMP Surveys, 2022

MEEMP Component	Relevant PC Conditions	Collection Methods	Sampling Effort	Sampling Frequency	Years of Data
Marine Water Quality	76, 83 (a), 87, 89 and 99 (a)	Vessel-based using 2.0 L Kemmerer sampling bottles	8 stations	Annually; five sampling events/year	7
Marine Sediment Quality	76, 83(a), 84, 85, 87 and 99(a)	Vessel-based using a Van Veen grab sampler	4 stations	Targeted sampling, full sediment program every three years	9
Benthic Infauna	76, 87, 99(a), 99(c) and 126	Vessel-based using a Van Veen grab sampler	4 stations	Targeted sampling, full benthic infauna program every three years	4
Substrate, Macroflora, & Epifauna	76, 83a, 84, 87, 99 (a) and (c)	Quadrat surveys by SCUBA divers	26 quadrats	Annually	2
Marine Fish Community	99(b)(ii), (c), 113, and 114	Angling	11.5 hours	21 stations	6
		Fukui trap	1,852 hours	30 stations	10
		Gill net	54 hours	22 stations	11
		Hoop net	669 hours	Nine stations	4
		Trawling	1 hour	Two stations	3
Fish Health & Tissue Chemistry	76, 83 (a), 87, 99 (a), 99 (b) (ii), 99 (c), 113, and 114.	See above for collection methods. Chemistry analyses completed by specialized laboratories.	Incidental Arctic Char (8)	Annually	12
			Four Horned Sculpin (40)		4
			Hiatella arctica (40)		5

PATH: I:\2016\1663724\Mapping\MXD\64000_2022_MEEMP\166372401_64000_04_Fig1_2_RadialGradientStudyDesign_Rev0.mxd PRINTED ON: 2023-04-27 AT: 1:55:49 PM



LEGEND

- BATHYMETRIC CONTOUR (15 m INTERVAL)
- BATHYMETRIC CONTOUR (25 m INTERVAL)
- MILNE INLET TOTE ROAD
- TRANSECT
- WATERCOURSE
- AGGREGATE SOURCE (BORROW PIT OR QUARRY)
- INFRASTRUCTURE
- ORE DOCK
- LOCAL STUDY AREA
- PDA / QIA COMMERCIAL LEASE
- WATERBODY

0 500 1,000

1:30,000 METRES

REFERENCE(S)

BATHYMETRY CREATED BY GOLDER FROM MULTIPLE DATA SOURCES. FREIGHT DOCK DATA PROVIDED BY HATCH, MAY 21, 2020. ADDITIONAL MILNE PORT INFRASTRUCTURE PROVIDED BY CLIENT, MAY 28, 2018 AND PROVIDED BY HATCH, JANUARY 25, 2017, RETRIEVED FROM KNIGHT PIESOLD LTD. FULCRUM DATA MANAGEMENT SITE MAY 19, 2017. HYDROGRAPHY AND TOPOGRAPHY DATA BY EAGLE MAPPING (2005), RETRIEVED FROM KNIGHT PIESOLD LTD. FULCRUM DATA MANAGEMENT SITE, MAY 2017. HYDROGRAPHY, POPULATED PLACE, AND PROVINCIAL BOUNDARY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 17 DATUM: NAD 83

CLIENT
BAFFINLAND IRON MINES CORPORATION

PROJECT
MARY RIVER PROJECT

TITLE
STUDY AREA FOR THE MARINE ENVIRONMENTAL EFFECTS MONITORING PROGRAM (MEEMP), 2022

CONSULTANT

wsp

YYYY-MM-DD	2023-04-27
DESIGNED	CB
PREPARED	AA
REVIEWED	AL
APPROVED	AL

PROJECT NO.	CONTROL	REV.	FIGURE
166372401	64000-04	0	1-2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
25mm

1.5.3.1 Modifications to the Program

Since program inception, survey design has continually evolved based on refinements identified through consultation with regulatory agencies and Inuit stakeholders, and recommendations made in previous survey years. Table 1-5 summarizes key changes to the program since 2014.

Table 1-5: Summary of Modifications to the MEEMP Study Design from 2014 to 2022

Year	Component	Description of Modifications
2015	Marine Water Quality	Addition of water quality component to monitor for potential changes associated with site drainage and treated effluent discharges to the marine environment (including iron ore stockpile run-off). Four water quality stations were established near the site discharge point for compliance monitoring; one station next to the site discharge point, and three stations located slightly offshore to the northeast, north and northwest of the source.
2017	Physical Oceanography	Addition of sea level monitoring (using a tidal gauge) and vertical physical profiles of physical oceanographic parameters at Milne Port.
2017/18	Marine Fish Community	In 2017, fish sampling was limited to a two-week period in August, which was not necessarily representative of the entire open-water shipping season (late July to mid-October). In 2018, fish sampling was conducted throughout the duration of the MEEMP program (over four weeks, from the end of July to the end of August) for better representation of the shipping season. Fishing methods included gill netting and Fukui traps, with angling added in 2017, and beach seines added in 2018.
2018	Physical Oceanography	Sea level monitoring was expanded to include physical oceanographic monitoring throughout Milne Inlet including two sites at Milne Port and one at Bruce Head, and additional vertical physical profiles at select times and locations throughout Milne Inlet.
2018	Marine Sediment Quality	The number of sediment samples analyzed for hydrocarbon concentrations was reduced from three samples to one sample at each station, as hydrocarbon concentrations had been below detection limits (DL) in all samples to date. Additionally, two new sediment sampling stations were included along the East Transect to account for anticipated construction associated with the proposed Phase 2 ore dock and freight dock. (The freight dock was subsequently constructed but Phase 2 ore dock is no longer relevant.)
2018	Benthic Infauna	Addition of benthic infaunal sampling program, with input from MEWG. Previous years did not include infaunal sampling but, rather, evaluated changes to the benthic community using epifauna[2] and epiflora[3] as indicators using towed underwater video transect surveys – an approach that did not yield consistent nor reliable data primarily due to issues associated with video resolution.

[2] benthic invertebrates living on the substrate

[3] marine vegetation attached to the substrate (e.g. kelp)

Year	Component	Description of Modifications
2018	Epifauna and Epiflora	Study design was changed from one long video transect to a Before - After - Control - Impact (BACI) approach with five belt transects (1 m x 5 m plots) permanently installed on the seabed in each of the exposure and reference areas; monitoring was conducted using a remotely operated vehicle (ROV) underwater video system.
2018	Fish Health & Tissue Chemistry	Addition of local shellfish species, wrinkled rock-borer (*Hiatella arctica)*, as an additional effects indicator in the event finfish species (Arctic Char or sculpins) were sampled in insufficient numbers to adequately support statistical analyses. Measurement endpoints included body weight to length ratio and tissue (body burden) analysis. Prior to 2018, fish tissue sampling was limited to incidental Arctic Char mortalities, which fluctuated from year to year and did not always yield enough samples for a meaningful statistical analysis.
2019	Physical Oceanography	Vertical physical profiles of water quality parameters including temperature, salinity, conductivity, turbidity, pH, chlorophyll-a, and dissolved oxygen were taken north of Ragged Island in Eclipse Sound in August and September 2019.
2019	Benthic Infauna/ Marine Sediment Quality	Following the results of a power analysis, sampling intensity for benthic infauna and marine sediment was increased from four transects with five stations, to five transects with 15 stations each to improve statistical power and the ability to detect Project-related effects. Unlike in previous years, separate NIS/AIS stations were not sampled due to the expansion of the benthic sampling program.
2019	Benthic Infauna	In previous years, three replicate grab samples were taken at each benthic infauna sampling station. In 2019, the three grab samples were composited into a single sample for each station.
2019	Fish Health & Tissue Chemistry	Inclusion of sculpin (*Myoxocephalus* sp.) as a sentinel species and effects indicator due to the number of incidental mortalities being sufficient to support analyses.
2019	Fish Health & Tissue Chemistry	Instead of collecting length and weight measurements of *Hiatella arctica* samples in the field, *Hiatella arctica* specimens were submitted for age analysis in addition to the tissue (body burden) analysis.
2019	Marine Fish Community	Hoop nets were introduced to the fish sampling program to determine the capture efficiency of the method in Milne Port and to assess its potential as a replacement for Fukui trapping. Fukui traps will continue to be used in addition to hoop nets to meet commitments of continuing to sample at old locations for a minimum of three years (2022 was year 3) to facilitate comparison of old and new methods/results.
2020	Marine Water Quality	Addition of a second water quality monitoring station at the discharge location of MP-06, consistent with the study design for the existing water quality monitoring station at the discharge location for MP-05.
2020	Marine Water Quality	The collection of water samples was scheduled to coincide with at least one active discharge event at each discharge. One collection event also coincided with a de-ballasting event along the Ore Dock.

Year	Component	Description of Modifications
2020	Marine Sediment Quality/Benthic Infauna	Following time constraints in 2019, the sampling effort was increased from eight to ten sampling stations per transect to 15 sampling stations per transect.
2020	Marine Sediment Quality/Benthic Infauna	Benthic infauna and sediment sampling methodology and equipment was standardized across all stations to ensure consistency and comparability of results.
2020	Marine Sediment Quality/Benthic Infauna	The Coastal Transect was removed from the sampling plan after being determined as not contributing to the radial gradient design of the sediment and benthic sampling components.
2020	Substrate, Macroflora, and Benthic Epifauna	Due to the previously deployed belt transects being moved, twisted, and obscured following a short deployment period, the belt transects were replaced with ten steel quadrats that should be more robust under the local conditions.
2020	Substrate, Macroflora, and Benthic Epifauna	Following limitations in species identification in Remotely Operated Vehicle (ROV) footage on the belt transects, a dive team trained in the identification of marine biota were used in addition to ROV for survey of the quadrats.
2020	Marine Fish Community	Based on input and recommendations by Inuit field personnel, fishing locations were selected, and modifications were made to the methodologies for Fukui traps and hoop nets. Modifications included setting the traps in deeper locations to target demersal species and improve capture efficiency.
2020	Fish Health and Tissue Chemistry	Fourhorn Sculpin (*Myoxocephalus quadricornis*) were added as a targeted species for fish health and tissue chemistry/body burden analysis to monitor for impacts to resident fish species in Milne Port.
2020	Fish Health and Tissue Chemistry	Additional indicators were added to the fish health program to align with a Metal and Diamond Mining Effluent Regulations (MDMER) Environmental Effects Monitoring (EEM) program design. This included the addition of targeted lethal fish sampling to meet a minimum sample size.
2021/22	Marine Sediment Quality/Benthic Infauna	Monitoring frequency for the joint radial sediment and benthic sampling program has been adjusted to every three years, consistent with routine biological sampling for other mining effects monitoring programs and reflective of federal guidance (e.g., the federal Environmental Effects Monitoring Program [EEM]). Targeted sampling at SW-2 and in 2022, additional sampling at adjacent stations SW-1, SW-3 and SW-4.
2021	Substrate, Macroflora, and Benthic Epifauna	Ten additional quadrats were fabricated and deployed: five in each the reference and impact areas. ROV methods were replaced by exclusive use of divers to improve taxonomic resolution of the data. 2021 was the first year that opportunistic samples of macroflora and epifauna were collected for taxonomic/genetic identification.

Year	Component	Description of Modifications
2021	Marine Fish Community	Longlines were trialed as a fishing method to the 2021 program. In addition, two Fishing Areas were delineated based on habitat features and their location relative to Milne Port to help standardize sampling efforts and address variability in the catch data across Milne Port.
2022	Marine Water Quality	The outfall location of MP-05 was moved to a more westward position along the beach between the Ore Dock and the Freight Dock. The coordinates for Source-1 sample location were adjusted to reflect the new position.
2022	Substrate, Macroflora, and Benthic Epifauna	Six additional quadrats were fabricated and deployed: three in each the reference and impact areas.
2022	Marine Fish Community	Following an unsuccessful trial of longlines in 2021, the method was discontinued.
2022	Marine Fish Community	Catch-per-unit-effort (CPUE) calculations were revised for two fishing methods (hoop nets and Fukui traps) to better account for field variability. Data from 2020 and 2021 were re-calculated with the modified CPUE calculations and compared against 2022 results.
2022	Marine Fish Community	A reconnaissance for a potential reference area was performed in two locations north of Milne Port. Water quality, sediment quality and fish community sampling were completed as part of the reconnaissance survey.

1.5.4 NIS/AIS Monitoring

The NIS/AIS monitoring program was designed to detect for the potential introduction of non-native species from ballast water discharges and/or hull biofouling and focuses in areas with the highest likelihood of marine invasion. Due to ballast water releases occurring in Milne Port, NIS/AIS sampling largely focuses on southern Milne Inlet. The NIS/AIS Monitoring Program is conducted at a surveillance level, where detection of a single Project-related invasive species is the threshold for triggering of adaptive management measures (e.g., species rapid response plans) and/or potential corrective actions (e.g., measures to eradicate the NIS/AIS), if deemed feasible. The NIS/AIS monitoring program consisted of data collected across multiple trophic levels (marine vegetation, benthic invertebrates and fish) to establish a comprehensive inventory of existing marine biota in the Project area that is intended to serve as a point of reference for any new species identified over time, and to evaluate potential changes in community structure that may be linked to NIS/AIS introductions. Sampling efforts that contribute to the NIS/AIS monitoring program are summarized in Table 1-6. NIS/AIS monitoring is recommended to be conducted annually until results suggest that the frequency of monitoring in the receiving environment can be reduced.

Table 1-6: Summary of Sampling Efforts Performed in Milne Port for NIS/AIS Monitoring Program Surveys, 2022

Relevant PC Conditions	Collection Methods	Sampling Effort in 2022	Sampling Frequency	Years of Data
76, 87, 89, 91, 99 (a), and 99 (c)	Permanent Quadrats	26 Quadrats	Annual	5[1]
	Active Fish Sampling	84 Stations	Repetitive, Annually	11
	Fish Stomach Contents	33 Incidental Mortalities	Repetitive, Opportunistic, Annually	10
	Benthic Infauna	16 Stations	Annual	11
	Settlement Substrates	31 Plates 21 Baskets	Annual	4[2]
	Incidental Specimen Collection	N/A	Opportunistic, Annually	4

[1]Belt transects were used from 2017-2018 exclusively for NIS/AIS surveys until they were replaced by permanent quadrats and added to MEEMP surveys.

[2]Settlement substrates were first deployed in 2014, however they were only successful retrieved for analysis in 2018 and 2019. A new design was successfully implemented in 2020, with collections beginning in 2021.

1.5.4.1 Modifications to the Program

The initial NIS/AIS surveys were conducted in 2014 to enhance marine flora and fauna inventories collected during baseline sampling in 2008 and 2013. In subsequent years, NIS/AIS monitoring focused on identification of organisms not previously detected during the baseline program (as primary indicators of invasion). Equivalent NIS/AIS monitoring was continued in Milne Port area, although the program was expanded and modified based on refinements identified through consultation with regulatory agencies and Inuit stakeholders and recommendations made in previous survey years. Table 1-7 summarizes key changes to the program.

Table 1-7: Summary of Modifications to the NIS/AIS Monitoring Program Study Design from 2015 to 2021

Year	Program Component	Description of Modification
2015	Settlement Baskets	Baskets were redeployed instead of being collected for annual analysis due to insufficient colonization on the substrate.
2016	Settlement Baskets	New settlement baskets were deployed in Milne Port to replace sets previously lost.
2017	Benthic Infauna and Zooplankton	Four new sampling locations were added at Ragged Island to sample specifically for the NIS/AIS monitoring program in response to public concern over ships potentially discharging ballast water while occupying anchorage sites in this area.
2017	Zooplankton	Four new sampling locations were established in Milne Port for vertical zooplankton hauls, and two new locations for oblique zooplankton tows.
2017	Zooplankton	Modifications to the methodology for oblique zooplankton tows were made to target faster moving species and increase the total number of species identified.

Year	Program Component	Description of Modification
2018	ROV Surveys	ROV-based surveys were made along the hulls of several ore carriers to assess for potential biofouling on vessels originating from outside of Canadian waters.
2019	Benthic Infauna	In 2019, no benthic infauna sampling occurred at the original NIS/AIS specific stations, due to the significant expansion of the benthic sampling program. A greater number of stations were sampled for identification of benthic infauna. NIS/AIS status was determined for all infauna identified in benthic sampling.
2019	Macroflora and Epifauna	A new NIS/AIS towed video survey transect was added east of the new Freight Dock at Milne Port to account for potential changes in shipping rates in Milne Port.
2019	Zooplankton	Two oblique zooplankton tow sampling locations were added to the Ragged Island component.
2020	Overall Program	The program name was changed from AIS Monitoring to NIS/AIS monitoring to emphasize efforts to monitor for all potential species introductions to Milne Port, regardless of invasive status.
2020	ROV Surveys	Survey methodology was reviewed with the operator to ensure the methodology was aligned with the stratified survey design used in Sylvester and MacIsaac (2010).
2020	Ship Hull Monitoring	Performed ROV-based ship hull monitoring on two ships at anchorage to avoid limitations with hull visibility and accessibility when ships are moored at the Ore Dock, increasing the total area and survey time for each ship.
2020	Settlement Baskets	Deployment of nine new sets of settlement baskets and plates along the Freight Dock, as well as ten sets of settlement plates in other locations around Milne Port to increase monitoring of recruitment of encrusting biota.
2020	DNA Sampling	To improve taxonomic resolution, a DNA sampling component was added. Targeted sampling occurred at locations where potential NIS/AIS taxa had been observed previously, samples were preserved for DNA analysis at the Canadian Centre for DNA Barcoding at the University of Guelph. Incidentally-collected specimens were also selectively preserved for barcoding and taxonomic confirmation.
2021	Zooplankton	Zooplankton tows were removed from the sampling program due to the high variability in the data and limited sampling not capturing the seasonal presence of many taxa.
2021	Settlement Baskets	Deployment of new sets of settlement plates and baskets co-located with new quadrats around Milne Port to increase monitoring of recruitment of encrusting biota.
2021	Ship Hull Monitoring	Monitoring of ship hulls was not conducted in 2021 as Baffinland works with DFO to design a methodology that will improve the taxonomic resolution of the data collected to better inform assessment of NIS/AIS risk
2022	Benthic Infauna	Samples were collected at 12 additional benthic infauna stations (for a total of 16) to continue monitoring for NIS/AIS during reduced sampling years for MEEMP surveys.
2022	DNA Sampling	Following targeted sampling in 2020 and 2021 to obtain specimens for genetic analysis, no additional locations were identified for potential flagged taxa. As a result, no targeted sampling for genetic analysis occurred in 2022. Rather, the subfractions remaining following analysis of samples collected for genetic analysis in 2021 will be sorted for targeted organisms.

Year	Program Component	Description of Modification
2022	Zooplankton	Zooplankton sampling at 12 stations was completed, following removal from the program in 2021.
2022	Reporting	Standardized distribution and uncertainty categories have been created and defined to better express confidence in range assessments for new taxa observations.
2022	Reporting	Reports will be submitted to NIRB in final form, with responses to MEWG comments addressed in subsequent annual report,

1.5.5 Tidal Gauge

In 2022, Baffinland undertook water level measurements with a tidal gauge stationed at the Milne Port Ore Dock. The tidal gauge monitoring program is intended to satisfy requirements of the Project's EEM programs and address PC Terms and Conditions No. 1, 76 and 83. The approach to installing the tidal gauge on the Milne Port Ore Dock ladder was identical to that of 2021 and previous years (Golder, 2021). This was necessary to keep a repeatable installation location and elevation from season to season, which is essential to support inter-annual comparison of water level data.

1.6 Conclusions and Recommendations

The MEEMP has been designed to meet the objectives of the various conditions associated with Project Certificate 005, as well as to evaluate whether Project activities have potentially impacted the marine environment over time. Predictions from the FEIS and subsequent addenda indicated the potential for low magnitude changes in some ecological parameters, such as water quality and Arctic Char tissue chemistry, but characterized these as "not significant". Overall, monitoring data align with these predictions, as observed changes are typically minor and either within established guidelines or consistent with baseline levels. Thus, monitoring to date suggests that mitigation measures are functioning as intended and that Project activities are being managed in a way that has not adversely affected the marine ecosystem.

The main conclusions and recommendations based on the results of the 2022 MEEMP studies are as follows:

- **Marine Water Quality**
  - Relevant to PC No. 76, 83(a), 87, 89, 99(a).
  - Measured concentrations of metals were generally consistent with previous years and remained below CCME water quality guidelines for the protection of aquatic life while hydrocarbons and PAHs were not detected at all.
  - Laboratory analyses have not revealed a clear increase in the concentrations of iron in water samples collected between 2017 and 2022; iron was within the 2015-2021 range of detected concentrations.
  - Monitoring results remained within original FEIS predictions, which forecasted no significant residual effects on water quality but indicated the potential for minor localized increases in TSS, nutrient, metal, and hydrocarbon concentrations.

- **It is recommended that the water quality sampling program continue in 2023 to ensure compliance with Project requirements and that parameters of potential concern remain well below thresholds of harm for marine biota.**

- **Marine Sediment Quality**
  - Relevant to PC No. 76, 83(a), 84, 85, 87, and 99(a).
  - Sediment quality at stations SW-1 to SW-4 was consistent with previous MEEMP years:
    - Concentrations of metals and hydrocarbons continued to be below applicable CCME sediment quality guidelines, and the data do not suggest Project-related impacts.
    - Sediment grain size measurements indicated the stations were dominated by sand with varying, but low, proportions of fines content over time. It is expected that sediment results at these four stations will show high spatial and temporal variability in fines content – driven by natural factors, such as ice movement and coastal sediment processes, as well potential influences of vessel propeller wash.
  - Monitoring results remained within original FEIS predictions, which forecasted the potential for minor and localized sediment disturbance associated with propeller wash, which is expected to stabilize over time.
  - **It is recommended to continue targeted sampling of these stations in 2023 as part of the full-scale joint radial benthic and sediment sampling program conducted every three years to further increase understanding of sediment grain size variability and to monitor for potential effects of Project activities on grain size distribution.**

- **Benthic Infauna**
  - Relevant to PC No. 76, 87, 99(a), 99(c), and 126.
  - With the exception of SW-2 in 2020, benthic community indicators remained within the same range across years and compared to adjacent stations, as well as within the range observed at all 15 stations sampled along the West transect in 2020.
  - To date, 2020 was the only instance where reduced fines content was accompanied by a substantial reduction in benthic density, richness and diversity. Overall, the results indicated that benthic communities in Milne Port remained healthy and diverse.
  - Monitoring results remained within original FEIS predictions, which forecasted the potential for minor and localized sediment disturbance associated with propeller wash and associated short-term effects on benthic infaunal invertebrate community indicators.
  - **Sampling will continue in 2023 as part of the full-scale joint radial benthic and sediment sampling program conducted every three years and will further increase understanding of benthic infauna community variability and monitor for potential effects of Project activities.**

- **Substrate, Macroflora, and Benthic Epifauna**
  - Relevant to PC No. 76, 83(a), 87, 99(a), and 99(c).
  - Overall, macrofloral and benthic epifaunal community assemblages were comparable between exposure and reference areas but varied interannually for some assemblage indicators which were likely driven by

environmental factors. Monitoring efforts to date revealed no evidence of overarching spatial or temporal trends that might be associated with Project-induced effects from construction or operation activities and Milne Port.

- **Monitoring of macrofloral and benthic epifaunal assemblages should continue using the same sampling and statistical design. Additionally, it is recommended to continue to monitor opportunistically for observations of deceased bivalves and that a sample should be collected, when possible, for toxicological analyses.**

- **Marine Fish Community**
  - Relevant to PC No. 99(b)(ii), (c), 113, and 114.
  - Construction and operation of Milne Port does not appear to have triggered detectable changes in local fish communities to date.
  - Overall, fishing methods were deemed effective in characterizing the marine fish community in terms of species presence and relative abundance.
  - The delineation of fishing areas (Direct Project Footprint and Indirect Project Footprint) and standardization of fishing methods provides a rigorous study design for generating catch statistics that can be compared for assessing trends in the abundance and distribution of fish at Milne Port into the future.
  - Monitoring results aligned with predictions of the FEIS and subsequent addenda, which forecasted that the Project would have no significant effects on marine fish habitat, nor would it significantly affect Arctic Char populations.
  - **It is recommended that standardized fish sampling continue in 2023. It is also recommended that efforts for angling, gill nets, and hoop nets are increased to improve statistical power.**
- **Fish Health and Tissue Chemistry**
  - Relevant to PC No. 76, 83 (a), 87, 99 (a), 99 (b) (ii), 99 (c), 113, and 114.
  - Monitoring results remained well within predictions of the FEIS and subsequent addenda, which indicated the potential for non-significant, low magnitude effects on Arctic Char health and body condition that are expected to be reversible. Observed changes have generally been small and either within established guidelines, or consistent with baseline conditions, and are thus considered to reflect natural variability rather than effects potentially resulting from the Project.
  - Differences were observed among years in Fourhorn Sculpin survival, as well as sex-specific size at age and condition (as relative weight, relative liver weight, and reproductive investment). Size-dependent differences between years were also observed in mantle somatic index values for *Hiatella arctica*. Differences observed for fish and *Hiatella arctica* were small and inconsistent among years and likely reflect natural variability in these fish and shellfish populations over time.
  - Statistically significant interannual elevations in tissue concentrations of some metals were noted for the shellfish *Hiatella arctica* and Arctic Char in 2022; however, these differences were small and often

inconsistent among years, likely reflecting natural variability in both the bioavailability and subsequent uptake of metals, reflected in the reported tissue concentrations.

- **Continued monitoring is recommended to maintain continuity in established time series data for Arctic Char and the collection of additional fish health and tissue chemistry for Fourhorn Sculpin and *Hiatella arctica,* to provide an ongoing dataset for use in monitoring efforts for both species into the future.**

- **NIS/AIS Monitoring Program**
  - Relevant to PC No. 76, 87, 89, 91, 99 (a), and 99 (c).
  - Hundreds of taxa (880+) have been documented to date, including close to 400 identifiable to species, the vast majority of which are not NIS/AIS.
  - Taxa identified in 2022 surveys included 29 taxa not previously collected during Project monitoring in Milne Port. Almost all new taxa had records of occurrence in the Canadian Arctic. Algal specimens identified as cf. *Punctaria latifolia* and cf. *Stictyosiphon soriferus* were flagged for further review due to no or limited records in the Canadian Arctic. The fish species Halfbarred Pout (*Gymnelus hemifasciatus*) lacks records for the Eastern Canadian Arctic but is known from Arctic waters and the range may have been obscured by similarities to other *Gymnelus* species. A new record of Bryophyta indet. was sent to an expert for further identification as it had only been identified to phylum; this group mainly occurs in freshwater or terrestrial habitats and there are hundreds of species with records from the Canadian Arctic.2022 samples included two taxa currently listed on the Watch List. *Hesperonoe* sp. was sent for independent morphological review. Specimens of *Marenzelleria* sp. were lacking the features required for identification and therefore were not sent for independent review.
  - Two taxa, *Punctaria latifolia* and *Stictyosiphon soriferus,* were added to the Watch List in 2022 as a precaution.
  - There are currently no taxa on the Trigger List.
  - **It is recommended to continue the following:**
    - **sampling across multiple trophic levels continue in 2023 and continuing to expand the Milne Inlet Taxonomic Inventory**
    - **using external accredited laboratories and/or global specialists to confirm identifications of specimens requiring a more in-depth taxonomic analysis.**
    - **collecting targeted samples for DNA analysis at locations where high-risk taxa have previously been observed.**

- **Tidal Gauge**
  - Relevant to PC No. 1, 76, 83, and 86.
  - Significantly more accurate local elevation control as well as high precision atmospheric pressure correction of the water surface elevation measurements would be required to quantify relative sea level change using the Milne Port tidal data as changes in relative sea level are expected to be on the scale of fractions of a millimeter per year. Quantitative measurements of relative sea level change within this degree of precision and accuracy are generally considered beyond the scope of Project EEM.

- While Baffinland can explore alternative options for survey equipment that would increase the accuracy and precision of field measurements, the resolution of the data is still unlikely to meaningfully fulfill this Condition.
- Climate change in the region is most likely to impact features such as changes in sea ice cover, temperature regime, and hydrologic regime

It is recommended to not move forward with the tidal gauge monitoring in 2023 in favour of exploring alternative options to meet this Condition using an indicator(s) other than SLR.

Further details on each component of the MEEMP are provided in topic specific chapters: Marine Water Quality (Chapter 2.0); Marine Sediment Quality (Chapter 3.0); Benthic Infauna (Chapter 4.0); Substrate, Macroflora, and Benthic Epifauna (Chapter 5.0); Marine Fish Community Program (Chapter 6.0); Fish Health and Tissue Chemistry (Chapter 7.0); NIS/AIS Monitoring Program (Chapter 8.0); and Tidal Gauge (Chapter 9.0)

Comments on the 2022 MEEMP and NIS/AIS Monitoring Program Report are anticipated to be received from the Marine Environmental Working Group (MEWG) in June of 2023. Baffinland's responses to MEWG comments and recommendations on the final report will be circulated to the MEWG as a standalone document and included as Appendix A in the subsequent year's NIRB Annual Report (2024).

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REPORT

Chapter 2.0 Marine Water Quality

2022 Milne Port Marine Environmental Effects Monitoring Program (MEEMP) and Non-Indigenous Species and Aquatic Invasive Species (NIS/AIS) Monitoring Program

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28 April 2023

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APPENDICES

ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Definitions
ALS	ALS Canada Ltd.
BC	British Columbia
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CALA	Canadian Association for Laboratory Accreditation Inc.
CCME	Canadian Council of Ministers of the Environment
DL	Detection limit
DQOs	Data Quality Objectives
ERP	Early Revenue Phase
FEIS	Final Environmental Impact Statement
HEPH	Heavy Extractable Petroleum Hydrocarbons
LEPH	Light Extractable Petroleum Hydrocarbons
MEEMP	Marine Environmental Effects Monitoring Program
MDL	Method Detection Limit
PAHs	Polycyclic aromatic hydrocarbons
PC	Project Certificate
PSU	Practical Salinity Unit
QA/QC	Quality Assurance / Quality Control
QC	Quality Control
RPD	Relative Percent Difference
TSS	Total Suspended Solids
UTM	Universal Transverse Mercator
WQGs	Water Quality Guidelines

2.0 WATER QUALITY

2.1 Introduction

This chapter presents the results of the marine water quality monitoring program, a component of the larger Marine Environmental Effects Monitoring Program (MEEMP) conducted at Milne Port and in Milne Inlet during the 2022 open-water season. The water quality component was developed in consideration of the potential Project-related impacts to the marine environment as identified in the 2012 Final Environmental Impact Statement (FEIS) and subsequent addenda, as well as monitoring requirements outlined in the Project Certificate (PC) Conditions described in Chapter 1.0, Table 1-2 (i.e., PC Conditions No. 76, 83(a), 87, 89 and 99(a)), and as required by the Type 'A' Water License.

2.1.1 Objectives

The MEEMP objectives are outlined in Section 1.3 for the overall program. The objective specific to the marine water quality component is:

- Assess potential changes in marine water quality parameters in the receiving environment related to site drainage and effluent discharges MP-05 and MP-06.

2.2 Study Design

2.2.1 Sampling Parameters

The marine water quality program is designed to monitor potential changes in receiving environment water quality associated with site drainage and effluent from two discharge points (MP-05 and MP-06), including run-off from the iron ore stockpiles. The MP-05 discharge is permitted from the Milne Port Ore Stockpile Sedimentation Pond (East) and the MP-06 discharge is permitted from the Milne Port Ore Stockpile Sedimentation Pond (West). The quality of both effluent discharges is monitored monthly prior to and during each intermittent discharge period by Baffinland as per the requirements of the Type "A", Water Licence No. 2AM-MRY1325, and reported by Baffinland The marine receiving environment for the MP-05 primary discharge has been monitored annually since 2015, with monitoring at a second discharge point (MP-06) added in 2020. This sampling program has been applied to identify and characterize potential adverse effects on marine water quality in Milne Port from the two site discharges, to evaluate the current effectiveness of existing mitigation measures, and to inform the need for further mitigation and/or alterations to Project activities, as necessary.

In 2022, water quality samples were collected at four sampling stations near the primary site discharge (MP-05) that have been monitored annually from 2015 to 2021[1]. One station is situated downstream from the marine discharge point for effluent and collected site drainage (i.e., Source-1), while the remaining three stations are located approximately 250 m offshore from the outfall location to the northwest (WNE-1), north (North-1), and northeast (ENE-1), respectively (Figure 2-1, Table 2-1). The same sampling plan was applied to MP-06 in 2020 and so four water quality stations were monitored in 2021 and again in 2022 downstream from the discharge (Source-2) and approximately 250 m offshore in different directions (WNE-2, North-2, ENE-2) (Figure 2-1, Table 2-1). As indicated in Table 2-1, for up to two August sampling events there were some adjustments to the location of the discharge source locations mainly due to conditions on-Site; however, these modifications did not affect the relevance of the data to address study objectives or the reliability of the water quality data collected. Similar to previous years, efforts were made to collect water quality samples during active effluent discharge periods, given that site effluent discharges were intermittent during the 2022 open-water season.

[1] SEM 2016; SEM 2017; Golder 2018, Golder 2019, Golder 2020, Golder 2021, Golder 2022

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LEGEND

DISCRETE WATER QUALITY SAMPLES

- MP-05
- MP-06

0 250 500

1:10,000 METRES

REFERENCE(S)

HYDROGRAPHY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. MILNE PORT IMAGERY CAPTURED AUGUST 2020 © 2020 DIGITAL GLOBE, INC. ADDITIONAL IMAGERY COPYRIGHT © 20190802 ESRI AND ITS LICENSORS. SOURCE: MAXAR VIVID. USED UNDER LICENSE, ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 17 DATUM: NAD 83

CLIENT
BAFFINLAND IRON MINES CORPORATION

PROJECT
MARY RIVER PROJECT

TITLE
WATER QUALITY SAMPLING STATIONS FOR THE MP-05 AND MP-06 MILNE PORT SITE DISCHARGES, MEEMP 2022

CONSULTANT	YYYY-MM-DD	2023-04-27
wsp	DESIGNED	EI
	PREPARED	AA
	REVIEWED	AL
	APPROVED	AL

PROJECT NO.	CONTROL	REV.	FIGURE
166372401	64000-04	0	2-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
25mm
0

Table 2-1: 2022 Marine Water Quality Sampling Locations at MP-05 and MP-06.

Site Discharge Location	Station Name	UTM Zone	Easting (m)	Northing (m)
MP-05 (Milne Port Ore Stockpile Sedimentation Pond [East])	ENE-1	17W	503874	7976517
	North-1	17W	503725	7976612
	WNW-1	17W	503540	7976599
	Source-1 [1,2]	17W	503436	7976486
MP-06 (Milne Port Ore Stockpile Sedimentation Pond [West])	ENE-2	17W	503114	7976665
	North-2	17W	502943	7976619
	WNW-2	17W	502828	7976474
	Source-2 [1]	17W	503044	7976445

Notes: UTM = Universal Transverse Mercator; m = meter.

[1] - August 2 event, the Source-1 sampling location was moved 54 m east as fuel lines from the tanker prevented the team from sampling from these coordinates. The previous location for Source-2 was sampled (in 2020 the Source 2 locations had to be adjusted because it was on land).

[2] - August 6 event: It was observed that the discharge line had been moved 241 m west down the beach, closer to the Ore Dock (location identified as Source-1A).

2.2.2 Indicators and Thresholds

Indicators and thresholds selected for the MEEMP program are described in Section 1.4.2. For marine water quality, a number of parameters are measured, including physical parameters, nutrients, metals, and hydrocarbons. A subset of these parameters (i.e., metals, total suspended solids [TSS], nutrients, and hydrocarbons) are identified as performance indicators to assess potential effects of effluent discharge on the receiving environment. To provide early warning of environmental effects from the Project, applicable water quality guidelines (WQGs) are used as a threshold where these exist (i.e., Canadian Council of Ministers of the Environment [CCME] WQGs for the protection of aquatic life in marine environments [CCME 2021]). For indicators with no associated WQG, such as iron, concentrations were compared to the data range from previous years (2015-2021). If either of these thresholds were exceeded, then the treated effluent data from the discharge were reviewed to determine if the observed increase in these parameters was related to effluent discharges from MP-05 and MP-06.

2.3 Materials and Methods

2.3.1 Field Methodology

Water quality samples were collected during five sampling events scheduled between 2 August and 15 August 2022 to monitor for potential changes in water quality associated with site drainage and effluent discharges to the marine environment (including iron ore stockpile run-off). Samples were typically collected every few days over this period; however, some flexibility was built into the sampling program to facilitate the collection of effluent and receiving water quality samples from the same discharge period to allow for direct comparisons.

Water samples were collected from just below the surface (1 to 2 m) or mid-water column depth from the deeper sample MP-06 locations (MP-06-WNW, MP-06-North, and MP-06-ENE) from a zodiac vessel using a 2.0 L vertically oriented Kemmerer bottle sampler. The sampler was washed with laboratory-grade detergent and then rinsed with site-water prior to sample collection at each station. Samples were preserved in the field according to laboratory instructions and kept refrigerated until they were shipped (within 48 h of sample collection) on ice in coolers to ALS Canada Ltd. (ALS), a Canadian Association for Laboratory Accreditation Inc. (CALA) accredited analytical laboratory. To further limit the time between sample collection and preservation, dissolved metals and mercury samples were field-filtered and preserved, rather than being filtered by the analytical laboratory upon sample receipt. Samples were analyzed for routine parameters, TSS, nutrients, major ions, total and dissolved metals (including mercury), benzene, toluene, ethylbenzene, xylenes, hydrocarbons and PAHs. A full list of field water quality parameters is provided in Appendix 2A in the field data sheets, while a full chemistry parameter list is provided in the analytical reports in Appendix 2B. A total of three field duplicates and three field blank quality control (QC) samples were collected during the field program for Quality Assurance / Quality Control (QA/QC) purposes as discussed in Section 2.3.3.

The sampling effort for hydrocarbons (Petroleum hydrocarbons [BTEX/F1]; Hydrocarbons [LEPH/HEPH], F2-F4, Polycyclic Aromatic Hydrocarbons [PAHs]) was lowered in 2022 (replicating the 2021 sampling) because these organic constituents have not been detected in water samples collected since 2015. As such, for each of the five sampling events, hydrocarbons were sampled at two of the four stations at each discharge location, for a total of twenty samples.

Fecal coliform bacteria were not detected in the 2020 samples collected downstream of both discharges, which was consistent with either low or non-detectable bacteria counts measured in water samples collected from Milne Inlet since 2017. These multi-year data confirmed that MP-05 and MP-06 are not sources of fecal coliforms to Milne Inlet and monitoring of bacteria in receiving waters around each discharge was therefore discontinued in 2021 and was not investigated in 2022.

2.3.2 Data Analysis

Descriptive summary statistics (i.e., mean, minimum, maximum) were calculated for each sampling station over the five sampling events. For statistical calculations, the value of the reported detection limit (DL)[2] was conservatively used for measurements reported to be below the DL. The 2022 summary statistics were screened against the CCME WQGs for the protection of aquatic life in marine environments (CCME 2021). For parameters of interest without an applicable CCME WQG (e.g., iron), concentrations were qualitatively compared to the range of water concentrations reported in previous years (i.e., annually from 2015 to 2021). A point to note, analytical improvements in the ability to detect iron were made in 2017, which reduced the DL to <10 µg/L from the DL of 500 µg/L reported in the 2015 and 2016 MEEMP programs. Differences in the sensitivity of DL precludes comparison of the 2022 iron data to pre-2017 iron data.

Baffinland was responsible for summarizing the 2022 effluent data from MP-05 and MP-06 as per the Type ‘A’ Water Licence requirements and results are reported by Baffinland

[2] The lowest concentration at which individual measurement results for a specific analyte are statistically different from a blank (that may be zero) with a specified confidence level for a given method and representative matrix.

The application of CCME WQGs to total concentrations measured in the environment can be conservative, especially when those metals are part of the mineral matrix that makes up the particle. This is because total metal concentrations reflect both the proportion of metals associated with particles as well as dissolved in the water column. Dissolved concentrations[3] tend to provide a more realistic indication of the bioavailable concentration for direct uptake from the water, particularly in turbid receiving environments (Chapman and Wang 2000); however, water quality guidelines for the protection of aquatic life are generally based on total (not dissolved) concentrations. WQGs are derived from laboratory-based toxicity tests where exposure concentrations are based on metals in solution from metal salts and the laboratory test water has a low level of suspended matter (i.e., clear water). Typically, these toxicity tests involve exposure of test fish, invertebrate, or plant species to more bioavailable dissolved metal concentrations, whereas the exposure guideline is based on total concentrations, thus contributing to conservatism in the derivation of water quality guidelines.

2.3.3 Quality Management

Consistent application of QA/QC measures facilitates the collection of high-quality data which, in turn, increases confidence in the robustness of results. Quality management procedures were applied to the field collection, data analysis, and reporting tasks for the water quality program to verify that the data presented are valid and of acceptable quality to address MEEMP objectives.

2.3.3.1 Field QA/QC

Field staff were trained to be proficient in standardized sampling procedures, data recording using standard forms, and equipment operations applicable to the monitoring program. Field work was conducted according to specified instructions and established technical procedures for standard sample collection, preservation, handling, storage, and shipping procedures.

General QA/QC tasks applicable to the water quality program included, but were not limited to, the following:

- Preparing geo-referenced field maps for use during the program to accurately document sampling locations and project-specific data collection forms to standardize the field data collection process.
- Regular communications between the Project Manager and field staff.
- Collection of Quality Control (QC) samples in the field (i.e., field duplicates and blanks).
- Accredited laboratories were selected for sample analysis and the performance quality of these laboratories was verified through WSP's internal vendor approval and assessment procedures.
- Field data sheets were reviewed by the field supervisor at the end of each day for completeness and accuracy.
- Chain-of-custody documentation was used to track sample shipments to the individual subcontractor laboratoriesSamples were packaged and shipped to the laboratory in accordance with required holding times and storage conditions.Field blanks were collected to identify potential sources of contamination during field sampling. Field blank sample containers were filled with de-ionized water in the laboratory and then

[3] The measure of "dissolved" metals is an operational definition based on whether the metal passes through a small (0.45 micrometre [µm]) filter (BC MWLAP 2013)

processed in the field in the same manner as water samples from each station (i.e., uncapped, treated with preservative, re-capped). Three field duplicates and three field blanks were collected over the five sampling events.

2.3.3.2 Laboratory and Data Analysis QA/QC

Laboratory QA/QC reports were reviewed upon receipt to confirm adherence to sample hold times and laboratory data quality objectives (DQOs), and that the appropriate QA/QC information had been reported. Laboratory QA/QC included verification of recommended sample holding times and the analysis of laboratory control samples, laboratory duplicates, and spiked samples to assess the reliability and reproducibility of the data.

The analysis of field QC samples involved a review of field blank results. Notable results were those detected in the field blanks that were greater than five times the respective DL, in accordance with the BC Field Sampling Manual (BC MWLAP 2013). To assess variability between field duplicates, the Relative Percent Difference (RPD) was calculated as follows:

$$RPD = \left(\frac{sample - duplicate}{(sample + duplicate)/2}\right) \times 100$$

In accordance with the BC Field Sampling Manual (BC MWLAP 2013), an RPD value of >20% was used to identify differences between original and duplicate samples. Values less than five times the Method Detection Limit (MDL) were not included in the RPD calculations because analytical variability near the MDL is higher and does not provide a good measure of variability associated with the collection of field samples.

2.4 Results

2.4.1 QA/QC Results

The 2022 marine water quality data were considered valid based on the results of the QA/QC assessment provided in Appendix 2D for the following reasons:

- Most chemical analyses on surface water samples were completed within the sample hold time requirements. Although exceedances of sample hold time requirements have been documented, the hold times for the parameters in question are relatively short, generally less than ten days (listed in Appendix 2B). Given the remote location of the site, such exceedances were unavoidable, and so efforts were taken to minimize the extent of any hold time exceedances. The data should still be comparable to previous measurements as similar issues with hold time exceedances have been encountered in previous sampling years.
- Water sample temperature was slightly above laboratory thresholds (< 10ºC) in four of the five sampling events (VA22B8899, VA22B8083, YL2201255, VA22B9293), with measured sample temperatures between 13 and 20ºC. These water temperatures did not affect interpretation of the data and were for a limited time period.
- Data reported by the laboratory were considered reliable according to the accredited laboratory QA/QC assessment because there was a low frequency and magnitude of notable detected concentrations in blank QC samples and low variability between duplicates QC samples (Appendix 2D).

Overall, the QA/QC results indicate that the water chemistry data collected during the 2022 MEEMP are of acceptable quality to address the objectives stated in Section 2.1.1.

2.4.2 Marine Water Quality Results

Field water quality measurements are documented in Appendix 2A and laboratory reports are provided in Appendix 2B. The field measurements and laboratory raw data for each station sampled in 2022 are summarized in Appendix 2C. Summary statistics (mean, maximum, and minimum) for the 2022 water quality program calculated from these data are presented in Table 2-2. Summary statistics for parameters of interest for the seven monitoring years between 2015 and 2022 are provided in Appendix 2E – Table 1.

2.4.2.1 Conventional Parameters

The pH values in 2022 water samples collected downstream of both discharge points ranged from 7.8 to 8.0 (Table 2-2) and were within the CCME WQG range for marine waters (7.0 to 8.7) and within the pH range (7.0 – 8.2) reported in previous years (Appendix 2E – Table 1). Total suspended solids were low in most samples (<2 mg/L in 24 of 40 collected samples) and a maximum concentration of 12.2 mg/L in a sample collected from the MP-06 North location on 6 August 2022. Turbidity levels were similarly low (<0.1 NTU to 3.3 NTU) and both TSS and turbidity values were below CCME WQGs and within previously observed annual ranges (Appendix 2E – Table 1). Salinity ranged from 2,500 mg/L to 33,000 mg/L in 2022, reflective of an estuarine environment (i.e., one that fluctuates between brackish and fully saline) (Table 2-2) and dissolved oxygen levels at all stations were indicative of well-oxygenated conditions (Appendix 2A).

2.4.2.2 Nutrients

Nutrients were mostly undetectable over the five sampling events and where detected, concentrations were low and below applicable CCME WQGs[4]. Nitrate concentrations downstream of both discharges in 2022 were mostly below the detection limit, with a combined mean concentration of 0.02 mg-N/L and a maximum concentration of 0.45 mg-N/L. Nitrate concentrations in 2022 were consistent with those reported in 2021 for the MP-05 and MP-06 discharge stations, with similar mean concentrations (Table 2-2; Appendix 2E – Table 1). Nitrite concentrations were below detection in 2022, and the combined mean concentration of total ammonia was 0.009 mg-N/L (Table 2-2; Appendix 2C).

2.4.2.3 Metals

Measured metal concentrations downstream of both discharges were lower than applicable CCME WQGs over the five sampling events. The only exception was a single chromium sample[5], where the total metal concentration was slightly above the CCME WQG (i.e., by 1.1 times) and well within ±20% of the guideline value (which represents the variability associated with the laboratory analysis). This result lies within the range previously measured in Milne Inlet downstream from MP-05 and MP-06 (Appendix 2E – Table 1) and the corresponding dissolved concentration was below detection.

---

[4] No CCME marine WQGs are available for ammonia and nitrite.

[5] MP-05 ENE on 8 August 2022

Total concentrations for a number of metals[6] were low and often not detectable in each of the 2022 samples (Appendix 2C). For other metals (i.e., chromium, iron, and nickel), detectable concentrations were driven by the particulate form as corresponding dissolved concentrations were below detection limits.

Iron is the metal of primary interest for the MEEMP. A CCME marine WQG for iron is not available and, as such, the 2022 iron data were compared to the range measured between 2015 and 2021 downstream from the MP-05 and MP-06[7] discharges (Table 2-2, Appendix 2E – Table 1). Iron concentrations detected downstream of both discharges in 2022 were within detected concentrations measured from 2017 to 2021, which ranged from <10 to 286 mg/L (Appendix 2E – Table 1). The maximum total iron concentration in 2022 (96 µg/L) was similar to the maximum total iron concentration of 93 µg/L measured in 2018 (Table 2-2, Figure 2-2, Figure 2-3). Total iron concentrations were below detection limits in 20 of the 40 samples collected in 2022.

The temporal trend in iron concentrations for the MP-05 and MP-06 sampling locations from 2017 onwards is shown in Figure 2-2 and Figure 2-3. Total iron concentrations in marine water samples collected in 2022 remained within the range measured in previous years in the receiving environments of the MP-05 and MP-06 site discharges. While mean concentrations downstream of MP-05 remained fairly stable, higher variability was noted in the receiving environment, which was comparable to that observed in 2018. Dissolved iron concentrations were below detection limits in each of the samples collected in 2022 (Table 2-2), meaning the majority of detectable iron concentrations were driven by the particulate form and less bioavailable for uptake by aquatic biota.

In addition to iron, several other metals of interest do not have CCME marine WQGs. In these cases, comparisons of 2022 concentrations were made to the ranges reported in the 2015 to 2021 MEEMP water quality dataset (Appendix 2E – Table 1). These comparisons indicate that all measurements downstream from the primary site discharges MP-05 and MP-06 in 2022 were within range reported from previous years. The one exception was total copper, where the 2022 mean concentration of 3.46 µg/L for MP-05 and MP-06 (combined) was higher than mean concentrations calculated for previous years. The 2022 mean value was driven by a maximum concentration of 23.6 µg/L measured at the MP-05 ENE Station located approximately 250 m from the MP-05 discharge (Appendix 2C – Table 1) on 2 August, and a maximum concentration of 11 µg/L measured at MP-06 Source located just downstream from MP-06 on the same day (Figure 2-4 and Figure 2-5). The corresponding dissolved copper concentrations for these two samples were more than an order of magnitude lower than the total concentrations, representing 3% of the total concentration for the MP-05 sample and 9% of the MP-06 sample. Moreover, the site effluents were not expected to be a source of copper at the time of sampling because total copper concentrations in the discharged effluents (MP-05 = 1.7 µg/L; MP-06 = <5 µg/L) were lower than many of the samples taken several hundred metres into Milne Inlet (Figure 2-4).

2.4.2.4 Hydrocarbons

Hydrocarbons and PAHs were not detected in any water quality sample collected during the 2022 MEEMP. Hydrocarbons have consistently been below DLs since sampling was initiated in 2015 (SEM 2016; SEM 2017; Golder 2018; Golder 2019; Golder 2020; Golder 2021; Golder 2022).

[6] Total antimony, beryllium, bismuth, caesium, gallium, mercury, rhenium, selenium, silicon, silver, tellurium, thallium, thorium-232, tin, titanium, tungsten, yttrium, and zirconium.

[7] Receiving water quality data for the MP-06 discharge are only available from 2020 onwards.

Table 2-2: Marine Water Quality – Receiving Environment Summary Statistics for the MP-05 and MP-06 Milne Port Site Discharges over the Five Sampling Events in 2022

Parameter	CCME Marine WQG for Protection of Aquatic Life[(a)]		MP-05			MP-06			MP-05			MP-06			MP-05			MP-06			MP-05			MP-06		
			Source 1 (n=5)			Source 2 (n=5)			WNW 1 (n=5)			WNW 2 (n=5)			North 1 (n=5)			North 2 (n=5)			ENE 1 (n=5)			ENE 2 (n=5)		
	Short Term	Long Term	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Physical																										
pH	—	7.0-8.7	7.9	7.9	8.0	7.9	7.9	8.0	7.9	7.8	8.0	7.9	7.9	8.0	7.9	7.9	8.0	7.9	7.9	8.0	8.0	7.9	8.0	8.0	8.0	8.0
Salinity (PSU)[b]	—	—	10	2.5	31	11	3.6	31	11	3.7	31	20	5.8	32	11	3.7	31	11	3.6	31	11	3.1	31	31	28	33
TSS (mg/L)	<25 mg/L above background	<5 mg/L above background	2.7	< 2.0	4.3	2.1	< 2.0	2.3	3.0	< 2.0	6.5	2.3	< 2.0	3.4	2.6	< 2.0	5.0	2.1	< 2.0	2.3	3.3	< 2.0	8.6	3.2	< 2.0	6.3
Turbidity (NTU)	<8 NTU above background	<2 NTU above background	1.1	0.12	3.3	0.49	0.17	1.2	0.58	0.12	1.9	0.29	< 0.10	0.42	0.36	0.15	0.51	0.49	0.17	1.2	0.64	0.14	1.8	0.12	< 0.10	0.18
Nutrients (µg/L)																										
Nitrate (as N)	339,000	45,000	110	< 10	450	20	< 10	58	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	20	< 10	58	14	< 10	31	< 10	< 10	< 10
Total Metals (µg/L)																										
Aluminum	—	—	30	7.1	62	24	5.5	43	26	7.4	58	18	6.0	35	20	5.8	40	24	5.5	43	29	5.4	64	8.8	5.2	11
Arsenic	—	12.5	0.68	< 0.40	1.6	0.69	< 0.40	1.6	0.70	< 0.40	1.6	1.1	< 0.40	1.7	0.71	< 0.40	1.7	0.69	< 0.40	1.6	0.68	< 0.40	1.6	1.5	1.3	1.7
Cadmium	—	0.12	0.012	< 0.010	0.020	0.015	< 0.010	0.031	0.014	< 0.010	0.022	0.018	< 0.010	0.027	0.013	< 0.010	0.021	0.015	0.010	0.031	0.015	< 0.010	0.024	0.023	0.012	0.028
Chromium	—	1.5 (Cr(VI))	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.73	< 0.50	**1.7**	0.65	< 0.50	1.3
Copper	—	—	2.8	0.76	5.5	3.7	0.99	11	2.0	<0.50	3.3	2.2	< 0.50	5.3	1.6	< 0.50	3.8	3.8	0.59	7.7	7.0	< 0.50	24	4.5	1.6	8.1
Iron	—	—	35	< 10	77	27	< 10	45	28	< 10	63	19	< 10	42	21	< 10	47	27	< 10	45	40	< 10	96	14	< 10	25
Mercury	—	0.016	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silver	7.5	—	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.13	< 0.10	0.25
PAHs (µg/L)																										
Naphthalene	—	1.4	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050

Notes: (a) = Guidelines taken from CMME Marine WQG for the protection of Aquatic Life (http://ceqg-rcqe.ccme.ca/download/en/221); (b) Salinity reported as PSU by ALS and converted to mg/L for the purpose of this table. Bold Font = max exceeding a short term guideline or mean exceeding a long term guideline; CCME = Canadian Council of Ministers of the Environment; WQG = water quality guidelines; Min = minimum; Max = maximum; — = no guideline available; NR = not recorded; PSU = practical salinity unit; TSS = total suspended solid; mg/L = milligrams per liter; < = less than; N = Nitrogen; Cr(VI) = hexavalent chromium; PAH = polycyclic aromatic hydrocarbon; µg/L = micrograms per liter; mL = milliliter.

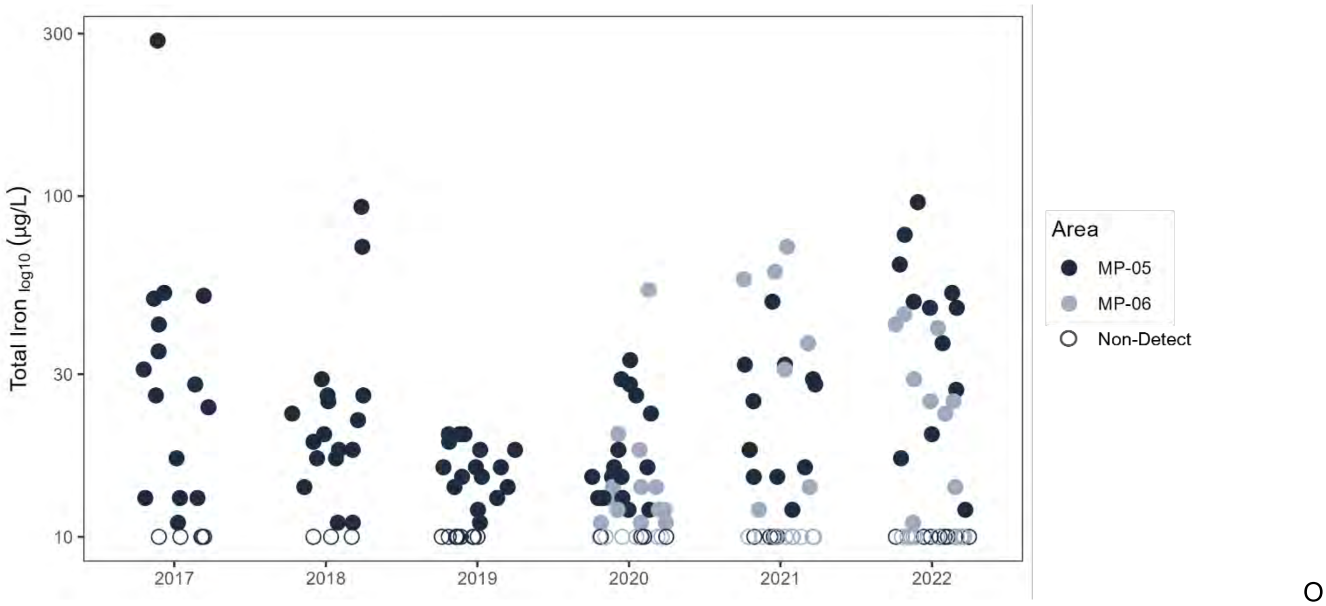

Figure 2-2: Receiving Environment Total Iron Concentrations in Milne Inlet for the MP-05 and MP-06 Milne Port Site Discharges, (2017-2022).

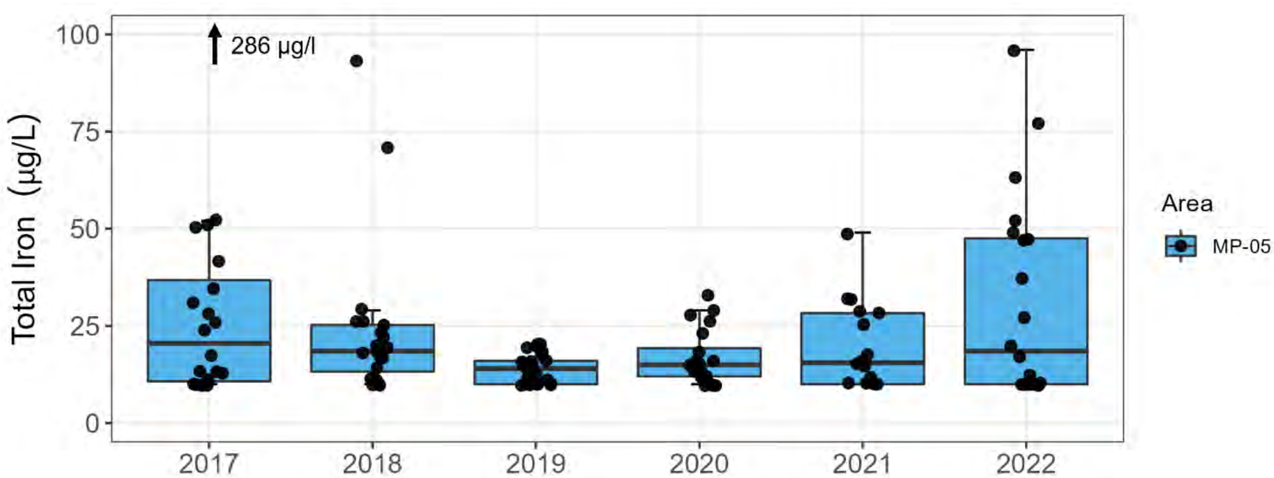

Figure 2-3: Receiving Environment Total Iron Concentrations in Milne Inlet for the MP-05 Milne Port Site Discharges, (2017-2022).

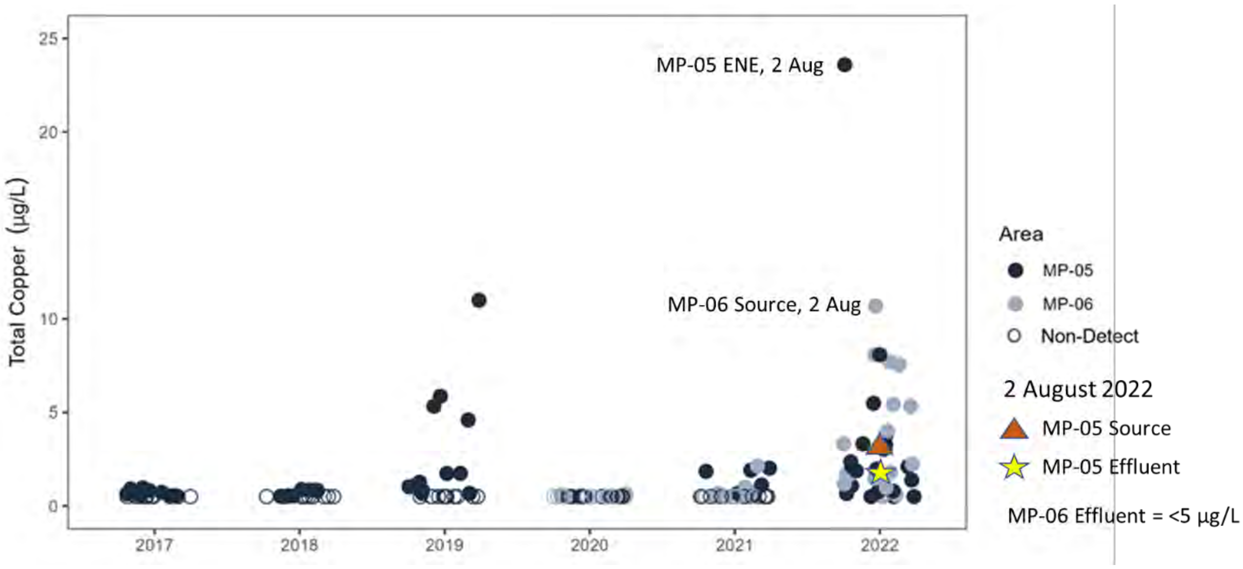

Figure 2-4: Receiving Environment Total Copper Concentrations in Milne Inlet for the MP-05 and MP-06 Milne Port Site Discharges, (2017-2022).

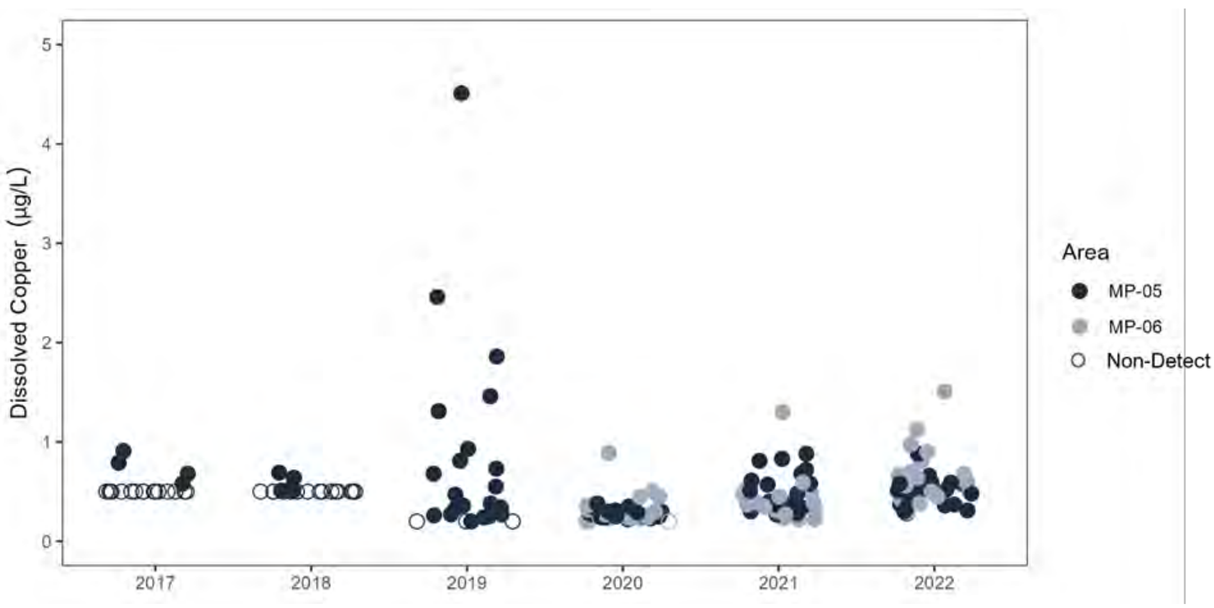

Figure 2-5: Receiving Environment Dissolved Copper Concentrations in Milne Inlet for the MP-05 and MP-06 Milne Port Site Discharges, (2017-2022).

2.5 Discussion

Monitoring results from 2022 remain within predictions of FEIS and subsequent addenda (see Table 2-1, which forecasted no significant residual effects on water quality but indicated the potential for minor localized increases in TSS, nutrient, metal, and hydrocarbon concentrations.

In 2022, concentrations of conventional water quality parameters, major ions, nutrients, and metals were often not detected in the water samples and did not exceed applicable CCME WQGs downstream from either discharge (Table 2-2). There was one exception where a single total chromium measurement was above the guideline by 1.1 times, while the corresponding dissolved concentration was below detection. Hence, this was not considered to be a meaningful exceedance because it was within analytical variability and is not anticipated to result in adverse effects on water quality and, by extension, aquatic biota in the receiving environment.

Where guidelines were not available, maximum concentrations downstream of both discharges were within detected concentration ranges measured from the 2015 to 2021 MEEMP water quality dataset, with the exception of total copper which was more variable in concentration in 2022 compared to previous years. This result does not appear to be due to the site effluent discharges as concentrations within the effluent and at the source were low (Figure 4). Continued monitoring in 2023 and evaluation of seven years of data will assess whether the maximum concentration measured in 2022 was an anomalous result and an outlier in the dataset, as can be common in water quality datasets. Moreover, dissolved copper concentrations (i.e., the fraction more bioavailable for uptake by marine biota) remained low in 2022 and were consistent with most other years, with concentrations not expected to have adverse effects on marine life. For both discharges, hydrocarbons and PAHs were not detected in downstream water samples, consistent with results from previous sampling years.

Water quality monitoring in 2022 shows that iron concentrations in marine water samples collected in 2022 remained within the range measured in previous years. While mean concentrations downstream of MP-05 remained fairly stable, higher variability was noted in the receiving environment comparable to that observed in 2018. Higher variability was not observed downstream of MP-06 compared to previous years, and dissolved iron concentrations were below detection limits in all samples collected downstream of both discharges. Further, it should be noted that for iron to be biologically available to phytoplankton and other marine biota, it generally needs to be in a dissolved form so that it can effectively cross biological membranes. Because iron ore particulates stored at the site are in mineral form, they would be expected to predominantly settle in marine sediments where they would be biologically inert. Environmental conditions in the receiving environment, such as pH, dissolved oxygen concentrations, and redox potential, can influence the proportion of biologically available iron that can be released from particulates into surrounding waters. According to Millero (1998) and Lis et al. (2015), in circumneutral pH and well oxygenated environments, similar to those observed in Milne Inlet, iron tends to be poorly soluble. As a result, many open ocean waters and some freshwater systems are characterized by low dissolved iron concentrations (Johnson et al 1997; McKay et al 2004). Accordingly, iron deposition from the Project, at both present levels and in its current form, is not expected to adversely effect aquatic life.

2.6 Conclusions and Recommendations

Site drainage and effluent discharge to the marine environment does not appear to have resulted in adverse effects on marine water quality, as measured concentrations in downstream waters were generally low and/or undetectable, below applicable guidelines, and largely consistent with previous years' measurements. With respect to iron, which is of primary concern for the Project, concentrations remain within the range measured in previous years in the receiving environments of the MP-05 and MP-06 site discharges. A clear visual trend of increased iron concentrations detected in water samples collected between 2015 and 2022 has not been observed from the laboratory analysis. For water quality in general, monitoring results remain within predictions of the FEIS and subsequent addenda, which forecasted no significant residual effects on water quality but indicated the potential for minor localized increases in TSS, nutrient, metal, and hydrocarbon concentrations.

These results confirm that mitigation measures are functioning as intended and that Project activities are being managed in a way that has not adversely affected marine water quality. Moving forward, annual marine water quality monitoring is recommended to continue to evaluate whether site operations are affecting downstream water chemistry and to provide continuity in the established time series for the MEEMP. This recommendation is in line with commitments in the Project Certificate and good practice with respect to the Type 'A' Water Licence. Monitoring also serves to confirm that mitigation measures in place are working and to inform if additional mitigation or other adaptive management measures are required.

2.7 Closure

We trust this information is sufficient for your needs at this time. Should you have any questions or concerns, please do not hesitate to contact Phil Rouget, on behalf of the undersigned, at +1 250 419 4945.

WSP Canada Inc.

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CP/EI/asd

https://golderassociates.sharepoint.com/sites/11206g/deliverables (do not use)/issued to client_for wp/400-499/1663724-430b-r-rev0-64000/1663724-430b-r-rev0-64000 2022 meemp_2.0 water quality_28apr_23.docx

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APPENDIX 2A

Water Quality Field Datasheets

Data entered into computer by________ Data proofed by DV 12-Aug-22

Header ID #__________

WATER QUALITY AND ENVIRONMENT FORM

PROJECT AND SITE DATA

Project Number: 1663724 - 14000	**Project Title:** Baffinland MEEMP	**Personnel:** MK/DV/TT
Date (d/m/y) 02/08/22	**Time (military)** 12:20	**(circle) WC WB** Site: WNW
Description of Location and Comments WQ station WNW		
Winkler: 1= 2= 3=	**Avg=** mg/L	**pH Testr=**

ENVIRONMENTAL DATA

Air Temp °C 8	Cloud Cover % 70	Wind Dir/Rate 11 Kts NE	Precip Y or N

WATER QUALITY DATA

Station	Frozen to Bottom? Y/N	Trap here? (write detail)	Profile or Point	UTM NAD/ Zone	Easting	Northing	Secchi Depth (m)	Effect-ive Water Depth (m)	Sample Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	pH	Spec. Cond. (µS/cm)	Ice Thickness (m)	Snow Depth (m)	Lab Sample Taken? Y/N
~~WNW~~																	
WNW	–	WQ stn	Point	83/17W	503546	7976599	–	[illegible]	1	10.0	11.30	–	8.0	6320	–	–	Y

*Effective Water Depth = depth of water below bottom of ice

17/07/2018

Data entered into computer by________ Data proofed by________

Header ID #__________

WATER QUALITY AND ENVIRONMENT FORM

PROJECT AND SITE DATA

Project Number: ~~1663724-14000~~ 166372401-64000-03	Project Title: Baffinland MEEMP	Personnel: DV/MR	
Date (d/m/y) 01/08/2022	Time (military) 14:30	(circle) WC **WB**	Site: DOCK (West beach)
Description of Location and Comments DOCK			
Winkler: 1= — 2= — 3= —	Avg= — mg/L —	pH Testr= — YSI Pro DDS	

ENVIRONMENTAL DATA

Air Temp °C 7°C	Cloud Cover % 100	Wind Dir/Rate 8Kt NE	Precip Y or N

WATER QUALITY DATA

Station	Frozen to Bottom? Y/N	Trap here? (write detail)	Profile or Point	UTM NAD/ Zone	17W Easting	Northing	Secchi Depth (m)	Effect-ive Water Depth (m)	Sample Depth (m)	Temp (°C)	DO (mg/L)	TDS ~~DO (%)~~	pH	Spec. Cond. (µS/cm)	ORP ~~Ice Thickness (m)~~	NTU Snow Depth (m)	Lab Sample Taken? Y/N
DOCK	N	N	point	DOCK	503069	7976426	n/a	n/a	1.0	10.4	10.93	5237	7.91	5809	167.4	471	N

*Effective Water Depth = depth of water below bottom of ice

17/07/2018

Golder Associates
2535 - 3rd Ave SE
Calgary, AB T2A 7W5

*(Active discharge of MP-06 (9:37), active discharge of MP-05 ~9:50)

Water Quality Field Log Project title: MEEMP 1663724 01 - 64000/03 Baffinland MEEMP

Date: 02 Aug 2022 Sampled By: TT/MR/DV

Weather: Overcast, 8°C Wind Spd/Dir: ~11 kts NE Tide: falling (lowtide at 10:06 am)

Station	Sample Name	Depth	Time	pH	DO (mg/L)	Cond.	Temp (c)		Turb (NTU)	Comments
~~Sou~~ MP-06	Source-2	1m	10:04	7.7	11.17	5928	10.0		6.0	0503044; 7976445 / DUP-A (DV WP001)
	WNW-2	13 m	10:35	8.0	12.28	23601	5.1		0.06	
	North-2	20 m	11:11	8.1	13.29	33472	1.3		<0.1	
	ENE-2	17 m	11:31	8.1	12.58	32900	3.6		<0.1	
MP-05	WNW-1	1m	12:20	8.0	11.30	6320	10.0		1.0	
	North-1	1m	12:30	8.1	11.20	7158	10.1		0.06	
	ENE-1	1m	12:50	8.1	11.43	6310	10.0		1.81	
	Source-1	1m	13:00	8.0	11.44	6484	10.0		5.28	0503715; 7976391 (DV-WP002)
	~~[illegible]~~									Sarah Desgagnes fuel lines prevented team from sampling on location

Date: 06 Aug 2022 Sampled By: TT/MR

Weather: Clear skies, 9°-10°C Wind Spd/Dir: 9-10 kts NE (gusts to 18) Tide: falling *MP-05 discharging*

Station	Sample Name	Depth	Time	pH	DO (mg/L)	Cond.	Temp		Turb	Comments
MP-06	Source-2	1m	10:10	8.0	10.9	7065	10.8		<0.1	
	WNW-2	13m	10:20	8.1	12.8	33964	1.2		<0.1	
	North-2	20m	10:30	8.1	12.8	33680	0.7		<0.1	
	ENE-2	17m	10:45	8.0	12.3	33620	0.1		<0.1	
MP05	WNW-1	1m	11:20	8.1	10.9	6188	10.7		<0.1	Active discharge
	Source-1	1m	11:35	8.2	10.9	4870	10.9		<0.1	Sarah Desgagnes has left
	North-1	1m	12:00	8.1	10.9	6082	10.7		<0.1	*Source-1 (DUP B) collected
	ENE-1	1m	12:15	8.1	10.9	5104	10.9		<0.1	17W 0503436; 7976486
										DV-Source 1A

↳ need to switch

Source-1, discharge pipe has moved, took photo and new coordinates

Water Quality Field Log				Project title:	1663724 -	Baffinland MEEMP

Date: 03 AUG 2022 Sampled By: MR

Weather: overcast 7-10 kt NNE Wind Spd/Dir: 14 kt NNE 3-5°C Tide:

Station	Sample Name	Depth	Time	pH	DO	Cond.	Temp	TDS	Turb	Comments
DOCK	n/a	1m	08:35	7.28	11.14	6674	10.0	6103	0.71	

Date: 04-Aug-22 Sampled By: DV

Weather: overcast 5 kt NNE Wind Spd/Dir: 5 kNt Tide: Ebb

Station	Sample Name	Depth	Time	pH	DO	Cond.	Temp	TDS	Turb	Comments
Dock	n/a	1.0	6:25	7.92	11.30	4210	10.01	3842	0.65	

Water Quality Field Log **Project title:** 1663724 - Baffinland MEEMP

Date: 5-Aug-22 Sampled By: DV

Weather: +7, Calm, Sunny Wind Spd/Dir: Calm Tide: Ebb

Station	Sample Name	Depth	Time	pH	DO	Cond.	Temp	TDS	Turb	Comments
Dock	NA	1.0	07:15	~~7.60~~ DV	11.33	2828	9.6	2604	Ø	
				7.95						

Date: Sampled By:

Weather: Wind Spd/Dir: Tide:

Station	Sample Name	Depth	Time	pH	DO	Cond.	Temp		Turb	Comments

Water Quality Field Log | **Project title:** 16637240~~1~~/64000/03 Baffinland MEEMP 2022

Date: 08 August 2022 | Sampled By: DV, MR

Weather: Sunny +10 | Wind Spd/Dir: Calm | Tide: falling 14:50 (0.7m)

Station	Sample Name	Depth	Time	pH	DO	Cond.	Temp	ORP	Turb	Comments
MP06	Source-2	1 m	12:05	8.05	10.70	8122	11.5	73.0	1.15	MP-06 - active discharge
	WNW-2	13 m	~~12:32~~ 1302	8.06	12.54	41168	0.6	86.4	<0.01	
	North-2	20m	12:43	8.07	12.38	33527	-0.2	76.3	<0.01	
	ENE-2	17m	13:20	8.06	12.45	33635	0.1	86.1	<0.01	
MP-05	North-1	1m	13:45	8.09	10.74	6552	11.6	71.6	<0.01	MP-05 - active discharge
	ENE-1	1m	14:10	8.13	10.73	5145	11.8	69.8	1.17	FB @ Source-2 (MLP-2)
	WNW-1	1m	14:15	8.12	10.73	5415	11.7	72.3	<0.01	
	Source-1A	1m	1436	8.15	10.73	4329	12.0	69.0	0.64	
	~~MLP-2~~									~~Field blank~~ collected

Date: 9-Aug-22 | Sampled By: MR DV

Weather: +12, Sunny, Calm | Wind Spd/Dir: Calm | Tide: Rising

Station	Sample Name	Depth	Time	pH	DO	Cond.	Temp	ORP	Turb	Comments
Dock	—	1.0	09:30	8.10	10.57	6158	10.9	39.6	0.60	

Fish Health Reference

Water Quality Field Log **Project #:** 1663724-~~3~~4000-03 **Project title: Baffinlands MEEMP** 2022

Date: 10 Aug 2022 Sampled By: TT/AR

Weather: Cloud cover, 12°C, [illegible] Wind Spd/Dir: 6 kts SW Tide: Rising

Station	Sample Name	Depth	# of Jars	Time	pH	DO(mg/L)	Cond.(uS/cm)	Temp(°C)	Turb(NTU)	Comments
TGT	TGT-REF-1	1.0 m	11	11:30	7.7	11.20	13215	8.7	<0.1	field blank also collected MLP-4

Date: Sampled By:

Weather: Wind Spd/Dir: Tide:

TT

Station	Sample Name	Depth	# of Jars	Time	pH	DO	Cond.	Temp	Turb	Comments

Water Quality Field Log **Project #:** 1663724-[redacted] 61000 **Project title: Baffinlands MEEMP** 2022

Date: 13-Aug-22 Sampled By: DV, NOB, MR

Both MP05 + MP06 discharging during sampling

Weather: +5°C, light South Wind Overcast Wind Spd/Dir: Light S Tide: Rising

Station	Sample Name	Depth	# of Jars	Time	pH	DO	Cond.	Temp	Turb	Comments
MP06-Source2	—	1.0	10	14:11	8.12	11.69	33440	2.4	Ø	DUP-C
MP06-WNW-2	—	13m	6	14:03	8.11	12.53	32783	0.8	Ø	
MP06-North-2	—	20m	6	13:55	8.03	12.28	32526	-0.1	Ø	Note: MP05-ENE-1
MP06-ENE-2	—	17m	10	13:43	8.06	12.31	32854	1.0	Ø	was sampled with
MP05-Source-1	—	1.0	10	14:58	8.08	11.52	33181	2.2	Ø	PAH/PHCs instead
MP05-WNW-1	—	~~2.0~~ 1.0	6	14:30	8.09	11.79	32971	1.8	Ø	of MP05-North-1
MP05-North-1	—	1.0	6	14:37	8.08	11.41	33100	2.2	Ø	
MP05-ENE-1	—	1.0	10	14:45	8.06	11.44	33142	2.3	Ø	

Date: ________ Sampled By: ________

Weather: ________ Wind Spd/Dir: ________ Tide: ________

Station	Sample Name	Depth	# of Jars	Time	pH	DO	Cond.	Temp	Turb	Comments

Water Quality Field Log **Project title:** 1663724 - Baffinland MEEMP

Date: 14 AUG 2022 Sampled By: MR

Weather: Sun/cloud Wind Spd/Dir: 5kt ~~10~~ SE Tide: low

Station	Sample Name	Depth	Time	pH	DO	Cond.	Temp	ORP	Turb	Comments
Dock	Fish	0.3	1030	8.17	11.40	1783	6.9	43.3	2.81	n/a

Date: Sampled By:

Weather: Wind Spd/Dir: Tide:

Station	Sample Name	Depth	Time	pH	DO	Cond.	Temp		Turb	Comments

Water Quality Field Log **Project title:** 16637240l- 64000 Baffinland MEEMP

Date: 10 AUG 2022 Sampled By: MR

Weather: Sun Wind Spd/Dir: SW 4-8kt Tide:

Station	Sample Name	Depth	Time	pH	DO	Cond.	Temp	ORP	Turb	Comments
DOCK	n/a	1.0	7:30	7.86	10.57	7707	12.1	114.8	<0.01	YSI Calibrated

Date: 11-Aug-2022 Sampled By: DV

Weather: Overcast, Rain +6°C Wind Spd/Dir: light out of South Tide: Rising

Station	Sample Name	Depth	Time	pH	DO	Cond.	Temp	ORP	Turb	Comments
Dock	—	1.0	07:30	7.97	10.55	5297	11.1	110.8	0.65	

Water Quality Field Log **Project #:** 1663724-[redacted] **Project title: Baffinlands MEEMP**

Date: 15-Aug-22 Sampled By: DV, NOB, MR ☆ Discharge started @ 9:50 of MP05 and MP06☆

Weather: +8, Sunny Wind Spd/Dir: Calm Tide: Rising

Station	Sample Name	Depth	# of Jars	Time	pH	DO	Cond.	Temp	Turb	Comments
	MP06-ENE-2	13	10	10:20	8.13	11.69	32808	0.8	Ø	
	MP06-North-2	20	6	10:10	8.21	12.55	32787	0.7	Ø	
	MP06-WNW-2	17	6	10:40	8.11	11.49	32717	1.1	Ø	
	MP06-Source-2	1	10	10:30	8.16	10.32	14037	7.1	Ø	
	MP05-WNW-1	0.5	6	10:50	8.17	11.68	17879	6.5	~~1.16~~	0.10
	MP05-North-1	0.5	10	11:05	8.13	11.20	16340	6.9	0.18	
	MP05-ENE-1	0.5	6	11:15	8.12	10.95	15778	7.1	Ø	
	MP05-Source-1	0.5	10	10:55	8.15	11.51	17302	6.8	0.45	
	MLP-3		6							

Date: ______ Sampled By: ______

Weather: ______ Wind Spd/Dir: ______ Tide: ______

Station	Sample Name	Depth	# of Jars	Time	pH	DO	Cond.	Temp	Turb	Comments

APPENDIX 2B

Water Quality Analytical Reports

CERTIFICATE OF ANALYSIS

Work Order	: **VA22B8083**	Page	: 1 of 14
Client	: **Golder Associates Ltd.**	Laboratory	: Vancouver - Environmental
Contact	: Elaine Irving	Account Manager	: Amber Springer
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: 166372401/64000/03	Date Samples Received	: 05-Aug-2022 08:15
PO	:	Date Analysis Commenced	: 05-Aug-2022
C-O-C number	: 21-01	Issue Date	: 16-Aug-2022 17:14
Sampler	: TT/MR/DV		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 10		
No. of samples analysed	: 10		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Ann Joby	Lab Assistant	Metals, Burnaby, British Columbia
Benjamin Oke	Lab Assistant	Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Erin Sanchez		Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Parnian Sane	Analyst	Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
psu	practical salinity units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Workorder Comments

Sample(s) 006 : Water sample for dissolved mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

Sample 006: Water sample for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

Qualifiers

Qualifier	*Description*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-1-22
				Client sampling date / time	02-Aug-2022 13:00	02-Aug-2022 12:30	02-Aug-2022 12:50	02-Aug-2022 12:22	02-Aug-2022
					VA22B8083-001	VA22B8083-002	VA22B8083-003	VA22B8083-004	VA22B8083-005
					Result	Result	Result	Result	Result
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	64.9	63.1	64.8	64.4	4.7
conductivity	----	E100S	2.0	µS/cm	6960	7570	6610	7020	22.9
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	751	839	762	749	<1.00
pH	----	E108	0.10	pH units	7.89	7.85	7.87	7.78	6.76
salinity	----	EC100S	1.0	psu	3.9	4.3	3.7	3.9	<1.0
solids, total dissolved [TDS]	----	E162S	10	mg/L	4210	4720	4030	4440	35 RRV
solids, total suspended [TSS]	----	E160S	2.0	mg/L	4.3	<2.0	2.1	6.5	<2.0
turbidity	----	E121	0.10	NTU	3.30	0.46	0.60	1.90	<0.10
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
bromide	24959-67-9	E235S.Br	5.0	mg/L	8.6	8.7	7.3	8.0	<5.0
chloride	16887-00-6	E235S.Cl	50	mg/L	2350	2510	2190	2160	<50
fluoride	16984-48-8	E235S.F-L	0.20	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20
Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	<0.050	<0.050	<0.050	0.056	<0.050
nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	0.011	<0.010	<0.010	<0.010	0.034 RRV
nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
phosphorus, total	7723-14-0	E372S	0.0020	mg/L	0.0081	0.0090	0.0060	0.0052	<0.0040
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	316	348	302	302	<3.0
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.12	1.10	1.25	0.92	<0.50
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.00	0.99	0.87	1.00	<0.50
Total Metals									
aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0451	0.0279	0.0480	0.0577	<0.0050
antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
arsenic, total	7440-38-2	E468S	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
barium, total	7440-39-3	E468S	0.0010	mg/L	0.0041	0.0040	0.0041	0.0041	<0.0010
beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
boron, total	7440-42-8	E468S	0.30	mg/L	0.52	0.53	0.51	0.54	<0.30
cadmium, total	7440-43-9	E468S	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

Analytical Results

Sub-Matrix: Seawater
(Matrix: Water)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-1-22
				Client sampling date / time	02-Aug-2022 13:00	02-Aug-2022 12:30	02-Aug-2022 12:50	02-Aug-2022 12:22	02-Aug-2022
					VA22B8083-001	VA22B8083-002	VA22B8083-003	VA22B8083-004	VA22B8083-005
					Result	Result	Result	Result	Result
Total Metals									
calcium, total	7440-70-2	E468S	1.0	mg/L	59.1	64.0	57.7	59.1	<1.0
cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
copper, total	7440-50-8	E468S	0.00050	mg/L	0.00304	0.00382	0.0236	0.00326	<0.00050
gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, total	7439-89-6	E468S	0.010	mg/L	0.052	0.027	0.037	0.063	<0.010
lead, total	7439-92-1	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, total	7439-93-2	E468S	0.020	mg/L	<0.020	0.020	<0.020	0.020	<0.020
magnesium, total	7439-95-4	E468S	1.0	mg/L	134	141	131	140	<1.0
manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00145	0.00106	0.00123	0.00156	<0.00020
mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00136	0.00150	0.00129	0.00135	<0.00010
nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, total	7440-09-7	E468S	1.0	mg/L	44.9	48.9	43.5	45.9	<1.0
rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.0139	0.0151	0.0133	0.0135	<0.0050
selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	1230	1330	1180	1200	4.2
strontium, total	7440-24-6	E468S	0.010	mg/L	0.883	0.998	0.848	0.952	<0.010
sulfur, total	7704-34-9	E468S	5.0	mg/L	106	118	100	107	<5.0
tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
uranium, total	7440-61-1	E468S	0.000050	mg/L	0.00116	0.000741	0.000906	0.000754	<0.000050

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

				Client sample ID	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-1-22
				Client sampling date / time	02-Aug-2022 13:00	02-Aug-2022 12:30	02-Aug-2022 12:50	02-Aug-2022 12:22	02-Aug-2022
Analyte	CAS Number	Method	LOR	Unit	VA22B8083-001	VA22B8083-002	VA22B8083-003	VA22B8083-004	VA22B8083-005
					Result	Result	Result	Result	Result
Total Metals									
vanadium, total	7440-62-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	0.0033 RRV
zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Metals									
aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	0.0050	<0.0050
antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0039	0.0039	0.0040	0.0040	<0.0010
beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
boron, dissolved	7440-42-8	E469S	0.30	mg/L	0.53	0.63	0.54	0.52	<0.30
cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
calcium, dissolved	7440-70-2	E469S	1.0	mg/L	59.9	65.6	57.9	61.0	<1.0
cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00050	0.00062	0.00059	0.00048	<0.00020
gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, dissolved	7439-93-2	E469S	0.020	mg/L	0.021	0.024	0.020	0.021	<0.020
magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	146	164	150	145	<1.0
manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00084	0.00068	0.00073	0.00079	<0.00010
mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00137	0.00156	0.00123	0.00131	<0.00010
nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E469S	1.0	mg/L	45.7	50.6	47.6	49.0	<1.0
rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.0135	0.0142	0.0137	0.0142	<0.0050

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-1-22
				Client sampling date / time	02-Aug-2022 13:00	02-Aug-2022 12:30	02-Aug-2022 12:50	02-Aug-2022 12:22	02-Aug-2022
					VA22B8083-001	VA22B8083-002	VA22B8083-003	VA22B8083-004	VA22B8083-005
					Result	Result	Result	Result	Result
Dissolved Metals									
selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	1240	1300	1200	1090	3.2
strontium, dissolved	7440-24-6	E469S	0.010	mg/L	0.932	1.00	0.878	0.916	<0.010
sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	108	123	113	104	<5.0
tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.00113	0.000743	0.000889	0.000729	<0.000050
vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	0.0013	0.0030 RRV
zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field
Volatile Organic Compounds [Fuels]									
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	----	----	<0.50
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	----	----	<0.50
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	----	----	<0.50
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	----	----	<0.50
toluene	108-88-3	E611A	0.50	µg/L	0.64	<0.50	----	----	<0.50
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	----	----	<0.40
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	----	----	<0.30
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	----	----	<0.50
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	95.8	89.4	----	----	90.4
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	103	101	----	----	104

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-1-22
				Client sampling date / time	02-Aug-2022 13:00	02-Aug-2022 12:30	02-Aug-2022 12:50	02-Aug-2022 12:22	02-Aug-2022
					VA22B8083-001	VA22B8083-002	VA22B8083-003	VA22B8083-004	VA22B8083-005
					Result	Result	Result	Result	Result
Hydrocarbons									
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	----	----	<250
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	----	----	<250
F2 (C10-C16)	----	E601	100	µg/L	<100	<100	----	----	<100
F3 (C16-C34)	----	E601	250	µg/L	<250	250	----	----	<250
F4 (C34-C50)	----	E601	250	µg/L	<250	<250	----	----	<250
TEH (C10-C50)	----	E601	400	µg/L	<400	<400	----	----	<400
TEH (C16-C50)	----	E601	400	µg/L	<400	<400	----	----	<400
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	----	<100
F1-BTEX	----	EC580	100	µg/L	<100	<100	----	----	<100
HEPHw	----	EC600A	250	µg/L	<250	<250	----	----	<250
LEPHw	----	EC600A	250	µg/L	<250	<250	----	----	<250
VPHw	----	EC580A	100	µg/L	<100	<100	----	----	<100
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	----	<100
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	65.4	64.1	----	----	68.0
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%	72.3	72.1	----	----	74.8
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	99.7	98.2	----	----	97.0
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
acridine	260-94-6	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
anthracene	120-12-7	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	<0.0050
benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	<0.015	<0.015	----	----	<0.015
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
chrysene	218-01-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	<0.0050
fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water)**

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-1-22
Client sampling date / time					02-Aug-2022 13:00	02-Aug-2022 12:30	02-Aug-2022 12:50	02-Aug-2022 12:22	02-Aug-2022
					VA22B8083-001	VA22B8083-002	VA22B8083-003	VA22B8083-004	VA22B8083-005
					Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons									
fluorene	86-73-7	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	0.010	<0.010	----	----	<0.010
naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	<0.050	----	----	<0.050
phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	<0.020	----	----	<0.020
pyrene	129-00-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
quinoline	91-22-5	E641A	0.050	µg/L	<0.050	<0.050	----	----	<0.050
Polycyclic Aromatic Hydrocarbons Surrogates									
chrysene-d12	1719-03-5	E641A	0.1	%	106	100.0	----	----	107
naphthalene-d8	1146-65-2	E641A	0.1	%	93.6	78.4	----	----	89.3
phenanthrene-d10	1517-22-2	E641A	0.1	%	107	94.9	----	----	111

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	DUP-A
				Client sampling date / time	02-Aug-2022 10:04	02-Aug-2022 11:11	02-Aug-2022 11:31	02-Aug-2022 10:35	02-Aug-2022
					VA22B8083-006	VA22B8083-007	VA22B8083-008	VA22B8083-009	VA22B8083-010
					Result	Result	Result	Result	Result
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	65.0	112	105	81.7	65.9
conductivity	----	E100S	2.0	µS/cm	6490	46100	42100	28600	6450
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	737	5560	4500	3110	689
pH	----	E108	0.10	pH units	7.87	7.99	8.00	7.94	7.87
salinity	----	EC100S	1.0	psu	3.6	30.7	27.8	18.1	3.6
solids, total dissolved [TDS]	----	E162S	10	mg/L	3920	42800	39600	25700	4000
solids, total suspended [TSS]	----	E160S	2.0	mg/L	<2.0	<2.0	3.8	2.1	3.2
turbidity	----	E121	0.10	NTU	0.46	0.10	0.18	0.34	1.14
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	0.0236	0.0268	0.0115	<0.0050
bromide	24959-67-9	E235S.Br	5.0	mg/L	7.4	62.6	55.3	34.2	8.0
chloride	16887-00-6	E235S.Cl	50	mg/L	2150	17800	15900	9890	2100
fluoride	16984-48-8	E235S.F-L	0.20	mg/L	<0.20	0.83	0.93	0.73	<0.20
Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	<0.050	0.131	0.117	0.081	<0.050
nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	0.011
nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
phosphorus, total	7723-14-0	E372S	0.0020	mg/L	0.0062	0.0268	0.0255	0.0154	0.0063
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	298	2460	2250	1470	295
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.10	1.32	1.38	1.39	1.27
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	0.75	0.93	0.99	1.08	0.97
Total Metals									
aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0431	0.0080	0.0110	0.0278	0.0544
antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
arsenic, total	7440-38-2	E468S	0.00040	mg/L	<0.00040	0.00137	0.00126	0.00092	<0.00040
barium, total	7440-39-3	E468S	0.0010	mg/L	0.0039	0.0080	0.0081	0.0072	0.0039
beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
boron, total	7440-42-8	E468S	0.30	mg/L	0.50	3.74	1.77	1.38	0.47
cadmium, total	7440-43-9	E468S	0.000010	mg/L	<0.000010	0.000019	0.000012	<0.000010	<0.000010
calcium, total	7440-70-2	E468S	1.0	mg/L	58.3	308	271	186	57.1

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	DUP-A
				Client sampling date / time	02-Aug-2022 10:04	02-Aug-2022 11:11	02-Aug-2022 11:31	02-Aug-2022 10:35	02-Aug-2022
Analyte	CAS Number	Method	LOR	Unit	VA22B8083-006	VA22B8083-007	VA22B8083-008	VA22B8083-009	VA22B8083-010
					Result	Result	Result	Result	Result
Total Metals									
cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
copper, total	7440-50-8	E468S	0.00050	mg/L	0.0107	0.00543	0.00808	0.00223	0.00348
gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, total	7439-89-6	E468S	0.010	mg/L	0.041	<0.010	0.014	0.023	0.052
lead, total	7439-92-1	E468S	0.000050	mg/L	0.000070	<0.000050	0.00126	0.000056	0.000064
lithium, total	7439-93-2	E468S	0.020	mg/L	<0.020	0.180	0.073	0.055	<0.020
magnesium, total	7439-95-4	E468S	1.0	mg/L	132	1160	718	517	124
manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00127	0.00081	0.00117	0.00108	0.00141
mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00130	0.00934	0.00875	0.00553	0.00137
nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, total	7440-09-7	E468S	1.0	mg/L	43.8	298	275	189	41.6
rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.0131	0.114	0.103	0.0632	0.0127
selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	1170	9540	8640	5710	1170
strontium, total	7440-24-6	E468S	0.010	mg/L	0.850	6.88	6.44	3.96	0.883
sulfur, total	7704-34-9	E468S	5.0	mg/L	103	760	696	466	95.2
tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
uranium, total	7440-61-1	E468S	0.000050	mg/L	0.000919	0.00259	0.00244	0.00159	0.00134
vanadium, total	7440-62-2	E468S	0.00050	mg/L	<0.00050	0.00129	0.00116	0.00082	<0.00050

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	DUP-A
				Client sampling date / time	02-Aug-2022 10:04	02-Aug-2022 11:11	02-Aug-2022 11:31	02-Aug-2022 10:35	02-Aug-2022
					VA22B8083-006	VA22B8083-007	VA22B8083-008	VA22B8083-009	VA22B8083-010
					Result	Result	Result	Result	Result
Total Metals									
yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Metals									
aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	0.00044	0.00150	0.00121	0.00096	<0.00040
barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0039	0.0082	0.0077	0.0068	0.0039
beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
boron, dissolved	7440-42-8	E469S	0.30	mg/L	0.49	3.73	2.38	1.80	0.46
cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	<0.000010	0.000014	<0.000010	<0.000010	<0.000010
calcium, dissolved	7440-70-2	E469S	1.0	mg/L	54.4	363	311	213	53.4
cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00097	0.00090	0.00056	0.00067	0.00040
gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
lead, dissolved	7439-92-1	E469S	0.000050	mg/L	0.000098	0.000095	0.000061	0.000103	0.000058
lithium, dissolved	7439-93-2	E469S	0.020	mg/L	<0.020	0.175	0.103	0.076	<0.020
magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	146	1130	903	626	135
manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00083	0.00074	0.00049	0.00076	0.00074
mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00125	0.00995	0.00911	0.00639	0.00127
nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E469S	1.0	mg/L	44.4	370	322	210	43.5
rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.0129	0.108	0.0942	0.0628	0.0121
selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water)**

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	DUP-A
				Client sampling date / time	02-Aug-2022 10:04	02-Aug-2022 11:11	02-Aug-2022 11:31	02-Aug-2022 10:35	02-Aug-2022
Analyte	CAS Number	Method	LOR	Unit	VA22B8083-006	VA22B8083-007	VA22B8083-008	VA22B8083-009	VA22B8083-010
					Result	Result	Result	Result	Result
Dissolved Metals									
silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	1140	9680	8340	5720	1200
strontium, dissolved	7440-24-6	E469S	0.010	mg/L	0.801	7.21	6.54	4.46	0.821
sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	110	955	834	561	103
tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.000841	0.00267	0.00237	0.00171	0.00124
vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	<0.00050	0.00133	0.00118	0.00080	<0.00050
yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	0.0030	<0.0010	0.0013	0.0012	0.0014
zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field
Volatile Organic Compounds [Fuels]									
benzene	71-43-2	E611A	0.50	µg/L	<0.50	----	<0.50	----	<0.50
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	----	<0.50	----	<0.50
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	----	<0.50	----	<0.50
styrene	100-42-5	E611A	0.50	µg/L	<0.50	----	<0.50	----	<0.50
toluene	108-88-3	E611A	0.50	µg/L	<0.50	----	<0.50	----	<0.50
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	----	<0.40	----	<0.40
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	----	<0.30	----	<0.30
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	----	<0.50	----	<0.50
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	93.8	----	88.2	----	89.8
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	103	----	101	----	103
Hydrocarbons									

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	DUP-A
				Client sampling date / time	02-Aug-2022 10:04	02-Aug-2022 11:11	02-Aug-2022 11:31	02-Aug-2022 10:35	02-Aug-2022
					VA22B8083-006	VA22B8083-007	VA22B8083-008	VA22B8083-009	VA22B8083-010
					Result	Result	Result	Result	Result
Hydrocarbons									
EPH (C10-C19)	----	E601A	250	µg/L	<250	----	<250	----	<250
EPH (C19-C32)	----	E601A	250	µg/L	<250	----	<250	----	<250
F2 (C10-C16)	----	E601	100	µg/L	<100	----	<100	----	<100
F3 (C16-C34)	----	E601	250	µg/L	<250	----	<250	----	<250
F4 (C34-C50)	----	E601	250	µg/L	<250	----	<250	----	<250
TEH (C10-C50)	----	E601	400	µg/L	<400	----	<400	----	<400
TEH (C16-C50)	----	E601	400	µg/L	<400	----	<400	----	<400
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----	<100	----	<100
F1-BTEX	----	EC580	100	µg/L	<100	----	<100	----	<100
HEPHw	----	EC600A	250	µg/L	<250	----	<250	----	<250
LEPHw	----	EC600A	250	µg/L	<250	----	<250	----	<250
VPHw	----	EC580A	100	µg/L	<100	----	<100	----	<100
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----	<100	----	<100
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	74.7	----	65.3	----	65.3
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%	77.5	----	71.8	----	72.8
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	86.2	----	92.6	----	97.3
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
acridine	260-94-6	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
anthracene	120-12-7	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	----	<0.0050	----	<0.0050
benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	<0.015	----	<0.015	----	<0.015
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
chrysene	218-01-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	----	<0.0050	----	<0.0050
fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	DUP-A
				Client sampling date / time	02-Aug-2022 10:04	02-Aug-2022 11:11	02-Aug-2022 11:31	02-Aug-2022 10:35	02-Aug-2022
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	VA22B8083-006	VA22B8083-007	VA22B8083-008	VA22B8083-009	VA22B8083-010
					Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons									
fluorene	86-73-7	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	----	<0.050	----	<0.050
phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	----	<0.020	----	<0.020
pyrene	129-00-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	<0.010
quinoline	91-22-5	E641A	0.050	µg/L	<0.050	----	<0.050	----	<0.050
Polycyclic Aromatic Hydrocarbons Surrogates									
chrysene-d12	1719-03-5	E641A	0.1	%	105	----	98.4	----	89.6
naphthalene-d8	1146-65-2	E641A	0.1	%	91.6	----	89.9	----	85.3
phenanthrene-d10	1517-22-2	E641A	0.1	%	102	----	101	----	116

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA22B8083**	Page	: 1 of 41
Client	: **Golder Associates Ltd.**	Laboratory	: Vancouver - Environmental
Contact	: Elaine Irving	Account Manager	: Amber Springer
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: 166372401/64000/03	Date Samples Received	: 05-Aug-2022 08:15
PO	:	Issue Date	: 16-Aug-2022 17:14
C-O-C number	: 21-01		
Sampler	: TT/MR/DV		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 10		
No. of samples analysed	: 10		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- Matrix Spike outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Total Metals	QC-MRG2-598730002	----	tellurium, total	13494-80-9	E468S	124 % MES	80.0-120%	Recovery greater than upper control limit
Dissolved Metals	QC-MRG2-598765002	----	boron, dissolved	7440-42-8	E469S	78.4 % MES	80.0-120%	Recovery less than lower control limit
Dissolved Metals	QC-MRG2-598765002	----	lithium, dissolved	7439-93-2	E469S	77.6 % MES	80.0-120%	Recovery less than lower control limit

Result Qualifiers

Qualifier	*Description*
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Matrix Spike (MS) Recoveries								
Total Metals	Anonymous	Anonymous	lithium, total	7439-93-2	E468S	68.0 % MES	70.0-130%	Recovery less than lower data quality objective
Dissolved Metals	Anonymous	Anonymous	lithium, dissolved	7439-93-2	E469S	66.8 % MES	70.0-130%	Recovery less than lower data quality objective

Result Qualifiers

Qualifier	*Description*
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) DUP-A	E298	02-Aug-2022	06-Aug-2022	----	----		11-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MLP-1-22	E298	02-Aug-2022	06-Aug-2022	----	----		11-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP05-ENE-1-22	E298	02-Aug-2022	06-Aug-2022	----	----		11-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP05-North-1-22	E298	02-Aug-2022	06-Aug-2022	----	----		11-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP05-Source-1-22	E298	02-Aug-2022	06-Aug-2022	----	----		11-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP05-WNW-1-22	E298	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP06-ENE-2-22	E298	02-Aug-2022	06-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP06-North-2-22	E298	02-Aug-2022	06-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP06-Source-2-22	E298	02-Aug-2022	06-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP06-WNW-2-22	E298	02-Aug-2022	06-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-WNW-1-22	E235S.Br	02-Aug-2022	11-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE DUP-A	E235S.Br	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MLP-1-22	E235S.Br	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-ENE-1-22	E235S.Br	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-North-1-22	E235S.Br	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-Source-1-22	E235S.Br	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-ENE-2-22	E235S.Br	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-North-2-22	E235S.Br	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-Source-2-22	E235S.Br	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-WNW-2-22	E235S.Br	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-WNW-1-22	E235S.Cl	02-Aug-2022	11-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE DUP-A	E235S.Cl	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MLP-1-22	E235S.Cl	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-ENE-1-22	E235S.Cl	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-North-1-22	E235S.Cl	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-Source-1-22	E235S.Cl	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-ENE-2-22	E235S.Cl	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-North-2-22	E235S.Cl	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-Source-2-22	E235S.Cl	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-WNW-2-22	E235S.Cl	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.F-L	02-Aug-2022	11-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE DUP-A	E235S.F-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MLP-1-22	E235S.F-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.F-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.F-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.F-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.F-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.F-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.F-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.F-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-WNW-1-22	E235S.NO3-T	02-Aug-2022	11-Aug-2022	----	----		12-Aug-2022	3 days	10 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE DUP-A	E235S.NO3-T	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MLP-1-22	E235S.NO3-T	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-ENE-1-22	E235S.NO3-T	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-North-1-22	E235S.NO3-T	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-Source-1-22	E235S.NO3-T	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-ENE-2-22	E235S.NO3-T	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-North-2-22	E235S.NO3-T	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-Source-2-22	E235S.NO3-T	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-WNW-2-22	E235S.NO3-T	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.NO2-L	02-Aug-2022	11-Aug-2022	----	----		12-Aug-2022	3 days	10 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE DUP-A	E235S.NO2-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MLP-1-22	E235S.NO2-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.NO2-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.NO2-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.NO2-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.NO2-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.NO2-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.NO2-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.NO2-L	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	3 days	6 days	× EHTL
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE DUP-A	E235S.SO4-L	02-Aug-2022	07-Aug-2022	28 days	5 days	✓	08-Aug-2022	23 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MLP-1-22	E235S.SO4-L	02-Aug-2022	07-Aug-2022	28 days	5 days	✓	08-Aug-2022	23 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.SO4-L	02-Aug-2022	07-Aug-2022	28 days	5 days	✓	08-Aug-2022	23 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.SO4-L	02-Aug-2022	07-Aug-2022	28 days	5 days	✓	08-Aug-2022	23 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.SO4-L	02-Aug-2022	07-Aug-2022	28 days	5 days	✓	08-Aug-2022	23 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.SO4-L	02-Aug-2022	07-Aug-2022	28 days	5 days	✓	08-Aug-2022	23 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.SO4-L	02-Aug-2022	07-Aug-2022	28 days	5 days	✓	08-Aug-2022	23 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.SO4-L	02-Aug-2022	07-Aug-2022	28 days	5 days	✓	08-Aug-2022	23 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.SO4-L	02-Aug-2022	07-Aug-2022	28 days	5 days	✓	08-Aug-2022	23 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.SO4-L	02-Aug-2022	11-Aug-2022	28 days	9 days	✓	12-Aug-2022	19 days	1 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP05-North-1-22	E318S	02-Aug-2022	06-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP05-WNW-1-22	E318S	02-Aug-2022	11-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP06-ENE-2-22	E318S	02-Aug-2022	06-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP06-North-2-22	E318S	02-Aug-2022	06-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP06-Source-2-22	E318S	02-Aug-2022	06-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP06-WNW-2-22	E318S	02-Aug-2022	06-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) DUP-A	E318S	02-Aug-2022	06-Aug-2022	----	----		12-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MLP-1-22	E318S	02-Aug-2022	06-Aug-2022	----	----		12-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP05-ENE-1-22	E318S	02-Aug-2022	06-Aug-2022	----	----		12-Aug-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP05-Source-1-22	E318S	02-Aug-2022	06-Aug-2022	----	----		12-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP05-WNW-1-22	E372S	02-Aug-2022	11-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) DUP-A	E372S	02-Aug-2022	06-Aug-2022	----	----		08-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MLP-1-22	E372S	02-Aug-2022	06-Aug-2022	----	----		08-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP05-ENE-1-22	E372S	02-Aug-2022	06-Aug-2022	----	----		08-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP05-North-1-22	E372S	02-Aug-2022	06-Aug-2022	----	----		08-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP05-Source-1-22	E372S	02-Aug-2022	06-Aug-2022	----	----		08-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP06-ENE-2-22	E372S	02-Aug-2022	06-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP06-North-2-22	E372S	02-Aug-2022	06-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP06-Source-2-22	E372S	02-Aug-2022	06-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP06-WNW-2-22	E372S	02-Aug-2022	06-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
HDPE dissolved (nitric acid) MP06-Source-2-22	E509S	02-Aug-2022	12-Aug-2022	28 days	10 days	✓	12-Aug-2022	18 days	0 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) DUP-A	E509S	02-Aug-2022	12-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MLP-1-22	E509S	02-Aug-2022	12-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-ENE-1-22	E509S	02-Aug-2022	12-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-North-1-22	E509S	02-Aug-2022	12-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-Source-1-22	E509S	02-Aug-2022	12-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-WNW-1-22	E509S	02-Aug-2022	12-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-ENE-2-22	E509S	02-Aug-2022	12-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-North-2-22	E509S	02-Aug-2022	12-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-WNW-2-22	E509S	02-Aug-2022	12-Aug-2022	----	----		12-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-WNW-1-22	E469S	02-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	13 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) DUP-A	E469S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MLP-1-22	E469S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-ENE-1-22	E469S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-North-1-22	E469S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-Source-1-22	E469S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-ENE-2-22	E469S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-North-2-22	E469S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-Source-2-22	E469S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-WNW-2-22	E469S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-WNW-1-22	E469S.NaSi	02-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	13 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) DUP-A	E469S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MLP-1-22	E469S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-ENE-1-22	E469S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-North-1-22	E469S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-Source-1-22	E469S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-ENE-2-22	E469S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-North-2-22	E469S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-Source-2-22	E469S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-WNW-2-22	E469S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MLP-1-22	E601A	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	11-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-North-1-22	E601A	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	11-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E601A	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	11-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E601A	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	11-Aug-2022	40 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E601A	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	11-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) DUP-A	E601A	02-Aug-2022	11-Aug-2022	14 days	9 days	✓	12-Aug-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MLP-1-22	E601	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	12-Aug-2022	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-North-1-22	E601	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	12-Aug-2022	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E601	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	12-Aug-2022	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E601	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	12-Aug-2022	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E601	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	12-Aug-2022	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) DUP-A	E601	02-Aug-2022	11-Aug-2022	14 days	9 days	✓	12-Aug-2022	40 days	1 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) DUP-A	E581.VH+F1	02-Aug-2022	09-Aug-2022	----	----		10-Aug-2022	14 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MLP-1-22	E581.VH+F1	02-Aug-2022	09-Aug-2022	----	----		10-Aug-2022	14 days	7 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP05-North-1-22	E581.VH+F1	02-Aug-2022	09-Aug-2022	----	----		10-Aug-2022	14 days	7 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP05-Source-1-22	E581.VH+F1	02-Aug-2022	09-Aug-2022	----	----		10-Aug-2022	14 days	7 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP06-ENE-2-22	E581.VH+F1	02-Aug-2022	09-Aug-2022	----	----		10-Aug-2022	14 days	7 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP06-Source-2-22	E581.VH+F1	02-Aug-2022	09-Aug-2022	----	----		10-Aug-2022	14 days	8 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) DUP-A	E358-L	02-Aug-2022	06-Aug-2022	3 days	3 days	×	07-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MLP-1-22	E358-L	02-Aug-2022	06-Aug-2022	3 days	3 days	×	07-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP05-ENE-1-22	E358-L	02-Aug-2022	06-Aug-2022	3 days	4 days	× EHTL	07-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP05-North-1-22	E358-L	02-Aug-2022	06-Aug-2022	3 days	4 days	× EHTL	07-Aug-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP05-Source-1-22	E358-L	02-Aug-2022	06-Aug-2022	3 days	4 days	× EHTL	07-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP06-ENE-2-22	E358-L	02-Aug-2022	06-Aug-2022	3 days	4 days	× EHTL	07-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP06-North-2-22	E358-L	02-Aug-2022	06-Aug-2022	3 days	4 days	× EHTL	07-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP06-Source-2-22	E358-L	02-Aug-2022	06-Aug-2022	3 days	4 days	× EHTL	07-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP06-WNW-2-22	E358-L	02-Aug-2022	06-Aug-2022	3 days	4 days	× EHTL	07-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP05-WNW-1-22	E358-L	02-Aug-2022	11-Aug-2022	3 days	9 days	× EHTL	11-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) DUP-A	E355-L	02-Aug-2022	06-Aug-2022	----	----		07-Aug-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MLP-1-22	E355-L	02-Aug-2022	06-Aug-2022	----	----		07-Aug-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP05-ENE-1-22	E355-L	02-Aug-2022	06-Aug-2022	----	----		07-Aug-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP05-North-1-22	E355-L	02-Aug-2022	06-Aug-2022	----	----		07-Aug-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP05-Source-1-22	E355-L	02-Aug-2022	06-Aug-2022	----	----		07-Aug-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP06-ENE-2-22	E355-L	02-Aug-2022	06-Aug-2022	----	----		07-Aug-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP06-North-2-22	E355-L	02-Aug-2022	06-Aug-2022	----	----		07-Aug-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP06-Source-2-22	E355-L	02-Aug-2022	06-Aug-2022	----	----		07-Aug-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP06-WNW-2-22	E355-L	02-Aug-2022	06-Aug-2022	----	----		07-Aug-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP05-WNW-1-22	E355-L	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE DUP-A	E290	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MLP-1-22	E290	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-ENE-1-22	E290	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-North-1-22	E290	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-Source-1-22	E290	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-ENE-2-22	E290	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-North-2-22	E290	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-Source-2-22	E290	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-WNW-2-22	E290	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-WNW-1-22	E290	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	14 days	9 days	✓
Physical Tests : Conductivity in Seawater										
HDPE DUP-A	E100S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Seawater										
HDPE MLP-1-22	E100S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-ENE-1-22	E100S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-North-1-22	E100S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-Source-1-22	E100S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-ENE-2-22	E100S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-North-2-22	E100S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-Source-2-22	E100S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-WNW-2-22	E100S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	28 days	6 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-WNW-1-22	E100S	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Physical Tests : pH by Meter										
HDPE DUP-A	E108	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	0.25 hrs	14.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MLP-1-22	E108	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	0.25 hrs	14.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-ENE-1-22	E108	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	0.25 hrs	14.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-North-1-22	E108	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	0.25 hrs	14.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-Source-1-22	E108	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	0.25 hrs	14.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-ENE-2-22	E108	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	0.25 hrs	14.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-North-2-22	E108	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	0.25 hrs	14.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-Source-2-22	E108	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	0.25 hrs	14.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-WNW-2-22	E108	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	0.25 hrs	14.25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: ✘ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : pH by Meter										
HDPE MP05-WNW-1-22	E108	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	0.25 hrs	2.25 hrs	✘ EHTR-FM
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE DUP-A	E162S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MLP-1-22	E162S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-ENE-1-22	E162S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-North-1-22	E162S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-Source-1-22	E162S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-ENE-2-22	E162S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-North-2-22	E162S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-Source-2-22	E162S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: ✘ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-WNW-2-22	E162S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-WNW-1-22	E162S	02-Aug-2022	----	----	----		10-Aug-2022	7 days	8 days	✘ EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE DUP-A	E160S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MLP-1-22	E160S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-ENE-1-22	E160S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-North-1-22	E160S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-Source-1-22	E160S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-ENE-2-22	E160S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-North-2-22	E160S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-Source-2-22	E160S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-WNW-2-22	E160S	02-Aug-2022	----	----	----		09-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-WNW-1-22	E160S	02-Aug-2022	----	----	----		10-Aug-2022	7 days	8 days	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-WNW-1-22	E121	02-Aug-2022	----	----	----		12-Aug-2022	3 days	10 days	× EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE DUP-A	E121	02-Aug-2022	----	----	----		05-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MLP-1-22	E121	02-Aug-2022	----	----	----		05-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-ENE-1-22	E121	02-Aug-2022	----	----	----		05-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-North-1-22	E121	02-Aug-2022	----	----	----		05-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-Source-1-22	E121	02-Aug-2022	----	----	----		05-Aug-2022	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-ENE-2-22	E121	02-Aug-2022	----	----	----		05-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-North-2-22	E121	02-Aug-2022	----	----	----		05-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-Source-2-22	E121	02-Aug-2022	----	----	----		05-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-WNW-2-22	E121	02-Aug-2022	----	----	----		05-Aug-2022	3 days	3 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MLP-1-22	E641A	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	11-Aug-2022	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-North-1-22	E641A	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	11-Aug-2022	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E641A	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	11-Aug-2022	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E641A	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	11-Aug-2022	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E641A	02-Aug-2022	10-Aug-2022	14 days	8 days	✓	11-Aug-2022	40 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) DUP-A	E641A	02-Aug-2022	11-Aug-2022	14 days	9 days	✓	12-Aug-2022	40 days	0 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
HDPE total (nitric acid) MP06-Source-2-22	E508S	02-Aug-2022	11-Aug-2022	28 days	9 days	✓	11-Aug-2022	19 days	0 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) DUP-A	E508S	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MLP-1-22	E508S	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-ENE-1-22	E508S	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-North-1-22	E508S	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-Source-1-22	E508S	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-WNW-1-22	E508S	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-ENE-2-22	E508S	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-North-2-22	E508S	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-WNW-2-22	E508S	02-Aug-2022	11-Aug-2022	----	----		11-Aug-2022	28 days	9 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-WNW-1-22	E468S	02-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	13 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) DUP-A	E468S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MLP-1-22	E468S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-ENE-1-22	E468S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-North-1-22	E468S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-Source-1-22	E468S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-ENE-2-22	E468S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-North-2-22	E468S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-Source-2-22	E468S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-WNW-2-22	E468S	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-WNW-1-22	E468S.NaSi	02-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	13 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) DUP-A	E468S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MLP-1-22	E468S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-ENE-1-22	E468S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-North-1-22	E468S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-Source-1-22	E468S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-ENE-2-22	E468S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-North-2-22	E468S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-Source-2-22	E468S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-WNW-2-22	E468S.NaSi	02-Aug-2022	07-Aug-2022	----	----		08-Aug-2022	180 days	6 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) DUP-A	E611A	02-Aug-2022	09-Aug-2022	----	----		10-Aug-2022	14 days	7 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MLP-1-22	E611A	02-Aug-2022	09-Aug-2022	----	----		10-Aug-2022	14 days	7 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP05-North-1-22	E611A	02-Aug-2022	09-Aug-2022	----	----		10-Aug-2022	14 days	7 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP05-Source-1-22	E611A	02-Aug-2022	09-Aug-2022	----	----		10-Aug-2022	14 days	7 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP06-ENE-2-22	E611A	02-Aug-2022	09-Aug-2022	----	----		10-Aug-2022	14 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP06-Source-2-22	E611A	02-Aug-2022	09-Aug-2022	----	----		10-Aug-2022	14 days	8 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	592251	2	28	7.1	5.0	✓
Ammonia by Fluorescence	E298	591017	2	29	6.9	5.0	✓
Bromide in Seawater by IC	E235S.Br	592254	2	19	10.5	5.0	✓
BTEX by Headspace GC-MS	E611A	595561	1	14	7.1	5.0	✓
Chloride in Seawater by IC	E235S.Cl	592255	2	19	10.5	5.0	✓
Conductivity in Seawater	E100S	592250	2	10	20.0	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	599754	1	16	6.2	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	591867	2	26	7.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	591018	2	31	6.4	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	591866	2	25	8.0	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	592256	2	17	11.7	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	592257	2	17	11.7	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	592253	2	23	8.7	5.0	✓
pH by Meter	E108	592249	2	36	5.5	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	592258	2	17	11.7	5.0	✓
TDS by Gravimetry (Seawater)	E162S	594922	2	10	20.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	591020	2	10	20.0	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	598245	1	16	6.2	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	591838	3	32	9.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	591019	2	24	8.3	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	591016	2	10	20.0	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	591839	2	32	6.2	5.0	✓
Turbidity by Nephelometry	E121	590921	2	40	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	595560	1	14	7.1	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	592251	2	28	7.1	5.0	✓
Ammonia by Fluorescence	E298	591017	2	29	6.9	5.0	✓
BC PHCs - EPH by GC-FID	E601A	596927	2	11	18.1	5.0	✓
Bromide in Seawater by IC	E235S.Br	592254	2	19	10.5	5.0	✓
BTEX by Headspace GC-MS	E611A	595561	1	14	7.1	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	596929	2	24	8.3	5.0	✓
Chloride in Seawater by IC	E235S.Cl	592255	2	19	10.5	5.0	✓
Conductivity in Seawater	E100S	592250	2	10	20.0	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	599754	1	16	6.2	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	591867	2	26	7.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	591018	2	31	6.4	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	591866	2	25	8.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Fluoride in Seawater by IC (Low Level)	E235S.F-L	592256	2	17	11.7	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	592257	2	17	11.7	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	592253	2	23	8.7	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	596928	2	25	8.0	5.0	✓
pH by Meter	E108	592249	2	36	5.5	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	592258	2	17	11.7	5.0	✓
TDS by Gravimetry (Seawater)	E162S	594922	2	10	20.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	591020	2	10	20.0	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	598245	1	16	6.2	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	591838	3	32	9.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	591019	2	24	8.3	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	591016	2	10	20.0	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	591839	2	32	6.2	5.0	✓
TSS by Gravimetry (Seawater)	E160S	594921	2	12	16.6	5.0	✓
Turbidity by Nephelometry	E121	590921	2	40	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	595560	1	14	7.1	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	592251	2	28	7.1	5.0	✓
Ammonia by Fluorescence	E298	591017	2	29	6.9	5.0	✓
BC PHCs - EPH by GC-FID	E601A	596927	2	11	18.1	5.0	✓
Bromide in Seawater by IC	E235S.Br	592254	2	19	10.5	5.0	✓
BTEX by Headspace GC-MS	E611A	595561	1	14	7.1	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	596929	2	24	8.3	5.0	✓
Chloride in Seawater by IC	E235S.Cl	592255	2	19	10.5	5.0	✓
Conductivity in Seawater	E100S	592250	2	10	20.0	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	599754	1	16	6.2	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	591867	2	26	7.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	591018	2	31	6.4	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	591866	2	25	8.0	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	592256	2	17	11.7	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	592257	2	17	11.7	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	592253	2	23	8.7	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	596928	2	25	8.0	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	592258	2	17	11.7	5.0	✓
TDS by Gravimetry (Seawater)	E162S	594922	2	10	20.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	591020	2	10	20.0	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	598245	1	16	6.2	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	591838	3	32	9.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	591019	2	24	8.3	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	591016	2	10	20.0	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	591839	2	32	6.2	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
TSS by Gravimetry (Seawater)	E160S	594921	2	12	16.6	5.0	✓
Turbidity by Nephelometry	E121	590921	2	40	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	595560	1	14	7.1	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	591017	2	29	6.9	5.0	✓
Bromide in Seawater by IC	E235S.Br	592254	2	19	10.5	5.0	✓
BTEX by Headspace GC-MS	E611A	595561	1	14	7.1	5.0	✓
Chloride in Seawater by IC	E235S.Cl	592255	2	19	10.5	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	599754	1	16	6.2	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	591867	2	26	7.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	591018	2	31	6.4	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	591866	2	25	8.0	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	592256	2	17	11.7	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	592257	2	17	11.7	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	592253	2	23	8.7	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	592258	2	17	11.7	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	591020	1	10	10.0	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	598245	1	16	6.2	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	591838	2	32	6.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	591019	2	24	8.3	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	591016	1	10	10.0	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	591839	2	32	6.2	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	595560	1	14	7.1	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by “mod”).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Seawater	E100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TSS by Gravimetry (Seawater)	E160S Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry (Seawater)	E162S Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Seawater by IC	E235S.Br Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Seawater by IC	E235S.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Seawater by IC (Low Level)	E235S.F-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence	E318S Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Metals in Seawater by CRC ICPMS (HMI)	E468S Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Seawater samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS (HMI Mode). This method is compliant with digestion requirements of the British Columbia Environmental Laboratory Manual.
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Seawater samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. This method is compliant with digestion requirements of the British Columbia Environmental Laboratory Manual.
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Seawater samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS (HMI Mode).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Seawater samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.
Total Mercury in Seawater by CVAAS	E508S Vancouver - Environmental	Water	EPA 1631E (mod)	Seawater samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Mercury in Seawater by CVAAS	E509S Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Seawater samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Vancouver - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hexane LVI GC-MS	E641A Vancouver - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Salinity in Water (calculation)	EC100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
F1-BTEX	EC580 Vancouver - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.
LEPH and HEPH: EPH-PAH	EC600A Vancouver - Environmental	Water	BC MOE Lab Manual (LEPH and HEPH) (mod)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in Seawater	EP318S Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: **VA22B8083**			
Client	: Golder Associates Ltd.		Laboratory	: Vancouver - Environmental
Contact	: Elaine Irving		Account Manager	: Amber Springer
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4		Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----		Telephone	: +1 604 253 4188
Project	: 166372401/64000/03		Date Samples Received	: 05-Aug-2022 08:15
PO	:		Date Analysis Commenced	: 05-Aug-2022
C-O-C number	: 21-01		Issue Date	: 16-Aug-2022 17:14
Sampler	: TT/MR/DV			
Site	: ----			
Quote number	: VA22-GOLD100-028			
No. of samples received	: 10			
No. of samples analysed	: 10			

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
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Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
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Tracy Harley	Supervisor - Water Quality Instrumentation	Vancouver Inorganics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 590921)											
VA22B8083-001	MP05-Source-1-22	turbidity	----	E121	0.10	NTU	3.30	3.00	9.47%	15%	----
Physical Tests (QC Lot: 592249)											
VA22B8083-003	MP05-ENE-1-22	pH	----	E108	0.10	pH units	7.87	7.87	0.00%	4%	----
Physical Tests (QC Lot: 592250)											
VA22B8083-003	MP05-ENE-1-22	conductivity	----	E100S	2.0	µS/cm	6610	6610	0.00%	20%	----
Physical Tests (QC Lot: 592251)											
VA22B8083-003	MP05-ENE-1-22	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	64.8	66.4	2.44%	20%	----
Physical Tests (QC Lot: 594922)											
VA22B8083-001	MP05-Source-1-22	solids, total dissolved [TDS]	----	E162S	20	mg/L	4210	4250	0.910%	20%	----
Physical Tests (QC Lot: 597366)											
VA22B8083-004	MP05-WNW-1-22	solids, total dissolved [TDS]	----	E162S	20	mg/L	4440	4420	0.462%	20%	----
Physical Tests (QC Lot: 597927)											
VA22B8083-004	MP05-WNW-1-22	pH	----	E108	0.10	pH units	7.78	7.78	0.00%	4%	----
Physical Tests (QC Lot: 597928)											
VA22B8083-004	MP05-WNW-1-22	conductivity	----	E100S	2.0	µS/cm	7020	6980	0.571%	20%	----
Physical Tests (QC Lot: 597929)											
VA22B8516-002	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 599884)											
FJ2202111-001	Anonymous	turbidity	----	E121	0.10	NTU	16.3	15.5	4.90%	15%	----
Anions and Nutrients (QC Lot: 591016)											
VA22B8083-001	MP05-Source-1-22	phosphorus, total	7723-14-0	E372S	0.0040	mg/L	0.0081	0.0082	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 591017)											
KS2202832-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0108	0.0109	0.00004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 591020)											
VA22B8083-001	MP05-Source-1-22	Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 592253)											
VA22B8067-021	Anonymous	nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 592254)											
VA22B8083-001	MP05-Source-1-22	bromide	24959-67-9	E235S.Br	5.0	mg/L	8.6	7.5	1.0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 592255)											
VA22B8083-001	MP05-Source-1-22	chloride	16887-00-6	E235S.Cl	50	mg/L	2350	2280	3.21%	20%	----

Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Anions and Nutrients (QC Lot: 592256)											
VA22B8083-001	MP05-Source-1-22	fluoride	16984-48-8	E235S.F-L	0.20	mg/L	<0.20	<0.20	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 592257)											
VA22B8083-001	MP05-Source-1-22	nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	0.011	<0.010	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 592258)											
VA22B8083-001	MP05-Source-1-22	sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	316	318	0.455%	20%	----
Anions and Nutrients (QC Lot: 597773)											
VA22B7986-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0824	0.0836	1.55%	20%	----
Anions and Nutrients (QC Lot: 597774)											
VA22B8083-004	MP05-WNW-1-22	Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	0.056	<0.050	0.006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 597775)											
VA22B8083-004	MP05-WNW-1-22	phosphorus, total	7723-14-0	E372S	0.0040	mg/L	0.0052	0.0061	0.0009	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 597931)											
VA22B8083-004	MP05-WNW-1-22	sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	302	302	0.0410%	20%	----
Anions and Nutrients (QC Lot: 597932)											
VA22B8083-004	MP05-WNW-1-22	nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 597933)											
VA22B8083-004	MP05-WNW-1-22	fluoride	16984-48-8	E235S.F-L	0.20	mg/L	<0.20	<0.20	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 597934)											
VA22B8083-004	MP05-WNW-1-22	chloride	16887-00-6	E235S.Cl	50	mg/L	2160	2180	0.488%	20%	----
Anions and Nutrients (QC Lot: 597935)											
VA22B8083-004	MP05-WNW-1-22	bromide	24959-67-9	E235S.Br	5.0	mg/L	8.0	7.8	0.2	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 597936)											
VA22B8083-004	MP05-WNW-1-22	nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 591018)											
VA22B8075-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.05	2.13	0.08	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 591019)											
VA22B8075-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.23	2.14	0.08	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 597771)											
VA22B8083-004	MP05-WNW-1-22	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	0.92	0.96	0.04	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 597772)											
VA22B8083-004	MP05-WNW-1-22	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.00	0.96	0.04	Diff <2x LOR	----
Total Metals (QC Lot: 591838)											
VA22B7897-001	Anonymous	aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0094	0.0080	0.0014	Diff <2x LOR	----
		antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E468S	0.00040	mg/L	0.00146	0.00138	0.00008	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
					Laboratory Duplicate (DUP) Report						
Total Metals (QC Lot: 591838) - continued											
VA22B7897-001	Anonymous	barium, total	7440-39-3	E468S	0.0010	mg/L	0.0100	0.0099	0.00008	Diff <2x LOR	----
		beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E468S	0.30	mg/L	2.64	2.16	0.48	Diff <2x LOR	----
		cadmium, total	7440-43-9	E468S	0.000010	mg/L	0.000058	0.000050	0.000008	Diff <2x LOR	----
		calcium, total	7440-70-2	E468S	1.0	mg/L	312	293	6.02%	20%	----
		cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, total	7440-50-8	E468S	0.00050	mg/L	0.00072	0.00071	0.000007	Diff <2x LOR	----
		gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E468S	0.010	mg/L	0.014	0.013	0.0009	Diff <2x LOR	----
		lead, total	7439-92-1	E468S	0.000050	mg/L	0.00136	0.00148	8.50%	20%	----
		lithium, total	7439-93-2	E468S	0.020	mg/L	0.120	0.097	0.023	Diff <2x LOR	----
		magnesium, total	7439-95-4	E468S	1.0	mg/L	845	756	11.1%	20%	----
		manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00545	0.00508	7.06%	20%	----
		molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00833	0.00904	8.22%	20%	----
		nickel, total	7440-02-0	E468S	0.00050	mg/L	0.00081	<0.00050	0.00031	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E468S	0.050	mg/L	0.065	<0.050	0.015	Diff <2x LOR	----
		potassium, total	7440-09-7	E468S	1.0	mg/L	308	286	7.41%	20%	----
		rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.0953	0.0923	3.24%	20%	----
		selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		strontium, total	7440-24-6	E468S	0.010	mg/L	5.94	6.56	9.87%	20%	----
		sulfur, total	7704-34-9	E468S	5.0	mg/L	778	713	8.63%	20%	----
		tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E468S	0.000050	mg/L	0.00227	0.00247	8.20%	20%	----
		vanadium, total	7440-62-2	E468S	0.00050	mg/L	0.00169	0.00158	0.00010	Diff <2x LOR	----
		yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
					Laboratory Duplicate (DUP) Report						
Total Metals (QC Lot: 591838) - continued											
VA22B7897-001	Anonymous	zinc, total	7440-66-6	E468S	0.0030	mg/L	0.0089	0.0088	0.00009	Diff <2x LOR	----
		zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Total Metals (QC Lot: 591839)											
VA22B7897-001	Anonymous	silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	7720	7660	0.695%	20%	----
Total Metals (QC Lot: 594822)											
VA22B8083-005	MLP-1-22	zinc, total	7440-66-6	E468S	0.0030	mg/L	0.0033	0.0032	0.00008	Diff <2x LOR	----
Total Metals (QC Lot: 598245)											
VA22B8067-021	Anonymous	mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 598730)											
VA22B8083-004	MP05-WNW-1-22	aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0577	0.0560	2.98%	20%	----
		antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E468S	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		barium, total	7440-39-3	E468S	0.0010	mg/L	0.0041	0.0040	0.00007	Diff <2x LOR	----
		beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E468S	0.30	mg/L	0.54	0.52	0.02	Diff <2x LOR	----
		cadmium, total	7440-43-9	E468S	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E468S	1.0	mg/L	59.1	58.7	0.670%	20%	----
		cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, total	7440-50-8	E468S	0.00050	mg/L	0.00326	0.00319	0.00007	Diff <2x LOR	----
		gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E468S	0.010	mg/L	0.063	0.061	0.002	Diff <2x LOR	----
		lead, total	7439-92-1	E468S	0.000050	mg/L	<0.000050	0.000050	0.00000008	Diff <2x LOR	----
		lithium, total	7439-93-2	E468S	0.020	mg/L	0.020	0.021	0.0004	Diff <2x LOR	----
		magnesium, total	7439-95-4	E468S	1.0	mg/L	140	143	2.11%	20%	----
		manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00156	0.00162	0.00006	Diff <2x LOR	----
		molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00135	0.00133	1.78%	20%	----
		nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E468S	1.0	mg/L	45.9	46.1	0.535%	20%	----
		rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.0135	0.0139	0.0004	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 598730) - continued											
VA22B8083-004	MP05-WNW-1-22	selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		strontium, total	7440-24-6	E468S	0.010	mg/L	0.952	0.921	3.35%	20%	----
		sulfur, total	7704-34-9	E468S	5.0	mg/L	107	108	1.20%	20%	----
		tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E468S	0.000050	mg/L	0.000754	0.000754	0.0668%	20%	----
		vanadium, total	7440-62-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Total Metals (QC Lot: 598731)											
VA22B8083-004	MP05-WNW-1-22	silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	1200	1230	2.63%	20%	----
Dissolved Metals (QC Lot: 591866)											
VA22B8083-001	MP05-Source-1-22	silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	1240	1250	1.45%	20%	----
Dissolved Metals (QC Lot: 591867)											
VA22B8083-001	MP05-Source-1-22	aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0039	0.0037	0.0001	Diff <2x LOR	----
		beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E469S	0.30	mg/L	0.53	0.56	0.03	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E469S	1.0	mg/L	59.9	60.3	0.527%	20%	----
		cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00050	0.00048	0.00001	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 591867) - continued											
VA22B8083-001	MP05-Source-1-22	gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E469S	0.020	mg/L	0.021	0.021	0.0002	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	146	145	0.609%	20%	----
		manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00084	0.00081	0.00003	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00137	0.00142	3.37%	20%	----
		nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E469S	1.0	mg/L	45.7	45.9	0.521%	20%	----
		rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.0135	0.0130	0.0005	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		strontium, dissolved	7440-24-6	E469S	0.010	mg/L	0.932	0.925	0.682%	20%	----
		sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	108	112	3.07%	20%	----
		tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.00113	0.00113	0.330%	20%	----
		vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 598765)											
VA22B8083-004	MP05-WNW-1-22	aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	0.0050	<0.0050	0.00003	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0040	0.0037	0.0003	Diff <2x LOR	----
		beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E469S	0.30	mg/L	0.52	0.50	0.02	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
					Laboratory Duplicate (DUP) Report						
Dissolved Metals (QC Lot: 598765) - continued											
VA22B8083-004	MP05-WNW-1-22	cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E469S	1.0	mg/L	61.0	59.4	2.59%	20%	----
		cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00048	0.00045	0.00003	Diff <2x LOR	----
		gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E469S	0.020	mg/L	0.021	<0.020	0.0008	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	145	140	3.45%	20%	----
		manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00079	0.00078	0.000009	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00131	0.00135	3.14%	20%	----
		nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E469S	1.0	mg/L	49.0	47.2	3.75%	20%	----
		rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.0142	0.0138	0.0004	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		strontium, dissolved	7440-24-6	E469S	0.010	mg/L	0.916	0.954	4.13%	20%	----
		sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	104	103	0.968%	20%	----
		tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.000729	0.000750	2.92%	20%	----
		vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	0.0013	0.0013	0.00002	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 598766)											
VA22B8083-004	MP05-WNW-1-22	silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
					Laboratory Duplicate (DUP) Report						
Dissolved Metals (QC Lot: 598766) - continued											
VA22B8083-004	MP05-WNW-1-22	sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	1090	1110	2.08%	20%	----
Dissolved Metals (QC Lot: 599754)											
VA22B8067-021	Anonymous	mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 595561)											
VA22B8083-001	MP05-Source-1-22	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	0.64	0.66	0.009	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 595560)											
VA22B8083-001	MP05-Source-1-22	F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----
		VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 590921)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 592250)						
conductivity	----	E100S	2	µS/cm	<2.0	----
Physical Tests (QCLot: 592251)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 594921)						
solids, total suspended [TSS]	----	E160S	2	mg/L	<2.0	----
Physical Tests (QCLot: 594922)						
solids, total dissolved [TDS]	----	E162S	10	mg/L	<10	----
Physical Tests (QCLot: 597080)						
solids, total suspended [TSS]	----	E160S	2	mg/L	<2.0	----
Physical Tests (QCLot: 597366)						
solids, total dissolved [TDS]	----	E162S	10	mg/L	<10	----
Physical Tests (QCLot: 597928)						
conductivity	----	E100S	2	µS/cm	<2.0	----
Physical Tests (QCLot: 597929)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	1.1	----
Physical Tests (QCLot: 599884)						
turbidity	----	E121	0.1	NTU	<0.10	----
Anions and Nutrients (QCLot: 591016)						
phosphorus, total	7723-14-0	E372S	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 591017)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 591020)						
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 592253)						
nitrite (as N)	14797-65-0	E235S.NO2-L	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 592254)						
bromide	24959-67-9	E235S.Br	5	mg/L	<5.0	----
Anions and Nutrients (QCLot: 592255)						
chloride	16887-00-6	E235S.Cl	50	mg/L	<50	----
Anions and Nutrients (QCLot: 592256)						
fluoride	16984-48-8	E235S.F-L	0.2	mg/L	<0.20	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 592257)						
nitrate (as N)	14797-55-8	E235S.NO3-T	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 592258)						
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 597773)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 597774)						
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 597775)						
phosphorus, total	7723-14-0	E372S	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 597931)						
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 597932)						
nitrite (as N)	14797-65-0	E235S.NO2-L	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 597933)						
fluoride	16984-48-8	E235S.F-L	0.2	mg/L	<0.20	----
Anions and Nutrients (QCLot: 597934)						
chloride	16887-00-6	E235S.Cl	50	mg/L	<50	----
Anions and Nutrients (QCLot: 597935)						
bromide	24959-67-9	E235S.Br	5	mg/L	<5.0	----
Anions and Nutrients (QCLot: 597936)						
nitrate (as N)	14797-55-8	E235S.NO3-T	0.01	mg/L	<0.010	----
Organic / Inorganic Carbon (QCLot: 591018)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 591019)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 597771)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 597772)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 591838)						
aluminum, total	7429-90-5	E468S	0.005	mg/L	<0.0050	----
antimony, total	7440-36-0	E468S	0.001	mg/L	<0.0010	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	<0.00040	----
barium, total	7440-39-3	E468S	0.001	mg/L	<0.0010	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	<0.00050	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	<0.00050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 591838) - continued						
boron, total	7440-42-8	E468S	0.3	mg/L	<0.30	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	<0.000010	----
calcium, total	7440-70-2	E468S	1	mg/L	<1.0	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	<0.00050	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	<0.000050	----
copper, total	7440-50-8	E468S	0.0005	mg/L	<0.00050	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E468S	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E468S	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E468S	0.02	mg/L	<0.020	----
magnesium, total	7439-95-4	E468S	1	mg/L	<1.0	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	<0.00020	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	<0.00010	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E468S	1	mg/L	<1.0	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	<0.00050	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	<0.0050	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	<0.00050	----
silver, total	7440-22-4	E468S	0.0001	mg/L	<0.00010	----
strontium, total	7440-24-6	E468S	0.01	mg/L	<0.010	----
sulfur, total	7704-34-9	E468S	5	mg/L	<5.0	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	<0.00050	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	<0.000050	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	<0.00050	----
tin, total	7440-31-5	E468S	0.001	mg/L	<0.0010	----
titanium, total	7440-32-6	E468S	0.005	mg/L	<0.0050	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	<0.0010	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	<0.000050	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	<0.00050	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E468S	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 591839)						
silicon, total	7440-21-3	E468S.NaSi	1	mg/L	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 591839) - continued						
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	<2.5	----
Total Metals (QCLot: 594822)						
aluminum, total	7429-90-5	E468S	0.005	mg/L	<0.0050	----
antimony, total	7440-36-0	E468S	0.001	mg/L	<0.0010	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	<0.00040	----
barium, total	7440-39-3	E468S	0.001	mg/L	<0.0010	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	<0.00050	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	<0.00050	----
boron, total	7440-42-8	E468S	0.3	mg/L	<0.30	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	<0.000010	----
calcium, total	7440-70-2	E468S	1	mg/L	<1.0	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	<0.00050	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	<0.000050	----
copper, total	7440-50-8	E468S	0.0005	mg/L	<0.00050	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E468S	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E468S	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E468S	0.02	mg/L	<0.020	----
magnesium, total	7439-95-4	E468S	1	mg/L	<1.0	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	<0.00020	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	<0.00010	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E468S	1	mg/L	<1.0	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	<0.00050	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	<0.0050	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	<0.00050	----
silver, total	7440-22-4	E468S	0.0001	mg/L	<0.00010	----
strontium, total	7440-24-6	E468S	0.01	mg/L	<0.010	----
sulfur, total	7704-34-9	E468S	5	mg/L	<5.0	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	<0.00050	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	<0.000050	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	<0.00050	----
tin, total	7440-31-5	E468S	0.001	mg/L	<0.0010	----
titanium, total	7440-32-6	E468S	0.005	mg/L	<0.0050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 594822) - continued						
tungsten, total	7440-33-7	E468S	0.001	mg/L	<0.0010	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	<0.000050	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	<0.00050	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E468S	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 598245)						
mercury, total	7439-97-6	E508S	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 598730)						
aluminum, total	7429-90-5	E468S	0.005	mg/L	<0.0050	----
antimony, total	7440-36-0	E468S	0.001	mg/L	<0.0010	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	<0.00040	----
barium, total	7440-39-3	E468S	0.001	mg/L	<0.0010	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	<0.00050	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	<0.00050	----
boron, total	7440-42-8	E468S	0.3	mg/L	<0.30	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	<0.000010	----
calcium, total	7440-70-2	E468S	1	mg/L	<1.0	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	<0.00050	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	<0.000050	----
copper, total	7440-50-8	E468S	0.0005	mg/L	<0.00050	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E468S	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E468S	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E468S	0.02	mg/L	<0.020	----
magnesium, total	7439-95-4	E468S	1	mg/L	<1.0	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	<0.00020	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	<0.00010	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E468S	1	mg/L	<1.0	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	<0.00050	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	<0.0050	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	<0.00050	----
silver, total	7440-22-4	E468S	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 598730) - continued						
strontium, total	7440-24-6	E468S	0.01	mg/L	<0.010	----
sulfur, total	7704-34-9	E468S	5	mg/L	<5.0	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	<0.00050	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	<0.000050	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	<0.00050	----
tin, total	7440-31-5	E468S	0.001	mg/L	<0.0010	----
titanium, total	7440-32-6	E468S	0.005	mg/L	<0.0050	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	<0.0010	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	<0.000050	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	<0.00050	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E468S	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 598731)						
silicon, total	7440-21-3	E468S.NaSi	1	mg/L	<1.0	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	<2.5	----
Dissolved Metals (QCLot: 591866)						
silicon, dissolved	7440-21-3	E469S.NaSi	1	mg/L	<1.0	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	<2.5	----
Dissolved Metals (QCLot: 591867)						
aluminum, dissolved	7429-90-5	E469S	0.005	mg/L	<0.0050	----
antimony, dissolved	7440-36-0	E469S	0.001	mg/L	<0.0010	----
arsenic, dissolved	7440-38-2	E469S	0.0004	mg/L	<0.00040	----
barium, dissolved	7440-39-3	E469S	0.001	mg/L	<0.0010	----
beryllium, dissolved	7440-41-7	E469S	0.0005	mg/L	<0.00050	----
bismuth, dissolved	7440-69-9	E469S	0.0005	mg/L	<0.00050	----
boron, dissolved	7440-42-8	E469S	0.3	mg/L	<0.30	----
cadmium, dissolved	7440-43-9	E469S	0.00001	mg/L	<0.000010	----
calcium, dissolved	7440-70-2	E469S	1	mg/L	<1.0	----
cesium, dissolved	7440-46-2	E469S	0.0005	mg/L	<0.00050	----
chromium, dissolved	7440-47-3	E469S	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E469S	0.00005	mg/L	<0.000050	----
copper, dissolved	7440-50-8	E469S	0.0002	mg/L	<0.00020	----
gallium, dissolved	7440-55-3	E469S	0.0005	mg/L	<0.00050	----
iron, dissolved	7439-89-6	E469S	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E469S	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 591867) - continued						
lithium, dissolved	7439-93-2	E469S	0.02	mg/L	<0.020	----
magnesium, dissolved	7439-95-4	E469S	1	mg/L	<1.0	----
manganese, dissolved	7439-96-5	E469S	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E469S	0.0001	mg/L	<0.00010	----
nickel, dissolved	7440-02-0	E469S	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E469S	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E469S	1	mg/L	<1.0	----
rhenium, dissolved	7440-15-5	E469S	0.0005	mg/L	<0.00050	----
rubidium, dissolved	7440-17-7	E469S	0.005	mg/L	<0.0050	----
selenium, dissolved	7782-49-2	E469S	0.0005	mg/L	<0.00050	----
silver, dissolved	7440-22-4	E469S	0.0001	mg/L	<0.00010	----
strontium, dissolved	7440-24-6	E469S	0.01	mg/L	<0.010	----
sulfur, dissolved	7704-34-9	E469S	5	mg/L	<5.0	----
tellurium, dissolved	13494-80-9	E469S	0.0005	mg/L	<0.00050	----
thallium, dissolved	7440-28-0	E469S	0.00005	mg/L	<0.000050	----
thorium, dissolved	7440-29-1	E469S	0.0005	mg/L	<0.00050	----
tin, dissolved	7440-31-5	E469S	0.001	mg/L	<0.0010	----
titanium, dissolved	7440-32-6	E469S	0.005	mg/L	<0.0050	----
tungsten, dissolved	7440-33-7	E469S	0.001	mg/L	<0.0010	----
uranium, dissolved	7440-61-1	E469S	0.00005	mg/L	<0.000050	----
vanadium, dissolved	7440-62-2	E469S	0.0005	mg/L	<0.00050	----
yttrium, dissolved	7440-65-5	E469S	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E469S	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E469S	0.0005	mg/L	<0.00050	----
Dissolved Metals (QCLot: 598765)						
aluminum, dissolved	7429-90-5	E469S	0.005	mg/L	<0.0050	----
antimony, dissolved	7440-36-0	E469S	0.001	mg/L	<0.0010	----
arsenic, dissolved	7440-38-2	E469S	0.0004	mg/L	<0.00040	----
barium, dissolved	7440-39-3	E469S	0.001	mg/L	<0.0010	----
beryllium, dissolved	7440-41-7	E469S	0.0005	mg/L	<0.00050	----
bismuth, dissolved	7440-69-9	E469S	0.0005	mg/L	<0.00050	----
boron, dissolved	7440-42-8	E469S	0.3	mg/L	<0.30	----
cadmium, dissolved	7440-43-9	E469S	0.00001	mg/L	<0.000010	----
calcium, dissolved	7440-70-2	E469S	1	mg/L	<1.0	----
cesium, dissolved	7440-46-2	E469S	0.0005	mg/L	<0.00050	----
chromium, dissolved	7440-47-3	E469S	0.0005	mg/L	<0.00050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 598765) - continued						
cobalt, dissolved	7440-48-4	E469S	0.00005	mg/L	<0.000050	----
copper, dissolved	7440-50-8	E469S	0.0002	mg/L	<0.00020	----
gallium, dissolved	7440-55-3	E469S	0.0005	mg/L	<0.00050	----
iron, dissolved	7439-89-6	E469S	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E469S	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E469S	0.02	mg/L	<0.020	----
magnesium, dissolved	7439-95-4	E469S	1	mg/L	<1.0	----
manganese, dissolved	7439-96-5	E469S	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E469S	0.0001	mg/L	<0.00010	----
nickel, dissolved	7440-02-0	E469S	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E469S	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E469S	1	mg/L	<1.0	----
rhenium, dissolved	7440-15-5	E469S	0.0005	mg/L	<0.00050	----
rubidium, dissolved	7440-17-7	E469S	0.005	mg/L	<0.0050	----
selenium, dissolved	7782-49-2	E469S	0.0005	mg/L	<0.00050	----
silver, dissolved	7440-22-4	E469S	0.0001	mg/L	<0.00010	----
strontium, dissolved	7440-24-6	E469S	0.01	mg/L	<0.010	----
sulfur, dissolved	7704-34-9	E469S	5	mg/L	<5.0	----
tellurium, dissolved	13494-80-9	E469S	0.0005	mg/L	<0.00050	----
thallium, dissolved	7440-28-0	E469S	0.00005	mg/L	<0.000050	----
thorium, dissolved	7440-29-1	E469S	0.0005	mg/L	<0.00050	----
tin, dissolved	7440-31-5	E469S	0.001	mg/L	<0.0010	----
titanium, dissolved	7440-32-6	E469S	0.005	mg/L	<0.0050	----
tungsten, dissolved	7440-33-7	E469S	0.001	mg/L	<0.0010	----
uranium, dissolved	7440-61-1	E469S	0.00005	mg/L	<0.000050	----
vanadium, dissolved	7440-62-2	E469S	0.0005	mg/L	<0.00050	----
yttrium, dissolved	7440-65-5	E469S	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E469S	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E469S	0.0005	mg/L	<0.00050	----
Dissolved Metals (QCLot: 598766)						
silicon, dissolved	7440-21-3	E469S.NaSi	1	mg/L	<1.0	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	<2.5	----
Dissolved Metals (QCLot: 599754)						
mercury, dissolved	7439-97-6	E509S	0.000005	mg/L	<0.0000050	----
Volatile Organic Compounds (QCLot: 595561)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 595561) - continued						
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 595560)						
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 596927)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
Hydrocarbons (QCLot: 596929)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----
F4 (C34-C50)	----	E601	250	µg/L	<250	----
Hydrocarbons (QCLot: 599112)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----
F4 (C34-C50)	----	E601	250	µg/L	<250	----
Hydrocarbons (QCLot: 599115)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
Polycyclic Aromatic Hydrocarbons (QCLot: 596928)						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 596928) - continued						
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
quinoline	91-22-5	E641A	0.05	µg/L	<0.050	----
Polycyclic Aromatic Hydrocarbons (QCLot: 599114)						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
quinoline	91-22-5	E641A	0.05	µg/L	<0.050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 590921)									
turbidity	----	E121	0.1	NTU	200 NTU	97.9	85.0	115	----
Physical Tests (QCLot: 592249)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 592250)									
conductivity	----	E100S	2	µS/cm	146.9 µS/cm	94.0	80.0	120	----
Physical Tests (QCLot: 592251)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	111	85.0	115	----
Physical Tests (QCLot: 594921)									
solids, total suspended [TSS]	----	E160S	2	mg/L	150 mg/L	97.3	85.0	115	----
Physical Tests (QCLot: 594922)									
solids, total dissolved [TDS]	----	E162S	10	mg/L	1000 mg/L	99.6	85.0	115	----
Physical Tests (QCLot: 597080)									
solids, total suspended [TSS]	----	E160S	2	mg/L	150 mg/L	99.5	85.0	115	----
Physical Tests (QCLot: 597366)									
solids, total dissolved [TDS]	----	E162S	10	mg/L	1000 mg/L	105	85.0	115	----
Physical Tests (QCLot: 597927)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 597928)									
conductivity	----	E100S	2	µS/cm	146.9 µS/cm	97.0	80.0	120	----
Physical Tests (QCLot: 597929)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	109	85.0	115	----
Physical Tests (QCLot: 599884)									
turbidity	----	E121	0.1	NTU	200 NTU	97.5	85.0	115	----
Anions and Nutrients (QCLot: 591016)									
phosphorus, total	7723-14-0	E372S	0.002	mg/L	0.05 mg/L	94.6	80.0	120	----
Anions and Nutrients (QCLot: 591017)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.5	85.0	115	----
Anions and Nutrients (QCLot: 591020)									
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	4 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 592253)									
nitrite (as N)	14797-65-0	E235S.NO2-L	0.01	mg/L	0.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 592254)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Anions and Nutrients (QCLot: 592254) - continued									
bromide	24959-67-9	E235S.Br	5	mg/L	0.5 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 592255)									
chloride	16887-00-6	E235S.Cl	50	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 592256)									
fluoride	16984-48-8	E235S.F-L	0.2	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 592257)									
nitrate (as N)	14797-55-8	E235S.NO3-T	0.01	mg/L	2.5 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 592258)									
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 597773)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	96.1	85.0	115	----
Anions and Nutrients (QCLot: 597774)									
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	4 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 597775)									
phosphorus, total	7723-14-0	E372S	0.002	mg/L	0.05 mg/L	93.3	80.0	120	----
Anions and Nutrients (QCLot: 597931)									
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 597932)									
nitrite (as N)	14797-65-0	E235S.NO2-L	0.01	mg/L	0.5 mg/L	99.2	90.0	110	----
Anions and Nutrients (QCLot: 597933)									
fluoride	16984-48-8	E235S.F-L	0.2	mg/L	1 mg/L	98.5	90.0	110	----
Anions and Nutrients (QCLot: 597934)									
chloride	16887-00-6	E235S.Cl	50	mg/L	100 mg/L	99.4	90.0	110	----
Anions and Nutrients (QCLot: 597935)									
bromide	24959-67-9	E235S.Br	5	mg/L	0.5 mg/L	99.2	85.0	115	----
Anions and Nutrients (QCLot: 597936)									
nitrate (as N)	14797-55-8	E235S.NO3-T	0.01	mg/L	2.5 mg/L	100	90.0	110	----
Organic / Inorganic Carbon (QCLot: 591018)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	98.4	80.0	120	----
Organic / Inorganic Carbon (QCLot: 591019)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	98.3	80.0	120	----
Organic / Inorganic Carbon (QCLot: 597771)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	99.3	80.0	120	----
Organic / Inorganic Carbon (QCLot: 597772)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	101	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Total Metals (QCLot: 591838)									
aluminum, total	7429-90-5	E468S	0.005	mg/L	2 mg/L	100	80.0	120	----
antimony, total	7440-36-0	E468S	0.001	mg/L	1 mg/L	104	80.0	120	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	1 mg/L	102	80.0	120	----
barium, total	7440-39-3	E468S	0.001	mg/L	0.25 mg/L	105	80.0	120	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	0.1 mg/L	107	80.0	120	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	1 mg/L	103	80.0	120	----
boron, total	7440-42-8	E468S	0.3	mg/L	10 mg/L	104	80.0	120	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	0.1 mg/L	102	80.0	120	----
calcium, total	7440-70-2	E468S	1	mg/L	50 mg/L	106	80.0	120	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	0.05 mg/L	95.4	80.0	120	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	0.25 mg/L	98.7	80.0	120	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
copper, total	7440-50-8	E468S	0.0005	mg/L	0.25 mg/L	106	80.0	120	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	0.25 mg/L	99.5	80.0	120	----
iron, total	7439-89-6	E468S	0.01	mg/L	1 mg/L	104	80.0	120	----
lead, total	7439-92-1	E468S	0.00005	mg/L	0.5 mg/L	103	80.0	120	----
lithium, total	7439-93-2	E468S	0.02	mg/L	0.25 mg/L	103	80.0	120	----
magnesium, total	7439-95-4	E468S	1	mg/L	50 mg/L	93.9	80.0	120	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	0.25 mg/L	101	80.0	120	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	0.25 mg/L	95.9	80.0	120	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	10 mg/L	94.6	80.0	120	----
potassium, total	7440-09-7	E468S	1	mg/L	50 mg/L	102	80.0	120	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	0.1 mg/L	100	80.0	120	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	0.1 mg/L	103	80.0	120	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	1 mg/L	108	80.0	120	----
silver, total	7440-22-4	E468S	0.0001	mg/L	0.1 mg/L	96.5	80.0	120	----
strontium, total	7440-24-6	E468S	0.01	mg/L	0.25 mg/L	102	80.0	120	----
sulfur, total	7704-34-9	E468S	5	mg/L	50 mg/L	98.0	80.0	120	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	0.1 mg/L	108	80.0	120	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	1 mg/L	96.1	80.0	120	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	0.1 mg/L	90.0	80.0	120	----
tin, total	7440-31-5	E468S	0.001	mg/L	0.5 mg/L	99.9	80.0	120	----
titanium, total	7440-32-6	E468S	0.005	mg/L	0.25 mg/L	96.3	80.0	120	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	0.1 mg/L	94.7	80.0	120	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	0.005 mg/L	97.0	80.0	120	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	0.5 mg/L	96.6	80.0	120	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	0.1 mg/L	96.8	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 591838) - continued									
zinc, total	7440-66-6	E468S	0.003	mg/L	0.5 mg/L	107	80.0	120	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	0.1 mg/L	93.5	80.0	120	----
Total Metals (QCLot: 591839)									
silicon, total	7440-21-3	E468S.NaSi	1	mg/L	10 mg/L	110	80.0	120	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	50 mg/L	109	80.0	120	----
Total Metals (QCLot: 594822)									
aluminum, total	7429-90-5	E468S	0.005	mg/L	2 mg/L	97.0	80.0	120	----
antimony, total	7440-36-0	E468S	0.001	mg/L	1 mg/L	108	80.0	120	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	1 mg/L	102	80.0	120	----
barium, total	7440-39-3	E468S	0.001	mg/L	0.25 mg/L	98.8	80.0	120	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	0.1 mg/L	102	80.0	120	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	1 mg/L	107	80.0	120	----
boron, total	7440-42-8	E468S	0.3	mg/L	10 mg/L	97.4	80.0	120	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	0.1 mg/L	106	80.0	120	----
calcium, total	7440-70-2	E468S	1	mg/L	50 mg/L	99.0	80.0	120	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	0.05 mg/L	108	80.0	120	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	0.25 mg/L	97.9	80.0	120	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	0.25 mg/L	98.4	80.0	120	----
copper, total	7440-50-8	E468S	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
iron, total	7439-89-6	E468S	0.01	mg/L	1 mg/L	103	80.0	120	----
lead, total	7439-92-1	E468S	0.00005	mg/L	0.5 mg/L	104	80.0	120	----
lithium, total	7439-93-2	E468S	0.02	mg/L	0.25 mg/L	101	80.0	120	----
magnesium, total	7439-95-4	E468S	1	mg/L	50 mg/L	98.8	80.0	120	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	0.25 mg/L	98.4	80.0	120	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	0.25 mg/L	97.4	80.0	120	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	10 mg/L	91.1	80.0	120	----
potassium, total	7440-09-7	E468S	1	mg/L	50 mg/L	101	80.0	120	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	0.1 mg/L	96.4	80.0	120	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	0.1 mg/L	98.7	80.0	120	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	1 mg/L	111	80.0	120	----
silver, total	7440-22-4	E468S	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
strontium, total	7440-24-6	E468S	0.01	mg/L	0.25 mg/L	104	80.0	120	----
sulfur, total	7704-34-9	E468S	5	mg/L	50 mg/L	99.6	80.0	120	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	0.1 mg/L	108	80.0	120	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	1 mg/L	105	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 594822) - continued									
thorium, total	7440-29-1	E468S	0.0005	mg/L	0.1 mg/L	104	80.0	120	----
tin, total	7440-31-5	E468S	0.001	mg/L	0.5 mg/L	99.1	80.0	120	----
titanium, total	7440-32-6	E468S	0.005	mg/L	0.25 mg/L	93.3	80.0	120	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	0.1 mg/L	96.3	80.0	120	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	0.005 mg/L	107	80.0	120	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	0.5 mg/L	96.9	80.0	120	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	0.1 mg/L	98.4	80.0	120	----
zinc, total	7440-66-6	E468S	0.003	mg/L	0.5 mg/L	106	80.0	120	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	0.1 mg/L	96.9	80.0	120	----
Total Metals (QCLot: 598245)									
mercury, total	7439-97-6	E508S	0.000005	mg/L	0.0001 mg/L	99.3	80.0	120	----
Total Metals (QCLot: 598730)									
aluminum, total	7429-90-5	E468S	0.005	mg/L	2 mg/L	104	80.0	120	----
antimony, total	7440-36-0	E468S	0.001	mg/L	1 mg/L	109	80.0	120	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	1 mg/L	107	80.0	120	----
barium, total	7440-39-3	E468S	0.001	mg/L	0.25 mg/L	104	80.0	120	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	0.1 mg/L	106	80.0	120	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	1 mg/L	106	80.0	120	----
boron, total	7440-42-8	E468S	0.3	mg/L	10 mg/L	103	80.0	120	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	0.1 mg/L	106	80.0	120	----
calcium, total	7440-70-2	E468S	1	mg/L	50 mg/L	98.7	80.0	120	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	0.05 mg/L	104	80.0	120	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
copper, total	7440-50-8	E468S	0.0005	mg/L	0.25 mg/L	111	80.0	120	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
iron, total	7439-89-6	E468S	0.01	mg/L	1 mg/L	112	80.0	120	----
lead, total	7439-92-1	E468S	0.00005	mg/L	0.5 mg/L	110	80.0	120	----
lithium, total	7439-93-2	E468S	0.02	mg/L	0.25 mg/L	90.3	80.0	120	----
magnesium, total	7439-95-4	E468S	1	mg/L	50 mg/L	105	80.0	120	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	0.5 mg/L	109	80.0	120	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	10 mg/L	109	80.0	120	----
potassium, total	7440-09-7	E468S	1	mg/L	50 mg/L	110	80.0	120	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	0.1 mg/L	103	80.0	120	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	0.1 mg/L	102	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Total Metals (QCLot: 598730) - continued									
selenium, total	7782-49-2	E468S	0.0005	mg/L	1 mg/L	118	80.0	120	----
silver, total	7440-22-4	E468S	0.0001	mg/L	0.1 mg/L	104	80.0	120	----
strontium, total	7440-24-6	E468S	0.01	mg/L	0.25 mg/L	103	80.0	120	----
sulfur, total	7704-34-9	E468S	5	mg/L	50 mg/L	103	80.0	120	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	0.1 mg/L	# 124	80.0	120	MES
thallium, total	7440-28-0	E468S	0.00005	mg/L	1 mg/L	107	80.0	120	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	0.1 mg/L	97.7	80.0	120	----
tin, total	7440-31-5	E468S	0.001	mg/L	0.5 mg/L	101	80.0	120	----
titanium, total	7440-32-6	E468S	0.005	mg/L	0.25 mg/L	95.2	80.0	120	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	0.1 mg/L	104	80.0	120	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	0.005 mg/L	103	80.0	120	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	0.5 mg/L	99.1	80.0	120	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	0.1 mg/L	97.5	80.0	120	----
zinc, total	7440-66-6	E468S	0.003	mg/L	0.5 mg/L	120	80.0	120	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	0.1 mg/L	103	80.0	120	----
Total Metals (QCLot: 598731)									
silicon, total	7440-21-3	E468S.NaSi	1	mg/L	10 mg/L	111	80.0	120	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	50 mg/L	110	80.0	120	----
silicon, dissolved	7440-21-3	E469S.NaSi	1	mg/L	10 mg/L	104	80.0	120	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	50 mg/L	102	80.0	120	----
Dissolved Metals (QCLot: 591867)									
aluminum, dissolved	7429-90-5	E469S	0.005	mg/L	2 mg/L	101	80.0	120	----
antimony, dissolved	7440-36-0	E469S	0.001	mg/L	1 mg/L	104	80.0	120	----
arsenic, dissolved	7440-38-2	E469S	0.0004	mg/L	1 mg/L	98.0	80.0	120	----
barium, dissolved	7440-39-3	E469S	0.001	mg/L	0.25 mg/L	105	80.0	120	----
beryllium, dissolved	7440-41-7	E469S	0.0005	mg/L	0.1 mg/L	99.6	80.0	120	----
bismuth, dissolved	7440-69-9	E469S	0.0005	mg/L	1 mg/L	102	80.0	120	----
boron, dissolved	7440-42-8	E469S	0.3	mg/L	10 mg/L	95.4	80.0	120	----
cadmium, dissolved	7440-43-9	E469S	0.00001	mg/L	0.1 mg/L	101	80.0	120	----
calcium, dissolved	7440-70-2	E469S	1	mg/L	50 mg/L	98.2	80.0	120	----
cesium, dissolved	7440-46-2	E469S	0.0005	mg/L	0.05 mg/L	96.7	80.0	120	----
chromium, dissolved	7440-47-3	E469S	0.0005	mg/L	0.25 mg/L	95.7	80.0	120	----
cobalt, dissolved	7440-48-4	E469S	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
copper, dissolved	7440-50-8	E469S	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
gallium, dissolved	7440-55-3	E469S	0.0005	mg/L	0.25 mg/L	96.8	80.0	120	----
iron, dissolved	7439-89-6	E469S	0.01	mg/L	1 mg/L	104	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 591867) - continued									
lead, dissolved	7439-92-1	E469S	0.00005	mg/L	0.5 mg/L	104	80.0	120	----
lithium, dissolved	7439-93-2	E469S	0.02	mg/L	0.25 mg/L	95.6	80.0	120	----
magnesium, dissolved	7439-95-4	E469S	1	mg/L	50 mg/L	99.8	80.0	120	----
manganese, dissolved	7439-96-5	E469S	0.0001	mg/L	0.25 mg/L	99.0	80.0	120	----
molybdenum, dissolved	7439-98-7	E469S	0.0001	mg/L	0.25 mg/L	98.5	80.0	120	----
nickel, dissolved	7440-02-0	E469S	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
phosphorus, dissolved	7723-14-0	E469S	0.05	mg/L	10 mg/L	104	80.0	120	----
potassium, dissolved	7440-09-7	E469S	1	mg/L	50 mg/L	98.5	80.0	120	----
rhenium, dissolved	7440-15-5	E469S	0.0005	mg/L	0.1 mg/L	95.9	80.0	120	----
rubidium, dissolved	7440-17-7	E469S	0.005	mg/L	0.1 mg/L	100	80.0	120	----
selenium, dissolved	7782-49-2	E469S	0.0005	mg/L	1 mg/L	105	80.0	120	----
silver, dissolved	7440-22-4	E469S	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
strontium, dissolved	7440-24-6	E469S	0.01	mg/L	0.25 mg/L	105	80.0	120	----
sulfur, dissolved	7704-34-9	E469S	5	mg/L	50 mg/L	94.1	80.0	120	----
tellurium, dissolved	13494-80-9	E469S	0.0005	mg/L	0.1 mg/L	111	80.0	120	----
thallium, dissolved	7440-28-0	E469S	0.00005	mg/L	1 mg/L	103	80.0	120	----
thorium, dissolved	7440-29-1	E469S	0.0005	mg/L	0.1 mg/L	90.9	80.0	120	----
tin, dissolved	7440-31-5	E469S	0.001	mg/L	0.5 mg/L	99.9	80.0	120	----
titanium, dissolved	7440-32-6	E469S	0.005	mg/L	0.25 mg/L	94.3	80.0	120	----
tungsten, dissolved	7440-33-7	E469S	0.001	mg/L	0.1 mg/L	95.5	80.0	120	----
uranium, dissolved	7440-61-1	E469S	0.00005	mg/L	0.005 mg/L	97.6	80.0	120	----
vanadium, dissolved	7440-62-2	E469S	0.0005	mg/L	0.5 mg/L	93.2	80.0	120	----
yttrium, dissolved	7440-65-5	E469S	0.0005	mg/L	0.1 mg/L	93.1	80.0	120	----
zinc, dissolved	7440-66-6	E469S	0.001	mg/L	0.5 mg/L	103	80.0	120	----
zirconium, dissolved	7440-67-7	E469S	0.0005	mg/L	0.1 mg/L	96.6	80.0	120	----
Dissolved Metals (QCLot: 598765)									
aluminum, dissolved	7429-90-5	E469S	0.005	mg/L	2 mg/L	90.7	80.0	120	----
antimony, dissolved	7440-36-0	E469S	0.001	mg/L	1 mg/L	98.8	80.0	120	----
arsenic, dissolved	7440-38-2	E469S	0.0004	mg/L	1 mg/L	105	80.0	120	----
barium, dissolved	7440-39-3	E469S	0.001	mg/L	0.25 mg/L	104	80.0	120	----
beryllium, dissolved	7440-41-7	E469S	0.0005	mg/L	0.1 mg/L	84.6	80.0	120	----
bismuth, dissolved	7440-69-9	E469S	0.0005	mg/L	1 mg/L	103	80.0	120	----
boron, dissolved	7440-42-8	E469S	0.3	mg/L	10 mg/L	# 78.4	80.0	120	MES
cadmium, dissolved	7440-43-9	E469S	0.00001	mg/L	0.1 mg/L	104	80.0	120	----
calcium, dissolved	7440-70-2	E469S	1	mg/L	50 mg/L	89.6	80.0	120	----
cesium, dissolved	7440-46-2	E469S	0.0005	mg/L	0.05 mg/L	98.8	80.0	120	----
chromium, dissolved	7440-47-3	E469S	0.0005	mg/L	0.25 mg/L	96.2	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 598765) - continued									
cobalt, dissolved	7440-48-4	E469S	0.00005	mg/L	0.25 mg/L	99.0	80.0	120	----
copper, dissolved	7440-50-8	E469S	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
gallium, dissolved	7440-55-3	E469S	0.0005	mg/L	0.25 mg/L	96.5	80.0	120	----
iron, dissolved	7439-89-6	E469S	0.01	mg/L	1 mg/L	105	80.0	120	----
lead, dissolved	7439-92-1	E469S	0.00005	mg/L	0.5 mg/L	105	80.0	120	----
lithium, dissolved	7439-93-2	E469S	0.02	mg/L	0.25 mg/L	# 77.6	80.0	120	MES
magnesium, dissolved	7439-95-4	E469S	1	mg/L	50 mg/L	92.6	80.0	120	----
manganese, dissolved	7439-96-5	E469S	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
molybdenum, dissolved	7439-98-7	E469S	0.0001	mg/L	0.25 mg/L	96.2	80.0	120	----
nickel, dissolved	7440-02-0	E469S	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
phosphorus, dissolved	7723-14-0	E469S	0.05	mg/L	10 mg/L	99.7	80.0	120	----
potassium, dissolved	7440-09-7	E469S	1	mg/L	50 mg/L	101	80.0	120	----
rhenium, dissolved	7440-15-5	E469S	0.0005	mg/L	0.1 mg/L	100	80.0	120	----
rubidium, dissolved	7440-17-7	E469S	0.005	mg/L	0.1 mg/L	100	80.0	120	----
selenium, dissolved	7782-49-2	E469S	0.0005	mg/L	1 mg/L	114	80.0	120	----
silver, dissolved	7440-22-4	E469S	0.0001	mg/L	0.1 mg/L	98.7	80.0	120	----
strontium, dissolved	7440-24-6	E469S	0.01	mg/L	0.25 mg/L	104	80.0	120	----
sulfur, dissolved	7704-34-9	E469S	5	mg/L	50 mg/L	95.0	80.0	120	----
tellurium, dissolved	13494-80-9	E469S	0.0005	mg/L	0.1 mg/L	115	80.0	120	----
thallium, dissolved	7440-28-0	E469S	0.00005	mg/L	1 mg/L	100	80.0	120	----
thorium, dissolved	7440-29-1	E469S	0.0005	mg/L	0.1 mg/L	91.6	80.0	120	----
tin, dissolved	7440-31-5	E469S	0.001	mg/L	0.5 mg/L	101	80.0	120	----
titanium, dissolved	7440-32-6	E469S	0.005	mg/L	0.25 mg/L	97.1	80.0	120	----
tungsten, dissolved	7440-33-7	E469S	0.001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, dissolved	7440-61-1	E469S	0.00005	mg/L	0.005 mg/L	92.9	80.0	120	----
vanadium, dissolved	7440-62-2	E469S	0.0005	mg/L	0.5 mg/L	94.2	80.0	120	----
yttrium, dissolved	7440-65-5	E469S	0.0005	mg/L	0.1 mg/L	101	80.0	120	----
zinc, dissolved	7440-66-6	E469S	0.001	mg/L	0.5 mg/L	110	80.0	120	----
zirconium, dissolved	7440-67-7	E469S	0.0005	mg/L	0.1 mg/L	96.1	80.0	120	----
silicon, dissolved	7440-21-3	E469S.NaSi	1	mg/L	10 mg/L	112	80.0	120	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	50 mg/L	106	80.0	120	----
mercury, dissolved	7439-97-6	E509S	0.000005	mg/L	0.0001 mg/L	102	80.0	120	----
Volatile Organic Compounds (QCLot: 595561)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	104	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	111	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	101	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	112	70.0	130	----

Sub-Matrix: **Water**

Laboratory Control Sample (LCS) Report

Analyte	CAS Number	Method	LOR	Unit	Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Volatile Organic Compounds (QCLot: 595561) - continued									
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	108	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	115	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	113	70.0	130	----
Hydrocarbons (QCLot: 595560)									
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	88.0	70.0	130	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	78.1	70.0	130	----
Hydrocarbons (QCLot: 596927)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	93.4	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	96.0	70.0	130	----
Hydrocarbons (QCLot: 596929)									
F2 (C10-C16)	----	E601	100	µg/L	3538 µg/L	98.1	70.0	130	----
F3 (C16-C34)	----	E601	250	µg/L	7053 µg/L	88.8	70.0	130	----
F4 (C34-C50)	----	E601	250	µg/L	5051 µg/L	106	70.0	130	----
Hydrocarbons (QCLot: 599112)									
F2 (C10-C16)	----	E601	100	µg/L	3538 µg/L	107	70.0	130	----
F3 (C16-C34)	----	E601	250	µg/L	7053 µg/L	96.2	70.0	130	----
F4 (C34-C50)	----	E601	250	µg/L	5051 µg/L	110	70.0	130	----
Hydrocarbons (QCLot: 599115)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	93.6	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	96.7	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 596928)									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.608 µg/L	88.4	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.631 µg/L	90.0	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	0.5 µg/L	115	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	0.675 µg/L	92.5	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.664 µg/L	104	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.675 µg/L	87.3	60.0	130	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.655 µg/L	83.0	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.682 µg/L	90.6	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.68 µg/L	85.8	60.0	130	----
chrysene	218-01-9	E641A	0.01	µg/L	0.684 µg/L	102	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.667 µg/L	90.4	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.657 µg/L	91.4	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	0.436 µg/L	90.2	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.684 µg/L	93.6	60.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 596928) - continued									
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.6 µg/L	86.1	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.595 µg/L	85.2	60.0	130	----
naphthalene	91-20-3	E641A	0.05	µg/L	0.601 µg/L	86.9	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.661 µg/L	91.7	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	0.67 µg/L	93.9	60.0	130	----
quinoline	91-22-5	E641A	0.05	µg/L	0.5 µg/L	121	60.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 599114)									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.5 µg/L	87.0	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5 µg/L	90.6	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	0.5 µg/L	108	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	0.5 µg/L	98.5	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5 µg/L	99.2	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5 µg/L	90.4	60.0	130	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.5 µg/L	84.7	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5 µg/L	98.9	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5 µg/L	91.7	60.0	130	----
chrysene	218-01-9	E641A	0.01	µg/L	0.5 µg/L	102	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5 µg/L	94.3	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.5 µg/L	95.2	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	0.5 µg/L	93.6	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5 µg/L	98.9	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5 µg/L	85.4	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5 µg/L	85.0	60.0	130	----
naphthalene	91-20-3	E641A	0.05	µg/L	0.5 µg/L	86.0	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.5 µg/L	95.6	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	0.5 µg/L	96.8	60.0	130	----
quinoline	91-22-5	E641A	0.05	µg/L	0.5 µg/L	110	60.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 591016)										
VA22B8083-002	MP05-North-1-22	phosphorus, total	7723-14-0	E372S	0.0899 mg/L	0.1 mg/L	89.9	70.0	130	----
Anions and Nutrients (QCLot: 591017)										
KS2202832-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0969 mg/L	0.1 mg/L	96.9	75.0	125	----
Anions and Nutrients (QCLot: 591020)										
VA22B8083-002	MP05-North-1-22	Kjeldahl nitrogen, total [TKN]	----	E318S	2.18 mg/L	2.5 mg/L	87.2	70.0	130	----
Anions and Nutrients (QCLot: 592253)										
VA22B8067-022	Anonymous	nitrite (as N)	14797-65-0	E235S.NO2-L	4.79 mg/L	5 mg/L	95.9	75.0	125	----
Anions and Nutrients (QCLot: 592254)										
VA22B8083-002	MP05-North-1-22	bromide	24959-67-9	E235S.Br	50.9 mg/L	50 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 592255)										
VA22B8083-002	MP05-North-1-22	chloride	16887-00-6	E235S.Cl	10200 mg/L	10000 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 592256)										
VA22B8083-002	MP05-North-1-22	fluoride	16984-48-8	E235S.F-L	10.1 mg/L	10 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 592257)										
VA22B8083-002	MP05-North-1-22	nitrate (as N)	14797-55-8	E235S.NO3-T	7.71 mg/L	7.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 592258)										
VA22B8083-002	MP05-North-1-22	sulfate (as SO4)	14808-79-8	E235S.SO4-L	1040 mg/L	1000 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 597773)										
VA22B8083-004	MP05-WNW-1-22	ammonia, total (as N)	7664-41-7	E298	0.107 mg/L	0.1 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 597931)										
VA22B8443-001	Anonymous	sulfate (as SO4)	14808-79-8	E235S.SO4-L	909 mg/L	1000 mg/L	90.9	75.0	125	----
Anions and Nutrients (QCLot: 597932)										
VA22B8443-001	Anonymous	nitrite (as N)	14797-65-0	E235S.NO2-L	4.54 mg/L	5 mg/L	90.8	75.0	125	----
Anions and Nutrients (QCLot: 597933)										
VA22B8443-001	Anonymous	fluoride	16984-48-8	E235S.F-L	9.34 mg/L	10 mg/L	93.4	75.0	125	----
Anions and Nutrients (QCLot: 597934)										
VA22B8443-001	Anonymous	chloride	16887-00-6	E235S.Cl	8540 mg/L	10000 mg/L	85.4	75.0	125	----
Anions and Nutrients (QCLot: 597935)										

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Anions and Nutrients (QCLot: 597935) - continued										
VA22B8443-001	Anonymous	bromide	24959-67-9	E235S.Br	42.6 mg/L	50 mg/L	85.2	75.0	125	----
Anions and Nutrients (QCLot: 597936)										
VA22B8443-001	Anonymous	nitrate (as N)	14797-55-8	E235S.NO3-T	7.46 mg/L	7.5 mg/L	99.5	75.0	125	----
Organic / Inorganic Carbon (QCLot: 591018)										
VA22B8077-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	4.73 mg/L	5 mg/L	94.6	70.0	130	----
Organic / Inorganic Carbon (QCLot: 591019)										
VA22B8083-001	MP05-Source-1-22	carbon, total organic [TOC]	----	E355-L	4.39 mg/L	5 mg/L	87.8	70.0	130	----
Organic / Inorganic Carbon (QCLot: 597771)										
VA22B8160-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 597772)										
VA22B8160-001	Anonymous	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 591838)										
VA22B7897-002	Anonymous	aluminum, total	7429-90-5	E468S	0.336 mg/L	0.4 mg/L	83.9	70.0	130	----
		antimony, total	7440-36-0	E468S	0.0382 mg/L	0.04 mg/L	95.4	70.0	130	----
		arsenic, total	7440-38-2	E468S	0.0358 mg/L	0.04 mg/L	89.4	70.0	130	----
		barium, total	7440-39-3	E468S	0.0371 mg/L	0.04 mg/L	92.8	70.0	130	----
		beryllium, total	7440-41-7	E468S	0.217 mg/L	0.2 mg/L	109	70.0	130	----
		bismuth, total	7440-69-9	E468S	0.0168 mg/L	0.02 mg/L	84.2	70.0	130	----
		boron, total	7440-42-8	E468S	ND mg/L	0.2 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E468S	0.00678 mg/L	0.008 mg/L	84.8	70.0	130	----
		calcium, total	7440-70-2	E468S	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E468S	0.0191 mg/L	0.02 mg/L	95.5	70.0	130	----
		chromium, total	7440-47-3	E468S	0.0718 mg/L	0.08 mg/L	89.8	70.0	130	----
		cobalt, total	7440-48-4	E468S	0.0348 mg/L	0.04 mg/L	87.1	70.0	130	----
		copper, total	7440-50-8	E468S	0.0330 mg/L	0.04 mg/L	82.5	70.0	130	----
		gallium, total	7440-55-3	E468S	0.00457 mg/L	0.005 mg/L	91.4	70.0	130	----
		iron, total	7439-89-6	E468S	3.52 mg/L	4 mg/L	88.1	70.0	130	----
		lead, total	7439-92-1	E468S	0.0342 mg/L	0.04 mg/L	85.5	70.0	130	----
		lithium, total	7439-93-2	E468S	0.501 mg/L	0.5 mg/L	100	70.0	130	----
		magnesium, total	7439-95-4	E468S	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E468S	0.0372 mg/L	0.04 mg/L	93.0	70.0	130	----
		molybdenum, total	7439-98-7	E468S	0.0368 mg/L	0.04 mg/L	91.9	70.0	130	----
		nickel, total	7440-02-0	E468S	0.0668 mg/L	0.08 mg/L	83.4	70.0	130	----
		phosphorus, total	7723-14-0	E468S	16.6 mg/L	20 mg/L	83.0	70.0	130	----
		potassium, total	7440-09-7	E468S	ND mg/L	8 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Total Metals (QCLot: 591838) - continued										
VA22B7897-002	Anonymous	rhenium, total	7440-15-5	E468S	0.00421 mg/L	0.005 mg/L	84.3	70.0	130	----
		rubidium, total	7440-17-7	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		selenium, total	7782-49-2	E468S	0.0735 mg/L	0.08 mg/L	91.9	70.0	130	----
		silver, total	7440-22-4	E468S	0.00669 mg/L	0.008 mg/L	83.6	70.0	130	----
		strontium, total	7440-24-6	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E468S	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E468S	0.0664 mg/L	0.08 mg/L	83.1	70.0	130	----
		thallium, total	7440-28-0	E468S	0.00680 mg/L	0.008 mg/L	85.1	70.0	130	----
		thorium, total	7440-29-1	E468S	0.0378 mg/L	0.04 mg/L	94.5	70.0	130	----
		tin, total	7440-31-5	E468S	0.0362 mg/L	0.04 mg/L	90.6	70.0	130	----
		titanium, total	7440-32-6	E468S	0.0766 mg/L	0.08 mg/L	95.8	70.0	130	----
		tungsten, total	7440-33-7	E468S	0.0364 mg/L	0.04 mg/L	91.1	70.0	130	----
		uranium, total	7440-61-1	E468S	0.00705 mg/L	0.008 mg/L	88.1	70.0	130	----
		vanadium, total	7440-62-2	E468S	0.189 mg/L	0.2 mg/L	94.4	70.0	130	----
		yttrium, total	7440-65-5	E468S	0.00507 mg/L	0.005 mg/L	101	70.0	130	----
		zinc, total	7440-66-6	E468S	0.664 mg/L	0.8 mg/L	83.0	70.0	130	----
		zirconium, total	7440-67-7	E468S	0.0771 mg/L	0.08 mg/L	96.4	70.0	130	----
Total Metals (QCLot: 591839)										
VA22B7897-002	Anonymous	silicon, total	7440-21-3	E468S.NaSi	502 mg/L	500 mg/L	100	70.0	130	----
		sodium, total	7440-23-5	E468S.NaSi	ND mg/L	100 mg/L	ND	70.0	130	----
Total Metals (QCLot: 598245)										
VA22B8067-022	Anonymous	mercury, total	7439-97-6	E508S	0.000100 mg/L	0.0001 mg/L	100	70.0	130	----
Total Metals (QCLot: 598730)										
VA22B8443-005	Anonymous	aluminum, total	7429-90-5	E468S	0.375 mg/L	0.4 mg/L	93.7	70.0	130	----
		antimony, total	7440-36-0	E468S	0.0383 mg/L	0.04 mg/L	95.8	70.0	130	----
		arsenic, total	7440-38-2	E468S	0.0390 mg/L	0.04 mg/L	97.6	70.0	130	----
		barium, total	7440-39-3	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E468S	0.0705 mg/L	0.08 mg/L	88.1	70.0	130	----
		bismuth, total	7440-69-9	E468S	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		boron, total	7440-42-8	E468S	ND mg/L	0.2 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E468S	0.00745 mg/L	0.008 mg/L	93.1	70.0	130	----
		calcium, total	7440-70-2	E468S	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E468S	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		chromium, total	7440-47-3	E468S	0.0736 mg/L	0.08 mg/L	92.0	70.0	130	----
		cobalt, total	7440-48-4	E468S	0.0375 mg/L	0.04 mg/L	93.8	70.0	130	----
		copper, total	7440-50-8	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 598730) - continued										
VA22B8443-005	Anonymous	gallium, total	7440-55-3	E468S	0.00475 mg/L	0.005 mg/L	95.0	70.0	130	----
		iron, total	7439-89-6	E468S	3.76 mg/L	4 mg/L	93.9	70.0	130	----
		lead, total	7439-92-1	E468S	0.0384 mg/L	0.04 mg/L	95.9	70.0	130	----
		lithium, total	7439-93-2	E468S	0.136 mg/L	0.2 mg/L	68.0	70.0	130	MES
		magnesium, total	7439-95-4	E468S	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E468S	0.0381 mg/L	0.04 mg/L	95.3	70.0	130	----
		molybdenum, total	7439-98-7	E468S	0.0388 mg/L	0.04 mg/L	97.0	70.0	130	----
		nickel, total	7440-02-0	E468S	0.0757 mg/L	0.08 mg/L	94.7	70.0	130	----
		phosphorus, total	7723-14-0	E468S	19.9 mg/L	20 mg/L	99.6	70.0	130	----
		potassium, total	7440-09-7	E468S	ND mg/L	8 mg/L	ND	70.0	130	----
		rhenium, total	7440-15-5	E468S	0.00487 mg/L	0.005 mg/L	97.4	70.0	130	----
		rubidium, total	7440-17-7	E468S	0.0387 mg/L	0.04 mg/L	96.8	70.0	130	----
		selenium, total	7782-49-2	E468S	0.0821 mg/L	0.08 mg/L	103	70.0	130	----
		silver, total	7440-22-4	E468S	0.00748 mg/L	0.008 mg/L	93.5	70.0	130	----
		strontium, total	7440-24-6	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E468S	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E468S	0.0751 mg/L	0.08 mg/L	93.8	70.0	130	----
		thallium, total	7440-28-0	E468S	0.00742 mg/L	0.008 mg/L	92.7	70.0	130	----
		thorium, total	7440-29-1	E468S	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		tin, total	7440-31-5	E468S	0.0372 mg/L	0.04 mg/L	92.9	70.0	130	----
		titanium, total	7440-32-6	E468S	0.0748 mg/L	0.08 mg/L	93.6	70.0	130	----
		tungsten, total	7440-33-7	E468S	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
		uranium, total	7440-61-1	E468S	0.00754 mg/L	0.008 mg/L	94.3	70.0	130	----
		vanadium, total	7440-62-2	E468S	0.188 mg/L	0.2 mg/L	94.2	70.0	130	----
		yttrium, total	7440-65-5	E468S	0.00495 mg/L	0.005 mg/L	98.9	70.0	130	----
		zinc, total	7440-66-6	E468S	0.786 mg/L	0.8 mg/L	98.2	70.0	130	----
		zirconium, total	7440-67-7	E468S	0.0796 mg/L	0.08 mg/L	99.5	70.0	130	----
Total Metals (QCLot: 598731)										
VA22B8443-005	Anonymous	silicon, total	7440-21-3	E468S.NaSi	511 mg/L	500 mg/L	102	70.0	130	----
		sodium, total	7440-23-5	E468S.NaSi	ND mg/L	100 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 591866)										
VA22B8083-002	MP05-North-1-22	silicon, dissolved	7440-21-3	E469S.NaSi	505 mg/L	500 mg/L	101	70.0	130	----
		sodium, dissolved	7440-23-5	E469S.NaSi	ND mg/L	100 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 591867)										
VA22B8083-002	MP05-North-1-22	aluminum, dissolved	7429-90-5	E469S	0.395 mg/L	0.4 mg/L	98.7	70.0	130	----
		antimony, dissolved	7440-36-0	E469S	0.0385 mg/L	0.04 mg/L	96.2	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 591867) - continued										
VA22B8083-002	MP05-North-1-22	arsenic, dissolved	7440-38-2	E469S	0.0376 mg/L	0.04 mg/L	93.9	70.0	130	----
		barium, dissolved	7440-39-3	E469S	0.0385 mg/L	0.04 mg/L	96.2	70.0	130	----
		beryllium, dissolved	7440-41-7	E469S	0.0743 mg/L	0.08 mg/L	92.9	70.0	130	----
		bismuth, dissolved	7440-69-9	E469S	0.0178 mg/L	0.02 mg/L	89.0	70.0	130	----
		boron, dissolved	7440-42-8	E469S	ND mg/L	0.2 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E469S	0.00705 mg/L	0.008 mg/L	88.1	70.0	130	----
		calcium, dissolved	7440-70-2	E469S	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E469S	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		chromium, dissolved	7440-47-3	E469S	0.0758 mg/L	0.08 mg/L	94.7	70.0	130	----
		cobalt, dissolved	7440-48-4	E469S	0.0378 mg/L	0.04 mg/L	94.5	70.0	130	----
		copper, dissolved	7440-50-8	E469S	0.0366 mg/L	0.04 mg/L	91.6	70.0	130	----
		gallium, dissolved	7440-55-3	E469S	0.00466 mg/L	0.005 mg/L	93.2	70.0	130	----
		iron, dissolved	7439-89-6	E469S	3.76 mg/L	4 mg/L	94.0	70.0	130	----
		lead, dissolved	7439-92-1	E469S	0.0351 mg/L	0.04 mg/L	87.8	70.0	130	----
		lithium, dissolved	7439-93-2	E469S	0.164 mg/L	0.2 mg/L	82.1	70.0	130	----
		magnesium, dissolved	7439-95-4	E469S	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E469S	0.0382 mg/L	0.04 mg/L	95.4	70.0	130	----
		molybdenum, dissolved	7439-98-7	E469S	0.0392 mg/L	0.04 mg/L	97.9	70.0	130	----
		nickel, dissolved	7440-02-0	E469S	0.0729 mg/L	0.08 mg/L	91.1	70.0	130	----
		phosphorus, dissolved	7723-14-0	E469S	20.5 mg/L	20 mg/L	103	70.0	130	----
		potassium, dissolved	7440-09-7	E469S	ND mg/L	8 mg/L	ND	70.0	130	----
		rhenium, dissolved	7440-15-5	E469S	0.00455 mg/L	0.005 mg/L	90.9	70.0	130	----
		rubidium, dissolved	7440-17-7	E469S	0.0379 mg/L	0.04 mg/L	94.8	70.0	130	----
		selenium, dissolved	7782-49-2	E469S	0.0803 mg/L	0.08 mg/L	100	70.0	130	----
		silver, dissolved	7440-22-4	E469S	0.00745 mg/L	0.008 mg/L	93.2	70.0	130	----
		strontium, dissolved	7440-24-6	E469S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E469S	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E469S	0.0730 mg/L	0.08 mg/L	91.2	70.0	130	----
		thallium, dissolved	7440-28-0	E469S	0.00679 mg/L	0.008 mg/L	84.9	70.0	130	----
		thorium, dissolved	7440-29-1	E469S	0.0360 mg/L	0.04 mg/L	89.9	70.0	130	----
		tin, dissolved	7440-31-5	E469S	0.0373 mg/L	0.04 mg/L	93.3	70.0	130	----
		titanium, dissolved	7440-32-6	E469S	0.0777 mg/L	0.08 mg/L	97.2	70.0	130	----
		tungsten, dissolved	7440-33-7	E469S	0.0381 mg/L	0.04 mg/L	95.3	70.0	130	----
		uranium, dissolved	7440-61-1	E469S	0.00684 mg/L	0.008 mg/L	85.5	70.0	130	----
		vanadium, dissolved	7440-62-2	E469S	0.193 mg/L	0.2 mg/L	96.4	70.0	130	----
		yttrium, dissolved	7440-65-5	E469S	0.00480 mg/L	0.005 mg/L	96.1	70.0	130	----
		zinc, dissolved	7440-66-6	E469S	0.722 mg/L	0.8 mg/L	90.3	70.0	130	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 591867) - continued										
VA22B8083-002	MP05-North-1-22	zirconium, dissolved	7440-67-7	E469S	0.0792 mg/L	0.08 mg/L	99.1	70.0	130	----
Dissolved Metals (QCLot: 598765)										
VA22B8443-001	Anonymous	aluminum, dissolved	7429-90-5	E469S	0.339 mg/L	0.4 mg/L	84.7	70.0	130	----
		antimony, dissolved	7440-36-0	E469S	0.0382 mg/L	0.04 mg/L	95.6	70.0	130	----
		arsenic, dissolved	7440-38-2	E469S	0.0386 mg/L	0.04 mg/L	96.4	70.0	130	----
		barium, dissolved	7440-39-3	E469S	0.0369 mg/L	0.04 mg/L	92.4	70.0	130	----
		beryllium, dissolved	7440-41-7	E469S	0.0596 mg/L	0.08 mg/L	74.4	70.0	130	----
		bismuth, dissolved	7440-69-9	E469S	0.0179 mg/L	0.02 mg/L	89.6	70.0	130	----
		boron, dissolved	7440-42-8	E469S	ND mg/L	0.2 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E469S	0.00749 mg/L	0.008 mg/L	93.6	70.0	130	----
		calcium, dissolved	7440-70-2	E469S	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E469S	0.0194 mg/L	0.02 mg/L	97.1	70.0	130	----
		chromium, dissolved	7440-47-3	E469S	0.0733 mg/L	0.08 mg/L	91.6	70.0	130	----
		cobalt, dissolved	7440-48-4	E469S	0.0363 mg/L	0.04 mg/L	90.8	70.0	130	----
		copper, dissolved	7440-50-8	E469S	0.0352 mg/L	0.04 mg/L	88.0	70.0	130	----
		gallium, dissolved	7440-55-3	E469S	0.00510 mg/L	0.005 mg/L	102	70.0	130	----
		iron, dissolved	7439-89-6	E469S	3.75 mg/L	4 mg/L	93.7	70.0	130	----
		lead, dissolved	7439-92-1	E469S	0.0383 mg/L	0.04 mg/L	95.8	70.0	130	----
		lithium, dissolved	7439-93-2	E469S	0.134 mg/L	0.2 mg/L	66.8	70.0	130	MES
		magnesium, dissolved	7439-95-4	E469S	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E469S	0.0383 mg/L	0.04 mg/L	95.8	70.0	130	----
		molybdenum, dissolved	7439-98-7	E469S	0.0381 mg/L	0.04 mg/L	95.2	70.0	130	----
		nickel, dissolved	7440-02-0	E469S	0.0729 mg/L	0.08 mg/L	91.1	70.0	130	----
		phosphorus, dissolved	7723-14-0	E469S	18.3 mg/L	20 mg/L	91.7	70.0	130	----
		potassium, dissolved	7440-09-7	E469S	ND mg/L	8 mg/L	ND	70.0	130	----
		rhenium, dissolved	7440-15-5	E469S	0.00462 mg/L	0.005 mg/L	92.5	70.0	130	----
		rubidium, dissolved	7440-17-7	E469S	0.0396 mg/L	0.04 mg/L	99.0	70.0	130	----
		selenium, dissolved	7782-49-2	E469S	0.0776 mg/L	0.08 mg/L	97.0	70.0	130	----
		silver, dissolved	7440-22-4	E469S	0.00718 mg/L	0.008 mg/L	89.7	70.0	130	----
		strontium, dissolved	7440-24-6	E469S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E469S	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E469S	0.0706 mg/L	0.08 mg/L	88.2	70.0	130	----
		thallium, dissolved	7440-28-0	E469S	0.00732 mg/L	0.008 mg/L	91.5	70.0	130	----
		thorium, dissolved	7440-29-1	E469S	0.0414 mg/L	0.04 mg/L	104	70.0	130	----
		tin, dissolved	7440-31-5	E469S	0.0373 mg/L	0.04 mg/L	93.3	70.0	130	----
		titanium, dissolved	7440-32-6	E469S	0.0746 mg/L	0.08 mg/L	93.3	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Dissolved Metals (QCLot: 598765) - continued										
VA22B8443-001	Anonymous	tungsten, dissolved	7440-33-7	E469S	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		uranium, dissolved	7440-61-1	E469S	0.00753 mg/L	0.008 mg/L	94.1	70.0	130	----
		vanadium, dissolved	7440-62-2	E469S	0.186 mg/L	0.2 mg/L	92.9	70.0	130	----
		yttrium, dissolved	7440-65-5	E469S	0.00532 mg/L	0.005 mg/L	106	70.0	130	----
		zinc, dissolved	7440-66-6	E469S	0.730 mg/L	0.8 mg/L	91.2	70.0	130	----
		zirconium, dissolved	7440-67-7	E469S	0.0838 mg/L	0.08 mg/L	105	70.0	130	----
Dissolved Metals (QCLot: 598766)										
VA22B8443-001	Anonymous	silicon, dissolved	7440-21-3	E469S.NaSi	496 mg/L	500 mg/L	99.1	70.0	130	----
		sodium, dissolved	7440-23-5	E469S.NaSi	ND mg/L	100 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 599754)										
VA22B8067-022	Anonymous	mercury, dissolved	7439-97-6	E509S	0.0000718 mg/L	0.0001 mg/L	71.8	70.0	130	----
Volatile Organic Compounds (QCLot: 595561)										
VA22B8083-001	MP05-Source-1-22	benzene	71-43-2	E611A	95.0 µg/L	100 µg/L	95.0	60.0	140	----
		ethylbenzene	100-41-4	E611A	101 µg/L	100 µg/L	101	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	93.5 µg/L	100 µg/L	93.5	60.0	140	----
		styrene	100-42-5	E611A	104 µg/L	100 µg/L	104	60.0	140	----
		toluene	108-88-3	E611A	96.6 µg/L	100 µg/L	96.6	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	206 µg/L	200 µg/L	103	60.0	140	----
		xylene, o-	95-47-6	E611A	103 µg/L	100 µg/L	103	60.0	140	----
Hydrocarbons (QCLot: 595560)										
VA22B8083-002	MP05-North-1-22	F1 (C6-C10)	----	E581.VH+F1	5540 µg/L	6310 µg/L	87.9	60.0	140	----
		VHw (C6-C10)	----	E581.VH+F1	5000 µg/L	6310 µg/L	79.3	60.0	140	----

Qualifiers

Qualifier	*Description*
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

ALS www.alsglobal.com

COC Number: 21 - 01

Page 1 of 1

Environmental Division
Vancouver
Work Order Reference
VA22B8083

Telephone : +1 604 253 4188

Report To	Contact and company name below will appear on the final report
Company:	Golder Associates Ltd.
Contact:	Elaine Irving/Connor Pettern
Phone:	1-604-297-2030/1-604-296-4200
	Company address below will appear on the final report
Street:	Suite 200 - 2920 Virtual Way
City/Province:	Vancouver, BC
Postal Code:	V5M 0C4
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: elaine.irving@wsp.com
Email 2: connor.pettern@wsp.com
Email 3: trish.tomliens@wsp.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax:
Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #:
Job #: GOLD 100-028
PO / AFE: 166372401/64000/03
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: | PO#
Major/Minor Code: | Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (ALS use only):

ALS Contact: Amber Springer | Sampler: TT/MR/DV

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	General (alkalinity, turbidity, conduc	Anions, TOC, DOC, Hardness, Salin	pH, TSS, TDS, Ammonia, TKN)	Dissolved Metals (F/P)	Total Metals (P)	Dissolved Mercury (F/P)	Total Mercury (P)	Nutrients (including total phosphoru (P)	Petroleum hydrocarbons (MTBE) (P)	Petroleum hydrocarbons (BTEX,F1) (P)	Hydrocarbons (LEPH/HEPH) (P)	PAH, F2-F4 (P)			SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
1	MP05-Source-1-22	2-Aug-22	13:00	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
2	MP05-North-1-22	2-Aug-22	12:30	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
3	MP05-ENE-1-22	2-Aug-22	12:50	Seawater	6	R	R	R	R	R	R	R	R									
4	MP05-WNW-1-22	2-Aug-22	12:20	Seawater	6	R	R	R	R	R	R	R	R									
5	MLP-1-22	2-Aug-22		Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
6	MP06-Source-2-22	2-Aug-22	10:04	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
7	MP06-North-2-22	2-Aug-22	11:11	Seawater	6	R	R	R	R	R	R	R	R									
8	MP06-ENE-2-22	2-Aug-22	11:31	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
9	MP06-WNW-2-22	2-Aug-22	10:35	Seawater	6	R	R	R	R	R	R	R	R									
10	DUP-A	2-Aug-22		Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

MP06-Source-2-22: Mercury Total vs Dissolved not noted. Both are preserved, but only one has been field filtered. Unsure which has been filtered. Confirm analyses on quote.

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☑ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☐ N/A | Sample Custody Seals Intact: ☐ YES ☐ N/A
INITIAL COOLER TEMPERATURES °C:
FINAL COOLER TEMPERATURES °C: 13 13

SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Patricia Tomlins	Date: 3 Aug 2022 Time:	Received by:	Date:	Time:	Received by: JC	Date: AUG 05 2022	Time: 8:15am

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY

AUG 2020 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **YL2201196**	Page	: 1 of 14
Client	: **Golder Associates Ltd.**	Laboratory	: Yellowknife - Environmental
Contact	: Elaine Irving	Account Manager	: Amber Springer
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	: 314 Old Airport Road, Unit 116 Yellowknife NT Canada X1A 3T3
Telephone	: ----	Telephone	: +1 867 873 5593
Project	: 166372401/64000/03	Date Samples Received	: 12-Aug-2022 10:10
PO	: ----	Date Analysis Commenced	: 15-Aug-2022
C-O-C number	: 21-02	Issue Date	: 23-Aug-2022 16:38
Sampler	: TT/MR/DV		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Erin Sanchez		Metals, Burnaby, British Columbia
Hamideh Moradi	Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Parnian Sane	Analyst	Metals, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
psu	practical salinity units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	Dup-B
Client sampling date / time					06-Aug-2022 11:35	06-Aug-2022 12:00	06-Aug-2022 12:15	06-Aug-2022 11:20	06-Aug-2022
					YL2201196-001	YL2201196-002	YL2201196-003	YL2201196-004	YL2201196-005
					Result	Result	Result	Result	Result
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	65.8	65.3	64.4	65.1	65.7
conductivity	----	E100S	2.0	µS/cm	5300	6680	5680	6870	5340
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	538	708	567	723	523
pH	----	E108	0.10	pH units	7.94	7.94	7.95	7.96	7.96
salinity	----	EC100S	1.0	psu	2.9	3.7	3.1	3.8	2.9
solids, total dissolved [TDS]	----	E162S	10	mg/L	3370	4200	3380	4230	3340
solids, total suspended [TSS]	----	E160S	2.0	mg/L	<2.0	5.0	<2.0	<2.0	3.1
turbidity	----	E121	0.10	NTU	0.22	0.30	0.26	0.19	0.22
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0072	<0.0050	<0.0050	<0.0050	0.0060
bromide	24959-67-9	E235S.Br	5.0	mg/L	<5.0	6.5	5.1	6.2	5.1
chloride	16887-00-6	E235S.Cl	50	mg/L	1560	2050	1680	2040	1590
fluoride	16984-48-8	E235S.F-L	0.20	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20
Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	0.143	0.051	<0.050	<0.050	0.092
nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
phosphorus, total	7723-14-0	E372S	0.0020	mg/L	0.0116	0.0127	0.0096	0.0081	0.0116
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0122	0.0082	0.0092	0.0059	0.0137
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	224	288	239	293	216
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.25	1.16	0.92	1.26	0.86
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.03	0.95	0.80	0.68	0.97
Total Metals									
aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0174	0.0155	0.0127	0.0145	0.0185
antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
arsenic, total	7440-38-2	E468S	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
barium, total	7440-39-3	E468S	0.0010	mg/L	0.0035	0.0036	0.0037	0.0038	0.0036
beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
boron, total	7440-42-8	E468S	0.30	mg/L	0.41	0.52	0.46	0.58	0.43

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water)**

				Client sample ID	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	Dup-B
				Client sampling date / time	06-Aug-2022 11:35	06-Aug-2022 12:00	06-Aug-2022 12:15	06-Aug-2022 11:20	06-Aug-2022
Analyte	CAS Number	Method	LOR	Unit	YL2201196-001	YL2201196-002	YL2201196-003	YL2201196-004	YL2201196-005
					Result	Result	Result	Result	Result
Total Metals									
cadmium, total	7440-43-9	E468S	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
calcium, total	7440-70-2	E468S	1.0	mg/L	48.3	56.5	50.6	59.6	48.7
cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
copper, total	7440-50-8	E468S	0.00050	mg/L	0.00549	<0.00050	0.00188	0.00212	0.00652
gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, total	7439-89-6	E468S	0.010	mg/L	0.020	0.010	<0.010	0.012	0.022
lead, total	7439-92-1	E468S	0.000050	mg/L	<0.000050	0.000071	<0.000050	0.000101	0.000084
lithium, total	7439-93-2	E468S	0.020	mg/L	<0.020	<0.020	<0.020	0.020	<0.020
magnesium, total	7439-95-4	E468S	1.0	mg/L	98.9	127	112	135	104
manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00105	0.00079	0.00073	0.00083	0.00109
mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00096	0.00128	0.00101	0.00132	0.00102
nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, total	7440-09-7	E468S	1.0	mg/L	31.2	41.5	35.4	43.3	33.2
rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.0092	0.0122	0.0104	0.0126	0.0097
selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	876	1120	920	1160	895
strontium, total	7440-24-6	E468S	0.010	mg/L	0.600	0.809	0.657	0.842	0.645
sulfur, total	7704-34-9	E468S	5.0	mg/L	74.8	98.6	83.9	103	77.6
tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	Dup-B
				Client sampling date / time	06-Aug-2022 11:35	06-Aug-2022 12:00	06-Aug-2022 12:15	06-Aug-2022 11:20	06-Aug-2022
					YL2201196-001	YL2201196-002	YL2201196-003	YL2201196-004	YL2201196-005
					Result	Result	Result	Result	Result
Total Metals									
uranium, total	7440-61-1	E468S	0.000050	mg/L	0.000801	0.00101	0.000750	0.000802	0.000789
vanadium, total	7440-62-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Metals									
aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0035	0.0039	0.0037	0.0041	0.0036
beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
boron, dissolved	7440-42-8	E469S	0.30	mg/L	0.38	0.50	0.39	0.47	0.37
cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
calcium, dissolved	7440-70-2	E469S	1.0	mg/L	47.2	57.6	47.2	55.5	46.5
cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00030	0.00052	0.00031	0.00051	0.00032
gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, dissolved	7439-93-2	E469S	0.020	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020
magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	102	137	109	142	98.8
manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00065	0.00063	0.00058	0.00062	0.00064
mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00098	0.00121	0.00109	0.00130	0.00098
nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E469S	1.0	mg/L	32.0	44.1	35.3	46.1	32.9
rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	Dup-B
				Client sampling date / time	06-Aug-2022 11:35	06-Aug-2022 12:00	06-Aug-2022 12:15	06-Aug-2022 11:20	06-Aug-2022
Analyte	CAS Number	Method	LOR	Unit	YL2201196-001	YL2201196-002	YL2201196-003	YL2201196-004	YL2201196-005
					Result	Result	Result	Result	Result
Dissolved Metals									
rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.0094	0.0124	0.0099	0.0134	0.0097
selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	877	1140	917	1140	883
strontium, dissolved	7440-24-6	E469S	0.010	mg/L	0.637	0.841	0.716	0.858	0.657
sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	75.1	104	82.1	100	75.8
tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.000801	0.000967	0.000722	0.000799	0.000751
vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	0.0014	<0.0010	0.0011	0.0014	<0.0010
zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field
Volatile Organic Compounds [Fuels]									
benzene	71-43-2	E611A	0.50	μg/L	<0.50	<0.50	----	----	<0.50
ethylbenzene	100-41-4	E611A	0.50	μg/L	<0.50	<0.50	----	----	<0.50
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	μg/L	<0.50	<0.50	----	----	<0.50
styrene	100-42-5	E611A	0.50	μg/L	<0.50	<0.50	----	----	<0.50
toluene	108-88-3	E611A	0.50	μg/L	<0.50	<0.50	----	----	<0.50
xylene, m+p-	179601-23-1	E611A	0.40	μg/L	<0.40	<0.40	----	----	<0.40
xylene, o-	95-47-6	E611A	0.30	μg/L	<0.30	<0.30	----	----	<0.30
xylenes, total	1330-20-7	E611A	0.50	μg/L	<0.50	<0.50	----	----	<0.50
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	101	97.9	----	----	103

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	Dup-B
				Client sampling date / time	06-Aug-2022 11:35	06-Aug-2022 12:00	06-Aug-2022 12:15	06-Aug-2022 11:20	06-Aug-2022
					YL2201196-001	YL2201196-002	YL2201196-003	YL2201196-004	YL2201196-005
					Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates									
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	103	107	----	----	110
Hydrocarbons									
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	----	----	<250
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	----	----	<250
F2 (C10-C16)	----	E601	100	µg/L	<100	<100	----	----	<100
F3 (C16-C34)	----	E601	250	µg/L	<250	<250	----	----	<250
F4 (C34-C50)	----	E601	250	µg/L	<250	<250	----	----	<250
TEH (C10-C50)	----	E601	400	µg/L	<400	<400	----	----	<400
TEH (C16-C50)	----	E601	400	µg/L	<400	<400	----	----	<400
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	----	<100
F1-BTEX	----	EC580	100	µg/L	<100	<100	----	----	<100
HEPHw	----	EC600A	250	µg/L	<250	<250	----	----	<250
LEPHw	----	EC600A	250	µg/L	<250	<250	----	----	<250
VPHw	----	EC580A	100	µg/L	<100	<100	----	----	<100
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	----	<100
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	98.6	96.6	----	----	93.0
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%	91.9	91.2	----	----	90.8
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	99.1	96.6	----	----	109
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
acridine	260-94-6	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
anthracene	120-12-7	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	<0.0050
benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	<0.015	<0.015	----	----	<0.015
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
chrysene	218-01-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: Water)

				Client sample ID	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	Dup-B
				Client sampling date / time	06-Aug-2022 11:35	06-Aug-2022 12:00	06-Aug-2022 12:15	06-Aug-2022 11:20	06-Aug-2022
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	YL2201196-001	YL2201196-002	YL2201196-003	YL2201196-004	YL2201196-005
					Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons									
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	<0.0050
fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
fluorene	86-73-7	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	0.013	<0.010	----	----	0.011
naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	<0.050	----	----	<0.050
phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	<0.020	----	----	<0.020
pyrene	129-00-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	<0.010
quinoline	91-22-5	E641A	0.050	µg/L	<0.050	<0.050	----	----	<0.050
Polycyclic Aromatic Hydrocarbons Surrogates									
chrysene-d12	1719-03-5	E641A	0.1	%	126	114	----	----	122
naphthalene-d8	1146-65-2	E641A	0.1	%	102	93.9	----	----	95.8
phenanthrene-d10	1517-22-2	E641A	0.1	%	124	112	----	----	114

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	06-Aug-2022 10:10	06-Aug-2022 10:30	06-Aug-2022 10:45	06-Aug-2022 10:20	----
Analyte	CAS Number	Method	LOR	Unit	YL2201196-006	YL2201196-007	YL2201196-008	YL2201196-009	--------
					Result	Result	Result	Result	----
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	64.0	112	112	111	----
conductivity	----	E100S	2.0	µS/cm	8510	48800	48900	48600	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	837	6100	5660	5930	----
pH	----	E108	0.10	pH units	7.87	7.96	7.97	7.94	----
salinity	----	EC100S	1.0	psu	4.8	32.2	32.2	32.0	----
solids, total dissolved [TDS]	----	E162S	10	mg/L	5360	49100	48400	47400	----
solids, total suspended [TSS]	----	E160S	2.0	mg/L	2.3	12.2	6.3	<2.0	----
turbidity	----	E121	0.10	NTU	0.25	<0.10	<0.10	<0.10	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0066	0.0121	0.0130	0.0185	----
bromide	24959-67-9	E235S.Br	5.0	mg/L	8.3	53.8	57.1	58.9	----
chloride	16887-00-6	E235S.Cl	50	mg/L	2620	17200	18300	18800	----
fluoride	16984-48-8	E235S.F-L	0.20	mg/L	<0.20	0.90	1.00	1.00	----
Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	0.064	0.121	0.073	0.212	----
nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	----
nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	----
phosphorus, total	7723-14-0	E372S	0.0020	mg/L	0.0081	0.0285	0.0273	0.0319	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0102	0.0257	0.0249	0.0247	----
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	369	2410	2510	2430	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.11	0.96	1.20	1.20	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	0.76	0.73	0.99	1.33	----
Total Metals									
aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0148	0.0098	0.0113	0.0119	----
antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
arsenic, total	7440-38-2	E468S	0.00040	mg/L	<0.00040	0.00167	0.00161	0.00168	----
barium, total	7440-39-3	E468S	0.0010	mg/L	0.0040	0.0090	0.0088	0.0091	----
beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
boron, total	7440-42-8	E468S	0.30	mg/L	0.68	4.49	4.50	4.51	----
cadmium, total	7440-43-9	E468S	0.000010	mg/L	<0.000010	0.000022	0.000026	0.000026	----

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	06-Aug-2022 10:10	06-Aug-2022 10:30	06-Aug-2022 10:45	06-Aug-2022 10:20	----
Analyte	CAS Number	Method	LOR	Unit	YL2201196-006	YL2201196-007	YL2201196-008	YL2201196-009	--------
					Result	Result	Result	Result	----
Total Metals									
calcium, total	7440-70-2	E468S	1.0	mg/L	68.4	432	433	440	----
cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	----
copper, total	7440-50-8	E468S	0.00050	mg/L	0.00171	0.00771	0.00332	0.00533	----
gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
iron, total	7439-89-6	E468S	0.010	mg/L	0.011	<0.010	<0.010	<0.010	----
lead, total	7439-92-1	E468S	0.000050	mg/L	0.000050	0.000067	<0.000050	0.000051	----
lithium, total	7439-93-2	E468S	0.020	mg/L	0.025	0.169	0.173	0.170	----
magnesium, total	7439-95-4	E468S	1.0	mg/L	170	1290	1280	1250	----
manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00091	0.00068	0.00068	0.00100	----
mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	----
molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00159	0.0110	0.0112	0.0108	----
nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	0.053	0.069	0.059	----
potassium, total	7440-09-7	E468S	1.0	mg/L	53.9	449	447	440	----
rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.0153	0.109	0.107	0.108	----
selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----
silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	1430	10000	9780	9780	----
strontium, total	7440-24-6	E468S	0.010	mg/L	1.07	7.70	7.75	7.62	----
sulfur, total	7704-34-9	E468S	5.0	mg/L	131	1100	1120	1130	----
tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	----
thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	----
tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
uranium, total	7440-61-1	E468S	0.000050	mg/L	0.000820	0.00256	0.00248	0.00259	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	06-Aug-2022 10:10	06-Aug-2022 10:30	06-Aug-2022 10:45	06-Aug-2022 10:20	----
Analyte	CAS Number	Method	LOR	Unit	YL2201196-006	YL2201196-007	YL2201196-008	YL2201196-009	--------
					Result	Result	Result	Result	----
Total Metals									
vanadium, total	7440-62-2	E468S	0.00050	mg/L	<0.00050	0.00156	0.00150	0.00152	----
yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	----
zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0125 DLM	<0.0050	----
antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0025 DLM	<0.0010	----
arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	<0.00040	0.00157	0.00154	0.00149	----
barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0039	0.0088	0.0080	0.0088	----
beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00125 DLM	<0.00050	----
bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00125 DLM	<0.00050	----
boron, dissolved	7440-42-8	E469S	0.30	mg/L	0.57	2.95	3.70	2.85	----
cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	<0.000010	0.000018	<0.000025 DLM	0.000017	----
calcium, dissolved	7440-70-2	E469S	1.0	mg/L	64.7	414	355	414	----
cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00125 DLM	<0.00050	----
chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00125 DLM	<0.00050	----
cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000100 DLM	<0.000050	----
copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00068	0.00064	<0.00050 DLM	0.00061	----
gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00125 DLM	<0.00050	----
iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	<0.025 DLM	<0.010	----
lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000100 DLM	<0.000050	----
lithium, dissolved	7439-93-2	E469S	0.020	mg/L	0.024	0.132	0.165	0.127	----
magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	164	1230	1160	1190	----
manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00070	0.00035	0.00032	0.00071	----
mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	----
molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00159	0.0104	0.0101	0.0102	----
nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00125 DLM	<0.00050	----
phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	<0.125 DLM	<0.050	----
potassium, dissolved	7440-09-7	E469S	1.0	mg/L	55.5	448	392	429	----
rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00125 DLM	<0.00050	----
rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.0158	0.114	0.111	0.110	----

Analytical Results

Sub-Matrix: Seawater
(Matrix: Water)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	06-Aug-2022 10:10	06-Aug-2022 10:30	06-Aug-2022 10:45	06-Aug-2022 10:20	----
Analyte	CAS Number	Method	LOR	Unit	YL2201196-006	YL2201196-007	YL2201196-008	YL2201196-009	--------
					Result	Result	Result	Result	----
Dissolved Metals									
selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00125 DLM	<0.00050	----
silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----
silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	<0.00025 DLM	<0.00010	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	1420	10200	9980	9940	----
strontium, dissolved	7440-24-6	E469S	0.010	mg/L	1.08	7.71	7.14	7.65	----
sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	128	1110	928	1040	----
tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00125 DLM	<0.00050	----
thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000100 DLM	<0.000050	----
thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00125 DLM	<0.00050	----
tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0025 DLM	<0.0010	----
titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0125 DLM	<0.0050	----
tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0025 DLM	<0.0010	----
uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.000835	0.00251	0.00269	0.00239	----
vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	<0.00050	0.00140	0.00131	0.00131	----
yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00125 DLM	<0.00050	----
zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	0.0015	<0.0010	<0.0025 DLM	0.0021	----
zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00125 DLM	<0.00050	----
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	----
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	----
Volatile Organic Compounds [Fuels]									
benzene	71-43-2	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
styrene	100-42-5	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
toluene	108-88-3	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	----	<0.40	----	----
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	----	<0.30	----	----
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	96.0	----	102	----	----
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	108	----	105	----	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	06-Aug-2022 10:10	06-Aug-2022 10:30	06-Aug-2022 10:45	06-Aug-2022 10:20	----
					YL2201196-006	YL2201196-007	YL2201196-008	YL2201196-009	--------
					Result	Result	Result	Result	----
Hydrocarbons									
EPH (C10-C19)	----	E601A	250	µg/L	<250	----	<250	----	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----	<250	----	----
F2 (C10-C16)	----	E601	100	µg/L	<100	----	<100	----	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----	<250	----	----
F4 (C34-C50)	----	E601	250	µg/L	<250	----	<250	----	----
TEH (C10-C50)	----	E601	400	µg/L	<400	----	<400	----	----
TEH (C16-C50)	----	E601	400	µg/L	<400	----	<400	----	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----	<100	----	----
F1-BTEX	----	EC580	100	µg/L	<100	----	<100	----	----
HEPHw	----	EC600A	250	µg/L	<250	----	<250	----	----
LEPHw	----	EC600A	250	µg/L	<250	----	<250	----	----
VPHw	----	EC580A	100	µg/L	<100	----	<100	----	----
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----	<100	----	----
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	90.2	----	92.0	----	----
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%	89.6	----	87.5	----	----
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	101	----	112	----	----
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
acridine	260-94-6	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
anthracene	120-12-7	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	----	<0.0050	----	----
benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	<0.015	----	<0.015	----	----
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
chrysene	218-01-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	----	<0.0050	----	----
fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water)**

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	06-Aug-2022 10:10	06-Aug-2022 10:30	06-Aug-2022 10:45	06-Aug-2022 10:20	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	YL2201196-006	YL2201196-007	YL2201196-008	YL2201196-009	--------
					Result	Result	Result	Result	----
Polycyclic Aromatic Hydrocarbons									
fluorene	86-73-7	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	----	<0.050	----	----
phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	----	<0.020	----	----
pyrene	129-00-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
quinoline	91-22-5	E641A	0.050	µg/L	<0.050	----	<0.050	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
chrysene-d12	1719-03-5	E641A	0.1	%	124	----	114	----	----
naphthalene-d8	1146-65-2	E641A	0.1	%	98.5	----	93.8	----	----
phenanthrene-d10	1517-22-2	E641A	0.1	%	116	----	115	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

ALS Environmental

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **YL2201196**	Page	: 1 of 39
Client	: **Golder Associates Ltd.**	Laboratory	: Yellowknife - Environmental
Contact	: Elaine Irving	Account Manager	: Amber Springer
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	: 314 Old Airport Road, Unit 116 Yellowknife, Northwest Territories Canada X1A 3T3
Telephone	: ----	Telephone	: +1 867 873 5593
Project	: 166372401/64000/03	Date Samples Received	: 12-Aug-2022 10:10
PO	: ----	Issue Date	: 23-Aug-2022 16:39
C-O-C number	: 21-02		
Sampler	: TT/MR/DV		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Dissolved Metals	QC-MRG2-604471002	----	tellurium, dissolved	13494-80-9	E469S	122 % MES	80.0-120%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	*Description*
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Dup-B	E298	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	12 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP05-ENE-1-22	E298	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP05-North-1-22	E298	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP05-Source-1-22	E298	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP05-WNW-1-22	E298	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP06-ENE-2-22	E298	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP06-North-2-22	E298	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP06-Source-2-22	E298	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP06-WNW-2-22	E298	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-ENE-1-22	E235S.Br	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-North-1-22	E235S.Br	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-Source-1-22	E235S.Br	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-WNW-1-22	E235S.Br	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-ENE-2-22	E235S.Br	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-North-2-22	E235S.Br	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-Source-2-22	E235S.Br	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-WNW-2-22	E235S.Br	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE Dup-B	E235S.Br	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-ENE-1-22	E235S.Cl	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-North-1-22	E235S.Cl	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-Source-1-22	E235S.Cl	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-WNW-1-22	E235S.Cl	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-ENE-2-22	E235S.Cl	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-North-2-22	E235S.Cl	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-Source-2-22	E235S.Cl	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-WNW-2-22	E235S.Cl	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE Dup-B	E235S.Cl	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.F-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.F-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.F-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.F-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.F-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.F-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.F-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: ✘ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.F-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE Dup-B	E235S.F-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-ENE-1-22	E235S.NO3-T	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	✘ EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-North-1-22	E235S.NO3-T	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	✘ EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-Source-1-22	E235S.NO3-T	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	✘ EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-WNW-1-22	E235S.NO3-T	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	✘ EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-ENE-2-22	E235S.NO3-T	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	✘ EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-North-2-22	E235S.NO3-T	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	✘ EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-Source-2-22	E235S.NO3-T	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	✘ EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-WNW-2-22	E235S.NO3-T	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE Dup-B	E235S.NO3-T	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	9 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.NO2-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.NO2-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.NO2-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.NO2-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.NO2-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.NO2-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.NO2-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.NO2-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE Dup-B	E235S.NO2-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	3 days	9 days	× EHTR-FM
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.SO4-L	06-Aug-2022	16-Aug-2022	28 days	10 days	✓	16-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.SO4-L	06-Aug-2022	16-Aug-2022	28 days	10 days	✓	16-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.SO4-L	06-Aug-2022	16-Aug-2022	28 days	10 days	✓	16-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.SO4-L	06-Aug-2022	16-Aug-2022	28 days	10 days	✓	16-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.SO4-L	06-Aug-2022	16-Aug-2022	28 days	10 days	✓	16-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.SO4-L	06-Aug-2022	16-Aug-2022	28 days	10 days	✓	16-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.SO4-L	06-Aug-2022	16-Aug-2022	28 days	10 days	✓	16-Aug-2022	18 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.SO4-L	06-Aug-2022	16-Aug-2022	28 days	10 days	✓	16-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE Dup-B	E235S.SO4-L	06-Aug-2022	16-Aug-2022	28 days	9 days	✓	16-Aug-2022	19 days	0 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) MP05-ENE-1-22	E375-T	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) MP05-North-1-22	E375-T	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) MP05-Source-1-22	E375-T	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) MP05-WNW-1-22	E375-T	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) MP06-ENE-2-22	E375-T	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
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Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) MP06-WNW-2-22	E375-T	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) Dup-B	E375-T	06-Aug-2022	16-Aug-2022	3 days	9 days	× EHTR	16-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) Dup-B	E318S	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	12 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP05-ENE-1-22	E318S	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP05-North-1-22	E318S	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
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Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation* Preparation Date	Holding Times Rec	Holding Times Actual	Eval	*Analysis* Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP06-Source-2-22	E318S	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP06-WNW-2-22	E318S	06-Aug-2022	16-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) Dup-B	E372S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP05-ENE-1-22	E372S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	11 days	✓
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Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP05-WNW-1-22	E372S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	11 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP06-ENE-2-22	E372S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	11 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP06-North-2-22	E372S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	11 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP06-Source-2-22	E372S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	11 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP06-WNW-2-22	E372S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-Source-1-22	E509S	06-Aug-2022	19-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) Dup-B	E509S	06-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	28 days	14 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-ENE-1-22	E509S	06-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	28 days	14 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-North-1-22	E509S	06-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	28 days	14 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-WNW-1-22	E509S	06-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	28 days	14 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-ENE-2-22	E509S	06-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	28 days	14 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-North-2-22	E509S	06-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	28 days	14 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-Source-2-22	E509S	06-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	28 days	14 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-WNW-2-22	E509S	06-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	28 days	14 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) Dup-B	E469S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-ENE-1-22	E469S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-North-1-22	E469S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-Source-1-22	E469S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-WNW-1-22	E469S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-ENE-2-22	E469S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-North-2-22	E469S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	180 days	10 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-Source-2-22	E469S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-WNW-2-22	E469S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) Dup-B	E469S.NaSi	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	180 days	11 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-ENE-1-22	E469S.NaSi	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	180 days	11 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-North-1-22	E469S.NaSi	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	180 days	11 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-Source-1-22	E469S.NaSi	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	180 days	11 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-WNW-1-22	E469S.NaSi	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	180 days	11 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-ENE-2-22	E469S.NaSi	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	180 days	11 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-North-2-22	E469S.NaSi	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	180 days	11 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-Source-2-22	E469S.NaSi	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	180 days	11 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-WNW-2-22	E469S.NaSi	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	180 days	11 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Dup-B	E601A	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	18-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-North-1-22	E601A	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	18-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E601A	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	18-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E601A	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	18-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E601A	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	18-Aug-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Dup-B	E601	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	18-Aug-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-North-1-22	E601	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	18-Aug-2022	40 days	1 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E601	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	18-Aug-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E601	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	18-Aug-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E601	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	18-Aug-2022	40 days	1 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Dup-B	E581.VH+F1	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	14 days	10 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP05-North-1-22	E581.VH+F1	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	14 days	10 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP05-Source-1-22	E581.VH+F1	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	14 days	10 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP06-ENE-2-22	E581.VH+F1	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	14 days	10 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP06-Source-2-22	E581.VH+F1	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	14 days	11 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP05-ENE-1-22	E358-L	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	0 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP05-North-1-22	E358-L	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP05-Source-1-22	E358-L	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP05-WNW-1-22	E358-L	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP06-ENE-2-22	E358-L	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP06-North-2-22	E358-L	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP06-Source-2-22	E358-L	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP06-WNW-2-22	E358-L	06-Aug-2022	16-Aug-2022	3 days	10 days	× EHTR	16-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) Dup-B	E358-L	06-Aug-2022	16-Aug-2022	3 days	9 days	× EHTR	16-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP05-ENE-1-22	E355-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓

Matrix: **Water**

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Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP05-North-1-22	E355-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP05-Source-1-22	E355-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP05-WNW-1-22	E355-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP06-ENE-2-22	E355-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP06-North-2-22	E355-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP06-Source-2-22	E355-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP06-WNW-2-22	E355-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Dup-B	E355-L	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	9 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-ENE-1-22	E290	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	14 days	10 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-North-1-22	E290	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-Source-1-22	E290	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-WNW-1-22	E290	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-ENE-2-22	E290	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-North-2-22	E290	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-Source-2-22	E290	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-WNW-2-22	E290	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Dup-B	E290	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	14 days	9 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-ENE-1-22	E100S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Seawater										
HDPE MP05-North-1-22	E100S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-Source-1-22	E100S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-WNW-1-22	E100S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-ENE-2-22	E100S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-North-2-22	E100S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-Source-2-22	E100S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-WNW-2-22	E100S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE Dup-B	E100S	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	28 days	9 days	✓
Physical Tests : pH by Meter										
HDPE Dup-B	E108	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	0.25 hrs	4.25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Physical Tests : pH by Meter										
HDPE MP05-ENE-1-22	E108	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	0.25 hrs	4.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-North-1-22	E108	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	0.25 hrs	4.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-Source-1-22	E108	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	0.25 hrs	4.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-WNW-1-22	E108	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	0.25 hrs	4.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-ENE-2-22	E108	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	0.25 hrs	4.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-North-2-22	E108	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	0.25 hrs	4.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-Source-2-22	E108	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	0.25 hrs	4.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-WNW-2-22	E108	06-Aug-2022	16-Aug-2022	----	----		16-Aug-2022	0.25 hrs	4.25 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE Dup-B	E162S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-ENE-1-22	E162S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-North-1-22	E162S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-Source-1-22	E162S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-WNW-1-22	E162S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-ENE-2-22	E162S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-North-2-22	E162S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-Source-2-22	E162S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-WNW-2-22	E162S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE Dup-B	E160S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-ENE-1-22	E160S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-North-1-22	E160S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-Source-1-22	E160S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-WNW-1-22	E160S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-ENE-2-22	E160S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-North-2-22	E160S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-Source-2-22	E160S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-WNW-2-22	E160S	06-Aug-2022	----	----	----		16-Aug-2022	7 days	10 days	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-ENE-2-22	E121	06-Aug-2022	----	----	----		15-Aug-2022	3 days	10 days	× EHTR

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-North-2-22	E121	06-Aug-2022	----	----	----		15-Aug-2022	3 days	10 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-Source-2-22	E121	06-Aug-2022	----	----	----		15-Aug-2022	3 days	10 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-WNW-2-22	E121	06-Aug-2022	----	----	----		15-Aug-2022	3 days	10 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE Dup-B	E121	06-Aug-2022	----	----	----		15-Aug-2022	3 days	9 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-ENE-1-22	E121	06-Aug-2022	----	----	----		15-Aug-2022	3 days	9 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-North-1-22	E121	06-Aug-2022	----	----	----		15-Aug-2022	3 days	9 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-Source-1-22	E121	06-Aug-2022	----	----	----		15-Aug-2022	3 days	9 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-WNW-1-22	E121	06-Aug-2022	----	----	----		15-Aug-2022	3 days	9 days	× EHTR
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) Dup-B	E641A	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	17-Aug-2022	40 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-North-1-22	E641A	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	17-Aug-2022	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E641A	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	17-Aug-2022	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E641A	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	17-Aug-2022	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E641A	06-Aug-2022	17-Aug-2022	14 days	11 days	✓	17-Aug-2022	40 days	1 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) Dup-B	E508S	06-Aug-2022	19-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-ENE-1-22	E508S	06-Aug-2022	19-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-North-1-22	E508S	06-Aug-2022	19-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-Source-1-22	E508S	06-Aug-2022	19-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-WNW-1-22	E508S	06-Aug-2022	19-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-ENE-2-22	E508S	06-Aug-2022	19-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-North-2-22	E508S	06-Aug-2022	19-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-Source-2-22	E508S	06-Aug-2022	19-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-WNW-2-22	E508S	06-Aug-2022	19-Aug-2022	----	----		19-Aug-2022	28 days	13 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) Dup-B	E468S	06-Aug-2022	18-Aug-2022	----	----		22-Aug-2022	180 days	16 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-ENE-1-22	E468S	06-Aug-2022	18-Aug-2022	----	----		22-Aug-2022	180 days	16 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-North-1-22	E468S	06-Aug-2022	18-Aug-2022	----	----		22-Aug-2022	180 days	16 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-Source-1-22	E468S	06-Aug-2022	18-Aug-2022	----	----		22-Aug-2022	180 days	16 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-WNW-1-22	E468S	06-Aug-2022	18-Aug-2022	----	----		22-Aug-2022	180 days	16 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-ENE-2-22	E468S	06-Aug-2022	18-Aug-2022	----	----		22-Aug-2022	180 days	16 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-North-2-22	E468S	06-Aug-2022	18-Aug-2022	----	----		22-Aug-2022	180 days	16 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-Source-2-22	E468S	06-Aug-2022	18-Aug-2022	----	----		22-Aug-2022	180 days	16 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-WNW-2-22	E468S	06-Aug-2022	18-Aug-2022	----	----		22-Aug-2022	180 days	16 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) Dup-B	E468S.NaSi	06-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	180 days	12 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-ENE-1-22	E468S.NaSi	06-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	180 days	12 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-North-1-22	E468S.NaSi	06-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	180 days	12 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-Source-1-22	E468S.NaSi	06-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	180 days	12 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-WNW-1-22	E468S.NaSi	06-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	180 days	12 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-ENE-2-22	E468S.NaSi	06-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	180 days	12 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-North-2-22	E468S.NaSi	06-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	180 days	12 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-Source-2-22	E468S.NaSi	06-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	180 days	12 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-WNW-2-22	E468S.NaSi	06-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	180 days	12 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Dup-B	E611A	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	14 days	10 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP05-North-1-22	E611A	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	14 days	10 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP05-Source-1-22	E611A	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	14 days	10 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP06-ENE-2-22	E611A	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	14 days	10 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP06-Source-2-22	E611A	06-Aug-2022	16-Aug-2022	----	----		17-Aug-2022	14 days	11 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHTR: Exceeded ALS recommended hold time prior to sample receipt.

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	603828	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	603782	1	20	5.0	5.0	✓
Bromide in Seawater by IC	E235S.Br	603830	1	11	9.0	5.0	✓
BTEX by Headspace GC-MS	E611A	605565	1	17	5.8	5.0	✓
Chloride in Seawater by IC	E235S.Cl	603831	1	11	9.0	5.0	✓
Conductivity in Seawater	E100S	603827	1	11	9.0	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	609969	2	11	18.1	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	604472	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	603783	1	9	11.1	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	604471	1	9	11.1	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	603832	1	11	9.0	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	603833	1	11	9.0	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	603834	1	11	9.0	5.0	✓
pH by Meter	E108	603829	1	11	9.0	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	603835	1	11	9.0	5.0	✓
TDS by Gravimetry (Seawater)	E162S	604361	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	603785	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	603786	1	9	11.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	609914	1	9	11.1	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	604481	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	603784	1	9	11.1	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	603787	1	9	11.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	604482	1	18	5.5	5.0	✓
Turbidity by Nephelometry	E121	603727	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	605564	1	17	5.8	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	603828	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	603782	1	20	5.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	605942	1	18	5.5	5.0	✓
Bromide in Seawater by IC	E235S.Br	603830	1	11	9.0	5.0	✓
BTEX by Headspace GC-MS	E611A	605565	1	17	5.8	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	605944	1	7	14.2	5.0	✓
Chloride in Seawater by IC	E235S.Cl	603831	1	11	9.0	5.0	✓
Conductivity in Seawater	E100S	603827	1	11	9.0	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	609969	2	11	18.1	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	604472	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	603783	1	9	11.1	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	604471	1	9	11.1	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	603832	1	11	9.0	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	603833	1	11	9.0	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	603834	1	11	9.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	605943	1	14	7.1	5.0	✓
pH by Meter	E108	603829	1	11	9.0	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	603835	1	11	9.0	5.0	✓
TDS by Gravimetry (Seawater)	E162S	604361	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	603785	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	603786	1	9	11.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	609914	1	9	11.1	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	604481	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	603784	1	9	11.1	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	603787	1	9	11.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	604482	1	18	5.5	5.0	✓
TSS by Gravimetry (Seawater)	E160S	604345	1	11	9.0	5.0	✓
Turbidity by Nephelometry	E121	603727	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	605564	1	17	5.8	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	603828	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	603782	1	20	5.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	605942	1	18	5.5	5.0	✓
Bromide in Seawater by IC	E235S.Br	603830	1	11	9.0	5.0	✓
BTEX by Headspace GC-MS	E611A	605565	1	17	5.8	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	605944	1	7	14.2	5.0	✓
Chloride in Seawater by IC	E235S.Cl	603831	1	11	9.0	5.0	✓
Conductivity in Seawater	E100S	603827	1	11	9.0	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	609969	2	11	18.1	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	604472	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	603783	1	9	11.1	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	604471	1	9	11.1	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	603832	1	11	9.0	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	603833	1	11	9.0	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	603834	1	11	9.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	605943	1	14	7.1	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	603835	1	11	9.0	5.0	✓
TDS by Gravimetry (Seawater)	E162S	604361	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	603785	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	603786	1	9	11.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	609914	1	9	11.1	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	604481	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	603784	1	9	11.1	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	603787	1	9	11.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	604482	1	18	5.5	5.0	✓
TSS by Gravimetry (Seawater)	E160S	604345	1	11	9.0	5.0	✓
Turbidity by Nephelometry	E121	603727	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	605564	1	17	5.8	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	603782	1	20	5.0	5.0	✓
Bromide in Seawater by IC	E235S.Br	603830	1	11	9.0	5.0	✓
BTEX by Headspace GC-MS	E611A	605565	1	17	5.8	5.0	✓
Chloride in Seawater by IC	E235S.Cl	603831	1	11	9.0	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	609969	2	11	18.1	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	604472	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	603783	1	9	11.1	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	604471	1	9	11.1	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	603832	1	11	9.0	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	603833	1	11	9.0	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	603834	1	11	9.0	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	603835	1	11	9.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	603785	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	603786	1	9	11.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	609914	1	9	11.1	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	604481	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	603784	1	9	11.1	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	603787	1	9	11.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	604482	1	18	5.5	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	605564	1	17	5.8	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Seawater	E100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TSS by Gravimetry (Seawater)	E160S Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry (Seawater)	E162S Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Seawater by IC	E235S.Br Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and /or UV detection.
Chloride in Seawater by IC	E235S.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and /or UV detection.
Fluoride in Seawater by IC (Low Level)	E235S.F-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and /or UV detection.
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and /or UV detection.
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and /or UV detection.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence	E318S Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total Metals in Seawater by CRC ICPMS (HMI)	E468S Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Seawater samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS (HMI Mode). This method is compliant with digestion requirements of the British Columbia Environmental Laboratory Manual.
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Seawater samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. This method is compliant with digestion requirements of the British Columbia Environmental Laboratory Manual.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Seawater samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS (HMI Mode).
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Seawater samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.
Total Mercury in Seawater by CVAAS	E508S Vancouver - Environmental	Water	EPA 1631E (mod)	Seawater samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Mercury in Seawater by CVAAS	E509S Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Seawater samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Vancouver - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hexane LVI GC-MS	E641A Vancouver - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Salinity in Water (calculation)	EC100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
F1-BTEX	EC580 Vancouver - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.
LEPH and HEPH: EPH-PAH	EC600A Vancouver - Environmental	Water	BC MOE Lab Manual (LEPH and HEPH) (mod)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in Seawater	EP318S Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: **YL2201196**	Laboratory	: Yellowknife - Environmental
Client	: Golder Associates Ltd.	Account Manager	: Amber Springer
Contact	: Elaine Irving	Address	: 314 Old Airport Road, Unit 116 Yellowknife, Northwest Territories Canada X1A 3T3
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Telephone	: +1 867 873 5593
Telephone	: ----	Date Samples Received	: 12-Aug-2022 10:10
Project	: 166372401/64000/03	Date Analysis Commenced	: 15-Aug-2022
PO	: ----	Issue Date	: 23-Aug-2022 16:39
C-O-C number	: 21-02		
Sampler	: TT/MR/DV		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 9		
No. of samples analysed	: 9		

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
Hamideh Moradi	Analyst	Vancouver Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Vancouver Organics, Burnaby, British Columbia
Owen Cheng		Vancouver Metals, Burnaby, British Columbia
Parnian Sane	Analyst	Vancouver Metals, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 603727)											
KS2202967-001	Anonymous	turbidity	----	E121	0.10	NTU	1.42	1.36	4.18%	15%	----
Physical Tests (QC Lot: 603827)											
VA22B8899-001	Anonymous	conductivity	----	E100S	2.0	µS/cm	17500	17500	0.171%	20%	----
Physical Tests (QC Lot: 603828)											
VA22B8899-001	Anonymous	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	59.0	58.9	0.170%	20%	----
Physical Tests (QC Lot: 603829)											
VA22B8899-001	Anonymous	pH	----	E108	0.10	pH units	7.86	7.87	0.127%	4%	----
Physical Tests (QC Lot: 604361)											
YL2201196-001	MP05-Source-1-22	solids, total dissolved [TDS]	----	E162S	20	mg/L	3370	3350	0.491%	20%	----
Anions and Nutrients (QC Lot: 603782)											
WR2200850-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 603785)											
YL2201196-001	MP05-Source-1-22	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0122	0.0123	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 603786)											
YL2201196-001	MP05-Source-1-22	Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	0.143	0.144	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 603787)											
YL2201196-001	MP05-Source-1-22	phosphorus, total	7723-14-0	E372S	0.0040	mg/L	0.0116	0.0118	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 603830)											
VA22B8899-001	Anonymous	bromide	24959-67-9	E235S.Br	5.0	mg/L	16.9	16.5	0.4	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 603831)											
VA22B8899-001	Anonymous	chloride	16887-00-6	E235S.Cl	50	mg/L	5580	5580	0.00930%	20%	----
Anions and Nutrients (QC Lot: 603832)											
VA22B8899-001	Anonymous	fluoride	16984-48-8	E235S.F-L	0.20	mg/L	0.38	0.38	0.006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 603833)											
VA22B8899-001	Anonymous	nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 603834)											
VA22B8899-001	Anonymous	nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 603835)											
VA22B8899-001	Anonymous	sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	806	792	1.69%	20%	----
Organic / Inorganic Carbon (QC Lot: 603783)											
YL2201196-001	MP05-Source-1-22	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.25	1.16	0.08	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
					Laboratory Duplicate (DUP) Report						
Organic / Inorganic Carbon (QC Lot: 603784)											
YL2201196-001	MP05-Source-1-22	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.03	1.03	0.006	Diff <2x LOR	----
Total Metals (QC Lot: 604481)											
VA22B8946-001	Anonymous	aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0172	0.0175	0.0003	Diff <2x LOR	----
		antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E468S	0.00040	mg/L	0.00168	0.00169	0.00002	Diff <2x LOR	----
		barium, total	7440-39-3	E468S	0.0010	mg/L	0.0094	0.0103	0.0009	Diff <2x LOR	----
		beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E468S	0.30	mg/L	3.87	4.22	8.63%	20%	----
		cadmium, total	7440-43-9	E468S	0.000010	mg/L	0.000071	0.000067	0.000004	Diff <2x LOR	----
		calcium, total	7440-70-2	E468S	1.0	mg/L	351	370	5.09%	20%	----
		cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, total	7440-50-8	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E468S	0.010	mg/L	0.021	0.022	0.0009	Diff <2x LOR	----
		lead, total	7439-92-1	E468S	0.000050	mg/L	0.000418	0.000428	0.000010	Diff <2x LOR	----
		lithium, total	7439-93-2	E468S	0.020	mg/L	0.152	0.152	0.0007	Diff <2x LOR	----
		magnesium, total	7439-95-4	E468S	1.0	mg/L	1040	1120	7.38%	20%	----
		manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00571	0.00615	7.44%	20%	----
		molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00917	0.00936	1.95%	20%	----
		nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E468S	0.050	mg/L	0.102	0.084	0.018	Diff <2x LOR	----
		potassium, total	7440-09-7	E468S	1.0	mg/L	356	394	9.90%	20%	----
		rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.0931	0.0950	2.06%	20%	----
		selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		strontium, total	7440-24-6	E468S	0.010	mg/L	6.36	6.52	2.45%	20%	----
		sulfur, total	7704-34-9	E468S	5.0	mg/L	886	983	10.4%	20%	----
		tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 604481) - continued											
VA22B8946-001	Anonymous	titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E468S	0.000050	mg/L	0.00240	0.00229	4.84%	20%	----
		vanadium, total	7440-62-2	E468S	0.00050	mg/L	0.00197	0.00194	0.00002	Diff <2x LOR	----
		yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E468S	0.0030	mg/L	0.0076	0.0072	0.0003	Diff <2x LOR	----
		zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Total Metals (QC Lot: 604482)											
VA22B8946-001	Anonymous	silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	1.5	1.5	0.02	Diff <2x LOR	----
		sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	8320	8700	4.54%	20%	----
Total Metals (QC Lot: 609914)											
YL2201196-001	MP05-Source-1-22	mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 604471)											
YL2201196-001	MP05-Source-1-22	silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	877	909	3.56%	20%	----
Dissolved Metals (QC Lot: 604472)											
YL2201196-001	MP05-Source-1-22	aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0035	0.0034	0.00003	Diff <2x LOR	----
		beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E469S	0.30	mg/L	0.38	0.38	0.002	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E469S	1.0	mg/L	47.2	46.1	2.45%	20%	----
		cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00030	0.00032	0.00002	Diff <2x LOR	----
		gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E469S	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	102	103	1.11%	20%	----
		manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00065	0.00063	0.00002	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 604472) - continued											
YL2201196-001	MP05-Source-1-22	molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00098	0.00096	0.00002	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E469S	1.0	mg/L	32.0	32.1	0.232%	20%	----
		rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.0094	0.0101	0.0006	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		strontium, dissolved	7440-24-6	E469S	0.010	mg/L	0.637	0.639	0.288%	20%	----
		sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	75.1	76.2	1.53%	20%	----
		tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.000801	0.000788	1.66%	20%	----
		vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	0.0014	0.0015	0.0001	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 609969)											
VA22B8899-001	Anonymous	mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 610980)											
YL2201196-002	MP05-North-1-22	mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 605565)											
VA22B8899-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 605564)											
VA22B8899-001	Anonymous	F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Hydrocarbons (QC Lot: 605564) - continued											
VA22B8899-001	Anonymous	VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 603727)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 603827)						
conductivity	----	E100S	2	µS/cm	<2.0	----
Physical Tests (QCLot: 603828)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 604345)						
solids, total suspended [TSS]	----	E160S	2	mg/L	<2.0	----
Physical Tests (QCLot: 604361)						
solids, total dissolved [TDS]	----	E162S	10	mg/L	<10	----
Anions and Nutrients (QCLot: 603782)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 603785)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 603786)						
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 603787)						
phosphorus, total	7723-14-0	E372S	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 603830)						
bromide	24959-67-9	E235S.Br	5	mg/L	<5.0	----
Anions and Nutrients (QCLot: 603831)						
chloride	16887-00-6	E235S.Cl	50	mg/L	<50	----
Anions and Nutrients (QCLot: 603832)						
fluoride	16984-48-8	E235S.F-L	0.2	mg/L	<0.20	----
Anions and Nutrients (QCLot: 603833)						
nitrate (as N)	14797-55-8	E235S.NO3-T	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 603834)						
nitrite (as N)	14797-65-0	E235S.NO2-L	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 603835)						
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3	mg/L	<3.0	----
Organic / Inorganic Carbon (QCLot: 603783)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 603784)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 604481)						
aluminum, total	7429-90-5	E468S	0.005	mg/L	<0.0050	----
antimony, total	7440-36-0	E468S	0.001	mg/L	<0.0010	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	<0.00040	----
barium, total	7440-39-3	E468S	0.001	mg/L	<0.0010	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	<0.00050	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	<0.00050	----
boron, total	7440-42-8	E468S	0.3	mg/L	<0.30	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	<0.000010	----
calcium, total	7440-70-2	E468S	1	mg/L	<1.0	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	<0.00050	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	<0.000050	----
copper, total	7440-50-8	E468S	0.0005	mg/L	<0.00050	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E468S	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E468S	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E468S	0.02	mg/L	<0.020	----
magnesium, total	7439-95-4	E468S	1	mg/L	<1.0	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	<0.00020	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	<0.00010	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E468S	1	mg/L	<1.0	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	<0.00050	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	<0.0050	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	<0.00050	----
silver, total	7440-22-4	E468S	0.0001	mg/L	<0.00010	----
strontium, total	7440-24-6	E468S	0.01	mg/L	<0.010	----
sulfur, total	7704-34-9	E468S	5	mg/L	<5.0	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	<0.00050	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	<0.000050	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	<0.00050	----
tin, total	7440-31-5	E468S	0.001	mg/L	<0.0010	----
titanium, total	7440-32-6	E468S	0.005	mg/L	<0.0050	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	<0.0010	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 604481) - continued						
vanadium, total	7440-62-2	E468S	0.0005	mg/L	<0.00050	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E468S	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 604482)						
silicon, total	7440-21-3	E468S.NaSi	1	mg/L	<1.0	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	<2.5	----
Total Metals (QCLot: 609914)						
mercury, total	7439-97-6	E508S	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 604471)						
silicon, dissolved	7440-21-3	E469S.NaSi	1	mg/L	<1.0	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	<2.5	----
Dissolved Metals (QCLot: 604472)						
aluminum, dissolved	7429-90-5	E469S	0.005	mg/L	<0.0050	----
antimony, dissolved	7440-36-0	E469S	0.001	mg/L	<0.0010	----
arsenic, dissolved	7440-38-2	E469S	0.0004	mg/L	<0.00040	----
barium, dissolved	7440-39-3	E469S	0.001	mg/L	<0.0010	----
beryllium, dissolved	7440-41-7	E469S	0.0005	mg/L	<0.00050	----
bismuth, dissolved	7440-69-9	E469S	0.0005	mg/L	<0.00050	----
boron, dissolved	7440-42-8	E469S	0.3	mg/L	<0.30	----
cadmium, dissolved	7440-43-9	E469S	0.00001	mg/L	<0.000010	----
calcium, dissolved	7440-70-2	E469S	1	mg/L	<1.0	----
cesium, dissolved	7440-46-2	E469S	0.0005	mg/L	<0.00050	----
chromium, dissolved	7440-47-3	E469S	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E469S	0.00005	mg/L	<0.000050	----
copper, dissolved	7440-50-8	E469S	0.0002	mg/L	<0.00020	----
gallium, dissolved	7440-55-3	E469S	0.0005	mg/L	<0.00050	----
iron, dissolved	7439-89-6	E469S	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E469S	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E469S	0.02	mg/L	<0.020	----
magnesium, dissolved	7439-95-4	E469S	1	mg/L	<1.0	----
manganese, dissolved	7439-96-5	E469S	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E469S	0.0001	mg/L	<0.00010	----
nickel, dissolved	7440-02-0	E469S	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E469S	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E469S	1	mg/L	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 604472) - continued						
rhenium, dissolved	7440-15-5	E469S	0.0005	mg/L	<0.00050	----
rubidium, dissolved	7440-17-7	E469S	0.005	mg/L	<0.0050	----
selenium, dissolved	7782-49-2	E469S	0.0005	mg/L	<0.00050	----
silver, dissolved	7440-22-4	E469S	0.0001	mg/L	<0.00010	----
strontium, dissolved	7440-24-6	E469S	0.01	mg/L	<0.010	----
sulfur, dissolved	7704-34-9	E469S	5	mg/L	<5.0	----
tellurium, dissolved	13494-80-9	E469S	0.0005	mg/L	<0.00050	----
thallium, dissolved	7440-28-0	E469S	0.00005	mg/L	<0.000050	----
thorium, dissolved	7440-29-1	E469S	0.0005	mg/L	<0.00050	----
tin, dissolved	7440-31-5	E469S	0.001	mg/L	<0.0010	----
titanium, dissolved	7440-32-6	E469S	0.005	mg/L	<0.0050	----
tungsten, dissolved	7440-33-7	E469S	0.001	mg/L	<0.0010	----
uranium, dissolved	7440-61-1	E469S	0.00005	mg/L	<0.000050	----
vanadium, dissolved	7440-62-2	E469S	0.0005	mg/L	<0.00050	----
yttrium, dissolved	7440-65-5	E469S	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E469S	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E469S	0.0005	mg/L	<0.00050	----
Dissolved Metals (QCLot: 609969)						
mercury, dissolved	7439-97-6	E509S	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 610980)						
mercury, dissolved	7439-97-6	E509S	0.000005	mg/L	<0.0000050	----
Volatile Organic Compounds (QCLot: 605565)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 605564)						
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 605942)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
Hydrocarbons (QCLot: 605944)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Hydrocarbons (QCLot: 605944) - continued						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----
F4 (C34-C50)	----	E601	250	µg/L	<250	----
Polycyclic Aromatic Hydrocarbons (QCLot: 605943)						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
quinoline	91-22-5	E641A	0.05	µg/L	<0.050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 603727)									
turbidity	----	E121	0.1	NTU	200 NTU	98.5	85.0	115	----
Physical Tests (QCLot: 603827)									
conductivity	----	E100S	2	µS/cm	146.9 µS/cm	101	80.0	120	----
Physical Tests (QCLot: 603828)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	109	85.0	115	----
Physical Tests (QCLot: 603829)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 604345)									
solids, total suspended [TSS]	----	E160S	2	mg/L	150 mg/L	86.7	85.0	115	----
Physical Tests (QCLot: 604361)									
solids, total dissolved [TDS]	----	E162S	10	mg/L	1000 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 603782)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 603785)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	90.7	80.0	120	----
Anions and Nutrients (QCLot: 603786)									
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	4 mg/L	97.7	75.0	125	----
Anions and Nutrients (QCLot: 603787)									
phosphorus, total	7723-14-0	E372S	0.002	mg/L	0.05 mg/L	94.7	80.0	120	----
Anions and Nutrients (QCLot: 603830)									
bromide	24959-67-9	E235S.Br	5	mg/L	0.5 mg/L	87.2	85.0	115	----
Anions and Nutrients (QCLot: 603831)									
chloride	16887-00-6	E235S.Cl	50	mg/L	100 mg/L	99.7	90.0	110	----
Anions and Nutrients (QCLot: 603832)									
fluoride	16984-48-8	E235S.F-L	0.2	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 603833)									
nitrate (as N)	14797-55-8	E235S.NO3-T	0.01	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 603834)									
nitrite (as N)	14797-65-0	E235S.NO2-L	0.01	mg/L	0.5 mg/L	98.6	90.0	110	----
Anions and Nutrients (QCLot: 603835)									
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3	mg/L	100 mg/L	101	90.0	110	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 603783)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	98.1	80.0	120	----
Organic / Inorganic Carbon (QCLot: 603784)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	99.4	80.0	120	----
Total Metals (QCLot: 604481)									
aluminum, total	7429-90-5	E468S	0.005	mg/L	2 mg/L	102	80.0	120	----
antimony, total	7440-36-0	E468S	0.001	mg/L	1 mg/L	110	80.0	120	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	1 mg/L	102	80.0	120	----
barium, total	7440-39-3	E468S	0.001	mg/L	0.25 mg/L	100	80.0	120	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	0.1 mg/L	97.4	80.0	120	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	1 mg/L	105	80.0	120	----
boron, total	7440-42-8	E468S	0.3	mg/L	10 mg/L	94.8	80.0	120	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	0.1 mg/L	99.5	80.0	120	----
calcium, total	7440-70-2	E468S	1	mg/L	50 mg/L	97.4	80.0	120	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	0.05 mg/L	98.4	80.0	120	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	0.25 mg/L	100	80.0	120	----
copper, total	7440-50-8	E468S	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
iron, total	7439-89-6	E468S	0.01	mg/L	1 mg/L	104	80.0	120	----
lead, total	7439-92-1	E468S	0.00005	mg/L	0.5 mg/L	105	80.0	120	----
lithium, total	7439-93-2	E468S	0.02	mg/L	0.25 mg/L	98.2	80.0	120	----
magnesium, total	7439-95-4	E468S	1	mg/L	50 mg/L	98.9	80.0	120	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	0.25 mg/L	99.8	80.0	120	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	10 mg/L	101	80.0	120	----
potassium, total	7440-09-7	E468S	1	mg/L	50 mg/L	101	80.0	120	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	0.1 mg/L	100	80.0	120	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	0.1 mg/L	104	80.0	120	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	1 mg/L	111	80.0	120	----
silver, total	7440-22-4	E468S	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
strontium, total	7440-24-6	E468S	0.01	mg/L	0.25 mg/L	103	80.0	120	----
sulfur, total	7704-34-9	E468S	5	mg/L	50 mg/L	101	80.0	120	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	0.1 mg/L	114	80.0	120	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	1 mg/L	109	80.0	120	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	0.1 mg/L	96.1	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Total Metals (QCLot: 604481) - continued									
tin, total	7440-31-5	E468S	0.001	mg/L	0.5 mg/L	96.0	80.0	120	----
titanium, total	7440-32-6	E468S	0.005	mg/L	0.25 mg/L	96.6	80.0	120	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	0.1 mg/L	99.1	80.0	120	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	0.005 mg/L	98.1	80.0	120	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	0.5 mg/L	99.0	80.0	120	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	0.1 mg/L	90.6	80.0	120	----
zinc, total	7440-66-6	E468S	0.003	mg/L	0.5 mg/L	105	80.0	120	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	0.1 mg/L	96.5	80.0	120	----
Total Metals (QCLot: 604482)									
silicon, total	7440-21-3	E468S.NaSi	1	mg/L	10 mg/L	111	80.0	120	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	50 mg/L	111	80.0	120	----
Total Metals (QCLot: 609914)									
mercury, total	7439-97-6	E508S	0.000005	mg/L	0.0001 mg/L	102	80.0	120	----
silicon, dissolved	7440-21-3	E469S.NaSi	1	mg/L	10 mg/L	107	80.0	120	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	50 mg/L	105	80.0	120	----
Dissolved Metals (QCLot: 604472)									
aluminum, dissolved	7429-90-5	E469S	0.005	mg/L	2 mg/L	101	80.0	120	----
antimony, dissolved	7440-36-0	E469S	0.001	mg/L	1 mg/L	107	80.0	120	----
arsenic, dissolved	7440-38-2	E469S	0.0004	mg/L	1 mg/L	105	80.0	120	----
barium, dissolved	7440-39-3	E469S	0.001	mg/L	0.25 mg/L	105	80.0	120	----
beryllium, dissolved	7440-41-7	E469S	0.0005	mg/L	0.1 mg/L	102	80.0	120	----
bismuth, dissolved	7440-69-9	E469S	0.0005	mg/L	1 mg/L	108	80.0	120	----
boron, dissolved	7440-42-8	E469S	0.3	mg/L	10 mg/L	95.5	80.0	120	----
cadmium, dissolved	7440-43-9	E469S	0.00001	mg/L	0.1 mg/L	103	80.0	120	----
calcium, dissolved	7440-70-2	E469S	1	mg/L	50 mg/L	100	80.0	120	----
cesium, dissolved	7440-46-2	E469S	0.0005	mg/L	0.05 mg/L	110	80.0	120	----
chromium, dissolved	7440-47-3	E469S	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
cobalt, dissolved	7440-48-4	E469S	0.00005	mg/L	0.25 mg/L	101	80.0	120	----
copper, dissolved	7440-50-8	E469S	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
gallium, dissolved	7440-55-3	E469S	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
iron, dissolved	7439-89-6	E469S	0.01	mg/L	1 mg/L	109	80.0	120	----
lead, dissolved	7439-92-1	E469S	0.00005	mg/L	0.5 mg/L	110	80.0	120	----
lithium, dissolved	7439-93-2	E469S	0.02	mg/L	0.25 mg/L	107	80.0	120	----
magnesium, dissolved	7439-95-4	E469S	1	mg/L	50 mg/L	100	80.0	120	----
manganese, dissolved	7439-96-5	E469S	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
molybdenum, dissolved	7439-98-7	E469S	0.0001	mg/L	0.25 mg/L	103	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 604472) - continued									
nickel, dissolved	7440-02-0	E469S	0.0005	mg/L	0.5 mg/L	108	80.0	120	----
phosphorus, dissolved	7723-14-0	E469S	0.05	mg/L	10 mg/L	99.8	80.0	120	----
potassium, dissolved	7440-09-7	E469S	1	mg/L	50 mg/L	105	80.0	120	----
rhenium, dissolved	7440-15-5	E469S	0.0005	mg/L	0.1 mg/L	102	80.0	120	----
rubidium, dissolved	7440-17-7	E469S	0.005	mg/L	0.1 mg/L	107	80.0	120	----
selenium, dissolved	7782-49-2	E469S	0.0005	mg/L	1 mg/L	108	80.0	120	----
silver, dissolved	7440-22-4	E469S	0.0001	mg/L	0.1 mg/L	107	80.0	120	----
strontium, dissolved	7440-24-6	E469S	0.01	mg/L	0.25 mg/L	112	80.0	120	----
sulfur, dissolved	7704-34-9	E469S	5	mg/L	50 mg/L	97.8	80.0	120	----
tellurium, dissolved	13494-80-9	E469S	0.0005	mg/L	0.1 mg/L	# 122	80.0	120	MES
thallium, dissolved	7440-28-0	E469S	0.00005	mg/L	1 mg/L	108	80.0	120	----
thorium, dissolved	7440-29-1	E469S	0.0005	mg/L	0.1 mg/L	99.3	80.0	120	----
tin, dissolved	7440-31-5	E469S	0.001	mg/L	0.5 mg/L	99.1	80.0	120	----
titanium, dissolved	7440-32-6	E469S	0.005	mg/L	0.25 mg/L	100	80.0	120	----
tungsten, dissolved	7440-33-7	E469S	0.001	mg/L	0.1 mg/L	98.1	80.0	120	----
uranium, dissolved	7440-61-1	E469S	0.00005	mg/L	0.005 mg/L	101	80.0	120	----
vanadium, dissolved	7440-62-2	E469S	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
yttrium, dissolved	7440-65-5	E469S	0.0005	mg/L	0.1 mg/L	96.9	80.0	120	----
zinc, dissolved	7440-66-6	E469S	0.001	mg/L	0.5 mg/L	109	80.0	120	----
zirconium, dissolved	7440-67-7	E469S	0.0005	mg/L	0.1 mg/L	103	80.0	120	----
mercury, dissolved	7439-97-6	E509S	0.000005	mg/L	0.0001 mg/L	106	80.0	120	----
mercury, dissolved	7439-97-6	E509S	0.000005	mg/L	0.0001 mg/L	103	80.0	120	----
Volatile Organic Compounds (QCLot: 605565)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	127	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	111	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	114	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	116	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	112	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	117	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	110	70.0	130	----
Hydrocarbons (QCLot: 605564)									
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	98.8	70.0	130	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	89.2	70.0	130	----
Hydrocarbons (QCLot: 605942)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	113	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	117	70.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Hydrocarbons (QCLot: 605944)									
F2 (C10-C16)	----	E601	100	µg/L	3538 µg/L	121	70.0	130	----
F3 (C16-C34)	----	E601	250	µg/L	7053 µg/L	105	70.0	130	----
F4 (C34-C50)	----	E601	250	µg/L	5051 µg/L	103	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 605943)									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.5 µg/L	104	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5 µg/L	108	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	0.5 µg/L	88.0	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	0.5 µg/L	119	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5 µg/L	122	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5 µg/L	105	60.0	130	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.5 µg/L	96.2	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5 µg/L	104	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5 µg/L	97.7	60.0	130	----
chrysene	218-01-9	E641A	0.01	µg/L	0.5 µg/L	119	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5 µg/L	110	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.5 µg/L	113	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	0.5 µg/L	112	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5 µg/L	119	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5 µg/L	101	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5 µg/L	99.2	60.0	130	----
naphthalene	91-20-3	E641A	0.05	µg/L	0.5 µg/L	101	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.5 µg/L	115	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	0.5 µg/L	115	60.0	130	----
quinoline	91-22-5	E641A	0.05	µg/L	0.5 µg/L	109	60.0	130	----

Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 603782)										
WR2200850-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.103 mg/L	0.1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 603785)										
YL2201196-002	MP05-North-1-22	phosphorus, total dissolved	7723-14-0	E375-T	0.0454 mg/L	0.05 mg/L	90.8	70.0	130	----
Anions and Nutrients (QCLot: 603786)										
YL2201196-002	MP05-North-1-22	Kjeldahl nitrogen, total [TKN]	----	E318S	1.79 mg/L	2.5 mg/L	71.7	70.0	130	----
Anions and Nutrients (QCLot: 603787)										
YL2201196-002	MP05-North-1-22	phosphorus, total	7723-14-0	E372S	0.0880 mg/L	0.1 mg/L	88.0	70.0	130	----
Anions and Nutrients (QCLot: 603830)										
VA22B8899-002	Anonymous	bromide	24959-67-9	E235S.Br	39.1 mg/L	50 mg/L	78.2	75.0	125	----
Anions and Nutrients (QCLot: 603831)										
VA22B8899-002	Anonymous	chloride	16887-00-6	E235S.Cl	9320 mg/L	10000 mg/L	93.2	75.0	125	----
Anions and Nutrients (QCLot: 603832)										
VA22B8899-002	Anonymous	fluoride	16984-48-8	E235S.F-L	9.44 mg/L	10 mg/L	94.4	75.0	125	----
Anions and Nutrients (QCLot: 603833)										
VA22B8899-002	Anonymous	nitrate (as N)	14797-55-8	E235S.NO3-T	7.03 mg/L	7.5 mg/L	93.7	75.0	125	----
Anions and Nutrients (QCLot: 603834)										
VA22B8899-002	Anonymous	nitrite (as N)	14797-65-0	E235S.NO2-L	4.58 mg/L	5 mg/L	91.6	75.0	125	----
Anions and Nutrients (QCLot: 603835)										
VA22B8899-002	Anonymous	sulfate (as SO4)	14808-79-8	E235S.SO4-L	950 mg/L	1000 mg/L	95.0	75.0	125	----
Organic / Inorganic Carbon (QCLot: 603783)										
YL2201196-002	MP05-North-1-22	carbon, dissolved organic [DOC]	----	E358-L	4.81 mg/L	5 mg/L	96.3	70.0	130	----
Organic / Inorganic Carbon (QCLot: 603784)										
YL2201196-002	MP05-North-1-22	carbon, total organic [TOC]	----	E355-L	4.90 mg/L	5 mg/L	97.9	70.0	130	----
Total Metals (QCLot: 604481)										
VA22B8946-002	Anonymous	aluminum, total	7429-90-5	E468S	0.455 mg/L	0.4 mg/L	114	70.0	130	----
		antimony, total	7440-36-0	E468S	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		arsenic, total	7440-38-2	E468S	0.0383 mg/L	0.04 mg/L	95.7	70.0	130	----
		barium, total	7440-39-3	E468S	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		beryllium, total	7440-41-7	E468S	0.0840 mg/L	0.08 mg/L	105	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 604481) - continued										
VA22B8946-002	Anonymous	bismuth, total	7440-69-9	E468S	0.0158 mg/L	0.02 mg/L	79.2	70.0	130	----
		boron, total	7440-42-8	E468S	ND mg/L	0.2 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E468S	0.00709 mg/L	0.008 mg/L	88.6	70.0	130	----
		calcium, total	7440-70-2	E468S	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E468S	0.0184 mg/L	0.02 mg/L	92.2	70.0	130	----
		chromium, total	7440-47-3	E468S	0.0809 mg/L	0.08 mg/L	101	70.0	130	----
		cobalt, total	7440-48-4	E468S	0.0367 mg/L	0.04 mg/L	91.8	70.0	130	----
		copper, total	7440-50-8	E468S	0.0330 mg/L	0.04 mg/L	82.4	70.0	130	----
		gallium, total	7440-55-3	E468S	0.00519 mg/L	0.005 mg/L	104	70.0	130	----
		iron, total	7439-89-6	E468S	3.87 mg/L	4 mg/L	96.6	70.0	130	----
		lead, total	7439-92-1	E468S	0.0329 mg/L	0.04 mg/L	82.3	70.0	130	----
		lithium, total	7439-93-2	E468S	0.195 mg/L	0.2 mg/L	97.4	70.0	130	----
		magnesium, total	7439-95-4	E468S	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E468S	0.0415 mg/L	0.04 mg/L	104	70.0	130	----
		molybdenum, total	7439-98-7	E468S	0.0430 mg/L	0.04 mg/L	107	70.0	130	----
		nickel, total	7440-02-0	E468S	0.0705 mg/L	0.08 mg/L	88.2	70.0	130	----
		phosphorus, total	7723-14-0	E468S	23.6 mg/L	20 mg/L	118	70.0	130	----
		potassium, total	7440-09-7	E468S	ND mg/L	8 mg/L	ND	70.0	130	----
		rhenium, total	7440-15-5	E468S	0.00462 mg/L	0.005 mg/L	92.4	70.0	130	----
		rubidium, total	7440-17-7	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		selenium, total	7782-49-2	E468S	0.0784 mg/L	0.08 mg/L	98.0	70.0	130	----
		silver, total	7440-22-4	E468S	0.00707 mg/L	0.008 mg/L	88.4	70.0	130	----
		strontium, total	7440-24-6	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E468S	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E468S	0.0710 mg/L	0.08 mg/L	88.7	70.0	130	----
		thallium, total	7440-28-0	E468S	0.00675 mg/L	0.008 mg/L	84.4	70.0	130	----
		thorium, total	7440-29-1	E468S	0.0339 mg/L	0.04 mg/L	84.7	70.0	130	----
		tin, total	7440-31-5	E468S	0.0383 mg/L	0.04 mg/L	95.7	70.0	130	----
		titanium, total	7440-32-6	E468S	0.0916 mg/L	0.08 mg/L	114	70.0	130	----
		tungsten, total	7440-33-7	E468S	0.0388 mg/L	0.04 mg/L	97.1	70.0	130	----
		uranium, total	7440-61-1	E468S	0.00642 mg/L	0.008 mg/L	80.2	70.0	130	----
		vanadium, total	7440-62-2	E468S	0.217 mg/L	0.2 mg/L	108	70.0	130	----
		yttrium, total	7440-65-5	E468S	0.00559 mg/L	0.005 mg/L	112	70.0	130	----
		zinc, total	7440-66-6	E468S	0.691 mg/L	0.8 mg/L	86.4	70.0	130	----
		zirconium, total	7440-67-7	E468S	0.0842 mg/L	0.08 mg/L	105	70.0	130	----
Total Metals (QCLot: 604482)										

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
					Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 604482) - continued										
VA22B8946-002	Anonymous	silicon, total	7440-21-3	E468S.NaSi	511 mg/L	500 mg/L	102	70.0	130	----
		sodium, total	7440-23-5	E468S.NaSi	ND mg/L	100 mg/L	ND	70.0	130	----
Total Metals (QCLot: 609914)										
YL2201196-002	MP05-North-1-22	mercury, total	7439-97-6	E508S	0.000102 mg/L	0.0001 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 604471)										
YL2201196-002	MP05-North-1-22	silicon, dissolved	7440-21-3	E469S.NaSi	499 mg/L	500 mg/L	99.8	70.0	130	----
		sodium, dissolved	7440-23-5	E469S.NaSi	ND mg/L	100 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 604472)										
YL2201196-002	MP05-North-1-22	aluminum, dissolved	7429-90-5	E469S	0.389 mg/L	0.4 mg/L	97.2	70.0	130	----
		antimony, dissolved	7440-36-0	E469S	0.0373 mg/L	0.04 mg/L	93.2	70.0	130	----
		arsenic, dissolved	7440-38-2	E469S	0.0383 mg/L	0.04 mg/L	95.7	70.0	130	----
		barium, dissolved	7440-39-3	E469S	0.0383 mg/L	0.04 mg/L	95.7	70.0	130	----
		beryllium, dissolved	7440-41-7	E469S	0.0755 mg/L	0.08 mg/L	94.4	70.0	130	----
		bismuth, dissolved	7440-69-9	E469S	0.0171 mg/L	0.02 mg/L	85.4	70.0	130	----
		boron, dissolved	7440-42-8	E469S	ND mg/L	0.2 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E469S	0.00713 mg/L	0.008 mg/L	89.1	70.0	130	----
		calcium, dissolved	7440-70-2	E469S	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E469S	0.0197 mg/L	0.02 mg/L	98.3	70.0	130	----
		chromium, dissolved	7440-47-3	E469S	0.0748 mg/L	0.08 mg/L	93.6	70.0	130	----
		cobalt, dissolved	7440-48-4	E469S	0.0363 mg/L	0.04 mg/L	90.7	70.0	130	----
		copper, dissolved	7440-50-8	E469S	0.0358 mg/L	0.04 mg/L	89.5	70.0	130	----
		gallium, dissolved	7440-55-3	E469S	0.00512 mg/L	0.005 mg/L	102	70.0	130	----
		iron, dissolved	7439-89-6	E469S	3.73 mg/L	4 mg/L	93.4	70.0	130	----
		lead, dissolved	7439-92-1	E469S	0.0359 mg/L	0.04 mg/L	89.7	70.0	130	----
		lithium, dissolved	7439-93-2	E469S	0.180 mg/L	0.2 mg/L	90.2	70.0	130	----
		magnesium, dissolved	7439-95-4	E469S	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E469S	0.0382 mg/L	0.04 mg/L	95.6	70.0	130	----
		molybdenum, dissolved	7439-98-7	E469S	0.0387 mg/L	0.04 mg/L	96.7	70.0	130	----
		nickel, dissolved	7440-02-0	E469S	0.0738 mg/L	0.08 mg/L	92.3	70.0	130	----
		phosphorus, dissolved	7723-14-0	E469S	20.0 mg/L	20 mg/L	100	70.0	130	----
		potassium, dissolved	7440-09-7	E469S	ND mg/L	8 mg/L	ND	70.0	130	----
		rhenium, dissolved	7440-15-5	E469S	0.00477 mg/L	0.005 mg/L	95.3	70.0	130	----
		rubidium, dissolved	7440-17-7	E469S	0.0397 mg/L	0.04 mg/L	99.2	70.0	130	----
		selenium, dissolved	7782-49-2	E469S	0.0774 mg/L	0.08 mg/L	96.7	70.0	130	----
		silver, dissolved	7440-22-4	E469S	0.00740 mg/L	0.008 mg/L	92.4	70.0	130	----
		strontium, dissolved	7440-24-6	E469S	ND mg/L	0.04 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 604472) - continued										
YL2201196-002	MP05-North-1-22	sulfur, dissolved	7704-34-9	E469S	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E469S	0.0748 mg/L	0.08 mg/L	93.5	70.0	130	----
		thallium, dissolved	7440-28-0	E469S	0.00700 mg/L	0.008 mg/L	87.5	70.0	130	----
		thorium, dissolved	7440-29-1	E469S	0.0380 mg/L	0.04 mg/L	94.9	70.0	130	----
		tin, dissolved	7440-31-5	E469S	0.0368 mg/L	0.04 mg/L	92.0	70.0	130	----
		titanium, dissolved	7440-32-6	E469S	0.0791 mg/L	0.08 mg/L	98.8	70.0	130	----
		tungsten, dissolved	7440-33-7	E469S	0.0354 mg/L	0.04 mg/L	88.5	70.0	130	----
		uranium, dissolved	7440-61-1	E469S	0.00688 mg/L	0.008 mg/L	85.9	70.0	130	----
		vanadium, dissolved	7440-62-2	E469S	0.195 mg/L	0.2 mg/L	97.6	70.0	130	----
		yttrium, dissolved	7440-65-5	E469S	0.00496 mg/L	0.005 mg/L	99.2	70.0	130	----
		zinc, dissolved	7440-66-6	E469S	0.717 mg/L	0.8 mg/L	89.6	70.0	130	----
		zirconium, dissolved	7440-67-7	E469S	0.0813 mg/L	0.08 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 609969)										
VA22B8899-002	Anonymous	mercury, dissolved	7439-97-6	E509S	0.000105 mg/L	0.0001 mg/L	105	70.0	130	----
Dissolved Metals (QCLot: 610980)										
YL2201196-003	MP05-ENE-1-22	mercury, dissolved	7439-97-6	E509S	0.000104 mg/L	0.0001 mg/L	104	70.0	130	----
Volatile Organic Compounds (QCLot: 605565)										
VA22B8899-001	Anonymous	benzene	71-43-2	E611A	103 µg/L	100 µg/L	103	60.0	140	----
		ethylbenzene	100-41-4	E611A	102 µg/L	100 µg/L	102	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	98.8 µg/L	100 µg/L	98.8	60.0	140	----
		styrene	100-42-5	E611A	109 µg/L	100 µg/L	109	60.0	140	----
		toluene	108-88-3	E611A	104 µg/L	100 µg/L	104	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	214 µg/L	200 µg/L	107	60.0	140	----
		xylene, o-	95-47-6	E611A	103 µg/L	100 µg/L	103	60.0	140	----
Hydrocarbons (QCLot: 605564)										
VA22B8899-002	Anonymous	F1 (C6-C10)	----	E581.VH+F1	5160 µg/L	6310 µg/L	81.8	60.0	140	----
		VHw (C6-C10)	----	E581.VH+F1	5170 µg/L	6310 µg/L	81.9	60.0	140	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 21 - 02

Page 1 of 1

Canada Toll Free: 1 800 668 9878

ALS www.alsglobal.com

Report To — Contact and company name below will appear on the final report

Company:	Golder Associates Ltd.
Contact:	Elaine Irving/Connor Pettern
Phone:	1-604-297-2030/1-604-296-4200
	Company address below will appear on the final report
Street:	Suite 200 - 2920 Virtual Way
City/Province:	Vancouver, BC
Postal Code:	V5M 0C4

Invoice To

Same as Report To	☑ YES	☐ NO
Copy of Invoice with Report	☐ YES	☑ NO
Company:		
Contact:		

Project Information

ALS Account # / Quote #:	
Job #:	GOLD 100-028
PO / AFE:	166372401/64000/03
LSD:	

ALS Lab Work Order # (ALS use only):

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: elaine.irving@wsp.com

Email 2: connor.pettern@wsp.com

Email 3: trish.tomliens@wsp.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax:

Email 2:

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Amber Springer — Sampler: TT/MR/DV

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please contact your AM to confirm availability.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

Environmental Division
Yellowknife
Work Order Reference
YL2201196

Telephone: +1 867 873 5593

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	General (alkalinity, turbidity, conduc	Anions, TOC, DOC, Hardness, Salir	pH, TSS, TDS, Ammonia, TKN)	Dissolved Metals	Total Metals	Dissolved Mercury	Total Mercury	Nutrients (including total phosphoru	Petroleum hydrocarbons (MTBE)	Petroleum hydrocarbons (BTEX,F1)	Hydrocarbons (LEPH/HEPH)	PAH, F2-F4			SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
									F/P	P	F/P	P	P	P	P	P	P					
	MP05-Source-1-22	6-Aug-22	11:35	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
	MP05-North-1-22	6-Aug-22	12:00	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
	MP05-ENE-1-22	6-Aug-22	12:15	Seawater	6	R	R	R	R	R	R	R	R									
	MP05-WNW-1-22	6-Aug-22	11:20	Seawater	5	R	R	R	R	R	R	R	R									
	DUP-B	6-Aug-22		Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
	MP06-Source-2-22	6-Aug-22	10:10	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
	MP06-North-2-22	6-Aug-22	10:30	Seawater	6	R	R	R	R	R	R	R	R									
	MP06-ENE-2-22	6-Aug-22	10:45	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
	MP06-WNW-2-22	6-Aug-22	10:20	Seawater	6	R	R	R	R	R	R	R	R									

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?
☐ YES ☑ NO

Are samples for human consumption/ use?
☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please refer to quote for all analyses.

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A — Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C — FINAL COOLER TEMPERATURES °C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Patricia Tomliens	Date: 6 Aug 2022	Time: 16:34	Received by:	Date:	Time:	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order	: **VA22B8597**	Page	: 1 of 14
Client	: **Golder Associates Ltd.**	Laboratory	: Vancouver - Environmental
Contact	: Elaine Irving	Account Manager	: Amber Springer
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: 166372401/64000/03	Date Samples Received	: 11-Aug-2022 08:12
PO	:	Date Analysis Commenced	: 11-Aug-2022
C-O-C number	: 21-03	Issue Date	: 25-Aug-2022 16:04
Sampler	: TT/MR/DV		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Thornton	Analyst	Metals, Burnaby, British Columbia
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Ann Joby	Lab Assistant	Metals, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Erin Sanchez		Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Inorganics, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
psu	practical salinity units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Sample Comments

Sample	*Client Id*	*Comment*
VA22B8597-004	MP05-WNW-1-22	Sample 4: Water sample for dissolved mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

Qualifiers

Qualifier	*Description*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-2
				Client sampling date / time	08-Aug-2022 14:35	08-Aug-2022 13:45	08-Aug-2022 14:10	08-Aug-2022 14:15	08-Aug-2022
					VA22B8597-001	VA22B8597-002	VA22B8597-003	VA22B8597-004	VA22B8597-005
					Result	Result	Result	Result	Result
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	69.7	65.6	66.1	67.1	4.6
conductivity	----	E100S	2.0	µS/cm	4630	7140	6210	6640	21.8
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	484	672	563	623	<1.00
pH	----	E108	0.10	pH units	7.94	7.93	7.94	7.94	6.83
salinity	----	EC100S	1.0	psu	2.5	4.0	3.4	3.7	<1.0
solids, total dissolved [TDS]	----	E162S	10	mg/L	2680	4330	3750	3860	12
solids, total suspended [TSS]	----	E160S	2.0	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0
turbidity	----	E121	0.10	NTU	0.58	0.37	0.37	0.33	<0.10
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
bromide	24959-67-9	E235S.Br	5.0	mg/L	<5.0	7.4	6.5	7.0	<5.0
chloride	16887-00-6	E235S.Cl	50	mg/L	1390	2220	1960	2040	<50
fluoride	16984-48-8	E235S.F-L	0.20	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20
Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	<0.050	0.069	<0.050	<0.050	<0.050
nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	0.066	<0.010	<0.010	<0.010	0.034
nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
phosphorus, total	7723-14-0	E372S	0.0020	mg/L	0.0127	0.0057	0.0063	0.0065	<0.0020
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0092	0.0042	0.0051	0.0044	<0.0020
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	194	309	276	279	<3.0
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.10	1.18	1.11	1.18	0.53
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.31	0.91	0.82	0.94	<0.50
Total Metals									
aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0170	0.0131	0.0163	0.0127	<0.0050
antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
arsenic, total	7440-38-2	E468S	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
barium, total	7440-39-3	E468S	0.0010	mg/L	0.0038	0.0040	0.0042	0.0042	<0.0010
beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
boron, total	7440-42-8	E468S	0.30	mg/L	0.32	0.48	0.41	0.44	<0.30

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-2
Client sampling date / time					08-Aug-2022 14:35	08-Aug-2022 13:45	08-Aug-2022 14:10	08-Aug-2022 14:15	08-Aug-2022
					VA22B8597-001	VA22B8597-002	VA22B8597-003	VA22B8597-004	VA22B8597-005
					Result	Result	Result	Result	Result
Total Metals									
cadmium, total	7440-43-9	E468S	0.000010	mg/L	<0.000010	<0.000010	0.000024	0.000010	<0.000010
calcium, total	7440-70-2	E468S	1.0	mg/L	45.9	61.7	56.0	57.9	<1.0
cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0.00165	<0.00050	<0.00050
cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
copper, total	7440-50-8	E468S	0.00050	mg/L	0.00332	0.00210	0.00809	0.00236	<0.00050
gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, total	7439-89-6	E468S	0.010	mg/L	0.017	<0.010	0.049	<0.010	<0.010
lead, total	7439-92-1	E468S	0.000050	mg/L	0.000101	<0.000050	0.00125	0.000132	<0.000050
lithium, total	7439-93-2	E468S	0.020	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020
magnesium, total	7439-95-4	E468S	1.0	mg/L	97.1	149	124	141	<1.0
manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00105	0.00094	0.00123	0.00089	<0.00020
mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00093	0.00138	0.00122	0.00126	<0.00010
nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	0.00073	<0.00050	<0.00050
phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, total	7440-09-7	E468S	1.0	mg/L	30.4	47.2	40.2	44.1	<1.0
rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.0089	0.0135	0.0114	0.0127	<0.0050
selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	803	1230	1050	1110	2.6
strontium, total	7440-24-6	E468S	0.010	mg/L	0.589	0.945	0.796	0.833	<0.010
sulfur, total	7704-34-9	E468S	5.0	mg/L	70.0	111	95.9	102	<5.0
tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Analytical Results

Sub-Matrix: Seawater
(Matrix: Water)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-2
				Client sampling date / time	08-Aug-2022 14:35	08-Aug-2022 13:45	08-Aug-2022 14:10	08-Aug-2022 14:15	08-Aug-2022
					VA22B8597-001	VA22B8597-002	VA22B8597-003	VA22B8597-004	VA22B8597-005
					Result	Result	Result	Result	Result
Total Metals									
uranium, total	7440-61-1	E468S	0.000050	mg/L	0.000824	0.000900	0.00102	0.000854	<0.000050
vanadium, total	7440-62-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	0.0062	<0.0030	0.0038 RRV
zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Metals									
aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0035	0.0040	0.0036	0.0038	<0.0010
beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
boron, dissolved	7440-42-8	E469S	0.30	mg/L	<0.30	0.43	0.36	0.37	<0.30
cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
calcium, dissolved	7440-70-2	E469S	1.0	mg/L	42.9	54.6	47.4	50.0	<1.0
cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00088	0.00059	0.00058	0.00066	<0.00020
gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, dissolved	7439-93-2	E469S	0.020	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020
magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	91.4	130	108	121	<1.0
manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00067	0.00079	0.00068	0.00073	<0.00010
mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00089	0.00128	0.00106	0.00119	<0.00010
nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E469S	1.0	mg/L	28.2	44.8	35.4	40.0	<1.0
rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: Seawater
(Matrix: Water)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-2
Client sampling date / time					08-Aug-2022 14:35	08-Aug-2022 13:45	08-Aug-2022 14:10	08-Aug-2022 14:15	08-Aug-2022
					VA22B8597-001	VA22B8597-002	VA22B8597-003	VA22B8597-004	VA22B8597-005
					Result	Result	Result	Result	Result
Dissolved Metals									
rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.0088	0.0132	0.0108	0.0119	<0.0050
selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	737	1180	982	1100	<2.5
strontium, dissolved	7440-24-6	E469S	0.010	mg/L	0.558	0.886	0.702	0.797	<0.010
sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	62.7	99.5	81.2	93.1	<5.0
tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.000899	0.000942	0.000992	0.000888	<0.000050
vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	0.0012	<0.0010	<0.0010	0.0012	0.0047 RRV
zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field
Volatile Organic Compounds [Fuels]									
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	----	----	----
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	----	----	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	----	----	----
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	----	----	----
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	----	----	----
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	----	----	----
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	----	----	----
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	----	----	----
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	80.0	78.5	----	----	----

Analytical Results

Sub-Matrix: Seawater

(Matrix: Water)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-2 2	MP05-ENE-1-22	MP05-WNW-1-2 2	MLP-2
Client sampling date / time					08-Aug-2022 14:35	08-Aug-2022 13:45	08-Aug-2022 14:10	08-Aug-2022 14:15	08-Aug-2022
					VA22B8597-001	VA22B8597-002	VA22B8597-003	VA22B8597-004	VA22B8597-005
					Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates									
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	103	102	----	----	----
Hydrocarbons									
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	----	----	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	----	----	----
F2 (C10-C16)	----	E601	100	µg/L	<100	<100	----	----	----
F3 (C16-C34)	----	E601	250	µg/L	<250	<250	----	----	----
F4 (C34-C50)	----	E601	250	µg/L	<250	<250	----	----	----
TEH (C10-C50)	----	E601	400	µg/L	<400	<400	----	----	----
TEH (C16-C50)	----	E601	400	µg/L	<400	<400	----	----	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	----	----
F1-BTEX	----	EC580	100	µg/L	<100	<100	----	----	----
HEPHw	----	EC600A	250	µg/L	<250	<250	----	----	----
LEPHw	----	EC600A	250	µg/L	<250	<250	----	----	----
VPHw	----	EC580A	100	µg/L	<100	<100	----	----	----
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	----	----
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	92.1	96.2	----	----	----
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%	86.1	89.7	----	----	----
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	94.2	99.1	----	----	----
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
acridine	260-94-6	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
anthracene	120-12-7	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	----
benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	<0.015	<0.015	----	----	----
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
chrysene	218-01-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	----

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

				Client sample ID	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-2
				Client sampling date / time	08-Aug-2022 14:35	08-Aug-2022 13:45	08-Aug-2022 14:10	08-Aug-2022 14:15	08-Aug-2022
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	VA22B8597-001	VA22B8597-002	VA22B8597-003	VA22B8597-004	VA22B8597-005
					Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons									
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	----
fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
fluorene	86-73-7	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	<0.050	----	----	----
phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	<0.020	----	----	----
pyrene	129-00-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
quinoline	91-22-5	E641A	0.050	µg/L	<0.050	<0.050	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
chrysene-d12	1719-03-5	E641A	0.1	%	105	112	----	----	----
naphthalene-d8	1146-65-2	E641A	0.1	%	102	104	----	----	----
phenanthrene-d10	1517-22-2	E641A	0.1	%	105	118	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Seawater
(Matrix: Water)

Analyte	CAS Number	Method	LOR	Unit	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
Client sampling date / time					08-Aug-2022 12:05	08-Aug-2022 12:43	08-Aug-2022 13:20	08-Aug-2022 13:02	----
					VA22B8597-006	VA22B8597-007	VA22B8597-008	VA22B8597-009	--------
					Result	Result	Result	Result	----
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	65.5	117	114	65.8	----
conductivity	----	E100S	2.0	µS/cm	8390	47500	47300	10200	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	765	5580	5560	811	----
pH	----	E108	0.10	pH units	7.91	7.95	7.97	7.90	----
salinity	----	EC100S	1.0	psu	4.7	31.3	31.2	5.8	----
solids, total dissolved [TDS]	----	E162S	10	mg/L	5000	25000	31200	6220	----
solids, total suspended [TSS]	----	E160S	2.0	mg/L	2.3	<2.0	<2.0	<2.0	----
turbidity	----	E121	0.10	NTU	1.20	0.11	0.10	0.42	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	0.0287	0.0133	<0.0050	----
bromide	24959-67-9	E235S.Br	5.0	mg/L	8.8	61.5	61.6	10.5	----
chloride	16887-00-6	E235S.Cl	50	mg/L	2650	18000	17800	3270	----
fluoride	16984-48-8	E235S.F-L	0.20	mg/L	<0.20	0.76	0.89	0.23	----
Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	<0.050	0.142	0.126	0.088	----
nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	0.058	<0.010	<0.010	<0.010	----
nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	----
phosphorus, total	7723-14-0	E372S	0.0020	mg/L	0.0058	0.0295	0.0272	0.0056	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0036	0.0268	0.0258	0.0038	----
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	373	2460	2450	460	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.19	1.60	1.45	1.06	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	0.83	0.93	0.90	0.84	----
Total Metals									
aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0227	0.0104	0.0099	0.0094	----
antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0025 DLM	<0.0025 DLM	<0.0010	----
arsenic, total	7440-38-2	E468S	0.00040	mg/L	<0.00040	0.00160	0.00153	<0.00040	----
barium, total	7440-39-3	E468S	0.0010	mg/L	0.0042	0.0084	0.0087	0.0042	----
beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
boron, total	7440-42-8	E468S	0.30	mg/L	0.58	3.31	3.31	0.55	----
cadmium, total	7440-43-9	E468S	0.000010	mg/L	0.000012	0.000032	<0.000025 DLM	<0.000010	----

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	08-Aug-2022 12:05	08-Aug-2022 12:43	08-Aug-2022 13:20	08-Aug-2022 13:02	----
					VA22B8597-006	VA22B8597-007	VA22B8597-008	VA22B8597-009	--------
					Result	Result	Result	Result	----
Total Metals									
calcium, total	7440-70-2	E468S	1.0	mg/L	70.1	396	384	66.0	----
cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000100 DLM	<0.000100 DLM	<0.000050	----
copper, total	7440-50-8	E468S	0.00050	mg/L	0.00326	0.00401	0.00756	0.00168	----
gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
iron, total	7439-89-6	E468S	0.010	mg/L	0.029	<0.025 DLM	<0.025 DLM	<0.010	----
lead, total	7439-92-1	E468S	0.000050	mg/L	0.000163	<0.000100 DLM	0.000224	<0.000050	----
lithium, total	7439-93-2	E468S	0.020	mg/L	0.022	0.136	0.133	<0.020	----
magnesium, total	7439-95-4	E468S	1.0	mg/L	182	1200	1200	187	----
manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00126	0.00068	0.00068	0.00079	----
mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	----
molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00160	0.0104	0.0103	0.00186	----
nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	<0.125 DLM	<0.125 DLM	<0.050	----
potassium, total	7440-09-7	E468S	1.0	mg/L	57.4	404	408	61.8	----
rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.0160	0.110	0.106	0.0193	----
selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----
silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00025 DLM	<0.00025 DLM	<0.00010	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	1500	9830	10200	1810	----
strontium, total	7440-24-6	E468S	0.010	mg/L	1.13	7.54	7.53	1.26	----
sulfur, total	7704-34-9	E468S	5.0	mg/L	140	982	983	142	----
tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000100 DLM	<0.000100 DLM	<0.000050	----
thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0025 DLM	<0.0025 DLM	<0.0010	----
titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0125 DLM	<0.0125 DLM	<0.0050	----
tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0025 DLM	<0.0025 DLM	<0.0010	----
uranium, total	7440-61-1	E468S	0.000050	mg/L	0.00185	0.00265	0.00256	0.000862	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	08-Aug-2022 12:05	08-Aug-2022 12:43	08-Aug-2022 13:20	08-Aug-2022 13:02	----
Analyte	CAS Number	Method	LOR	Unit	VA22B8597-006	VA22B8597-007	VA22B8597-008	VA22B8597-009	--------
					Result	Result	Result	Result	----
Total Metals									
vanadium, total	7440-62-2	E468S	0.00050	mg/L	<0.00050	0.00133	0.00126	<0.00050	----
yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0050 DLM	<0.0050 DLM	<0.0030	----
zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	<0.0050	<0.0125 DLM	<0.0125 DLM	<0.0050	----
antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0025 DLM	<0.0025 DLM	<0.0010	----
arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	<0.00040	0.00146	0.00147	<0.00040	----
barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0039	0.0082	0.0082	0.0041	----
beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
boron, dissolved	7440-42-8	E469S	0.30	mg/L	0.47	3.51	3.48	0.44	----
cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	<0.000010	<0.000025 DLM	0.000026	<0.000010	----
calcium, dissolved	7440-70-2	E469S	1.0	mg/L	60.8	389	379	64.3	----
cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000100 DLM	<0.000100 DLM	<0.000050	----
copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00038	0.00062	0.00112	0.00045	----
gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.025 DLM	<0.025 DLM	<0.010	----
lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000100 DLM	<0.000100 DLM	<0.000050	----
lithium, dissolved	7439-93-2	E469S	0.020	mg/L	<0.020	0.135	0.133	<0.020	----
magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	149	1120	1120	158	----
manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00067	0.00045	0.00042	0.00064	----
mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	----
molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00154	0.00983	0.0102	0.00177	----
nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.125 DLM	<0.125 DLM	<0.050	----
potassium, dissolved	7440-09-7	E469S	1.0	mg/L	51.2	382	386	55.9	----
rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.0155	0.107	0.106	0.0189	----

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	08-Aug-2022 12:05	08-Aug-2022 12:43	08-Aug-2022 13:20	08-Aug-2022 13:02	----
Analyte	CAS Number	Method	LOR	Unit	VA22B8597-006	VA22B8597-007	VA22B8597-008	VA22B8597-009	--------
					Result	Result	Result	Result	----
Dissolved Metals									
selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----
silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00025 DLM	<0.00025 DLM	<0.00010	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	1410	9720	9640	1760	----
strontium, dissolved	7440-24-6	E469S	0.010	mg/L	1.02	7.47	7.55	1.26	----
sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	126	965	946	128	----
tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000100 DLM	<0.000100 DLM	<0.000050	----
thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0025 DLM	<0.0025 DLM	<0.0010	----
titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0125 DLM	<0.0125 DLM	<0.0050	----
tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0025 DLM	<0.0025 DLM	<0.0010	----
uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.00182	0.00273	0.00259	0.000843	----
vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	0.0014	<0.0025 DLM	<0.0025 DLM	<0.0010	----
zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00125 DLM	<0.00125 DLM	<0.00050	----
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	----
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	----
Volatile Organic Compounds [Fuels]									
benzene	71-43-2	E611A	0.50	μg/L	<0.50	----	<0.50	----	----
ethylbenzene	100-41-4	E611A	0.50	μg/L	<0.50	----	<0.50	----	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	μg/L	<0.50	----	<0.50	----	----
styrene	100-42-5	E611A	0.50	μg/L	<0.50	----	<0.50	----	----
toluene	108-88-3	E611A	0.50	μg/L	<0.50	----	<0.50	----	----
xylene, m+p-	179601-23-1	E611A	0.40	μg/L	<0.40	----	<0.40	----	----
xylene, o-	95-47-6	E611A	0.30	μg/L	<0.30	----	<0.30	----	----
xylenes, total	1330-20-7	E611A	0.50	μg/L	<0.50	----	<0.50	----	----
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	79.1	----	79.0	----	----
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	101	----	101	----	----

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	08-Aug-2022 12:05	08-Aug-2022 12:43	08-Aug-2022 13:20	08-Aug-2022 13:02	----
					VA22B8597-006	VA22B8597-007	VA22B8597-008	VA22B8597-009	--------
					Result	Result	Result	Result	----
Hydrocarbons									
EPH (C10-C19)	----	E601A	250	µg/L	<250	----	<250	----	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----	<250	----	----
F2 (C10-C16)	----	E601	100	µg/L	<100	----	<100	----	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----	<250	----	----
F4 (C34-C50)	----	E601	250	µg/L	<250	----	<250	----	----
TEH (C10-C50)	----	E601	400	µg/L	<400	----	<400	----	----
TEH (C16-C50)	----	E601	400	µg/L	<400	----	<400	----	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----	<100	----	----
F1-BTEX	----	EC580	100	µg/L	<100	----	<100	----	----
HEPHw	----	EC600A	250	µg/L	<250	----	<250	----	----
LEPHw	----	EC600A	250	µg/L	<250	----	<250	----	----
VPHw	----	EC580A	100	µg/L	<100	----	<100	----	----
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----	<100	----	----
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	92.4	----	96.9	----	----
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%	88.1	----	89.7	----	----
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	106	----	107	----	----
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
acridine	260-94-6	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
anthracene	120-12-7	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	----	<0.0050	----	----
benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	<0.015	----	<0.015	----	----
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
chrysene	218-01-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	----	<0.0050	----	----
fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	08-Aug-2022 12:05	08-Aug-2022 12:43	08-Aug-2022 13:20	08-Aug-2022 13:02	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	VA22B8597-006	VA22B8597-007	VA22B8597-008	VA22B8597-009	--------
					Result	Result	Result	Result	----
Polycyclic Aromatic Hydrocarbons									
fluorene	86-73-7	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	----	<0.050	----	----
phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	----	<0.020	----	----
pyrene	129-00-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
quinoline	91-22-5	E641A	0.050	µg/L	<0.050	----	<0.050	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
chrysene-d12	1719-03-5	E641A	0.1	%	110	----	118	----	----
naphthalene-d8	1146-65-2	E641A	0.1	%	100	----	112	----	----
phenanthrene-d10	1517-22-2	E641A	0.1	%	105	----	121	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA22B8597**	Laboratory	: Vancouver - Environmental
Client	: **Golder Associates Ltd.**	Account Manager	: Amber Springer
Contact	: Elaine Irving	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Telephone	: +1 604 253 4188
Telephone	: ----	Date Samples Received	: 11-Aug-2022 08:12
Project	: 166372401/64000/03	Issue Date	: 25-Aug-2022 16:05
PO	:		
C-O-C number	: 21-03		
Sampler	: TT/MR/DV		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- Matrix Spike outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Total Metals	QC-MRG2-598730002	----	tellurium, total	13494-80-9	E468S	124 % MES	80.0-120%	Recovery greater than upper control limit
Dissolved Metals	QC-MRG2-598765002	----	boron, dissolved	7440-42-8	E469S	78.4 % MES	80.0-120%	Recovery less than lower control limit
Dissolved Metals	QC-MRG2-598765002	----	lithium, dissolved	7439-93-2	E469S	77.6 % MES	80.0-120%	Recovery less than lower control limit

Result Qualifiers

Qualifier	*Description*
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Matrix Spike (MS) Recoveries								
Total Metals	Anonymous	Anonymous	lithium, total	7439-93-2	E468S	68.0 % MES	70.0-130%	Recovery less than lower data quality objective
Dissolved Metals	Anonymous	Anonymous	lithium, dissolved	7439-93-2	E469S	66.8 % MES	70.0-130%	Recovery less than lower data quality objective

Result Qualifiers

Qualifier	*Description*
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MLP-2	E298	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	17-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-ENE-1-22	E298	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	17-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-Source-1-22	E298	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	17-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-WNW-1-22	E298	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	17-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-North-1-22	E298	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	17-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-ENE-2-22	E298	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	17-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-North-2-22	E298	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	17-Aug-2022	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-Source-2-22	E298	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	17-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-WNW-2-22	E298	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	17-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MLP-2	E235S.Br	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-ENE-1-22	E235S.Br	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-North-1-22	E235S.Br	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-Source-1-22	E235S.Br	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-WNW-1-22	E235S.Br	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-ENE-2-22	E235S.Br	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-North-2-22	E235S.Br	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-Source-2-22	E235S.Br	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-WNW-2-22	E235S.Br	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MLP-2	E235S.Cl	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-ENE-1-22	E235S.Cl	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-North-1-22	E235S.Cl	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-Source-1-22	E235S.Cl	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-WNW-1-22	E235S.Cl	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-ENE-2-22	E235S.Cl	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-North-2-22	E235S.Cl	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-Source-2-22	E235S.Cl	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-WNW-2-22	E235S.Cl	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MLP-2	E235S.F-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.F-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.F-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.F-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.F-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.F-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.F-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.F-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.F-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MLP-2	E235S.NO3-T	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-ENE-1-22	E235S.NO3-T	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-North-1-22	E235S.NO3-T	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-Source-1-22	E235S.NO3-T	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-WNW-1-22	E235S.NO3-T	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-ENE-2-22	E235S.NO3-T	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-North-2-22	E235S.NO3-T	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-Source-2-22	E235S.NO3-T	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-WNW-2-22	E235S.NO3-T	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MLP-2	E235S.NO2-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.NO2-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.NO2-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.NO2-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.NO2-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.NO2-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.NO2-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.NO2-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.NO2-L	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	3 days	7 days	× EHTL
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MLP-2	E235S.SO4-L	08-Aug-2022	15-Aug-2022	28 days	7 days	✓	15-Aug-2022	21 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.SO4-L	08-Aug-2022	15-Aug-2022	28 days	7 days	✓	15-Aug-2022	21 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.SO4-L	08-Aug-2022	15-Aug-2022	28 days	7 days	✓	15-Aug-2022	21 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.SO4-L	08-Aug-2022	15-Aug-2022	28 days	7 days	✓	15-Aug-2022	21 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.SO4-L	08-Aug-2022	15-Aug-2022	28 days	7 days	✓	15-Aug-2022	21 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.SO4-L	08-Aug-2022	15-Aug-2022	28 days	7 days	✓	15-Aug-2022	21 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.SO4-L	08-Aug-2022	15-Aug-2022	28 days	7 days	✓	15-Aug-2022	21 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.SO4-L	08-Aug-2022	15-Aug-2022	28 days	7 days	✓	15-Aug-2022	21 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.SO4-L	08-Aug-2022	15-Aug-2022	28 days	7 days	✓	15-Aug-2022	21 days	0 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MLP-2	E375-T	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP05-Source-1-22	E375-T	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP05-ENE-1-22	E375-T	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP05-North-1-22	E375-T	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP05-WNW-1-22	E375-T	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP06-ENE-2-22	E375-T	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP06-North-2-22	E375-T	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	13-Aug-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP06-Source-2-22	E375-T	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP06-WNW-2-22	E375-T	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MLP-2	E318S	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	18-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-ENE-1-22	E318S	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	18-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-Source-1-22	E318S	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	18-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-WNW-1-22	E318S	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	18-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-North-1-22	E318S	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	18-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-ENE-2-22	E318S	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	18-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-North-2-22	E318S	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	18-Aug-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: ✘ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation* Preparation Date	Holding Times Rec	Holding Times Actual	Eval	*Analysis* Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-Source-2-22	E318S	08-Aug-2022	12-Aug-2022	3 days	4 days	✘ EHTL	18-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-WNW-2-22	E318S	08-Aug-2022	12-Aug-2022	3 days	4 days	✘ EHTL	18-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MLP-2	E372S	08-Aug-2022	12-Aug-2022	3 days	3 days	✘ EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP05-ENE-1-22	E372S	08-Aug-2022	12-Aug-2022	3 days	3 days	✘ EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP05-Source-1-22	E372S	08-Aug-2022	12-Aug-2022	3 days	3 days	✘ EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP05-WNW-1-22	E372S	08-Aug-2022	12-Aug-2022	3 days	3 days	✘ EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP05-North-1-22	E372S	08-Aug-2022	12-Aug-2022	3 days	4 days	✘ EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP06-ENE-2-22	E372S	08-Aug-2022	12-Aug-2022	3 days	4 days	✘ EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP06-North-2-22	E372S	08-Aug-2022	12-Aug-2022	3 days	4 days	✘ EHTL	13-Aug-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP06-Source-2-22	E372S	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	13-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP06-WNW-2-22	E372S	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	13-Aug-2022	28 days	1 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
HDPE dissolved (nitric acid) MP05-WNW-1-22	E509S	08-Aug-2022	18-Aug-2022	28 days	10 days	✓	18-Aug-2022	18 days	0 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MLP-2	E509S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-ENE-1-22	E509S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-North-1-22	E509S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-Source-1-22	E509S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-ENE-2-22	E509S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-North-2-22	E509S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-Source-2-22	E509S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-WNW-2-22	E509S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MLP-2	E469S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-ENE-1-22	E469S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-North-1-22	E469S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-Source-1-22	E469S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-WNW-1-22	E469S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-ENE-2-22	E469S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-North-2-22	E469S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-Source-2-22	E469S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-WNW-2-22	E469S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MLP-2	E469S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-ENE-1-22	E469S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-North-1-22	E469S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-Source-1-22	E469S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-WNW-1-22	E469S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-ENE-2-22	E469S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-North-2-22	E469S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-Source-2-22	E469S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-WNW-2-22	E469S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-North-1-22	E601A	08-Aug-2022	16-Aug-2022	14 days	8 days	✓	17-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E601A	08-Aug-2022	16-Aug-2022	14 days	8 days	✓	17-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E601A	08-Aug-2022	16-Aug-2022	14 days	8 days	✓	17-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E601A	08-Aug-2022	16-Aug-2022	14 days	8 days	✓	17-Aug-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-North-1-22	E601	08-Aug-2022	16-Aug-2022	14 days	8 days	✓	17-Aug-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E601	08-Aug-2022	16-Aug-2022	14 days	8 days	✓	17-Aug-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E601	08-Aug-2022	16-Aug-2022	14 days	8 days	✓	17-Aug-2022	40 days	1 days	✓

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E601	08-Aug-2022	16-Aug-2022	14 days	8 days	✓	17-Aug-2022	40 days	1 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP05-North-1-22	E581.VH+F1	08-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	8 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP05-Source-1-22	E581.VH+F1	08-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	8 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP06-ENE-2-22	E581.VH+F1	08-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	8 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP06-Source-2-22	E581.VH+F1	08-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	8 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MLP-2	E358-L	08-Aug-2022	12-Aug-2022	3 days	3 days	✖ EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP05-Source-1-22	E358-L	08-Aug-2022	12-Aug-2022	3 days	3 days	✖ EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP05-ENE-1-22	E358-L	08-Aug-2022	12-Aug-2022	3 days	4 days	✖ EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP05-North-1-22	E358-L	08-Aug-2022	12-Aug-2022	3 days	4 days	✖ EHTL	12-Aug-2022	28 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP05-WNW-1-22	E358-L	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP06-ENE-2-22	E358-L	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP06-North-2-22	E358-L	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP06-Source-2-22	E358-L	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP06-WNW-2-22	E358-L	08-Aug-2022	12-Aug-2022	3 days	4 days	× EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MLP-2	E355-L	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP05-ENE-1-22	E355-L	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP05-Source-1-22	E355-L	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP05-WNW-1-22	E355-L	08-Aug-2022	12-Aug-2022	3 days	3 days	× EHTL	12-Aug-2022	28 days	0 days	✓

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP05-North-1-22	E355-L	08-Aug-2022	12-Aug-2022	3 days	4 days	✖ EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP06-ENE-2-22	E355-L	08-Aug-2022	12-Aug-2022	3 days	4 days	✖ EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP06-North-2-22	E355-L	08-Aug-2022	12-Aug-2022	3 days	4 days	✖ EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP06-Source-2-22	E355-L	08-Aug-2022	12-Aug-2022	3 days	4 days	✖ EHTL	12-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP06-WNW-2-22	E355-L	08-Aug-2022	12-Aug-2022	3 days	4 days	✖ EHTL	12-Aug-2022	28 days	0 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MLP-2	E290	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-ENE-1-22	E290	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-North-1-22	E290	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-Source-1-22	E290	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	14 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-WNW-1-22	E290	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-ENE-2-22	E290	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-North-2-22	E290	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-Source-2-22	E290	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	14 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-WNW-2-22	E290	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	14 days	7 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MLP-2	E100S	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-ENE-1-22	E100S	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-North-1-22	E100S	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-Source-1-22	E100S	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Physical Tests : Conductivity in Seawater										
HDPE MP05-WNW-1-22	E100S	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-ENE-2-22	E100S	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-North-2-22	E100S	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-Source-2-22	E100S	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-WNW-2-22	E100S	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	28 days	7 days	✓
Physical Tests : pH by Meter										
HDPE MLP-2	E108	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	0.25 hrs	0.61 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-ENE-1-22	E108	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	0.25 hrs	0.61 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-North-1-22	E108	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	0.25 hrs	0.61 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-Source-1-22	E108	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	0.25 hrs	0.61 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Physical Tests : pH by Meter										
HDPE MP05-WNW-1-22	E108	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	0.25 hrs	0.61 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-ENE-2-22	E108	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	0.25 hrs	0.61 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-North-2-22	E108	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	0.25 hrs	0.61 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-Source-2-22	E108	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	0.25 hrs	0.61 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-WNW-2-22	E108	08-Aug-2022	15-Aug-2022	----	----		15-Aug-2022	0.25 hrs	0.61 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MLP-2	E162S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-ENE-1-22	E162S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-North-1-22	E162S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-Source-1-22	E162S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE										
MP05-WNW-1-22	E162S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE										
MP06-ENE-2-22	E162S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE										
MP06-North-2-22	E162S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE										
MP06-Source-2-22	E162S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE										
MP06-WNW-2-22	E162S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE										
MLP-2	E160S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE										
MP05-ENE-1-22	E160S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE										
MP05-North-1-22	E160S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE										
MP05-Source-1-22	E160S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE										
MP05-WNW-1-22	E160S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE										
MP06-ENE-2-22	E160S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE										
MP06-North-2-22	E160S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE										
MP06-Source-2-22	E160S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE										
MP06-WNW-2-22	E160S	08-Aug-2022	----	----	----		15-Aug-2022	7 days	7 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE										
MLP-2	E121	08-Aug-2022	----	----	----		11-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE										
MP05-ENE-1-22	E121	08-Aug-2022	----	----	----		11-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE										
MP05-North-1-22	E121	08-Aug-2022	----	----	----		11-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE										
MP05-Source-1-22	E121	08-Aug-2022	----	----	----		11-Aug-2022	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation* Preparation Date	Holding Times Rec	Holding Times Actual	Eval	*Analysis* Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-WNW-1-22	E121	08-Aug-2022	----	----	----		11-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-ENE-2-22	E121	08-Aug-2022	----	----	----		11-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-North-2-22	E121	08-Aug-2022	----	----	----		11-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-Source-2-22	E121	08-Aug-2022	----	----	----		11-Aug-2022	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-WNW-2-22	E121	08-Aug-2022	----	----	----		11-Aug-2022	3 days	3 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-North-1-22	E641A	08-Aug-2022	16-Aug-2022	14 days	8 days	✓	17-Aug-2022	40 days	0 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E641A	08-Aug-2022	16-Aug-2022	14 days	8 days	✓	17-Aug-2022	40 days	0 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E641A	08-Aug-2022	16-Aug-2022	14 days	8 days	✓	17-Aug-2022	40 days	0 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E641A	08-Aug-2022	16-Aug-2022	14 days	8 days	✓	17-Aug-2022	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MLP-2	E508S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-ENE-1-22	E508S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-North-1-22	E508S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-Source-1-22	E508S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-WNW-1-22	E508S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-ENE-2-22	E508S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-North-2-22	E508S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-Source-2-22	E508S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-WNW-2-22	E508S	08-Aug-2022	18-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MLP-2	E468S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-ENE-1-22	E468S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-North-1-22	E468S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-Source-1-22	E468S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-WNW-1-22	E468S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-ENE-2-22	E468S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-North-2-22	E468S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-Source-2-22	E468S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-WNW-2-22	E468S	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MLP-2	E468S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-ENE-1-22	E468S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-North-1-22	E468S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-Source-1-22	E468S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-WNW-1-22	E468S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-ENE-2-22	E468S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-North-2-22	E468S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-Source-2-22	E468S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-WNW-2-22	E468S.NaSi	08-Aug-2022	11-Aug-2022	----	----		15-Aug-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP05-North-1-22	E611A	08-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	8 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP05-Source-1-22	E611A	08-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	8 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP06-ENE-2-22	E611A	08-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	8 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP06-Source-2-22	E611A	08-Aug-2022	15-Aug-2022	----	----		16-Aug-2022	14 days	8 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	602575	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	599322	1	15	6.6	5.0	✓
Bromide in Seawater by IC	E235S.Br	602578	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	603603	1	12	8.3	5.0	✓
Chloride in Seawater by IC	E235S.Cl	602579	1	9	11.1	5.0	✓
Conductivity in Seawater	E100S	602576	1	9	11.1	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	607593	1	9	11.1	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	598765	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	599336	1	19	5.2	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	598766	1	16	6.2	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	602580	1	9	11.1	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	602581	1	9	11.1	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	602582	1	9	11.1	5.0	✓
pH by Meter	E108	602577	1	9	11.1	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	602583	1	9	11.1	5.0	✓
TDS by Gravimetry (Seawater)	E162S	602805	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	599331	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	599332	1	9	11.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	608342	1	9	11.1	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	598730	1	12	8.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	599328	1	19	5.2	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	599330	1	9	11.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	598731	1	12	8.3	5.0	✓
Turbidity by Nephelometry	E121	598781	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	603602	1	17	5.8	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	602575	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	599322	1	15	6.6	5.0	✓
BC PHCs - EPH by GC-FID	E601A	605543	1	17	5.8	5.0	✓
Bromide in Seawater by IC	E235S.Br	602578	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	603603	1	12	8.3	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	605544	1	4	25.0	5.0	✓
Chloride in Seawater by IC	E235S.Cl	602579	1	9	11.1	5.0	✓
Conductivity in Seawater	E100S	602576	1	9	11.1	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	607593	1	9	11.1	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	598765	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	599336	1	19	5.2	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	598766	1	16	6.2	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	602580	1	9	11.1	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	602581	1	9	11.1	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	602582	1	9	11.1	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	605545	1	11	9.0	5.0	✓
pH by Meter	E108	602577	1	9	11.1	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	602583	1	9	11.1	5.0	✓
TDS by Gravimetry (Seawater)	E162S	602805	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	599331	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	599332	1	9	11.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	608342	1	9	11.1	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	598730	1	12	8.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	599328	1	19	5.2	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	599330	1	9	11.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	598731	1	12	8.3	5.0	✓
TSS by Gravimetry (Seawater)	E160S	602773	1	10	10.0	5.0	✓
Turbidity by Nephelometry	E121	598781	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	603602	1	17	5.8	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	602575	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	599322	1	15	6.6	5.0	✓
BC PHCs - EPH by GC-FID	E601A	605543	1	17	5.8	5.0	✓
Bromide in Seawater by IC	E235S.Br	602578	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	603603	1	12	8.3	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	605544	1	4	25.0	5.0	✓
Chloride in Seawater by IC	E235S.Cl	602579	1	9	11.1	5.0	✓
Conductivity in Seawater	E100S	602576	1	9	11.1	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	607593	1	9	11.1	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	598765	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	599336	1	19	5.2	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	598766	1	16	6.2	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	602580	1	9	11.1	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	602581	1	9	11.1	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	602582	1	9	11.1	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	605545	1	11	9.0	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	602583	1	9	11.1	5.0	✓
TDS by Gravimetry (Seawater)	E162S	602805	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	599331	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	599332	1	9	11.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	608342	1	9	11.1	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	598730	1	12	8.3	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	599328	1	19	5.2	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	599330	1	9	11.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	598731	1	12	8.3	5.0	✓
TSS by Gravimetry (Seawater)	E160S	602773	1	10	10.0	5.0	✓
Turbidity by Nephelometry	E121	598781	1	13	7.6	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	603602	1	17	5.8	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	599322	1	15	6.6	5.0	✓
Bromide in Seawater by IC	E235S.Br	602578	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	603603	1	12	8.3	5.0	✓
Chloride in Seawater by IC	E235S.Cl	602579	1	9	11.1	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	607593	1	9	11.1	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	598765	1	17	5.8	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	599336	1	19	5.2	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	598766	1	16	6.2	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	602580	1	9	11.1	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	602581	1	9	11.1	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	602582	1	9	11.1	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	602583	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	599331	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	599332	1	9	11.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	608342	1	9	11.1	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	598730	1	12	8.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	599328	1	19	5.2	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	599330	1	9	11.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	598731	1	12	8.3	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	603602	1	17	5.8	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Seawater	E100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TSS by Gravimetry (Seawater)	E160S Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry (Seawater)	E162S Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Seawater by IC	E235S.Br Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Seawater by IC	E235S.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Seawater by IC (Low Level)	E235S.F-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence	E318S Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total Metals in Seawater by CRC ICPMS (HMI)	E468S Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Seawater samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS (HMI Mode). This method is compliant with digestion requirements of the British Columbia Environmental Laboratory Manual.
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Seawater samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. This method is compliant with digestion requirements of the British Columbia Environmental Laboratory Manual.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Seawater samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS (HMI Mode).
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Seawater samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.
Total Mercury in Seawater by CVAAS	E508S Vancouver - Environmental	Water	EPA 1631E (mod)	Seawater samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Mercury in Seawater by CVAAS	E509S Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Seawater samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Vancouver - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hexane LVI GC-MS	E641A Vancouver - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Salinity in Water (calculation)	EC100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
F1-BTEX	EC580 Vancouver - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.
LEPH and HEPH: EPH-PAH	EC600A Vancouver - Environmental	Water	BC MOE Lab Manual (LEPH and HEPH) (mod)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in Seawater	EP318S Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: **VA22B8597**	Page	: 1 of 20
Client	: Golder Associates Ltd.	Laboratory	: Vancouver - Environmental
Contact	: Elaine Irving	Account Manager	: Amber Springer
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
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Project	: 166372401/64000/03	Date Samples Received	: 11-Aug-2022 08:12
PO	:	Date Analysis Commenced	: 11-Aug-2022
C-O-C number	: 21-03	Issue Date	: 25-Aug-2022 16:05
Sampler	: TT/MR/DV		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Thornton	Analyst	Vancouver Metals, Burnaby, British Columbia
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General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 598781)											
VA22B8597-001	MP05-Source-1-22	turbidity	----	E121	0.10	NTU	0.58	0.56	0.02	Diff <2x LOR	----
Physical Tests (QC Lot: 602575)											
VA22B8597-003	MP05-ENE-1-22	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	66.1	66.5	0.603%	20%	----
Physical Tests (QC Lot: 602576)											
VA22B8597-003	MP05-ENE-1-22	conductivity	----	E100S	2.0	µS/cm	6210	6200	0.161%	20%	----
Physical Tests (QC Lot: 602577)											
VA22B8597-003	MP05-ENE-1-22	pH	----	E108	0.10	pH units	7.94	7.95	0.126%	4%	----
Physical Tests (QC Lot: 602805)											
VA22B8597-001	MP05-Source-1-22	solids, total dissolved [TDS]	----	E162S	20	mg/L	2680	2680	0.0560%	20%	----
Anions and Nutrients (QC Lot: 599322)											
VA22B8498-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0403	0.0422	0.0019	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 599330)											
VA22B8597-001	MP05-Source-1-22	phosphorus, total	7723-14-0	E372S	0.0020	mg/L	0.0127	0.0124	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 599331)											
VA22B8597-001	MP05-Source-1-22	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0092	0.0086	0.0006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 599332)											
VA22B8597-001	MP05-Source-1-22	Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	<0.050	0.125	0.075	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 602578)											
VA22B8597-001	MP05-Source-1-22	bromide	24959-67-9	E235S.Br	5.0	mg/L	<5.0	<5.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 602579)											
VA22B8597-001	MP05-Source-1-22	chloride	16887-00-6	E235S.Cl	50	mg/L	1390	1390	0.400%	20%	----
Anions and Nutrients (QC Lot: 602580)											
VA22B8597-001	MP05-Source-1-22	fluoride	16984-48-8	E235S.F-L	0.20	mg/L	<0.20	<0.20	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 602581)											
VA22B8597-001	MP05-Source-1-22	nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	0.066	0.064	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 602582)											
VA22B8597-001	MP05-Source-1-22	nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 602583)											
VA22B8597-001	MP05-Source-1-22	sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	194	193	0.547%	20%	----
Organic / Inorganic Carbon (QC Lot: 599328)											
VA22B8546-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	5.90	6.29	6.39%	20%	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
					Laboratory Duplicate (DUP) Report						
Organic / Inorganic Carbon (QC Lot: 599336)											
VA22B8546-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	5.57	5.88	5.40%	20%	----
Total Metals (QC Lot: 598730)											
VA22B8083-004	Anonymous	aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0577	0.0560	2.98%	20%	----
		antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E468S	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		barium, total	7440-39-3	E468S	0.0010	mg/L	0.0041	0.0040	0.00007	Diff <2x LOR	----
		beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E468S	0.30	mg/L	0.54	0.52	0.02	Diff <2x LOR	----
		cadmium, total	7440-43-9	E468S	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E468S	1.0	mg/L	59.1	58.7	0.670%	20%	----
		cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, total	7440-50-8	E468S	0.00050	mg/L	0.00326	0.00319	0.00007	Diff <2x LOR	----
		gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E468S	0.010	mg/L	0.063	0.061	0.002	Diff <2x LOR	----
		lead, total	7439-92-1	E468S	0.000050	mg/L	<0.000050	0.000050	0.00000008	Diff <2x LOR	----
		lithium, total	7439-93-2	E468S	0.020	mg/L	0.020	0.021	0.0004	Diff <2x LOR	----
		magnesium, total	7439-95-4	E468S	1.0	mg/L	140	143	2.11%	20%	----
		manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00156	0.00162	0.00006	Diff <2x LOR	----
		molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00135	0.00133	1.78%	20%	----
		nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E468S	1.0	mg/L	45.9	46.1	0.535%	20%	----
		rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.0135	0.0139	0.0004	Diff <2x LOR	----
		selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		strontium, total	7440-24-6	E468S	0.010	mg/L	0.952	0.921	3.35%	20%	----
		sulfur, total	7704-34-9	E468S	5.0	mg/L	107	108	1.20%	20%	----
		tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 598730) - continued											
VA22B8083-004	Anonymous	titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E468S	0.000050	mg/L	0.000754	0.000754	0.0668%	20%	----
		vanadium, total	7440-62-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Total Metals (QC Lot: 598731)											
VA22B8083-004	Anonymous	silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	1200	1230	2.63%	20%	----
Total Metals (QC Lot: 608342)											
VA22B8597-001	MP05-Source-1-22	mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 598765)											
VA22B8083-004	Anonymous	aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	0.0050	<0.0050	0.00003	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0040	0.0037	0.0003	Diff <2x LOR	----
		beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E469S	0.30	mg/L	0.52	0.50	0.02	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E469S	1.0	mg/L	61.0	59.4	2.59%	20%	----
		cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00048	0.00045	0.00003	Diff <2x LOR	----
		gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E469S	0.020	mg/L	0.021	<0.020	0.0008	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	145	140	3.45%	20%	----
		manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00079	0.00078	0.000009	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00131	0.00135	3.14%	20%	----
		nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
					Laboratory Duplicate (DUP) Report						
Dissolved Metals (QC Lot: 598765) - continued											
VA22B8083-004	Anonymous	potassium, dissolved	7440-09-7	E469S	1.0	mg/L	49.0	47.2	3.75%	20%	----
		rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.0142	0.0138	0.0004	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		strontium, dissolved	7440-24-6	E469S	0.010	mg/L	0.916	0.954	4.13%	20%	----
		sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	104	103	0.968%	20%	----
		tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.000729	0.000750	2.92%	20%	----
		vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	0.0013	0.0013	0.00002	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 598766)											
VA22B8083-004	Anonymous	silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	1090	1110	2.08%	20%	----
Dissolved Metals (QC Lot: 607593)											
VA22B8597-001	MP05-Source-1-22	mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 603603)											
VA22B8570-001	Anonymous	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 603602)											
VA22B8570-001	Anonymous	F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----
		VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 598781)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 602575)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	1.1	----
Physical Tests (QCLot: 602576)						
conductivity	----	E100S	2	µS/cm	<2.0	----
Physical Tests (QCLot: 602773)						
solids, total suspended [TSS]	----	E160S	2	mg/L	<2.0	----
Physical Tests (QCLot: 602805)						
solids, total dissolved [TDS]	----	E162S	10	mg/L	<10	----
Anions and Nutrients (QCLot: 599322)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 599330)						
phosphorus, total	7723-14-0	E372S	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 599331)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 599332)						
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 602578)						
bromide	24959-67-9	E235S.Br	5	mg/L	<5.0	----
Anions and Nutrients (QCLot: 602579)						
chloride	16887-00-6	E235S.Cl	50	mg/L	<50	----
Anions and Nutrients (QCLot: 602580)						
fluoride	16984-48-8	E235S.F-L	0.2	mg/L	<0.20	----
Anions and Nutrients (QCLot: 602581)						
nitrate (as N)	14797-55-8	E235S.NO3-T	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 602582)						
nitrite (as N)	14797-65-0	E235S.NO2-L	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 602583)						
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3	mg/L	<3.0	----
Organic / Inorganic Carbon (QCLot: 599328)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 599336)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 598730)						
aluminum, total	7429-90-5	E468S	0.005	mg/L	<0.0050	----
antimony, total	7440-36-0	E468S	0.001	mg/L	<0.0010	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	<0.00040	----
barium, total	7440-39-3	E468S	0.001	mg/L	<0.0010	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	<0.00050	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	<0.00050	----
boron, total	7440-42-8	E468S	0.3	mg/L	<0.30	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	<0.000010	----
calcium, total	7440-70-2	E468S	1	mg/L	<1.0	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	<0.00050	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	<0.000050	----
copper, total	7440-50-8	E468S	0.0005	mg/L	<0.00050	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E468S	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E468S	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E468S	0.02	mg/L	<0.020	----
magnesium, total	7439-95-4	E468S	1	mg/L	<1.0	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	<0.00020	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	<0.00010	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E468S	1	mg/L	<1.0	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	<0.00050	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	<0.0050	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	<0.00050	----
silver, total	7440-22-4	E468S	0.0001	mg/L	<0.00010	----
strontium, total	7440-24-6	E468S	0.01	mg/L	<0.010	----
sulfur, total	7704-34-9	E468S	5	mg/L	<5.0	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	<0.00050	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	<0.000050	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	<0.00050	----
tin, total	7440-31-5	E468S	0.001	mg/L	<0.0010	----
titanium, total	7440-32-6	E468S	0.005	mg/L	<0.0050	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	<0.0010	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 598730) - continued						
vanadium, total	7440-62-2	E468S	0.0005	mg/L	<0.00050	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E468S	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 598731)						
silicon, total	7440-21-3	E468S.NaSi	1	mg/L	<1.0	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	<2.5	----
Total Metals (QCLot: 608342)						
mercury, total	7439-97-6	E508S	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 598765)						
aluminum, dissolved	7429-90-5	E469S	0.005	mg/L	<0.0050	----
antimony, dissolved	7440-36-0	E469S	0.001	mg/L	<0.0010	----
arsenic, dissolved	7440-38-2	E469S	0.0004	mg/L	<0.00040	----
barium, dissolved	7440-39-3	E469S	0.001	mg/L	<0.0010	----
beryllium, dissolved	7440-41-7	E469S	0.0005	mg/L	<0.00050	----
bismuth, dissolved	7440-69-9	E469S	0.0005	mg/L	<0.00050	----
boron, dissolved	7440-42-8	E469S	0.3	mg/L	<0.30	----
cadmium, dissolved	7440-43-9	E469S	0.00001	mg/L	<0.000010	----
calcium, dissolved	7440-70-2	E469S	1	mg/L	<1.0	----
cesium, dissolved	7440-46-2	E469S	0.0005	mg/L	<0.00050	----
chromium, dissolved	7440-47-3	E469S	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E469S	0.00005	mg/L	<0.000050	----
copper, dissolved	7440-50-8	E469S	0.0002	mg/L	<0.00020	----
gallium, dissolved	7440-55-3	E469S	0.0005	mg/L	<0.00050	----
iron, dissolved	7439-89-6	E469S	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E469S	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E469S	0.02	mg/L	<0.020	----
magnesium, dissolved	7439-95-4	E469S	1	mg/L	<1.0	----
manganese, dissolved	7439-96-5	E469S	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E469S	0.0001	mg/L	<0.00010	----
nickel, dissolved	7440-02-0	E469S	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E469S	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E469S	1	mg/L	<1.0	----
rhenium, dissolved	7440-15-5	E469S	0.0005	mg/L	<0.00050	----
rubidium, dissolved	7440-17-7	E469S	0.005	mg/L	<0.0050	----
selenium, dissolved	7782-49-2	E469S	0.0005	mg/L	<0.00050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 598765) - continued						
silver, dissolved	7440-22-4	E469S	0.0001	mg/L	<0.00010	----
strontium, dissolved	7440-24-6	E469S	0.01	mg/L	<0.010	----
sulfur, dissolved	7704-34-9	E469S	5	mg/L	<5.0	----
tellurium, dissolved	13494-80-9	E469S	0.0005	mg/L	<0.00050	----
thallium, dissolved	7440-28-0	E469S	0.00005	mg/L	<0.000050	----
thorium, dissolved	7440-29-1	E469S	0.0005	mg/L	<0.00050	----
tin, dissolved	7440-31-5	E469S	0.001	mg/L	<0.0010	----
titanium, dissolved	7440-32-6	E469S	0.005	mg/L	<0.0050	----
tungsten, dissolved	7440-33-7	E469S	0.001	mg/L	<0.0010	----
uranium, dissolved	7440-61-1	E469S	0.00005	mg/L	<0.000050	----
vanadium, dissolved	7440-62-2	E469S	0.0005	mg/L	<0.00050	----
yttrium, dissolved	7440-65-5	E469S	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E469S	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E469S	0.0005	mg/L	<0.00050	----
Dissolved Metals (QCLot: 598766)						
silicon, dissolved	7440-21-3	E469S.NaSi	1	mg/L	<1.0	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	<2.5	----
Dissolved Metals (QCLot: 607593)						
mercury, dissolved	7439-97-6	E509S	0.000005	mg/L	<0.0000050	----
Volatile Organic Compounds (QCLot: 603603)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 603602)						
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 605543)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
Hydrocarbons (QCLot: 605544)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Hydrocarbons (QCLot: 605544) - continued						
F4 (C34-C50)	----	E601	250	µg/L	<250	----
Polycyclic Aromatic Hydrocarbons (QCLot: 605545)						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
quinoline	91-22-5	E641A	0.05	µg/L	<0.050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 598781)									
turbidity	----	E121	0.1	NTU	200 NTU	96.5	85.0	115	----
Physical Tests (QCLot: 602575)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	109	85.0	115	----
Physical Tests (QCLot: 602576)									
conductivity	----	E100S	2	µS/cm	146.9 µS/cm	98.6	80.0	120	----
Physical Tests (QCLot: 602577)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 602773)									
solids, total suspended [TSS]	----	E160S	2	mg/L	150 mg/L	87.7	85.0	115	----
Physical Tests (QCLot: 602805)									
solids, total dissolved [TDS]	----	E162S	10	mg/L	1000 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 599322)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	96.0	85.0	115	----
Anions and Nutrients (QCLot: 599330)									
phosphorus, total	7723-14-0	E372S	0.002	mg/L	0.05 mg/L	90.4	80.0	120	----
Anions and Nutrients (QCLot: 599331)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	90.1	80.0	120	----
Anions and Nutrients (QCLot: 599332)									
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	4 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 602578)									
bromide	24959-67-9	E235S.Br	5	mg/L	0.5 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 602579)									
chloride	16887-00-6	E235S.Cl	50	mg/L	100 mg/L	99.2	90.0	110	----
Anions and Nutrients (QCLot: 602580)									
fluoride	16984-48-8	E235S.F-L	0.2	mg/L	1 mg/L	98.1	90.0	110	----
Anions and Nutrients (QCLot: 602581)									
nitrate (as N)	14797-55-8	E235S.NO3-T	0.01	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 602582)									
nitrite (as N)	14797-65-0	E235S.NO2-L	0.01	mg/L	0.5 mg/L	98.5	90.0	110	----
Anions and Nutrients (QCLot: 602583)									
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3	mg/L	100 mg/L	101	90.0	110	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Organic / Inorganic Carbon (QCLot: 599328)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	98.3	80.0	120	----
Organic / Inorganic Carbon (QCLot: 599336)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	94.0	80.0	120	----
Total Metals (QCLot: 598730)									
aluminum, total	7429-90-5	E468S	0.005	mg/L	2 mg/L	104	80.0	120	----
antimony, total	7440-36-0	E468S	0.001	mg/L	1 mg/L	109	80.0	120	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	1 mg/L	107	80.0	120	----
barium, total	7440-39-3	E468S	0.001	mg/L	0.25 mg/L	104	80.0	120	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	0.1 mg/L	106	80.0	120	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	1 mg/L	106	80.0	120	----
boron, total	7440-42-8	E468S	0.3	mg/L	10 mg/L	103	80.0	120	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	0.1 mg/L	106	80.0	120	----
calcium, total	7440-70-2	E468S	1	mg/L	50 mg/L	98.7	80.0	120	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	0.05 mg/L	104	80.0	120	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
copper, total	7440-50-8	E468S	0.0005	mg/L	0.25 mg/L	111	80.0	120	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
iron, total	7439-89-6	E468S	0.01	mg/L	1 mg/L	112	80.0	120	----
lead, total	7439-92-1	E468S	0.00005	mg/L	0.5 mg/L	110	80.0	120	----
lithium, total	7439-93-2	E468S	0.02	mg/L	0.25 mg/L	90.3	80.0	120	----
magnesium, total	7439-95-4	E468S	1	mg/L	50 mg/L	105	80.0	120	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	0.5 mg/L	109	80.0	120	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	10 mg/L	109	80.0	120	----
potassium, total	7440-09-7	E468S	1	mg/L	50 mg/L	110	80.0	120	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	0.1 mg/L	103	80.0	120	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	0.1 mg/L	102	80.0	120	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	1 mg/L	118	80.0	120	----
silver, total	7440-22-4	E468S	0.0001	mg/L	0.1 mg/L	104	80.0	120	----
strontium, total	7440-24-6	E468S	0.01	mg/L	0.25 mg/L	103	80.0	120	----
sulfur, total	7704-34-9	E468S	5	mg/L	50 mg/L	103	80.0	120	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	0.1 mg/L	# 124	80.0	120	MES
thallium, total	7440-28-0	E468S	0.00005	mg/L	1 mg/L	107	80.0	120	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	0.1 mg/L	97.7	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Total Metals (QCLot: 598730) - continued									
tin, total	7440-31-5	E468S	0.001	mg/L	0.5 mg/L	101	80.0	120	----
titanium, total	7440-32-6	E468S	0.005	mg/L	0.25 mg/L	95.2	80.0	120	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	0.1 mg/L	104	80.0	120	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	0.005 mg/L	103	80.0	120	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	0.5 mg/L	99.1	80.0	120	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	0.1 mg/L	97.5	80.0	120	----
zinc, total	7440-66-6	E468S	0.003	mg/L	0.5 mg/L	120	80.0	120	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	0.1 mg/L	103	80.0	120	----
Total Metals (QCLot: 598731)									
silicon, total	7440-21-3	E468S.NaSi	1	mg/L	10 mg/L	111	80.0	120	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	50 mg/L	110	80.0	120	----
Total Metals (QCLot: 608342)									
mercury, total	7439-97-6	E508S	0.000005	mg/L	0.0001 mg/L	95.7	80.0	120	----
Dissolved Metals (QCLot: 598765)									
aluminum, dissolved	7429-90-5	E469S	0.005	mg/L	2 mg/L	90.7	80.0	120	----
antimony, dissolved	7440-36-0	E469S	0.001	mg/L	1 mg/L	98.8	80.0	120	----
arsenic, dissolved	7440-38-2	E469S	0.0004	mg/L	1 mg/L	105	80.0	120	----
barium, dissolved	7440-39-3	E469S	0.001	mg/L	0.25 mg/L	104	80.0	120	----
beryllium, dissolved	7440-41-7	E469S	0.0005	mg/L	0.1 mg/L	84.6	80.0	120	----
bismuth, dissolved	7440-69-9	E469S	0.0005	mg/L	1 mg/L	103	80.0	120	----
boron, dissolved	7440-42-8	E469S	0.3	mg/L	10 mg/L	# 78.4	80.0	120	MES
cadmium, dissolved	7440-43-9	E469S	0.00001	mg/L	0.1 mg/L	104	80.0	120	----
calcium, dissolved	7440-70-2	E469S	1	mg/L	50 mg/L	89.6	80.0	120	----
cesium, dissolved	7440-46-2	E469S	0.0005	mg/L	0.05 mg/L	98.8	80.0	120	----
chromium, dissolved	7440-47-3	E469S	0.0005	mg/L	0.25 mg/L	96.2	80.0	120	----
cobalt, dissolved	7440-48-4	E469S	0.00005	mg/L	0.25 mg/L	99.0	80.0	120	----
copper, dissolved	7440-50-8	E469S	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
gallium, dissolved	7440-55-3	E469S	0.0005	mg/L	0.25 mg/L	96.5	80.0	120	----
iron, dissolved	7439-89-6	E469S	0.01	mg/L	1 mg/L	105	80.0	120	----
lead, dissolved	7439-92-1	E469S	0.00005	mg/L	0.5 mg/L	105	80.0	120	----
lithium, dissolved	7439-93-2	E469S	0.02	mg/L	0.25 mg/L	# 77.6	80.0	120	MES
magnesium, dissolved	7439-95-4	E469S	1	mg/L	50 mg/L	92.6	80.0	120	----
manganese, dissolved	7439-96-5	E469S	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
molybdenum, dissolved	7439-98-7	E469S	0.0001	mg/L	0.25 mg/L	96.2	80.0	120	----
nickel, dissolved	7440-02-0	E469S	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
phosphorus, dissolved	7723-14-0	E469S	0.05	mg/L	10 mg/L	99.7	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
					Laboratory Control Sample (LCS) Report				
Dissolved Metals (QCLot: 598765) - continued									
potassium, dissolved	7440-09-7	E469S	1	mg/L	50 mg/L	101	80.0	120	----
rhenium, dissolved	7440-15-5	E469S	0.0005	mg/L	0.1 mg/L	100	80.0	120	----
rubidium, dissolved	7440-17-7	E469S	0.005	mg/L	0.1 mg/L	100	80.0	120	----
selenium, dissolved	7782-49-2	E469S	0.0005	mg/L	1 mg/L	114	80.0	120	----
silver, dissolved	7440-22-4	E469S	0.0001	mg/L	0.1 mg/L	98.7	80.0	120	----
strontium, dissolved	7440-24-6	E469S	0.01	mg/L	0.25 mg/L	104	80.0	120	----
sulfur, dissolved	7704-34-9	E469S	5	mg/L	50 mg/L	95.0	80.0	120	----
tellurium, dissolved	13494-80-9	E469S	0.0005	mg/L	0.1 mg/L	115	80.0	120	----
thallium, dissolved	7440-28-0	E469S	0.00005	mg/L	1 mg/L	100	80.0	120	----
thorium, dissolved	7440-29-1	E469S	0.0005	mg/L	0.1 mg/L	91.6	80.0	120	----
tin, dissolved	7440-31-5	E469S	0.001	mg/L	0.5 mg/L	101	80.0	120	----
titanium, dissolved	7440-32-6	E469S	0.005	mg/L	0.25 mg/L	97.1	80.0	120	----
tungsten, dissolved	7440-33-7	E469S	0.001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, dissolved	7440-61-1	E469S	0.00005	mg/L	0.005 mg/L	92.9	80.0	120	----
vanadium, dissolved	7440-62-2	E469S	0.0005	mg/L	0.5 mg/L	94.2	80.0	120	----
yttrium, dissolved	7440-65-5	E469S	0.0005	mg/L	0.1 mg/L	101	80.0	120	----
zinc, dissolved	7440-66-6	E469S	0.001	mg/L	0.5 mg/L	110	80.0	120	----
zirconium, dissolved	7440-67-7	E469S	0.0005	mg/L	0.1 mg/L	96.1	80.0	120	----
silicon, dissolved	7440-21-3	E469S.NaSi	1	mg/L	10 mg/L	112	80.0	120	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	50 mg/L	106	80.0	120	----
mercury, dissolved	7439-97-6	E509S	0.000005	mg/L	0.0001 mg/L	95.8	80.0	120	----
Volatile Organic Compounds (QCLot: 603603)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	101	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	92.2	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	96.0	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	93.0	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	90.8	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	97.9	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	94.3	70.0	130	----
Hydrocarbons (QCLot: 603602)									
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	98.8	70.0	130	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	89.2	70.0	130	----
Hydrocarbons (QCLot: 605543)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	113	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	116	70.0	130	----

Work Order : VA22B8597
Client : Golder Associates Ltd.
Project : 166372401/64000/03

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Hydrocarbons (QCLot: 605544)									
F2 (C10-C16)	----	E601	100	µg/L	3538 µg/L	114	70.0	130	----
F3 (C16-C34)	----	E601	250	µg/L	7053 µg/L	105	70.0	130	----
F4 (C34-C50)	----	E601	250	µg/L	5051 µg/L	93.0	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 605545)									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.5 µg/L	102	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5 µg/L	103	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	0.5 µg/L	117	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	0.5 µg/L	105	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5 µg/L	107	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5 µg/L	97.8	60.0	130	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.5 µg/L	96.7	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5 µg/L	111	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5 µg/L	106	60.0	130	----
chrysene	218-01-9	E641A	0.01	µg/L	0.5 µg/L	112	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5 µg/L	106	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.5 µg/L	105	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	0.5 µg/L	105	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5 µg/L	113	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5 µg/L	102	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5 µg/L	101	60.0	130	----
naphthalene	91-20-3	E641A	0.05	µg/L	0.5 µg/L	98.0	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.5 µg/L	105	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	0.5 µg/L	108	60.0	130	----
quinoline	91-22-5	E641A	0.05	µg/L	0.5 µg/L	113	60.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 599322)										
VA22B8498-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0903 mg/L	0.1 mg/L	90.3	75.0	125	----
Anions and Nutrients (QCLot: 599330)										
VA22B8597-002	MP05-North-1-22	phosphorus, total	7723-14-0	E372S	0.0459 mg/L	0.05 mg/L	91.8	70.0	130	----
Anions and Nutrients (QCLot: 599331)										
VA22B8597-002	MP05-North-1-22	phosphorus, total dissolved	7723-14-0	E375-T	0.0480 mg/L	0.05 mg/L	96.0	70.0	130	----
Anions and Nutrients (QCLot: 599332)										
VA22B8597-002	MP05-North-1-22	Kjeldahl nitrogen, total [TKN]	----	E318S	2.47 mg/L	2.5 mg/L	99.0	70.0	130	----
Anions and Nutrients (QCLot: 602578)										
VA22B8597-002	MP05-North-1-22	bromide	24959-67-9	E235S.Br	48.4 mg/L	50 mg/L	96.8	75.0	125	----
Anions and Nutrients (QCLot: 602579)										
VA22B8597-002	MP05-North-1-22	chloride	16887-00-6	E235S.Cl	9320 mg/L	10000 mg/L	93.2	75.0	125	----
Anions and Nutrients (QCLot: 602580)										
VA22B8597-002	MP05-North-1-22	fluoride	16984-48-8	E235S.F-L	9.18 mg/L	10 mg/L	91.8	75.0	125	----
Anions and Nutrients (QCLot: 602581)										
VA22B8597-002	MP05-North-1-22	nitrate (as N)	14797-55-8	E235S.NO3-T	7.12 mg/L	7.5 mg/L	94.9	75.0	125	----
Anions and Nutrients (QCLot: 602582)										
VA22B8597-002	MP05-North-1-22	nitrite (as N)	14797-65-0	E235S.NO2-L	4.64 mg/L	5 mg/L	92.8	75.0	125	----
Anions and Nutrients (QCLot: 602583)										
VA22B8597-002	MP05-North-1-22	sulfate (as SO4)	14808-79-8	E235S.SO4-L	941 mg/L	1000 mg/L	94.1	75.0	125	----
Organic / Inorganic Carbon (QCLot: 599328)										
VA22B8546-002	Anonymous	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 599336)										
VA22B8546-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 598730)										
VA22B8443-005	Anonymous	aluminum, total	7429-90-5	E468S	0.375 mg/L	0.4 mg/L	93.7	70.0	130	----
		antimony, total	7440-36-0	E468S	0.0383 mg/L	0.04 mg/L	95.8	70.0	130	----
		arsenic, total	7440-38-2	E468S	0.0390 mg/L	0.04 mg/L	97.6	70.0	130	----
		barium, total	7440-39-3	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E468S	0.0705 mg/L	0.08 mg/L	88.1	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 598730) - continued										
VA22B8443-005	Anonymous	bismuth, total	7440-69-9	E468S	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		boron, total	7440-42-8	E468S	ND mg/L	0.2 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E468S	0.00745 mg/L	0.008 mg/L	93.1	70.0	130	----
		calcium, total	7440-70-2	E468S	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E468S	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		chromium, total	7440-47-3	E468S	0.0736 mg/L	0.08 mg/L	92.0	70.0	130	----
		cobalt, total	7440-48-4	E468S	0.0375 mg/L	0.04 mg/L	93.8	70.0	130	----
		copper, total	7440-50-8	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		gallium, total	7440-55-3	E468S	0.00475 mg/L	0.005 mg/L	95.0	70.0	130	----
		iron, total	7439-89-6	E468S	3.76 mg/L	4 mg/L	93.9	70.0	130	----
		lead, total	7439-92-1	E468S	0.0384 mg/L	0.04 mg/L	95.9	70.0	130	----
		lithium, total	7439-93-2	E468S	0.136 mg/L	0.2 mg/L	68.0	70.0	130	MES
		magnesium, total	7439-95-4	E468S	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E468S	0.0381 mg/L	0.04 mg/L	95.3	70.0	130	----
		molybdenum, total	7439-98-7	E468S	0.0388 mg/L	0.04 mg/L	97.0	70.0	130	----
		nickel, total	7440-02-0	E468S	0.0757 mg/L	0.08 mg/L	94.7	70.0	130	----
		phosphorus, total	7723-14-0	E468S	19.9 mg/L	20 mg/L	99.6	70.0	130	----
		potassium, total	7440-09-7	E468S	ND mg/L	8 mg/L	ND	70.0	130	----
		rhenium, total	7440-15-5	E468S	0.00487 mg/L	0.005 mg/L	97.4	70.0	130	----
		rubidium, total	7440-17-7	E468S	0.0387 mg/L	0.04 mg/L	96.8	70.0	130	----
		selenium, total	7782-49-2	E468S	0.0821 mg/L	0.08 mg/L	103	70.0	130	----
		silver, total	7440-22-4	E468S	0.00748 mg/L	0.008 mg/L	93.5	70.0	130	----
		strontium, total	7440-24-6	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E468S	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E468S	0.0751 mg/L	0.08 mg/L	93.8	70.0	130	----
		thallium, total	7440-28-0	E468S	0.00742 mg/L	0.008 mg/L	92.7	70.0	130	----
		thorium, total	7440-29-1	E468S	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		tin, total	7440-31-5	E468S	0.0372 mg/L	0.04 mg/L	92.9	70.0	130	----
		titanium, total	7440-32-6	E468S	0.0748 mg/L	0.08 mg/L	93.6	70.0	130	----
		tungsten, total	7440-33-7	E468S	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
		uranium, total	7440-61-1	E468S	0.00754 mg/L	0.008 mg/L	94.3	70.0	130	----
		vanadium, total	7440-62-2	E468S	0.188 mg/L	0.2 mg/L	94.2	70.0	130	----
		yttrium, total	7440-65-5	E468S	0.00495 mg/L	0.005 mg/L	98.9	70.0	130	----
		zinc, total	7440-66-6	E468S	0.786 mg/L	0.8 mg/L	98.2	70.0	130	----
		zirconium, total	7440-67-7	E468S	0.0796 mg/L	0.08 mg/L	99.5	70.0	130	----
Total Metals (QCLot: 598731)										

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Total Metals (QCLot: 598731) - continued										
VA22B8443-005	Anonymous	silicon, total	7440-21-3	E468S.NaSi	511 mg/L	500 mg/L	102	70.0	130	----
		sodium, total	7440-23-5	E468S.NaSi	ND mg/L	100 mg/L	ND	70.0	130	----
Total Metals (QCLot: 608342)										
VA22B8597-002	MP05-North-1-22	mercury, total	7439-97-6	E508S	0.000101 mg/L	0.0001 mg/L	101	70.0	130	----
Dissolved Metals (QCLot: 598765)										
VA22B8443-001	Anonymous	aluminum, dissolved	7429-90-5	E469S	0.339 mg/L	0.4 mg/L	84.7	70.0	130	----
		antimony, dissolved	7440-36-0	E469S	0.0382 mg/L	0.04 mg/L	95.6	70.0	130	----
		arsenic, dissolved	7440-38-2	E469S	0.0386 mg/L	0.04 mg/L	96.4	70.0	130	----
		barium, dissolved	7440-39-3	E469S	0.0369 mg/L	0.04 mg/L	92.4	70.0	130	----
		beryllium, dissolved	7440-41-7	E469S	0.0596 mg/L	0.08 mg/L	74.4	70.0	130	----
		bismuth, dissolved	7440-69-9	E469S	0.0179 mg/L	0.02 mg/L	89.6	70.0	130	----
		boron, dissolved	7440-42-8	E469S	ND mg/L	0.2 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E469S	0.00749 mg/L	0.008 mg/L	93.6	70.0	130	----
		calcium, dissolved	7440-70-2	E469S	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E469S	0.0194 mg/L	0.02 mg/L	97.1	70.0	130	----
		chromium, dissolved	7440-47-3	E469S	0.0733 mg/L	0.08 mg/L	91.6	70.0	130	----
		cobalt, dissolved	7440-48-4	E469S	0.0363 mg/L	0.04 mg/L	90.8	70.0	130	----
		copper, dissolved	7440-50-8	E469S	0.0352 mg/L	0.04 mg/L	88.0	70.0	130	----
		gallium, dissolved	7440-55-3	E469S	0.00510 mg/L	0.005 mg/L	102	70.0	130	----
		iron, dissolved	7439-89-6	E469S	3.75 mg/L	4 mg/L	93.7	70.0	130	----
		lead, dissolved	7439-92-1	E469S	0.0383 mg/L	0.04 mg/L	95.8	70.0	130	----
		lithium, dissolved	7439-93-2	E469S	0.134 mg/L	0.2 mg/L	66.8	70.0	130	MES
		magnesium, dissolved	7439-95-4	E469S	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E469S	0.0383 mg/L	0.04 mg/L	95.8	70.0	130	----
		molybdenum, dissolved	7439-98-7	E469S	0.0381 mg/L	0.04 mg/L	95.2	70.0	130	----
		nickel, dissolved	7440-02-0	E469S	0.0729 mg/L	0.08 mg/L	91.1	70.0	130	----
		phosphorus, dissolved	7723-14-0	E469S	18.3 mg/L	20 mg/L	91.7	70.0	130	----
		potassium, dissolved	7440-09-7	E469S	ND mg/L	8 mg/L	ND	70.0	130	----
		rhenium, dissolved	7440-15-5	E469S	0.00462 mg/L	0.005 mg/L	92.5	70.0	130	----
		rubidium, dissolved	7440-17-7	E469S	0.0396 mg/L	0.04 mg/L	99.0	70.0	130	----
		selenium, dissolved	7782-49-2	E469S	0.0776 mg/L	0.08 mg/L	97.0	70.0	130	----
		silver, dissolved	7440-22-4	E469S	0.00718 mg/L	0.008 mg/L	89.7	70.0	130	----
		strontium, dissolved	7440-24-6	E469S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E469S	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E469S	0.0706 mg/L	0.08 mg/L	88.2	70.0	130	----
		thallium, dissolved	7440-28-0	E469S	0.00732 mg/L	0.008 mg/L	91.5	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 598765) - continued										
VA22B8443-001	Anonymous	thorium, dissolved	7440-29-1	E469S	0.0414 mg/L	0.04 mg/L	104	70.0	130	----
		tin, dissolved	7440-31-5	E469S	0.0373 mg/L	0.04 mg/L	93.3	70.0	130	----
		titanium, dissolved	7440-32-6	E469S	0.0746 mg/L	0.08 mg/L	93.3	70.0	130	----
		tungsten, dissolved	7440-33-7	E469S	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		uranium, dissolved	7440-61-1	E469S	0.00753 mg/L	0.008 mg/L	94.1	70.0	130	----
		vanadium, dissolved	7440-62-2	E469S	0.186 mg/L	0.2 mg/L	92.9	70.0	130	----
		yttrium, dissolved	7440-65-5	E469S	0.00532 mg/L	0.005 mg/L	106	70.0	130	----
		zinc, dissolved	7440-66-6	E469S	0.730 mg/L	0.8 mg/L	91.2	70.0	130	----
		zirconium, dissolved	7440-67-7	E469S	0.0838 mg/L	0.08 mg/L	105	70.0	130	----
Dissolved Metals (QCLot: 598766)										
VA22B8443-001	Anonymous	silicon, dissolved	7440-21-3	E469S.NaSi	496 mg/L	500 mg/L	99.1	70.0	130	----
		sodium, dissolved	7440-23-5	E469S.NaSi	ND mg/L	100 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 607593)										
VA22B8597-002	MP05-North-1-22	mercury, dissolved	7439-97-6	E509S	0.0000981 mg/L	0.0001 mg/L	98.1	70.0	130	----
Volatile Organic Compounds (QCLot: 603603)										
VA22B8570-001	Anonymous	benzene	71-43-2	E611A	101 µg/L	100 µg/L	101	60.0	140	----
		ethylbenzene	100-41-4	E611A	98.0 µg/L	100 µg/L	98.0	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	96.6 µg/L	100 µg/L	96.6	60.0	140	----
		styrene	100-42-5	E611A	94.6 µg/L	100 µg/L	94.6	60.0	140	----
		toluene	108-88-3	E611A	96.7 µg/L	100 µg/L	96.7	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	208 µg/L	200 µg/L	104	60.0	140	----
		xylene, o-	95-47-6	E611A	99.3 µg/L	100 µg/L	99.3	60.0	140	----
Hydrocarbons (QCLot: 603602)										
VA22B8570-002	Anonymous	F1 (C6-C10)	----	E581.VH+F1	5960 µg/L	6310 µg/L	94.4	60.0	140	----
		VHw (C6-C10)	----	E581.VH+F1	5380 µg/L	6310 µg/L	85.2	60.0	140	----

Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 21 - 03

Page 1 of 1

ALS www.alsglobal.com

Report To	Contact and company name below will appear on the final report
Company:	Golder Associates Ltd.
Contact:	Elaine Irving/Connor Pettern
Phone:	1-604-297-2030/1-604-296-4200
	Company address below will appear on the final report
Street:	Suite 200 - 2920 Virtual Way
City/Province:	Vancouver, BC
Postal Code:	V5M 0C4
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: elaine.irving@wsp.com

Email 2: connor.pettern@wsp.com

Email 3: trish.tomliens@wsp.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax:

Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #:	
Job #:	GOLD 100-028
PO / AFE:	166372401/64000/03
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center: | PO#

Major/Minor Code: | Routing Code:

Requisitioner:

Location:

ALS Lab Work Order # (ALS use only): 8597

ALS Contact: Amber Springer | Sampler: TT/MR/DV

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	General (alkalinity, turbidity, conduc	Anions, TOC, DOC, Hardness, Salir	pH, TSS, TDS, Ammonia, TKN)	Dissolved Metals (F/P)	Total Metals (P)	Dissolved Mercury (F/P)	Total Mercury (P)	Nutrients (including total phosphorus (P)	Petroleum hydrocarbons (MTBE) (P)	Petroleum hydrocarbons (BTEX,F1) (P)	Hydrocarbons (LEPH/HEPH) (P)	PAH, F2-F4 (P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
1	MP05-Source-1-22	8-Aug-22	14:35	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R			
2	MP05-North-1-22	8-Aug-22	13:45	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R			
3	MP05-ENE-1-22	8-Aug-22	14:10	Seawater	6	R	R	R	R	R	R	R	R							
4	MP05-WNW-1-22	8-Aug-22	14:15	Seawater	6	R	R	R	R	R	R	R	R							
5	MLP-2	8-Aug-22		Seawater	6	R	R	R	R	R	R	R	R							
6	MP06-Source-2-22	8-Aug-22	12:05	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R			
7	MP06-North-2-22	8-Aug-22	12:43	Seawater	6	R	R	R	R	R	R	R	R							
8	MP06-ENE-2-22	8-Aug-22	13:20	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R			
9	MP06-WNW-2-22	8-Aug-22	13:02	Seawater	6	R	R	R	R	R	R	R	R							

Environmental Division
Vancouver
Work Order Reference
VA22B8597

Telephone : +1 604 253 4188

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?

☐ YES ☑ NO

Are samples for human consumption/ use?

☐ YES ☑ NO

Please refer to quote for all analyses.

valuation by selecting from drop-down below
xcel COC only)

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☑ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☑ N/A Sample Custody Seals Intact: ☐ YES ☑ N/A

INITIAL COOLER TEMPERATURES °C | FINAL COOLER TEMPERATURES °C: 10°

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Patricia Jordens	Date: 8 Aug 2022	Time: 15:00	Received by:	Date:	Time:	Received by:	Date: Aug. 11/22	Time: 8:12 am

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 2020 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order	:	**YL2201255**	Page	:	1 of 14
Client	:	**Golder Associates Ltd.**	Laboratory	:	Yellowknife - Environmental
Contact	:	Elaine Irving	Account Manager	:	Amber Springer
Address	:	200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	:	314 Old Airport Road, Unit 116 Yellowknife NT Canada X1A 3T3
Telephone	:	----	Telephone	:	+1 867 873 5593
Project	:	166372401/64000/03	Date Samples Received	:	18-Aug-2022 12:05
PO	:	----	Date Analysis Commenced	:	22-Aug-2022
C-O-C number	:	21-05	Issue Date	:	06-Sep-2022 13:55
Sampler	:	TT/MR/DV			
Site	:	----			
Quote number	:	VA22-GOLD100-028			
No. of samples received	:	9			
No. of samples analysed	:	9			

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Courtney Cox	Analsyt	Inorganics, Burnaby, British Columbia
Erin Sanchez		Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Metals, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
psu	practical salinity units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DTMF	*Dissolved concentration exceeds total for field-filtered metals sample. Metallic contaminants may have been introduced to dissolved sample during field filtration.*

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	Dup-C
				Client sampling date / time	13-Aug-2022 14:58	13-Aug-2022 14:37	13-Aug-2022 14:45	13-Aug-2022 14:30	13-Aug-2022
					YL2201255-001	YL2201255-002	YL2201255-003	YL2201255-004	YL2201255-005
					Result	Result	Result	Result	Result
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	110	112	108	109	110
conductivity	----	E100S	2.0	µS/cm	45300	46100	45600	45400	45900
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	5030	5180	5090	5230	5240
pH	----	E108	0.10	pH units	7.99	7.99	7.99	7.99	7.99
salinity	----	EC100S	1.0	psu	30.7	31.3	30.9	30.8	31.2
solids, total dissolved [TDS]	----	E162S	10	mg/L	36400	38700	38200	37100	34400
solids, total suspended [TSS]	----	E160S	2.0	mg/L	3.2	<2.0	2.0	<2.0	2.1
turbidity	----	E121	0.10	NTU	0.12	0.15	0.14	0.12	0.18
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0067	0.0075	0.0059	0.0055	0.0059
bromide	24959-67-9	E235S.Br	5.0	mg/L	60.0	57.5	59.1	56.6	55.8
chloride	16887-00-6	E235S.Cl	50	mg/L	17000	16400	16600	16100	15800
fluoride	16984-48-8	E235S.F-L	0.20	mg/L	0.68	0.77	0.78	0.78	0.78
Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	0.066	0.102	0.098	0.125	0.103
nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	0.016	<0.010	<0.010	<0.010	<0.010
nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
phosphorus, total	7723-14-0	E372S	0.0020	mg/L	0.0242	0.0209	0.0256	0.0248	0.0249
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	2240	2330	2320	2320	2370
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	0.99	0.84	1.06	1.07	1.01
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.37	1.02	0.91	1.09	1.21
Total Metals									
aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0071	0.0058	0.0054	0.0074	0.0051
antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
arsenic, total	7440-38-2	E468S	0.00040	mg/L	0.00156	0.00167	0.00155	0.00160	0.00161
barium, total	7440-39-3	E468S	0.0010	mg/L	0.0094	0.0092	0.0089	0.0090	0.0086
beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
boron, total	7440-42-8	E468S	0.30	mg/L	3.80	3.83	3.78	3.88	3.90
cadmium, total	7440-43-9	E468S	0.000010	mg/L	0.000020	0.000021	0.000017	0.000022	0.000026

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	Dup-C
				Client sampling date / time	13-Aug-2022 14:58	13-Aug-2022 14:37	13-Aug-2022 14:45	13-Aug-2022 14:30	13-Aug-2022
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	YL2201255-001	YL2201255-002	YL2201255-003	YL2201255-004	YL2201255-005
					Result	Result	Result	Result	Result
Total Metals									
calcium, total	7440-70-2	E468S	1.0	mg/L	433	436	434	433	438
cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
copper, total	7440-50-8	E468S	0.00050	mg/L	0.00138	0.00079	<0.00050	0.00197	<0.00050
gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, total	7439-89-6	E468S	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
lead, total	7439-92-1	E468S	0.000050	mg/L	0.000057	<0.000050	<0.000050	<0.000050	<0.000050
lithium, total	7439-93-2	E468S	0.020	mg/L	0.163	0.163	0.159	0.166	0.165
magnesium, total	7439-95-4	E468S	1.0	mg/L	1170	1180	1140	1150	1140
manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00134	0.00102	0.00087	0.00093	0.00086
mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.0105	0.0112	0.0107	0.0108	0.0110
nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, total	7440-09-7	E468S	1.0	mg/L	403	414	402	409	401
rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.108	0.109	0.106	0.109	0.110
selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	9280	9920	9460	9560	9920
strontium, total	7440-24-6	E468S	0.010	mg/L	7.40	7.82	7.52	7.69	7.66
sulfur, total	7704-34-9	E468S	5.0	mg/L	1060	1090	1060	1100	1040
tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
uranium, total	7440-61-1	E468S	0.000050	mg/L	0.00281	0.00253	0.00255	0.00249	0.00259

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	Dup-C
Client sampling date / time					13-Aug-2022 14:58	13-Aug-2022 14:37	13-Aug-2022 14:45	13-Aug-2022 14:30	13-Aug-2022
					YL2201255-001	YL2201255-002	YL2201255-003	YL2201255-004	YL2201255-005
					Result	Result	Result	Result	Result
Total Metals									
vanadium, total	7440-62-2	E468S	0.00050	mg/L	0.00139	0.00141	0.00133	0.00135	0.00134
yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Metals									
aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	0.00152	0.00155	0.00148	0.00144	0.00151
barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0085	0.0083	0.0082	0.0086	0.0086
beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
boron, dissolved	7440-42-8	E469S	0.30	mg/L	3.51	3.52	3.53	3.58	3.59
cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	0.000019	0.000019	0.000018	0.000020	0.000020
calcium, dissolved	7440-70-2	E469S	1.0	mg/L	389	407	405	414	418
cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00058	0.00037	0.00036	0.00036	0.00041
gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000071
lithium, dissolved	7439-93-2	E469S	0.020	mg/L	0.159	0.158	0.155	0.158	0.160
magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	986	1010	991	1020	1020
manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00101	0.00072	0.00062	0.00063	0.00065
mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00978	0.0102	0.0102	0.0104	0.0104
nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E469S	1.0	mg/L	366	383	369	379	388
rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.105	0.108	0.104	0.108	0.108

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	Dup-C
Client sampling date / time					13-Aug-2022 14:58	13-Aug-2022 14:37	13-Aug-2022 14:45	13-Aug-2022 14:30	13-Aug-2022
					YL2201255-001	YL2201255-002	YL2201255-003	YL2201255-004	YL2201255-005
					Result	Result	Result	Result	Result
Dissolved Metals									
selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	9440	9530	9410	9570	9460
strontium, dissolved	7440-24-6	E469S	0.010	mg/L	6.87	7.20	7.01	7.20	7.19
sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	939	1020	978	1000	1030
tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.00301	0.00252	0.00254	0.00254	0.00256
vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	0.00124	0.00128	0.00121	0.00128	0.00128
yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field
Volatile Organic Compounds [Fuels]									
benzene	71-43-2	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
styrene	100-42-5	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
toluene	108-88-3	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	----	<0.40	----	----
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	----	<0.30	----	----
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	97.3	----	97.8	----	----
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	96.9	----	97.2	----	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	Dup-C
				Client sampling date / time	13-Aug-2022 14:58	13-Aug-2022 14:37	13-Aug-2022 14:45	13-Aug-2022 14:30	13-Aug-2022
Analyte	CAS Number	Method	LOR	Unit	YL2201255-001	YL2201255-002	YL2201255-003	YL2201255-004	YL2201255-005
					Result	Result	Result	Result	Result
Hydrocarbons									
EPH (C10-C19)	----	E601A	250	µg/L	<250	----	<250	----	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----	<250	----	----
F2 (C10-C16)	----	E601	100	µg/L	<100	----	<100	----	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----	<250	----	----
F4 (C34-C50)	----	E601	250	µg/L	<250	----	<250	----	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----	<100	----	----
F1-BTEX	----	EC580	100	µg/L	<100	----	<100	----	----
HEPHw	----	EC600A	250	µg/L	<250	----	<250	----	----
LEPHw	----	EC600A	250	µg/L	<250	----	<250	----	----
VPHw	----	EC580A	100	µg/L	<100	----	<100	----	----
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----	<100	----	----
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	90.7	----	86.3	----	----
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%	86.3	----	83.3	----	----
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	83.7	----	88.0	----	----
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
acridine	260-94-6	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
anthracene	120-12-7	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	----	<0.0050	----	----
benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	<0.015	----	<0.015	----	----
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
chrysene	218-01-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	----	<0.0050	----	----
fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
fluorene	86-73-7	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	----	<0.010	----	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water)**

				Client sample ID	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	Dup-C
				Client sampling date / time	13-Aug-2022 14:58	13-Aug-2022 14:37	13-Aug-2022 14:45	13-Aug-2022 14:30	13-Aug-2022
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	YL2201255-001	YL2201255-002	YL2201255-003	YL2201255-004	YL2201255-005
					Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons									
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	----	<0.050	----	----
phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	----	<0.020	----	----
pyrene	129-00-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
quinoline	91-22-5	E641A	0.050	µg/L	<0.050	----	<0.050	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
chrysene-d12	1719-03-5	E641A	0.1	%	90.9	----	100	----	----
naphthalene-d8	1146-65-2	E641A	0.1	%	87.0	----	95.8	----	----
phenanthrene-d10	1517-22-2	E641A	0.1	%	94.2	----	104	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Seawater (Matrix: Water)				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	13-Aug-2022 14:11	13-Aug-2022 13:55	13-Aug-2022 13:43	13-Aug-2022 14:03	----
Analyte	CAS Number	Method	LOR	Unit	YL2201255-006	YL2201255-007	YL2201255-008	YL2201255-009	--------
					Result	Result	Result	Result	----
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	110	114	114	112	----
conductivity	----	E100S	2.0	µS/cm	45800	48200	48000	46700	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	5000	5410	5460	5390	----
pH	----	E108	0.10	pH units	7.99	7.97	7.97	7.98	----
salinity	----	EC100S	1.0	psu	31.1	32.9	32.8	31.8	----
solids, total dissolved [TDS]	----	E162S	10	mg/L	38000	39800	40300	39100	----
solids, total suspended [TSS]	----	E160S	2.0	mg/L	<2.0	2.2	<2.0	3.4	----
turbidity	----	E121	0.10	NTU	0.17	0.19	<0.10	0.17	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0054	0.0113	0.0172	0.0092	----
bromide	24959-67-9	E235S.Br	5.0	mg/L	58.5	58.5	64.6	62.3	----
chloride	16887-00-6	E235S.Cl	50	mg/L	16300	16600	18400	17600	----
fluoride	16984-48-8	E235S.F-L	0.20	mg/L	0.79	0.79	0.80	0.78	----
Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	0.124	0.104	0.080	0.108	----
nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	----
nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	----
phosphorus, total	7723-14-0	E372S	0.0020	mg/L	0.0263	0.0266	0.0262	0.0262	----
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	2370	2500	2480	2360	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	0.94	1.30	1.24	1.13	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.18	0.91	1.03	1.00	----
Total Metals									
aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0055	0.0074	0.0064	0.0060	----
antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
arsenic, total	7440-38-2	E468S	0.00040	mg/L	0.00159	0.00162	0.00169	0.00170	----
barium, total	7440-39-3	E468S	0.0010	mg/L	0.0089	0.0089	0.0086	0.0090	----
beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
boron, total	7440-42-8	E468S	0.30	mg/L	3.93	4.11	4.12	4.18	----
cadmium, total	7440-43-9	E468S	0.000010	mg/L	0.000031	0.000026	0.000022	0.000027	----
calcium, total	7440-70-2	E468S	1.0	mg/L	436	462	451	457	----

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	13-Aug-2022 14:11	13-Aug-2022 13:55	13-Aug-2022 13:43	13-Aug-2022 14:03	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	YL2201255-006	YL2201255-007	YL2201255-008	YL2201255-009	--------
					Result	Result	Result	Result	----
Total Metals									
cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	----
copper, total	7440-50-8	E468S	0.00050	mg/L	0.00180	0.00148	0.00191	0.00118	----
gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
iron, total	7439-89-6	E468S	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	----
lead, total	7439-92-1	E468S	0.000050	mg/L	<0.000050	<0.000050	0.000055	<0.000050	----
lithium, total	7439-93-2	E468S	0.020	mg/L	0.164	0.179	0.173	0.177	----
magnesium, total	7439-95-4	E468S	1.0	mg/L	1150	1210	1170	1170	----
manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00090	0.00066	0.00064	0.00081	----
mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	----
molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.0110	0.0118	0.0112	0.0115	----
nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	0.057	<0.050	0.051	----
potassium, total	7440-09-7	E468S	1.0	mg/L	404	433	419	424	----
rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.110	0.118	0.114	0.118	----
selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----
silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	9820	10300	10100	9880	----
strontium, total	7440-24-6	E468S	0.010	mg/L	7.52	8.29	8.00	8.05	----
sulfur, total	7704-34-9	E468S	5.0	mg/L	1040	1130	1120	1130	----
tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	----
thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	----
tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
uranium, total	7440-61-1	E468S	0.000050	mg/L	0.00264	0.00263	0.00266	0.00267	----
vanadium, total	7440-62-2	E468S	0.00050	mg/L	0.00136	0.00146	0.00142	0.00148	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	13-Aug-2022 14:11	13-Aug-2022 13:55	13-Aug-2022 13:43	13-Aug-2022 14:03	----
Analyte	CAS Number	Method	LOR	Unit	YL2201255-006	YL2201255-007	YL2201255-008	YL2201255-009	--------
					Result	Result	Result	Result	----
Total Metals									
yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	----
zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
Dissolved Metals									
aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	----
antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	0.00147	0.00157	0.00172	0.00154	----
barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0082	0.0085	0.0085	0.0082	----
beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
boron, dissolved	7440-42-8	E469S	0.30	mg/L	3.57	3.67	3.78	3.76	----
cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	0.000027	0.000026	0.000028	0.000018	----
calcium, dissolved	7440-70-2	E469S	1.0	mg/L	418	419	438	428	----
cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	0.000051	<0.000050	----
copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00050	0.00060	0.00151	0.00047	----
gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	----
lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	0.000244 DTMF	<0.000050	----
lithium, dissolved	7439-93-2	E469S	0.020	mg/L	0.156	0.160	0.163	0.162	----
magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	962	1060	1060	1050	----
manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00060	0.00034	0.00036	0.00056	----
mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	----
molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.0104	0.0103	0.0110	0.0106	----
nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	----
potassium, dissolved	7440-09-7	E469S	1.0	mg/L	362	407	398	388	----
rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.105	0.113	0.112	0.109	----
selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----

Analytical Results

Sub-Matrix: Seawater
(Matrix: Water)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	13-Aug-2022 14:11	13-Aug-2022 13:55	13-Aug-2022 13:43	13-Aug-2022 14:03	----
Analyte	CAS Number	Method	LOR	Unit	YL2201255-006	YL2201255-007	YL2201255-008	YL2201255-009	--------
					Result	Result	Result	Result	----
Dissolved Metals									
silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----
silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	9440	9750	9720	9680	----
strontium, dissolved	7440-24-6	E469S	0.010	mg/L	7.23	7.33	7.71	7.26	----
sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	997	1110	1060	1080	----
tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0.00051	<0.00050	----
thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	----
thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	----
tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.00255	0.00250	0.00265	0.00255	----
vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	0.00120	0.00138	0.00131	0.00129	----
yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	<0.0010	<0.0010	0.0015	<0.0010	----
zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	----
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	----
Volatile Organic Compounds [Fuels]									
benzene	71-43-2	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
styrene	100-42-5	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
toluene	108-88-3	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	----	<0.40	----	----
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	----	<0.30	----	----
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	95.7	----	98.5	----	----
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	96.7	----	97.1	----	----
Hydrocarbons									

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	13-Aug-2022 14:11	13-Aug-2022 13:55	13-Aug-2022 13:43	13-Aug-2022 14:03	----
Analyte	CAS Number	Method	LOR	Unit	YL2201255-006	YL2201255-007	YL2201255-008	YL2201255-009	--------
					Result	Result	Result	Result	----
Hydrocarbons									
EPH (C10-C19)	----	E601A	250	μg/L	<250	----	<250	----	----
EPH (C19-C32)	----	E601A	250	μg/L	<250	----	<250	----	----
F2 (C10-C16)	----	E601	100	μg/L	<100	----	<100	----	----
F3 (C16-C34)	----	E601	250	μg/L	<250	----	<250	----	----
F4 (C34-C50)	----	E601	250	μg/L	<250	----	<250	----	----
VHw (C6-C10)	----	E581.VH+F1	100	μg/L	<100	----	<100	----	----
F1-BTEX	----	EC580	100	μg/L	<100	----	<100	----	----
HEPHw	----	EC600A	250	μg/L	<250	----	<250	----	----
LEPHw	----	EC600A	250	μg/L	<250	----	<250	----	----
VPHw	----	EC580A	100	μg/L	<100	----	<100	----	----
F1 (C6-C10)	----	E581.VH+F1	100	μg/L	<100	----	<100	----	----
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	90.6	----	93.8	----	----
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%	86.0	----	87.8	----	----
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	84.3	----	89.3	----	----
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A	0.010	μg/L	<0.010	----	<0.010	----	----
acenaphthylene	208-96-8	E641A	0.010	μg/L	<0.010	----	<0.010	----	----
acridine	260-94-6	E641A	0.010	μg/L	<0.010	----	<0.010	----	----
anthracene	120-12-7	E641A	0.010	μg/L	<0.010	----	<0.010	----	----
benz(a)anthracene	56-55-3	E641A	0.010	μg/L	<0.010	----	<0.010	----	----
benzo(a)pyrene	50-32-8	E641A	0.0050	μg/L	<0.0050	----	<0.0050	----	----
benzo(b+j)fluoranthene	n/a	E641A	0.010	μg/L	<0.010	----	<0.010	----	----
benzo(b+j+k)fluoranthene	n/a	E641A	0.015	μg/L	<0.015	----	<0.015	----	----
benzo(g,h,i)perylene	191-24-2	E641A	0.010	μg/L	<0.010	----	<0.010	----	----
benzo(k)fluoranthene	207-08-9	E641A	0.010	μg/L	<0.010	----	<0.010	----	----
chrysene	218-01-9	E641A	0.010	μg/L	<0.010	----	<0.010	----	----
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	μg/L	<0.0050	----	<0.0050	----	----
fluoranthene	206-44-0	E641A	0.010	μg/L	<0.010	----	<0.010	----	----
fluorene	86-73-7	E641A	0.010	μg/L	<0.010	----	<0.010	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	μg/L	<0.010	----	<0.010	----	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	13-Aug-2022 14:11	13-Aug-2022 13:55	13-Aug-2022 13:43	13-Aug-2022 14:03	----
Analyte	CAS Number	Method	LOR	Unit	YL2201255-006	YL2201255-007	YL2201255-008	YL2201255-009	--------
					Result	Result	Result	Result	----
Polycyclic Aromatic Hydrocarbons									
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	----	<0.050	----	----
phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	----	<0.020	----	----
pyrene	129-00-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
quinoline	91-22-5	E641A	0.050	µg/L	<0.050	----	<0.050	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
chrysene-d12	1719-03-5	E641A	0.1	%	86.7	----	90.0	----	----
naphthalene-d8	1146-65-2	E641A	0.1	%	84.0	----	88.2	----	----
phenanthrene-d10	1517-22-2	E641A	0.1	%	91.6	----	96.3	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

ALS Environmental

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **YL2201255**	Page	: 1 of 36
Client	: **Golder Associates Ltd.**	Laboratory	: Yellowknife - Environmental
Contact	: Elaine Irving	Account Manager	: Amber Springer
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	: 314 Old Airport Road, Unit 116 Yellowknife, Northwest Territories Canada X1A 3T3
Telephone	: ----	Telephone	: +1 867 873 5593
Project	: 166372401/64000/03	Date Samples Received	: 18-Aug-2022 12:05
PO	: ----	Issue Date	: 06-Sep-2022 13:55
C-O-C number	: 21-05		
Sampler	: TT/MR/DV		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Dup-C	E298	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP05-ENE-1-22	E298	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP05-North-1-22	E298	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP05-Source-1-22	E298	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP05-WNW-1-22	E298	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP06-ENE-2-22	E298	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP06-North-2-22	E298	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP06-Source-2-22	E298	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MP06-WNW-2-22	E298	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE Dup-C	E235S.Br	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-ENE-1-22	E235S.Br	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-North-1-22	E235S.Br	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-Source-1-22	E235S.Br	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-WNW-1-22	E235S.Br	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-ENE-2-22	E235S.Br	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-North-2-22	E235S.Br	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-Source-2-22	E235S.Br	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-WNW-2-22	E235S.Br	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE Dup-C	E235S.Cl	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-ENE-1-22	E235S.Cl	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-North-1-22	E235S.Cl	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-Source-1-22	E235S.Cl	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-WNW-1-22	E235S.Cl	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-ENE-2-22	E235S.Cl	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-North-2-22	E235S.Cl	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-Source-2-22	E235S.Cl	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-WNW-2-22	E235S.Cl	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE Dup-C	E235S.F-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.F-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.F-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.F-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.F-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.F-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.F-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.F-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.F-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE Dup-C	E235S.NO3-T	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-ENE-1-22	E235S.NO3-T	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-North-1-22	E235S.NO3-T	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-Source-1-22	E235S.NO3-T	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-WNW-1-22	E235S.NO3-T	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-ENE-2-22	E235S.NO3-T	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-North-2-22	E235S.NO3-T	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-Source-2-22	E235S.NO3-T	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-WNW-2-22	E235S.NO3-T	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE Dup-C	E235S.NO2-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.NO2-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.NO2-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.NO2-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.NO2-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.NO2-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.NO2-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.NO2-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.NO2-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	3 days	10 days	× EHTR-FM
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE Dup-C	E235S.SO4-L	13-Aug-2022	23-Aug-2022	28 days	10 days	✓	23-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.SO4-L	13-Aug-2022	23-Aug-2022	28 days	10 days	✓	23-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.SO4-L	13-Aug-2022	23-Aug-2022	28 days	10 days	✓	23-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.SO4-L	13-Aug-2022	23-Aug-2022	28 days	10 days	✓	23-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.SO4-L	13-Aug-2022	23-Aug-2022	28 days	10 days	✓	23-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.SO4-L	13-Aug-2022	23-Aug-2022	28 days	10 days	✓	23-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.SO4-L	13-Aug-2022	23-Aug-2022	28 days	10 days	✓	23-Aug-2022	18 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.SO4-L	13-Aug-2022	23-Aug-2022	28 days	10 days	✓	23-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.SO4-L	13-Aug-2022	23-Aug-2022	28 days	10 days	✓	23-Aug-2022	18 days	0 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) Dup-C	E318S	13-Aug-2022	23-Aug-2022	----	----		25-Aug-2022	28 days	12 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP05-ENE-1-22	E318S	13-Aug-2022	23-Aug-2022	----	----		25-Aug-2022	28 days	12 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP05-North-1-22	E318S	13-Aug-2022	23-Aug-2022	----	----		25-Aug-2022	28 days	12 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP05-Source-1-22	E318S	13-Aug-2022	23-Aug-2022	----	----		25-Aug-2022	28 days	12 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP05-WNW-1-22	E318S	13-Aug-2022	23-Aug-2022	----	----		25-Aug-2022	28 days	12 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP06-ENE-2-22	E318S	13-Aug-2022	23-Aug-2022	----	----		25-Aug-2022	28 days	12 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP06-North-2-22	E318S	13-Aug-2022	23-Aug-2022	----	----		25-Aug-2022	28 days	12 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP06-Source-2-22	E318S	13-Aug-2022	23-Aug-2022	----	----		25-Aug-2022	28 days	12 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) MP06-WNW-2-22	E318S	13-Aug-2022	23-Aug-2022	----	----		25-Aug-2022	28 days	12 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) Dup-C	E372S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP05-ENE-1-22	E372S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP05-North-1-22	E372S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP05-Source-1-22	E372S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP05-WNW-1-22	E372S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP06-ENE-2-22	E372S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP06-North-2-22	E372S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP06-Source-2-22	E372S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MP06-WNW-2-22	E372S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) Dup-C	E509S	13-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-ENE-1-22	E509S	13-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-North-1-22	E509S	13-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-Source-1-22	E509S	13-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-WNW-1-22	E509S	13-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-ENE-2-22	E509S	13-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-North-2-22	E509S	13-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	11 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-Source-2-22	E509S	13-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-WNW-2-22	E509S	13-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) Dup-C	E469S	13-Aug-2022	28-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-ENE-1-22	E469S	13-Aug-2022	28-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-North-1-22	E469S	13-Aug-2022	28-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-Source-1-22	E469S	13-Aug-2022	28-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-WNW-1-22	E469S	13-Aug-2022	28-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-ENE-2-22	E469S	13-Aug-2022	28-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-North-2-22	E469S	13-Aug-2022	28-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-Source-2-22	E469S	13-Aug-2022	28-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-WNW-2-22	E469S	13-Aug-2022	28-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) Dup-C	E469S.NaSi	13-Aug-2022	28-Aug-2022	----	----		02-Sep-2022	180 days	20 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-ENE-1-22	E469S.NaSi	13-Aug-2022	28-Aug-2022	----	----		02-Sep-2022	180 days	20 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-North-1-22	E469S.NaSi	13-Aug-2022	28-Aug-2022	----	----		02-Sep-2022	180 days	20 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-Source-1-22	E469S.NaSi	13-Aug-2022	28-Aug-2022	----	----		02-Sep-2022	180 days	20 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-WNW-1-22	E469S.NaSi	13-Aug-2022	28-Aug-2022	----	----		02-Sep-2022	180 days	20 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-ENE-2-22	E469S.NaSi	13-Aug-2022	28-Aug-2022	----	----		02-Sep-2022	180 days	20 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-North-2-22	E469S.NaSi	13-Aug-2022	28-Aug-2022	----	----		02-Sep-2022	180 days	20 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-Source-2-22	E469S.NaSi	13-Aug-2022	28-Aug-2022	----	----		02-Sep-2022	180 days	20 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-WNW-2-22	E469S.NaSi	13-Aug-2022	28-Aug-2022	----	----		02-Sep-2022	180 days	20 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-ENE-1-22	E601A	13-Aug-2022	22-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	2 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E601A	13-Aug-2022	22-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	2 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E601A	13-Aug-2022	22-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	2 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E601A	13-Aug-2022	22-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-ENE-1-22	E601	13-Aug-2022	22-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E601	13-Aug-2022	22-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E601	13-Aug-2022	22-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	3 days	✓

Matrix: **Water**

Evaluation: ✘ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E601	13-Aug-2022	22-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	3 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP05-ENE-1-22	E581.VH+F1	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	14 days	10 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP05-Source-1-22	E581.VH+F1	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	14 days	10 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP06-ENE-2-22	E581.VH+F1	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	14 days	10 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP06-Source-2-22	E581.VH+F1	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	14 days	10 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP06-ENE-2-22	E358-L	13-Aug-2022	23-Aug-2022	3 days	10 days	✘ EHTR	23-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP06-North-2-22	E358-L	13-Aug-2022	23-Aug-2022	3 days	10 days	✘ EHTR	23-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP06-WNW-2-22	E358-L	13-Aug-2022	23-Aug-2022	3 days	10 days	✘ EHTR	23-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) Dup-C	E358-L	13-Aug-2022	23-Aug-2022	3 days	9 days	✘ EHTR	23-Aug-2022	28 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP05-ENE-1-22	E358-L	13-Aug-2022	23-Aug-2022	3 days	9 days	× EHTR	23-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP05-North-1-22	E358-L	13-Aug-2022	23-Aug-2022	3 days	9 days	× EHTR	23-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP05-Source-1-22	E358-L	13-Aug-2022	23-Aug-2022	3 days	9 days	× EHTR	23-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP05-WNW-1-22	E358-L	13-Aug-2022	23-Aug-2022	3 days	9 days	× EHTR	23-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) MP06-Source-2-22	E358-L	13-Aug-2022	23-Aug-2022	3 days	9 days	× EHTR	23-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Dup-C	E355-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP05-ENE-1-22	E355-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP05-North-1-22	E355-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP05-Source-1-22	E355-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP05-WNW-1-22	E355-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP06-ENE-2-22	E355-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP06-North-2-22	E355-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP06-Source-2-22	E355-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	9 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MP06-WNW-2-22	E355-L	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	9 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Dup-C	E290	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-ENE-1-22	E290	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-North-1-22	E290	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-Source-1-22	E290	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-WNW-1-22	E290	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-ENE-2-22	E290	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-North-2-22	E290	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-Source-2-22	E290	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-WNW-2-22	E290	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE Dup-C	E100S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-ENE-1-22	E100S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-North-1-22	E100S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-Source-1-22	E100S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Seawater										
HDPE MP05-WNW-1-22	E100S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-ENE-2-22	E100S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-North-2-22	E100S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-Source-2-22	E100S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-WNW-2-22	E100S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Physical Tests : pH by Meter										
HDPE Dup-C	E108	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	0.25 hrs	0.89 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-ENE-1-22	E108	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	0.25 hrs	0.89 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-North-1-22	E108	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	0.25 hrs	0.89 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-Source-1-22	E108	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	0.25 hrs	0.89 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE MP05-WNW-1-22	E108	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	0.25 hrs	0.89 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-ENE-2-22	E108	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	0.25 hrs	0.89 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-North-2-22	E108	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	0.25 hrs	0.89 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-Source-2-22	E108	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	0.25 hrs	0.89 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-WNW-2-22	E108	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	0.25 hrs	0.89 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE Dup-C	E162S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	× EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-ENE-1-22	E162S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	× EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-North-1-22	E162S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	× EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-Source-1-22	E162S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	× EHT

Work Order : YL2201255
Client : Golder Associates Ltd.
Project : 166372401/64000/03

Matrix: **Water**

Evaluation: ✘ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-WNW-1-22	E162S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	✘ EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-ENE-2-22	E162S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	✘ EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-North-2-22	E162S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	✘ EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-Source-2-22	E162S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	✘ EHT
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-WNW-2-22	E162S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	✘ EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE Dup-C	E160S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	✘ EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-ENE-1-22	E160S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	✘ EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-North-1-22	E160S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	✘ EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-Source-1-22	E160S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	✘ EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-WNW-1-22	E160S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	× EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-ENE-2-22	E160S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	× EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-North-2-22	E160S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	× EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-Source-2-22	E160S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	× EHT
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-WNW-2-22	E160S	13-Aug-2022	----	----	----		23-Aug-2022	7 days	9 days	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE Dup-C	E121	13-Aug-2022	----	----	----		23-Aug-2022	3 days	10 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-ENE-1-22	E121	13-Aug-2022	----	----	----		23-Aug-2022	3 days	10 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-North-1-22	E121	13-Aug-2022	----	----	----		23-Aug-2022	3 days	10 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-Source-1-22	E121	13-Aug-2022	----	----	----		23-Aug-2022	3 days	10 days	× EHTR

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-WNW-1-22	E121	13-Aug-2022	----	----	----		23-Aug-2022	3 days	10 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-ENE-2-22	E121	13-Aug-2022	----	----	----		23-Aug-2022	3 days	10 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-North-2-22	E121	13-Aug-2022	----	----	----		23-Aug-2022	3 days	10 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-Source-2-22	E121	13-Aug-2022	----	----	----		23-Aug-2022	3 days	10 days	× EHTR
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-WNW-2-22	E121	13-Aug-2022	----	----	----		23-Aug-2022	3 days	10 days	× EHTR
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-ENE-1-22	E641A	13-Aug-2022	22-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E641A	13-Aug-2022	22-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E641A	13-Aug-2022	22-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E641A	13-Aug-2022	22-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) Dup-C	E508S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-ENE-1-22	E508S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-North-1-22	E508S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-Source-1-22	E508S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-WNW-1-22	E508S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-ENE-2-22	E508S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-North-2-22	E508S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-Source-2-22	E508S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-WNW-2-22	E508S	13-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) Dup-C	E468S	13-Aug-2022	27-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-ENE-1-22	E468S	13-Aug-2022	27-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-North-1-22	E468S	13-Aug-2022	27-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-Source-1-22	E468S	13-Aug-2022	27-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-WNW-1-22	E468S	13-Aug-2022	27-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-ENE-2-22	E468S	13-Aug-2022	27-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-North-2-22	E468S	13-Aug-2022	27-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-Source-2-22	E468S	13-Aug-2022	27-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-WNW-2-22	E468S	13-Aug-2022	27-Aug-2022	----	----		28-Aug-2022	180 days	15 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) Dup-C	E468S.NaSi	13-Aug-2022	27-Aug-2022	----	----		29-Aug-2022	180 days	16 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-ENE-1-22	E468S.NaSi	13-Aug-2022	27-Aug-2022	----	----		29-Aug-2022	180 days	16 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-North-1-22	E468S.NaSi	13-Aug-2022	27-Aug-2022	----	----		29-Aug-2022	180 days	16 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-Source-1-22	E468S.NaSi	13-Aug-2022	27-Aug-2022	----	----		29-Aug-2022	180 days	16 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-WNW-1-22	E468S.NaSi	13-Aug-2022	27-Aug-2022	----	----		29-Aug-2022	180 days	16 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-ENE-2-22	E468S.NaSi	13-Aug-2022	27-Aug-2022	----	----		29-Aug-2022	180 days	16 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-North-2-22	E468S.NaSi	13-Aug-2022	27-Aug-2022	----	----		29-Aug-2022	180 days	16 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-Source-2-22	E468S.NaSi	13-Aug-2022	27-Aug-2022	----	----		29-Aug-2022	180 days	16 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-WNW-2-22	E468S.NaSi	13-Aug-2022	27-Aug-2022	----	----		29-Aug-2022	180 days	16 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP05-ENE-1-22	E611A	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	14 days	10 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP05-Source-1-22	E611A	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	14 days	10 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP06-ENE-2-22	E611A	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	14 days	10 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP06-Source-2-22	E611A	13-Aug-2022	23-Aug-2022	----	----		24-Aug-2022	14 days	10 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHTR: Exceeded ALS recommended hold time prior to sample receipt.

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	614082	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	613892	1	12	8.3	5.0	✓
Bromide in Seawater by IC	E235S.Br	614086	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	613865	1	4	25.0	5.0	✓
Chloride in Seawater by IC	E235S.Cl	614085	1	20	5.0	5.0	✓
Conductivity in Seawater	E100S	614083	1	9	11.1	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	615793	1	9	11.1	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	620420	1	9	11.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	613887	1	12	8.3	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	620419	1	9	11.1	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	614087	1	9	11.1	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	614088	1	9	11.1	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	614089	1	9	11.1	5.0	✓
pH by Meter	E108	614084	1	9	11.1	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	614090	1	9	11.1	5.0	✓
TDS by Gravimetry (Seawater)	E162S	613884	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	613895	1	9	11.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	615658	1	9	11.1	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	621099	2	20	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	613888	1	10	10.0	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	613891	1	9	11.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	621100	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	614247	1	19	5.2	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	613864	1	4	25.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	614082	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	613892	1	12	8.3	5.0	✓
BC PHCs - EPH by GC-FID	E601A	613818	1	15	6.6	5.0	✓
Bromide in Seawater by IC	E235S.Br	614086	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	613865	1	4	25.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	613820	1	6	16.6	5.0	✓
Chloride in Seawater by IC	E235S.Cl	614085	1	20	5.0	5.0	✓
Conductivity in Seawater	E100S	614083	1	9	11.1	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	615793	1	9	11.1	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	620420	1	9	11.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	613887	1	12	8.3	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	620419	1	9	11.1	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Fluoride in Seawater by IC (Low Level)	E235S.F-L	614087	1	9	11.1	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	614088	1	9	11.1	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	614089	1	9	11.1	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	613819	1	15	6.6	5.0	✓
pH by Meter	E108	614084	1	9	11.1	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	614090	1	9	11.1	5.0	✓
TDS by Gravimetry (Seawater)	E162S	613884	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	613895	1	9	11.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	615658	1	9	11.1	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	621099	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	613888	1	10	10.0	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	613891	1	9	11.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	621100	1	20	5.0	5.0	✓
TSS by Gravimetry (Seawater)	E160S	613883	1	9	11.1	5.0	✓
Turbidity by Nephelometry	E121	614247	1	19	5.2	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	613864	1	4	25.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	614082	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	613892	1	12	8.3	5.0	✓
BC PHCs - EPH by GC-FID	E601A	613818	1	15	6.6	5.0	✓
Bromide in Seawater by IC	E235S.Br	614086	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	613865	1	4	25.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	613820	1	6	16.6	5.0	✓
Chloride in Seawater by IC	E235S.Cl	614085	1	20	5.0	5.0	✓
Conductivity in Seawater	E100S	614083	1	9	11.1	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	615793	1	9	11.1	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	620420	1	9	11.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	613887	1	12	8.3	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	620419	1	9	11.1	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	614087	1	9	11.1	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	614088	1	9	11.1	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	614089	1	9	11.1	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	613819	1	15	6.6	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	614090	1	9	11.1	5.0	✓
TDS by Gravimetry (Seawater)	E162S	613884	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	613895	1	9	11.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	615658	1	9	11.1	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	621099	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	613888	1	10	10.0	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	613891	1	9	11.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	621100	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
TSS by Gravimetry (Seawater)	E160S	613883	1	9	11.1	5.0	✓
Turbidity by Nephelometry	E121	614247	1	19	5.2	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	613864	1	4	25.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	613892	1	12	8.3	5.0	✓
Bromide in Seawater by IC	E235S.Br	614086	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	613865	1	4	25.0	5.0	✓
Chloride in Seawater by IC	E235S.Cl	614085	1	20	5.0	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	615793	1	9	11.1	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	620420	1	9	11.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	613887	1	12	8.3	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	620419	1	9	11.1	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	614087	1	9	11.1	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	614088	1	9	11.1	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	614089	1	9	11.1	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	614090	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	613895	1	9	11.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	615658	1	9	11.1	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	621099	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	613888	1	10	10.0	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	613891	1	9	11.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	621100	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	613864	1	4	25.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by “mod”).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Seawater	E100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TSS by Gravimetry (Seawater)	E160S Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry (Seawater)	E162S Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Seawater by IC	E235S.Br Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Seawater by IC	E235S.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Seawater by IC (Low Level)	E235S.F-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence	E318S Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO 2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Metals in Seawater by CRC ICPMS (HMI)	E468S Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Seawater samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS (HMI Mode). This method is compliant with digestion requirements of the British Columbia Environmental Laboratory Manual.
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Seawater samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. This method is compliant with digestion requirements of the British Columbia Environmental Laboratory Manual.
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Seawater samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS (HMI Mode).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Seawater samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.
Total Mercury in Seawater by CVAAS	E508S Vancouver - Environmental	Water	EPA 1631E (mod)	Seawater samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Mercury in Seawater by CVAAS	E509S Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Seawater samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Vancouver - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hexane LVI GC-MS	E641A Vancouver - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Salinity in Water (calculation)	EC100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
F1-BTEX	EC580 Vancouver - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.
LEPH and HEPH: EPH-PAH	EC600A Vancouver - Environmental	Water	BC MOE Lab Manual (LEPH and HEPH) (mod)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in Seawater	EP318S Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	:	**YL2201255**	Page	:	1 of 20
Client	:	Golder Associates Ltd.	Laboratory	:	Yellowknife - Environmental
Contact	:	Elaine Irving	Account Manager	:	Amber Springer
Address	:	200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	:	314 Old Airport Road, Unit 116 Yellowknife, Northwest Territories Canada X1A 3T3
Telephone	:	----	Telephone	:	+1 867 873 5593
Project	:	166372401/64000/03	Date Samples Received	:	18-Aug-2022 12:05
PO	:	----	Date Analysis Commenced	:	22-Aug-2022
C-O-C number	:	21-05	Issue Date	:	06-Sep-2022 13:55
Sampler	:	TT/MR/DV			
Site	:	----			
Quote number	:	VA22-GOLD100-028			
No. of samples received	:	9			
No. of samples analysed	:	9			

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Courtney Cox	Analsyt	Vancouver Inorganics, Burnaby, British Columbia
Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Owen Cheng		Vancouver Metals, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Vancouver Metals, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 613884)											
YL2201255-001	MP05-Source-1-22	solids, total dissolved [TDS]	----	E162S	400	mg/L	36400	36400	0.137%	20%	----
Physical Tests (QC Lot: 614082)											
YL2201255-001	MP05-Source-1-22	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	110	110	0.635%	20%	----
Physical Tests (QC Lot: 614083)											
YL2201255-001	MP05-Source-1-22	conductivity	----	E100S	2.0	µS/cm	45300	45200	0.221%	20%	----
Physical Tests (QC Lot: 614084)											
YL2201255-001	MP05-Source-1-22	pH	----	E108	0.10	pH units	7.99	7.99	0.00%	4%	----
Physical Tests (QC Lot: 614247)											
YL2201228-001	Anonymous	turbidity	----	E121	0.10	NTU	16.6	16.2	2.56%	15%	----
Anions and Nutrients (QC Lot: 613891)											
YL2201255-002	MP05-North-1-22	phosphorus, total	7723-14-0	E372S	0.0040	mg/L	0.0209	0.0251	0.0043	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 613892)											
VA22B7558-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 613895)											
YL2201255-001	MP05-Source-1-22	Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	0.066	0.119	0.053	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 614085)											
YL2201255-001	MP05-Source-1-22	chloride	16887-00-6	E235S.Cl	50	mg/L	17000	15800	6.99%	20%	----
Anions and Nutrients (QC Lot: 614086)											
YL2201255-001	MP05-Source-1-22	bromide	24959-67-9	E235S.Br	5.0	mg/L	60.0	55.9	7.04%	20%	----
Anions and Nutrients (QC Lot: 614087)											
YL2201255-001	MP05-Source-1-22	fluoride	16984-48-8	E235S.F-L	0.20	mg/L	0.68	0.73	0.05	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 614088)											
YL2201255-001	MP05-Source-1-22	nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	0.016	0.016	0.0006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 614089)											
YL2201255-001	MP05-Source-1-22	nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 614090)											
YL2201255-001	MP05-Source-1-22	sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	2240	2160	3.75%	20%	----
Organic / Inorganic Carbon (QC Lot: 613887)											
VA22B7558-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.46	3.21	0.25	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 613888)											
VA22B7558-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.01	3.81	0.79	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 615658)											
YL2201255-001	MP05-Source-1-22	mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 621099)											
VA22B9805-007	Anonymous	silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
VA22B9805-007	Anonymous	aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0152	0.0136	0.0016	Diff <2x LOR	----
		antimony, total	7440-36-0	E468S	0.0010	mg/L	0.0010	<0.0010	0.000003	Diff <2x LOR	----
		arsenic, total	7440-38-2	E468S	0.00040	mg/L	0.00153	0.00154	0.00001	Diff <2x LOR	----
		barium, total	7440-39-3	E468S	0.0010	mg/L	0.0094	0.0094	0.000005	Diff <2x LOR	----
		beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E468S	0.30	mg/L	3.42	3.54	3.51%	20%	----
		cadmium, total	7440-43-9	E468S	0.000010	mg/L	0.000045	0.000051	0.000006	Diff <2x LOR	----
		calcium, total	7440-70-2	E468S	1.0	mg/L	338	361	6.44%	20%	----
		cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, total	7440-50-8	E468S	0.00050	mg/L	0.00057	0.00056	0.00002	Diff <2x LOR	----
		gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E468S	0.010	mg/L	0.021	0.021	0.0006	Diff <2x LOR	----
		lead, total	7439-92-1	E468S	0.000050	mg/L	0.00128	0.00128	0.0348%	20%	----
		lithium, total	7439-93-2	E468S	0.020	mg/L	0.142	0.140	0.002	Diff <2x LOR	----
		magnesium, total	7439-95-4	E468S	1.0	mg/L	1040	1040	0.224%	20%	----
		manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00774	0.00778	0.557%	20%	----
		molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00942	0.00951	0.922%	20%	----
		nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	0.060	0.010	Diff <2x LOR	----
		potassium, total	7440-09-7	E468S	1.0	mg/L	344	353	2.46%	20%	----
		rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.102	0.104	1.31%	20%	----
		selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		strontium, total	7440-24-6	E468S	0.010	mg/L	6.24	6.43	3.03%	20%	----
		sulfur, total	7704-34-9	E468S	5.0	mg/L	886	879	0.763%	20%	----
		tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
					Laboratory Duplicate (DUP) Report						
Total Metals (QC Lot: 621099) - continued											
VA22B9805-007	Anonymous	titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E468S	0.000050	mg/L	0.00242	0.00244	0.757%	20%	----
		vanadium, total	7440-62-2	E468S	0.00050	mg/L	0.00138	0.00140	0.00003	Diff <2x LOR	----
		yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Total Metals (QC Lot: 621100)											
VA22B9805-007	Anonymous	silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	8770	8840	0.761%	20%	----
Dissolved Metals (QC Lot: 615793)											
YL2201255-001	MP05-Source-1-22	mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 620419)											
YL2201255-001	MP05-Source-1-22	silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	9440	9290	1.57%	20%	----
Dissolved Metals (QC Lot: 620420)											
YL2201255-001	MP05-Source-1-22	aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	0.00152	0.00147	0.00005	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0085	0.0084	0.00004	Diff <2x LOR	----
		beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E469S	0.30	mg/L	3.51	3.47	1.13%	20%	----
		cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	0.000019	0.000017	0.000002	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E469S	1.0	mg/L	389	410	5.25%	20%	----
		cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00058	0.00057	0.00001	Diff <2x LOR	----
		gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E469S	0.020	mg/L	0.159	0.154	0.005	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	986	983	0.304%	20%	----
		manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00101	0.00098	0.00003	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 620420) - continued											
YL2201255-001	MP05-Source-1-22	molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00978	0.0102	4.50%	20%	----
		nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E469S	1.0	mg/L	366	377	2.79%	20%	----
		rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.105	0.106	0.354%	20%	----
		selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		strontium, dissolved	7440-24-6	E469S	0.010	mg/L	6.87	7.08	2.93%	20%	----
		sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	939	960	2.25%	20%	----
		tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.00301	0.00293	2.50%	20%	----
		vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	0.00124	0.00122	0.00002	Diff <2x LOR	----
		yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 613865)											
YL2201255-001	MP05-Source-1-22	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 613864)											
YL2201255-001	MP05-Source-1-22	F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----
		VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Physical Tests (QCLot: 613883)						
solids, total suspended [TSS]	----	E160S	2	mg/L	<2.0	----
Physical Tests (QCLot: 613884)						
solids, total dissolved [TDS]	----	E162S	10	mg/L	<10	----
Physical Tests (QCLot: 614082)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 614083)						
conductivity	----	E100S	2	µS/cm	<2.0	----
Physical Tests (QCLot: 614247)						
turbidity	----	E121	0.1	NTU	<0.10	----
Anions and Nutrients (QCLot: 613891)						
phosphorus, total	7723-14-0	E372S	0.002	mg/L	<0.0040	----
Anions and Nutrients (QCLot: 613892)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 613895)						
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 614085)						
chloride	16887-00-6	E235S.Cl	50	mg/L	<50	----
Anions and Nutrients (QCLot: 614086)						
bromide	24959-67-9	E235S.Br	5	mg/L	<5.0	----
Anions and Nutrients (QCLot: 614087)						
fluoride	16984-48-8	E235S.F-L	0.2	mg/L	<0.20	----
Anions and Nutrients (QCLot: 614088)						
nitrate (as N)	14797-55-8	E235S.NO3-T	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 614089)						
nitrite (as N)	14797-65-0	E235S.NO2-L	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 614090)						
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3	mg/L	<3.0	----
Organic / Inorganic Carbon (QCLot: 613887)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 613888)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 615658)						
mercury, total	7439-97-6	E508S	0.000005	mg/L	<0.0000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 621099)						
aluminum, total	7429-90-5	E468S	0.005	mg/L	<0.0050	----
antimony, total	7440-36-0	E468S	0.001	mg/L	<0.0010	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	<0.00040	----
barium, total	7440-39-3	E468S	0.001	mg/L	<0.0010	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	<0.00050	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	<0.00050	----
boron, total	7440-42-8	E468S	0.3	mg/L	<0.30	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	<0.000010	----
calcium, total	7440-70-2	E468S	1	mg/L	<1.0	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	<0.00050	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	<0.000050	----
copper, total	7440-50-8	E468S	0.0005	mg/L	<0.00050	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E468S	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E468S	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E468S	0.02	mg/L	<0.020	----
magnesium, total	7439-95-4	E468S	1	mg/L	<1.0	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	<0.00020	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	<0.00010	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E468S	1	mg/L	<1.0	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	<0.00050	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	<0.0050	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	<0.00050	----
silver, total	7440-22-4	E468S	0.0001	mg/L	<0.00010	----
strontium, total	7440-24-6	E468S	0.01	mg/L	<0.010	----
sulfur, total	7704-34-9	E468S	5	mg/L	<5.0	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	<0.00050	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	<0.000050	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	<0.00050	----
tin, total	7440-31-5	E468S	0.001	mg/L	<0.0010	----
titanium, total	7440-32-6	E468S	0.005	mg/L	<0.0050	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	<0.0010	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 621099) - continued						
vanadium, total	7440-62-2	E468S	0.0005	mg/L	<0.00050	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E468S	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 621100)						
silicon, total	7440-21-3	E468S.NaSi	1	mg/L	<1.0	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	<2.5	----
Dissolved Metals (QCLot: 615793)						
mercury, dissolved	7439-97-6	E509S	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 620419)						
silicon, dissolved	7440-21-3	E469S.NaSi	1	mg/L	<1.0	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	<2.5	----
Dissolved Metals (QCLot: 620420)						
aluminum, dissolved	7429-90-5	E469S	0.005	mg/L	<0.0050	----
antimony, dissolved	7440-36-0	E469S	0.001	mg/L	<0.0010	----
arsenic, dissolved	7440-38-2	E469S	0.0004	mg/L	<0.00040	----
barium, dissolved	7440-39-3	E469S	0.001	mg/L	<0.0010	----
beryllium, dissolved	7440-41-7	E469S	0.0005	mg/L	<0.00050	----
bismuth, dissolved	7440-69-9	E469S	0.0005	mg/L	<0.00050	----
boron, dissolved	7440-42-8	E469S	0.3	mg/L	<0.30	----
cadmium, dissolved	7440-43-9	E469S	0.00001	mg/L	<0.000010	----
calcium, dissolved	7440-70-2	E469S	1	mg/L	<1.0	----
cesium, dissolved	7440-46-2	E469S	0.0005	mg/L	<0.00050	----
chromium, dissolved	7440-47-3	E469S	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E469S	0.00005	mg/L	<0.000050	----
copper, dissolved	7440-50-8	E469S	0.0002	mg/L	<0.00020	----
gallium, dissolved	7440-55-3	E469S	0.0005	mg/L	<0.00050	----
iron, dissolved	7439-89-6	E469S	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E469S	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E469S	0.02	mg/L	<0.020	----
magnesium, dissolved	7439-95-4	E469S	1	mg/L	<1.0	----
manganese, dissolved	7439-96-5	E469S	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E469S	0.0001	mg/L	<0.00010	----
nickel, dissolved	7440-02-0	E469S	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E469S	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E469S	1	mg/L	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 620420) - continued						
rhenium, dissolved	7440-15-5	E469S	0.0005	mg/L	<0.00050	----
rubidium, dissolved	7440-17-7	E469S	0.005	mg/L	<0.0050	----
selenium, dissolved	7782-49-2	E469S	0.0005	mg/L	<0.00050	----
silver, dissolved	7440-22-4	E469S	0.0001	mg/L	<0.00010	----
strontium, dissolved	7440-24-6	E469S	0.01	mg/L	<0.010	----
sulfur, dissolved	7704-34-9	E469S	5	mg/L	<5.0	----
tellurium, dissolved	13494-80-9	E469S	0.0005	mg/L	<0.00050	----
thallium, dissolved	7440-28-0	E469S	0.00005	mg/L	<0.000050	----
thorium, dissolved	7440-29-1	E469S	0.0005	mg/L	<0.00050	----
tin, dissolved	7440-31-5	E469S	0.001	mg/L	<0.0010	----
titanium, dissolved	7440-32-6	E469S	0.005	mg/L	<0.0050	----
tungsten, dissolved	7440-33-7	E469S	0.001	mg/L	<0.0010	----
uranium, dissolved	7440-61-1	E469S	0.00005	mg/L	<0.000050	----
vanadium, dissolved	7440-62-2	E469S	0.0005	mg/L	<0.00050	----
yttrium, dissolved	7440-65-5	E469S	0.0005	mg/L	<0.00050	----
zinc, dissolved	7440-66-6	E469S	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E469S	0.0005	mg/L	<0.00050	----
Volatile Organic Compounds (QCLot: 613865)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 613818)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
Hydrocarbons (QCLot: 613820)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----
F4 (C34-C50)	----	E601	250	µg/L	<250	----
Hydrocarbons (QCLot: 613864)						
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Polycyclic Aromatic Hydrocarbons (QCLot: 613819)						

Work Order : YL2201255
Client : Golder Associates Ltd.
Project : 166372401/64000/03

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 613819) - continued						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
quinoline	91-22-5	E641A	0.05	µg/L	<0.050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 613883)									
solids, total suspended [TSS]	----	E160S	2	mg/L	150 mg/L	98.2	85.0	115	----
Physical Tests (QCLot: 613884)									
solids, total dissolved [TDS]	----	E162S	10	mg/L	1000 mg/L	92.8	85.0	115	----
Physical Tests (QCLot: 614082)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	107	85.0	115	----
Physical Tests (QCLot: 614083)									
conductivity	----	E100S	2	µS/cm	146.9 µS/cm	100	80.0	120	----
Physical Tests (QCLot: 614084)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 614247)									
turbidity	----	E121	0.1	NTU	200 NTU	102	85.0	115	----
Anions and Nutrients (QCLot: 613891)									
phosphorus, total	7723-14-0	E372S	0.002	mg/L	0.05 mg/L	92.7	80.0	120	----
Anions and Nutrients (QCLot: 613892)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	108	85.0	115	----
Anions and Nutrients (QCLot: 613895)									
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	4 mg/L	92.2	75.0	125	----
Anions and Nutrients (QCLot: 614085)									
chloride	16887-00-6	E235S.Cl	50	mg/L	100 mg/L	95.8	90.0	110	----
Anions and Nutrients (QCLot: 614086)									
bromide	24959-67-9	E235S.Br	5	mg/L	0.5 mg/L	97.0	85.0	115	----
Anions and Nutrients (QCLot: 614087)									
fluoride	16984-48-8	E235S.F-L	0.2	mg/L	1 mg/L	94.2	90.0	110	----
Anions and Nutrients (QCLot: 614088)									
nitrate (as N)	14797-55-8	E235S.NO3-T	0.01	mg/L	2.5 mg/L	96.2	90.0	110	----
Anions and Nutrients (QCLot: 614089)									
nitrite (as N)	14797-65-0	E235S.NO2-L	0.01	mg/L	0.5 mg/L	94.7	90.0	110	----
Anions and Nutrients (QCLot: 614090)									
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3	mg/L	100 mg/L	97.7	90.0	110	----
Organic / Inorganic Carbon (QCLot: 613887)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	96.6	80.0	120	----

Sub-Matrix: **Water**

Laboratory Control Sample (LCS) Report

Analyte	CAS Number	Method	LOR	Unit	Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Organic / Inorganic Carbon (QCLot: 613888)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	94.8	80.0	120	----
Total Metals (QCLot: 615658)									
mercury, total	7439-97-6	E508S	0.000005	mg/L	0.0001 mg/L	100	80.0	120	----
Total Metals (QCLot: 621099)									
aluminum, total	7429-90-5	E468S	0.005	mg/L	2 mg/L	106	80.0	120	----
antimony, total	7440-36-0	E468S	0.001	mg/L	1 mg/L	116	80.0	120	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	1 mg/L	108	80.0	120	----
barium, total	7440-39-3	E468S	0.001	mg/L	0.25 mg/L	106	80.0	120	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	0.1 mg/L	106	80.0	120	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	1 mg/L	103	80.0	120	----
boron, total	7440-42-8	E468S	0.3	mg/L	1 mg/L	95.4	80.0	120	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	0.1 mg/L	105	80.0	120	----
calcium, total	7440-70-2	E468S	1	mg/L	50 mg/L	110	80.0	120	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	0.05 mg/L	104	80.0	120	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
copper, total	7440-50-8	E468S	0.0005	mg/L	0.25 mg/L	106	80.0	120	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	0.25 mg/L	110	80.0	120	----
iron, total	7439-89-6	E468S	0.01	mg/L	1 mg/L	104	80.0	120	----
lead, total	7439-92-1	E468S	0.00005	mg/L	0.5 mg/L	102	80.0	120	----
lithium, total	7439-93-2	E468S	0.02	mg/L	0.25 mg/L	105	80.0	120	----
magnesium, total	7439-95-4	E468S	1	mg/L	50 mg/L	99.5	80.0	120	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	0.25 mg/L	109	80.0	120	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	0.5 mg/L	108	80.0	120	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	10 mg/L	112	80.0	120	----
potassium, total	7440-09-7	E468S	1	mg/L	50 mg/L	106	80.0	120	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	0.1 mg/L	104	80.0	120	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	0.1 mg/L	107	80.0	120	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	1 mg/L	106	80.0	120	----
silver, total	7440-22-4	E468S	0.0001	mg/L	0.1 mg/L	110	80.0	120	----
strontium, total	7440-24-6	E468S	0.01	mg/L	0.25 mg/L	99.5	80.0	120	----
sulfur, total	7704-34-9	E468S	5	mg/L	50 mg/L	114	80.0	120	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	0.1 mg/L	103	80.0	120	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	1 mg/L	104	80.0	120	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	0.1 mg/L	84.7	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 621099) - continued									
tin, total	7440-31-5	E468S	0.001	mg/L	0.5 mg/L	102	80.0	120	----
titanium, total	7440-32-6	E468S	0.005	mg/L	0.25 mg/L	104	80.0	120	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	0.005 mg/L	95.2	80.0	120	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	0.1 mg/L	100	80.0	120	----
zinc, total	7440-66-6	E468S	0.003	mg/L	0.5 mg/L	114	80.0	120	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	0.1 mg/L	101	80.0	120	----
Total Metals (QCLot: 621100)									
silicon, total	7440-21-3	E468S.NaSi	1	mg/L	10 mg/L	104	80.0	120	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	50 mg/L	110	80.0	120	----
mercury, dissolved	7439-97-6	E509S	0.000005	mg/L	0.0001 mg/L	99.6	80.0	120	----
silicon, dissolved	7440-21-3	E469S.NaSi	1	mg/L	10 mg/L	98.5	80.0	120	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	50 mg/L	103	80.0	120	----
Dissolved Metals (QCLot: 620420)									
aluminum, dissolved	7429-90-5	E469S	0.005	mg/L	2 mg/L	103	80.0	120	----
antimony, dissolved	7440-36-0	E469S	0.001	mg/L	1 mg/L	101	80.0	120	----
arsenic, dissolved	7440-38-2	E469S	0.0004	mg/L	1 mg/L	107	80.0	120	----
barium, dissolved	7440-39-3	E469S	0.001	mg/L	0.25 mg/L	104	80.0	120	----
beryllium, dissolved	7440-41-7	E469S	0.0005	mg/L	0.1 mg/L	104	80.0	120	----
bismuth, dissolved	7440-69-9	E469S	0.0005	mg/L	1 mg/L	107	80.0	120	----
boron, dissolved	7440-42-8	E469S	0.3	mg/L	10 mg/L	96.7	80.0	120	----
cadmium, dissolved	7440-43-9	E469S	0.00001	mg/L	0.1 mg/L	107	80.0	120	----
calcium, dissolved	7440-70-2	E469S	1	mg/L	50 mg/L	106	80.0	120	----
cesium, dissolved	7440-46-2	E469S	0.0005	mg/L	0.05 mg/L	96.5	80.0	120	----
chromium, dissolved	7440-47-3	E469S	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
cobalt, dissolved	7440-48-4	E469S	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
copper, dissolved	7440-50-8	E469S	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
gallium, dissolved	7440-55-3	E469S	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
iron, dissolved	7439-89-6	E469S	0.01	mg/L	1 mg/L	105	80.0	120	----
lead, dissolved	7439-92-1	E469S	0.00005	mg/L	0.5 mg/L	104	80.0	120	----
lithium, dissolved	7439-93-2	E469S	0.02	mg/L	0.25 mg/L	104	80.0	120	----
magnesium, dissolved	7439-95-4	E469S	1	mg/L	50 mg/L	99.6	80.0	120	----
manganese, dissolved	7439-96-5	E469S	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
molybdenum, dissolved	7439-98-7	E469S	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
nickel, dissolved	7440-02-0	E469S	0.0005	mg/L	0.5 mg/L	107	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 620420) - continued									
phosphorus, dissolved	7723-14-0	E469S	0.05	mg/L	10 mg/L	107	80.0	120	----
potassium, dissolved	7440-09-7	E469S	1	mg/L	50 mg/L	108	80.0	120	----
rhenium, dissolved	7440-15-5	E469S	0.0005	mg/L	0.1 mg/L	102	80.0	120	----
rubidium, dissolved	7440-17-7	E469S	0.005	mg/L	0.1 mg/L	111	80.0	120	----
selenium, dissolved	7782-49-2	E469S	0.0005	mg/L	1 mg/L	108	80.0	120	----
silver, dissolved	7440-22-4	E469S	0.0001	mg/L	0.1 mg/L	99.1	80.0	120	----
strontium, dissolved	7440-24-6	E469S	0.01	mg/L	0.25 mg/L	118	80.0	120	----
sulfur, dissolved	7704-34-9	E469S	5	mg/L	50 mg/L	112	80.0	120	----
tellurium, dissolved	13494-80-9	E469S	0.0005	mg/L	0.1 mg/L	114	80.0	120	----
thallium, dissolved	7440-28-0	E469S	0.00005	mg/L	1 mg/L	105	80.0	120	----
thorium, dissolved	7440-29-1	E469S	0.0005	mg/L	0.1 mg/L	89.6	80.0	120	----
tin, dissolved	7440-31-5	E469S	0.001	mg/L	0.5 mg/L	101	80.0	120	----
titanium, dissolved	7440-32-6	E469S	0.005	mg/L	0.25 mg/L	106	80.0	120	----
tungsten, dissolved	7440-33-7	E469S	0.001	mg/L	0.1 mg/L	99.7	80.0	120	----
uranium, dissolved	7440-61-1	E469S	0.00005	mg/L	0.005 mg/L	98.1	80.0	120	----
vanadium, dissolved	7440-62-2	E469S	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
yttrium, dissolved	7440-65-5	E469S	0.0005	mg/L	0.1 mg/L	102	80.0	120	----
zinc, dissolved	7440-66-6	E469S	0.001	mg/L	0.5 mg/L	113	80.0	120	----
zirconium, dissolved	7440-67-7	E469S	0.0005	mg/L	0.1 mg/L	93.4	80.0	120	----
Volatile Organic Compounds (QCLot: 613865)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	105	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	106	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	99.4	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	107	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	104	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	106	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	106	70.0	130	----
Hydrocarbons (QCLot: 613818)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	116	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	118	70.0	130	----
Hydrocarbons (QCLot: 613820)									
F2 (C10-C16)	----	E601	100	µg/L	3538 µg/L	124	70.0	130	----
F3 (C16-C34)	----	E601	250	µg/L	7053 µg/L	110	70.0	130	----
F4 (C34-C50)	----	E601	250	µg/L	5051 µg/L	106	70.0	130	----
Hydrocarbons (QCLot: 613864)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Hydrocarbons (QCLot: 613864) - continued									
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	99.9	70.0	130	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	104	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 613819)									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.5 µg/L	102	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5 µg/L	103	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	0.5 µg/L	126	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	0.5 µg/L	111	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5 µg/L	101	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5 µg/L	99.7	60.0	130	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.5 µg/L	99.1	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5 µg/L	118	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5 µg/L	112	60.0	130	----
chrysene	218-01-9	E641A	0.01	µg/L	0.5 µg/L	103	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5 µg/L	109	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.5 µg/L	112	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	0.5 µg/L	108	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5 µg/L	110	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5 µg/L	97.0	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5 µg/L	94.8	60.0	130	----
naphthalene	91-20-3	E641A	0.05	µg/L	0.5 µg/L	97.5	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.5 µg/L	110	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	0.5 µg/L	109	60.0	130	----
quinoline	91-22-5	E641A	0.05	µg/L	0.5 µg/L	112	60.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 613891)										
YL2201255-001	MP05-Source-1-22	phosphorus, total	7723-14-0	E372S	0.0898 mg/L	0.1 mg/L	89.8	70.0	130	----
Anions and Nutrients (QCLot: 613892)										
VA22B9571-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.109 mg/L	0.1 mg/L	109	75.0	125	----
Anions and Nutrients (QCLot: 613895)										
YL2201255-002	MP05-North-1-22	Kjeldahl nitrogen, total [TKN]	----	E318S	2.75 mg/L	2.5 mg/L	110	70.0	130	----
Anions and Nutrients (QCLot: 614085)										
YL2201255-002	MP05-North-1-22	chloride	16887-00-6	E235S.Cl	ND mg/L	10000 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 614086)										
YL2201255-002	MP05-North-1-22	bromide	24959-67-9	E235S.Br	ND mg/L	50 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 614087)										
YL2201255-002	MP05-North-1-22	fluoride	16984-48-8	E235S.F-L	9.89 mg/L	10 mg/L	98.9	75.0	125	----
Anions and Nutrients (QCLot: 614088)										
YL2201255-002	MP05-North-1-22	nitrate (as N)	14797-55-8	E235S.NO3-T	7.55 mg/L	7.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 614089)										
YL2201255-002	MP05-North-1-22	nitrite (as N)	14797-65-0	E235S.NO2-L	4.81 mg/L	5 mg/L	96.3	75.0	125	----
Anions and Nutrients (QCLot: 614090)										
YL2201255-002	MP05-North-1-22	sulfate (as SO4)	14808-79-8	E235S.SO4-L	ND mg/L	1000 mg/L	ND	75.0	125	----
Organic / Inorganic Carbon (QCLot: 613887)										
VA22B9571-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.26 mg/L	5 mg/L	105	70.0	130	----
Organic / Inorganic Carbon (QCLot: 613888)										
YL2201255-001	MP05-Source-1-22	carbon, total organic [TOC]	----	E355-L	4.91 mg/L	5 mg/L	98.2	70.0	130	----
Total Metals (QCLot: 615658)										
YL2201255-002	MP05-North-1-22	mercury, total	7439-97-6	E508S	0.000101 mg/L	0.0001 mg/L	101	70.0	130	----
Total Metals (QCLot: 621099)										
VA22B9805-008	Anonymous	aluminum, total	7429-90-5	E468S	0.477 mg/L	0.4 mg/L	119	70.0	130	----
		antimony, total	7440-36-0	E468S	0.0386 mg/L	0.04 mg/L	96.4	70.0	130	----
		arsenic, total	7440-38-2	E468S	0.0413 mg/L	0.04 mg/L	103	70.0	130	----
		barium, total	7440-39-3	E468S	0.0424 mg/L	0.04 mg/L	106	70.0	130	----
		beryllium, total	7440-41-7	E468S	0.0856 mg/L	0.08 mg/L	107	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Total Metals (QCLot: 621099) - continued										
VA22B9805-008	Anonymous	bismuth, total	7440-69-9	E468S	0.0160 mg/L	0.02 mg/L	80.0	70.0	130	----
		boron, total	7440-42-8	E468S	ND mg/L	0.2 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E468S	0.00720 mg/L	0.008 mg/L	89.9	70.0	130	----
		calcium, total	7440-70-2	E468S	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E468S	0.0186 mg/L	0.02 mg/L	93.1	70.0	130	----
		chromium, total	7440-47-3	E468S	0.0811 mg/L	0.08 mg/L	101	70.0	130	----
		cobalt, total	7440-48-4	E468S	0.0380 mg/L	0.04 mg/L	95.1	70.0	130	----
		copper, total	7440-50-8	E468S	0.0361 mg/L	0.04 mg/L	90.4	70.0	130	----
		gallium, total	7440-55-3	E468S	0.00531 mg/L	0.005 mg/L	106	70.0	130	----
		iron, total	7439-89-6	E468S	4.14 mg/L	4 mg/L	103	70.0	130	----
		lead, total	7439-92-1	E468S	0.0341 mg/L	0.04 mg/L	85.2	70.0	130	----
		lithium, total	7439-93-2	E468S	0.183 mg/L	0.2 mg/L	91.4	70.0	130	----
		magnesium, total	7439-95-4	E468S	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E468S	0.0446 mg/L	0.04 mg/L	112	70.0	130	----
		molybdenum, total	7439-98-7	E468S	0.0429 mg/L	0.04 mg/L	107	70.0	130	----
		nickel, total	7440-02-0	E468S	0.0745 mg/L	0.08 mg/L	93.2	70.0	130	----
		phosphorus, total	7723-14-0	E468S	25.7 mg/L	20 mg/L	128	70.0	130	----
		potassium, total	7440-09-7	E468S	ND mg/L	8 mg/L	ND	70.0	130	----
		rhenium, total	7440-15-5	E468S	0.00488 mg/L	0.005 mg/L	97.6	70.0	130	----
		rubidium, total	7440-17-7	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		selenium, total	7782-49-2	E468S	0.0742 mg/L	0.08 mg/L	92.8	70.0	130	----
		silver, total	7440-22-4	E468S	0.00705 mg/L	0.008 mg/L	88.1	70.0	130	----
		strontium, total	7440-24-6	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E468S	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E468S	0.0692 mg/L	0.08 mg/L	86.5	70.0	130	----
		thallium, total	7440-28-0	E468S	0.00676 mg/L	0.008 mg/L	84.6	70.0	130	----
		thorium, total	7440-29-1	E468S	0.0347 mg/L	0.04 mg/L	86.7	70.0	130	----
		tin, total	7440-31-5	E468S	0.0367 mg/L	0.04 mg/L	91.9	70.0	130	----
		titanium, total	7440-32-6	E468S	0.0951 mg/L	0.08 mg/L	119	70.0	130	----
		tungsten, total	7440-33-7	E468S	0.0382 mg/L	0.04 mg/L	95.6	70.0	130	----
		uranium, total	7440-61-1	E468S	0.00662 mg/L	0.008 mg/L	82.8	70.0	130	----
		vanadium, total	7440-62-2	E468S	0.224 mg/L	0.2 mg/L	112	70.0	130	----
		yttrium, total	7440-65-5	E468S	0.00582 mg/L	0.005 mg/L	116	70.0	130	----
		zinc, total	7440-66-6	E468S	0.769 mg/L	0.8 mg/L	96.2	70.0	130	----
		zirconium, total	7440-67-7	E468S	0.0852 mg/L	0.08 mg/L	106	70.0	130	----
Total Metals (QCLot: 621100)										

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Total Metals (QCLot: 621100) - continued										
VA22B9805-008	Anonymous	silicon, total	7440-21-3	E468S.NaSi	499 mg/L	500 mg/L	99.8	70.0	130	----
		sodium, total	7440-23-5	E468S.NaSi	ND mg/L	100 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 615793)										
YL2201255-002	MP05-North-1-22	mercury, dissolved	7439-97-6	E509S	0.0000991 mg/L	0.0001 mg/L	99.1	70.0	130	----
Dissolved Metals (QCLot: 620419)										
YL2201255-002	MP05-North-1-22	silicon, dissolved	7440-21-3	E469S.NaSi	521 mg/L	500 mg/L	104	70.0	130	----
		sodium, dissolved	7440-23-5	E469S.NaSi	ND mg/L	100 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 620420)										
YL2201255-002	MP05-North-1-22	aluminum, dissolved	7429-90-5	E469S	0.434 mg/L	0.4 mg/L	108	70.0	130	----
		antimony, dissolved	7440-36-0	E469S	0.0391 mg/L	0.04 mg/L	97.7	70.0	130	----
		arsenic, dissolved	7440-38-2	E469S	0.0397 mg/L	0.04 mg/L	99.3	70.0	130	----
		barium, dissolved	7440-39-3	E469S	0.0399 mg/L	0.04 mg/L	99.7	70.0	130	----
		beryllium, dissolved	7440-41-7	E469S	0.0864 mg/L	0.08 mg/L	108	70.0	130	----
		bismuth, dissolved	7440-69-9	E469S	0.0165 mg/L	0.02 mg/L	82.5	70.0	130	----
		boron, dissolved	7440-42-8	E469S	ND mg/L	0.2 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E469S	0.00703 mg/L	0.008 mg/L	87.9	70.0	130	----
		calcium, dissolved	7440-70-2	E469S	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E469S	0.0194 mg/L	0.02 mg/L	97.3	70.0	130	----
		chromium, dissolved	7440-47-3	E469S	0.0804 mg/L	0.08 mg/L	100	70.0	130	----
		cobalt, dissolved	7440-48-4	E469S	0.0374 mg/L	0.04 mg/L	93.5	70.0	130	----
		copper, dissolved	7440-50-8	E469S	0.0352 mg/L	0.04 mg/L	87.9	70.0	130	----
		gallium, dissolved	7440-55-3	E469S	0.00542 mg/L	0.005 mg/L	108	70.0	130	----
		iron, dissolved	7439-89-6	E469S	3.99 mg/L	4 mg/L	99.8	70.0	130	----
		lead, dissolved	7439-92-1	E469S	0.0349 mg/L	0.04 mg/L	87.4	70.0	130	----
		lithium, dissolved	7439-93-2	E469S	0.199 mg/L	0.2 mg/L	99.6	70.0	130	----
		magnesium, dissolved	7439-95-4	E469S	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E469S	0.0424 mg/L	0.04 mg/L	106	70.0	130	----
		molybdenum, dissolved	7439-98-7	E469S	0.0427 mg/L	0.04 mg/L	107	70.0	130	----
		nickel, dissolved	7440-02-0	E469S	0.0737 mg/L	0.08 mg/L	92.2	70.0	130	----
		phosphorus, dissolved	7723-14-0	E469S	23.5 mg/L	20 mg/L	118	70.0	130	----
		potassium, dissolved	7440-09-7	E469S	ND mg/L	8 mg/L	ND	70.0	130	----
		rhenium, dissolved	7440-15-5	E469S	0.00470 mg/L	0.005 mg/L	94.0	70.0	130	----
		rubidium, dissolved	7440-17-7	E469S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E469S	0.0729 mg/L	0.08 mg/L	91.1	70.0	130	----
		silver, dissolved	7440-22-4	E469S	0.00734 mg/L	0.008 mg/L	91.7	70.0	130	----
		strontium, dissolved	7440-24-6	E469S	ND mg/L	0.04 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	High	Qualifier
Dissolved Metals (QCLot: 620420) - continued										
YL2201255-002	MP05-North-1-22	sulfur, dissolved	7704-34-9	E469S	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E469S	0.0726 mg/L	0.08 mg/L	90.8	70.0	130	----
		thallium, dissolved	7440-28-0	E469S	0.00694 mg/L	0.008 mg/L	86.8	70.0	130	----
		thorium, dissolved	7440-29-1	E469S	0.0362 mg/L	0.04 mg/L	90.4	70.0	130	----
		tin, dissolved	7440-31-5	E469S	0.0373 mg/L	0.04 mg/L	93.4	70.0	130	----
		titanium, dissolved	7440-32-6	E469S	0.0909 mg/L	0.08 mg/L	114	70.0	130	----
		tungsten, dissolved	7440-33-7	E469S	0.0389 mg/L	0.04 mg/L	97.2	70.0	130	----
		uranium, dissolved	7440-61-1	E469S	0.00710 mg/L	0.008 mg/L	88.8	70.0	130	----
		vanadium, dissolved	7440-62-2	E469S	0.214 mg/L	0.2 mg/L	107	70.0	130	----
		yttrium, dissolved	7440-65-5	E469S	0.00564 mg/L	0.005 mg/L	113	70.0	130	----
		zinc, dissolved	7440-66-6	E469S	0.754 mg/L	0.8 mg/L	94.3	70.0	130	----
		zirconium, dissolved	7440-67-7	E469S	0.0857 mg/L	0.08 mg/L	107	70.0	130	----
Volatile Organic Compounds (QCLot: 613865)										
YL2201255-001	MP05-Source-1-22	benzene	71-43-2	E611A	96.1 µg/L	100 µg/L	96.1	60.0	140	----
		ethylbenzene	100-41-4	E611A	93.0 µg/L	100 µg/L	93.0	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	92.4 µg/L	100 µg/L	92.4	60.0	140	----
		styrene	100-42-5	E611A	97.4 µg/L	100 µg/L	97.4	60.0	140	----
		toluene	108-88-3	E611A	93.5 µg/L	100 µg/L	93.5	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	187 µg/L	200 µg/L	93.7	60.0	140	----
		xylene, o-	95-47-6	E611A	95.7 µg/L	100 µg/L	95.7	60.0	140	----
Hydrocarbons (QCLot: 613864)										
YL2201255-003	MP05-ENE-1-22	F1 (C6-C10)	----	E581.VH+F1	5430 µg/L	6310 µg/L	86.0	60.0	140	----
		VHw (C6-C10)	----	E581.VH+F1	5660 µg/L	6310 µg/L	89.6	60.0	140	----

Chain of Custody (COC) / Analytical Request Form

ALS www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 21 -05

Page 1 of 1

Environmental Division
Yellowknife
Work Order Reference
YL2201255

Telephone : +1 867 873 5593

Report To	Contact and company name below will appear on the final report
Company:	Golder Associates Ltd.
Contact:	Elaine Irving/Connor Pettern
Phone:	1-604-297-2030/1-604-296-4200
	Company address below will appear on the final report
Street:	Suite 200 - 2920 Virtual Way
City/Province:	Vancouver, BC
Postal Code:	V5M 0C4
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax elaine.irving@wsp.com

Email 2 connor.pettern@wsp.com

Email 3 trish.tomliens@wsp.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax

Email 2

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends,

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please conta

Project Information

ALS Account # / Quote #:	
Job #:	GOLD 100-028
PO / AFE:	166372401/64000/03
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center: | PO#
Major/Minor Code: | Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (ALS use only): YL22 1255

ALS Contact: Amber Springer

Sampler: TT/MR/DV

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	General (alkalinity, turbidity, conduc	Anions, TOC, DOC, Hardness, Salin	pH, TSS, TDS, Ammonia, TKN)	Dissolved Metals (F/P)	Total Metals (P)	Dissolved Mercury (F/P)	Total Mercury (P)	Nutrients (including total phosphorus (P)	Petroleum hydrocarbons (MTBE) (P)	Petroleum hydrocarbons (BTEX,F1) (P)	Hydrocarbons (LEPH/HEPH) (P)	PAH, F2-F4 (P)			SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes
	MP05-Source-1-22	13-Aug-22	14:58	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
	MP05-North-1-22	13-Aug-22	14:37	Seawater	6	R	R	R	R	R	R	R	R									
	MP05-ENE-1-22	13-Aug-22	14:45	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
	MP05-WNW-1-22	13-Aug-22	14:30	Seawater	6	R	R	R	R	R	R	R	R									
	DUP-C	13-Aug-22		Seawater	6	R	R	R	R	R	R	R	R									
	MP06-Source-2-22	13-Aug-22	14:11	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
	MP06-North-2-22	13-Aug-22	13:55	Seawater	6	R	R	R	R	R	R	R	R									
	MP06-ENE-2-22	13-Aug-22	13:43	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
	MP06-WNW-2-22	13-Aug-22	14:03	Seawater	6	R	R	R	R	R	R	R	R									

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please refer to quote for all analyses.

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☑ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C | FINAL COOLER TEMPERATURES °C: 17

SHIPMENT RELEASE (client use)	INITIAL SHIPMENT RECEPTION (ALS use only)	FINAL SHIPMENT RECEPTION (ALS use only)
Released by: Patricia Tomliens Date: 14 Aug 2022 Time: 7:14	Received by: Date: Time:	Received by: Date: AUG 18 2022 Time: 1105

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **VA22B9293**	Page	: 1 of 14
Client	: **Golder Associates Ltd.**	Laboratory	: Vancouver - Environmental
Contact	: Elaine Irving	Account Manager	: Amber Springer
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: 166372401/64000/03	Date Samples Received	: 18-Aug-2022 08:20
PO	:	Date Analysis Commenced	: 19-Aug-2022
C-O-C number	: 21-06	Issue Date	: 30-Aug-2022 03:53
Sampler	: TT/MR/DV		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Anshim Anshim	Lab Assistant	Metals, Burnaby, British Columbia
Benjamin Oke	Lab Assistant	Metals, Burnaby, British Columbia
Erin Sanchez		Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Parnian Sane	Analyst	Metals, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
psu	practical salinity units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLB	*Detection Limit Raised. Analyte detected at comparable level in Method Blank.*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-3
				Client sampling date / time	15-Aug-2022 10:55	15-Aug-2022 11:05	15-Aug-2022 11:15	15-Aug-2022 10:50	15-Aug-2022
					VA22B9293-001	VA22B9293-002	VA22B9293-003	VA22B9293-004	VA22B9293-005
					Result	Result	Result	Result	Result
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	83.2	74.1	73.1	75.4	7.8
conductivity	----	E100S	2.0	µS/cm	16900	19800	18900	20500	42.3
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	1740	2010	1870	2100	9.06
pH	----	E108	0.10	pH units	8.00	7.97	7.95	7.98	7.24
salinity	----	EC100S	1.0	psu	10.2	12.1	11.5	12.6	<1.0
solids, total dissolved [TDS]	----	E162S	10	mg/L	11300	13900	13300	13100	26
solids, total suspended [TSS]	----	E160S	2.0	mg/L	<2.0	<2.0	8.6	2.7	<2.0
turbidity	----	E121	0.10	NTU	1.13	0.51	1.82	0.35	<0.10
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0232	<0.0050	<0.0050	<0.0050	<0.0050
bromide	24959-67-9	E235S.Br	5.0	mg/L	17.5	19.1	19.4	21.2	<5.0
chloride	16887-00-6	E235S.Cl	50	mg/L	5670	6360	6410	6960	<50
fluoride	16984-48-8	E235S.F-L	0.20	mg/L	0.36	0.40	0.38	0.45	<0.20
Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	0.118	0.077	<0.050	0.100	<0.050
nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	0.448	<0.010	0.031	<0.010	0.055
nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
phosphorus, total	7723-14-0	E372S	0.0020	mg/L	0.0159	0.0093	0.0124	0.0100	<0.0040 DLM
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0147	0.0090	0.0107	0.0081	0.0023
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	780	922	867	949	<3.0
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.29	1.15	1.23	1.24	<0.50
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.58	0.93	0.90	1.07	<0.50
Total Metals									
aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0622	0.0397	0.0642	0.0358	<0.0050
antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
arsenic, total	7440-38-2	E468S	0.00040	mg/L	0.00066	0.00070	0.00067	0.00069	<0.00040
barium, total	7440-39-3	E468S	0.0010	mg/L	0.0102	0.0087	0.0088	0.0079	<0.0010
beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
boron, total	7440-42-8	E468S	0.30	mg/L	1.26	1.50	1.43	1.51	<0.30

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-3
Client sampling date / time					15-Aug-2022 10:55	15-Aug-2022 11:05	15-Aug-2022 11:15	15-Aug-2022 10:50	15-Aug-2022
					VA22B9293-001	VA22B9293-002	VA22B9293-003	VA22B9293-004	VA22B9293-005
					Result	Result	Result	Result	Result
Total Metals									
cadmium, total	7440-43-9	E468S	0.000010	mg/L	0.000012	0.000015	0.000014	0.000016	<0.000010
calcium, total	7440-70-2	E468S	1.0	mg/L	135	156	149	163	<1.0
cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, total	7440-48-4	E468S	0.000050	mg/L	0.000152	<0.000050	0.000061	<0.000050	<0.000050
copper, total	7440-50-8	E468S	0.00050	mg/L	0.00076	0.00066	0.00108	<0.00050	<0.00050
gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, total	7439-89-6	E468S	0.010	mg/L	0.077	0.047	0.096	0.047	<0.010
lead, total	7439-92-1	E468S	0.000050	mg/L	0.000088	0.000078	0.000083	0.000054	<0.000050
lithium, total	7439-93-2	E468S	0.020	mg/L	0.048	0.061	0.059	0.063	<0.020
magnesium, total	7439-95-4	E468S	1.0	mg/L	305	370	359	384	2.3 RRV
manganese, total	7439-96-5	E468S	0.00020	mg/L	0.0126	0.00191	0.00282	0.00187	<0.00020
mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00419	0.00392	0.00374	0.00423	<0.00010
nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, total	7440-09-7	E468S	1.0	mg/L	115	137	134	143	<1.0
rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.0338	0.0404	0.0391	0.0415	<0.0050
selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	2800	3750	3560	3650	3.9
strontium, total	7440-24-6	E468S	0.010	mg/L	2.16	2.76	2.58	2.91	<0.010
sulfur, total	7704-34-9	E468S	5.0	mg/L	262	330	318	339	<5.0
tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-3
				Client sampling date / time	15-Aug-2022 10:55	15-Aug-2022 11:05	15-Aug-2022 11:15	15-Aug-2022 10:50	15-Aug-2022
Analyte	CAS Number	Method	LOR	Unit	VA22B9293-001	VA22B9293-002	VA22B9293-003	VA22B9293-004	VA22B9293-005
					Result	Result	Result	Result	Result
Total Metals									
uranium, total	7440-61-1	E468S	0.000050	mg/L	0.0223	0.00153	0.00151	0.00158	<0.000050
vanadium, total	7440-62-2	E468S	0.00050	mg/L	<0.00100 DLB	<0.00100 DLB	<0.00100 DLB	<0.00100 DLB	<0.00050
yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	0.0140 RRV
zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Metals									
aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	0.0061	0.0053	0.0061	0.0057	<0.0050
antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	0.00052	0.00063	0.00057	0.00063	<0.00040
barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0083	0.0082	0.0081	0.0082	<0.0010
beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
boron, dissolved	7440-42-8	E469S	0.30	mg/L	1.31	1.49	1.38	1.55	<0.30
cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	0.000014	0.000016	<0.000010	0.000015	<0.000010
calcium, dissolved	7440-70-2	E469S	1.0	mg/L	142	159	144	166	<1.0
cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00037	0.00042	0.00045	0.00028	<0.00020
gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, dissolved	7439-93-2	E469S	0.020	mg/L	0.050	0.059	0.056	0.062	<0.020
magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	336	391	367	409	2.2 RRV
manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00229	0.00078	0.00080	0.00077	<0.00010
mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00363	0.00397	0.00367	0.00417	<0.00010
nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E469S	1.0	mg/L	121	141	129	148	<1.0
rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-3
				Client sampling date / time	15-Aug-2022 10:55	15-Aug-2022 11:05	15-Aug-2022 11:15	15-Aug-2022 10:50	15-Aug-2022
					VA22B9293-001	VA22B9293-002	VA22B9293-003	VA22B9293-004	VA22B9293-005
					Result	Result	Result	Result	Result
Dissolved Metals									
rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.0342	0.0395	0.0369	0.0422	<0.0050
selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	3140	3560	3260	3590	<2.5
strontium, dissolved	7440-24-6	E469S	0.010	mg/L	2.45	2.77	2.56	2.92	<0.010
sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	281	330	314	336	<5.0
tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.00415	0.00147	0.00144	0.00150	<0.000050
vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	0.00051	0.00060	0.00056	0.00061	<0.00050
yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0138 RRV
zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	Field
Volatile Organic Compounds [Fuels]									
benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	----	----	----
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	----	----	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	----	----	----
styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	----	----	----
toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	----	----	----
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	----	----	----
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	----	----	----
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	----	----	----
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	82.7	81.3	----	----	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-3
				Client sampling date / time	15-Aug-2022 10:55	15-Aug-2022 11:05	15-Aug-2022 11:15	15-Aug-2022 10:50	15-Aug-2022
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	VA22B9293-001	VA22B9293-002	VA22B9293-003	VA22B9293-004	VA22B9293-005
					Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates									
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	98.9	105	----	----	----
Hydrocarbons									
EPH (C10-C19)	----	E601A	250	µg/L	<250	<250	----	----	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	<250	----	----	----
F2 (C10-C16)	----	E601	100	µg/L	<100	<100	----	----	----
F3 (C16-C34)	----	E601	250	µg/L	<250	<250	----	----	----
F4 (C34-C50)	----	E601	250	µg/L	<250	<250	----	----	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	----	----
F1-BTEX	----	EC580	100	µg/L	<100	<100	----	----	----
HEPHw	----	EC600A	250	µg/L	<250	<250	----	----	----
LEPHw	----	EC600A	250	µg/L	<250	<250	----	----	----
VPHw	----	EC580A	100	µg/L	<100	<100	----	----	----
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	----	----	----
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	88.2	86.9	----	----	----
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%	84.1	81.8	----	----	----
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	110	112	----	----	----
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
acridine	260-94-6	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
anthracene	120-12-7	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	----
benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	<0.015	<0.015	----	----	----
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
chrysene	218-01-9	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	<0.0050	----	----	----
fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP05-Source-1-22	MP05-North-1-22	MP05-ENE-1-22	MP05-WNW-1-22	MLP-3
				Client sampling date / time	15-Aug-2022 10:55	15-Aug-2022 11:05	15-Aug-2022 11:15	15-Aug-2022 10:50	15-Aug-2022
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**VA22B9293-001**	**VA22B9293-002**	**VA22B9293-003**	**VA22B9293-004**	**VA22B9293-005**
					Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons									
fluorene	86-73-7	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	<0.050	----	----	----
phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	<0.020	----	----	----
pyrene	129-00-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	----
quinoline	91-22-5	E641A	0.050	µg/L	<0.050	<0.050	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
chrysene-d12	1719-03-5	E641A	0.1	%	103	102	----	----	----
naphthalene-d8	1146-65-2	E641A	0.1	%	98.8	95.6	----	----	----
phenanthrene-d10	1517-22-2	E641A	0.1	%	107	108	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Seawater
(Matrix: Water)

Analyte	CAS Number	Method	LOR	Unit	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
Client sampling date / time					15-Aug-2022 10:30	15-Aug-2022 10:10	15-Aug-2022 10:20	15-Aug-2022 10:40	----
					VA22B9293-006	VA22B9293-007	VA22B9293-008	VA22B9293-009	--------
					Result	Result	Result	Result	----
Physical Tests									
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	76.8	112	112	78.1	----
conductivity	----	E100S	2.0	µS/cm	19700	47600	47300	21900	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	1980	5390	5440	2120	----
pH	----	E108	0.10	pH units	8.01	8.01	8.02	8.01	----
salinity	----	EC100S	1.0	psu	12.0	31.9	31.7	13.5	----
solids, total dissolved [TDS]	----	E162S	10	mg/L	14600	31300	37200	14600	----
solids, total suspended [TSS]	----	E160S	2.0	mg/L	<2.0	2.5	<2.0	<2.0	----
turbidity	----	E121	0.10	NTU	0.37	<0.10	<0.10	0.42	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	0.0099	0.0132	<0.0050	----
bromide	24959-67-9	E235S.Br	5.0	mg/L	20.6	59.1	58.3	23.1	----
chloride	16887-00-6	E235S.Cl	50	mg/L	6680	17800	17700	7490	----
fluoride	16984-48-8	E235S.F-L	0.20	mg/L	<0.20	<0.20	<0.20	<0.20	----
Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	0.068	0.128	0.121	0.054	----
nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	<0.010	<0.010	0.010	<0.010	----
nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	----
phosphorus, total	7723-14-0	E372S	0.0020	mg/L	0.0089	0.0258	0.0285	0.0090	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0078	0.0253	0.0253	0.0086	----
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	<3.0	<3.0	<3.0	<3.0	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.04	1.20	1.33	1.07	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	0.92	1.04	1.17	0.89	----
Total Metals									
aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0329	<0.0050	0.0052	0.0346	----
antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
arsenic, total	7440-38-2	E468S	0.00040	mg/L	0.00067	0.00161	0.00161	0.00072	----
barium, total	7440-39-3	E468S	0.0010	mg/L	0.0072	0.0084	0.0088	0.0082	----
beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
boron, total	7440-42-8	E468S	0.30	mg/L	1.43	3.44	3.85	1.65	----
cadmium, total	7440-43-9	E468S	0.000010	mg/L	0.000013	0.000022	0.000028	0.000015	----

Analytical Results

Sub-Matrix: **Seawater**
(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	15-Aug-2022 10:30	15-Aug-2022 10:10	15-Aug-2022 10:20	15-Aug-2022 10:40	----
Analyte	CAS Number	Method	LOR	Unit	VA22B9293-006	VA22B9293-007	VA22B9293-008	VA22B9293-009	--------
					Result	Result	Result	Result	----
Total Metals									
calcium, total	7440-70-2	E468S	1.0	mg/L	154	351	436	174	----
cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	----
copper, total	7440-50-8	E468S	0.00050	mg/L	0.00099	0.00059	0.00160	<0.00050	----
gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
iron, total	7439-89-6	E468S	0.010	mg/L	0.045	<0.010	<0.010	0.042	----
lead, total	7439-92-1	E468S	0.000050	mg/L	0.000064	<0.000050	<0.000050	0.000051	----
lithium, total	7439-93-2	E468S	0.020	mg/L	0.058	0.129	0.156	0.065	----
magnesium, total	7439-95-4	E468S	1.0	mg/L	368	1060	1040	433	----
manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00190	0.00063	0.00076	0.00195	----
mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	----
molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00385	0.00998	0.0108	0.00454	----
nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	----
potassium, total	7440-09-7	E468S	1.0	mg/L	137	378	405	157	----
rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.0390	0.104	0.109	0.0456	----
selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----
silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	3480	9790	9730	4110	----
strontium, total	7440-24-6	E468S	0.010	mg/L	2.67	6.95	7.67	3.09	----
sulfur, total	7704-34-9	E468S	5.0	mg/L	323	939	964	376	----
tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0.00055	<0.00050	----
thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	----
thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	----
tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
uranium, total	7440-61-1	E468S	0.000050	mg/L	0.00146	0.00274	0.00262	0.00159	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

					Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
					Client sampling date / time	15-Aug-2022 10:30	15-Aug-2022 10:10	15-Aug-2022 10:20	15-Aug-2022 10:40	----
Analyte	CAS Number	Method	LOR	Unit		VA22B9293-006	VA22B9293-007	VA22B9293-008	VA22B9293-009	--------
						Result	Result	Result	Result	----
Total Metals										
vanadium, total	7440-62-2	E468S	0.00050	mg/L		<0.00100 DLB	0.00152	<0.00200 DLB	<0.00100 DLB	----
yttrium, total	7440-65-5	E468S	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
zinc, total	7440-66-6	E468S	0.0030	mg/L		<0.0030	<0.0030	<0.0030	<0.0030	----
zirconium, total	7440-67-7	E468S	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
Dissolved Metals										
aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L		<0.0050	<0.0050	<0.0050	0.0052	----
antimony, dissolved	7440-36-0	E469S	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L		0.00062	0.00164	0.00157	0.00066	----
barium, dissolved	7440-39-3	E469S	0.0010	mg/L		0.0070	0.0083	0.0082	0.0073	----
beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
boron, dissolved	7440-42-8	E469S	0.30	mg/L		1.42	3.52	3.73	1.58	----
cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L		0.000010	0.000025	0.000026	0.000013	----
calcium, dissolved	7440-70-2	E469S	1.0	mg/L		152	361	414	169	----
cesium, dissolved	7440-46-2	E469S	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
chromium, dissolved	7440-47-3	E469S	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
copper, dissolved	7440-50-8	E469S	0.00020	mg/L		0.00042	0.00081	0.00070	0.00029	----
gallium, dissolved	7440-55-3	E469S	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
iron, dissolved	7439-89-6	E469S	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	----
lead, dissolved	7439-92-1	E469S	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
lithium, dissolved	7439-93-2	E469S	0.020	mg/L		0.057	0.140	0.155	0.063	----
magnesium, dissolved	7439-95-4	E469S	1.0	mg/L		389	1090	1070	412	----
manganese, dissolved	7439-96-5	E469S	0.00010	mg/L		0.00084	0.00043	0.00052	0.00082	----
mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	----
molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L		0.00375	0.00965	0.0103	0.00422	----
nickel, dissolved	7440-02-0	E469S	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	----
potassium, dissolved	7440-09-7	E469S	1.0	mg/L		139	384	403	151	----
rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L		0.0405	0.110	0.108	0.0421	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	15-Aug-2022 10:30	15-Aug-2022 10:10	15-Aug-2022 10:20	15-Aug-2022 10:40	----
					VA22B9293-006	VA22B9293-007	VA22B9293-008	VA22B9293-009	--------
					Result	Result	Result	Result	----
Dissolved Metals									
selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----
silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	3310	3.8	9280	3710	----
strontium, dissolved	7440-24-6	E469S	0.010	mg/L	2.68	6.88	7.43	2.95	----
sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	318	967	973	349	----
tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	----
thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	----
tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.00142	0.00274	0.00258	0.00148	----
vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	0.00061	0.00150	0.00148	0.00060	----
yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	----
dissolved mercury filtration location	----	EP509	-	-	Field	Field	Field	Field	----
dissolved metals filtration location	----	EP421	-	-	Field	Field	Field	Field	----
Volatile Organic Compounds [Fuels]									
benzene	71-43-2	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
styrene	100-42-5	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
toluene	108-88-3	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	----	<0.40	----	----
xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	----	<0.30	----	----
xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	----	<0.50	----	----
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	76.1	----	80.5	----	----
difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	97.8	----	98.5	----	----

Analytical Results

Sub-Matrix: Seawater

(Matrix: Water)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	15-Aug-2022 10:30	15-Aug-2022 10:10	15-Aug-2022 10:20	15-Aug-2022 10:40	----
Analyte	CAS Number	Method	LOR	Unit	VA22B9293-006	VA22B9293-007	VA22B9293-008	VA22B9293-009	--------
					Result	Result	Result	Result	----
Hydrocarbons									
EPH (C10-C19)	----	E601A	250	µg/L	<250	----	<250	----	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----	<250	----	----
F2 (C10-C16)	----	E601	100	µg/L	<100	----	<100	----	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----	<250	----	----
F4 (C34-C50)	----	E601	250	µg/L	<250	----	<250	----	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----	<100	----	----
F1-BTEX	----	EC580	100	µg/L	<100	----	<100	----	----
HEPHw	----	EC600A	250	µg/L	<250	----	<250	----	----
LEPHw	----	EC600A	250	µg/L	<250	----	<250	----	----
VPHw	----	EC580A	100	µg/L	<100	----	<100	----	----
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----	<100	----	----
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (EPH surr)	392-83-6	E601A	1.0	%	87.5	----	81.3	----	----
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601	1.0	%	84.8	----	77.8	----	----
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	86.6	----	93.7	----	----
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
acridine	260-94-6	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
anthracene	120-12-7	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	----	<0.0050	----	----
benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	<0.015	----	<0.015	----	----
benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
chrysene	218-01-9	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	----	<0.0050	----	----
fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
fluorene	86-73-7	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	----	<0.010	----	----

Analytical Results

Sub-Matrix: **Seawater**

(Matrix: **Water**)

				Client sample ID	MP06-Source-2-22	MP06-North-2-22	MP06-ENE-2-22	MP06-WNW-2-22	----
				Client sampling date / time	15-Aug-2022 10:30	15-Aug-2022 10:10	15-Aug-2022 10:20	15-Aug-2022 10:40	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**VA22B9293-006**	**VA22B9293-007**	**VA22B9293-008**	**VA22B9293-009**	--------
					Result	Result	Result	Result	----
Polycyclic Aromatic Hydrocarbons									
methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	----	<0.050	----	----
phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	----	<0.020	----	----
pyrene	129-00-0	E641A	0.010	µg/L	<0.010	----	<0.010	----	----
quinoline	91-22-5	E641A	0.050	µg/L	<0.050	----	<0.050	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
chrysene-d12	1719-03-5	E641A	0.1	%	110	----	98.5	----	----
naphthalene-d8	1146-65-2	E641A	0.1	%	105	----	93.4	----	----
phenanthrene-d10	1517-22-2	E641A	0.1	%	113	----	105	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA22B9293**	Laboratory	: Vancouver - Environmental
Client	: **Golder Associates Ltd.**	Account Manager	: Amber Springer
Contact	: Elaine Irving	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Telephone	: +1 604 253 4188
Telephone	: ----	Date Samples Received	: 18-Aug-2022 08:20
Project	: 166372401/64000/03	Issue Date	: 30-Aug-2022 03:53
PO	:		
C-O-C number	: 21-06		
Sampler	: TT/MR/DV		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Total Metals	QC-MRG2-6123440 01	----	vanadium, total	7440-62-2	E468S	0.00056 MB-LOR mg/L	0.0005 mg/L	Blank result exceeds permitted value

Result Qualifiers

Qualifier	*Description*
MB-LOR	*Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-WNW-2-22	E298	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	19-Aug-2022	28 days	0 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MLP-3	E298	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-ENE-1-22	E298	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-North-1-22	E298	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-Source-1-22	E298	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-WNW-1-22	E298	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-ENE-2-22	E298	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	25-Aug-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-North-2-22	E298	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-Source-2-22	E298	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MLP-3	E235S.Br	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-ENE-1-22	E235S.Br	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-North-1-22	E235S.Br	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-Source-1-22	E235S.Br	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP05-WNW-1-22	E235S.Br	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-ENE-2-22	E235S.Br	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-North-2-22	E235S.Br	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-Source-2-22	E235S.Br	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Bromide in Seawater by IC										
HDPE MP06-WNW-2-22	E235S.Br	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MLP-3	E235S.Cl	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-ENE-1-22	E235S.Cl	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-North-1-22	E235S.Cl	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-Source-1-22	E235S.Cl	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP05-WNW-1-22	E235S.Cl	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-ENE-2-22	E235S.Cl	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-North-2-22	E235S.Cl	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-Source-2-22	E235S.Cl	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Seawater by IC										
HDPE MP06-WNW-2-22	E235S.Cl	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MLP-3	E235S.F-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.F-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.F-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.F-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.F-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.F-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.F-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.F-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.F-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MLP-3	E235S.NO3-T	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	✗ EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-ENE-1-22	E235S.NO3-T	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	✗ EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-North-1-22	E235S.NO3-T	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	✗ EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-Source-1-22	E235S.NO3-T	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	✗ EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP05-WNW-1-22	E235S.NO3-T	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	✗ EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-North-2-22	E235S.NO3-T	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	✗ EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-Source-2-22	E235S.NO3-T	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	✗ EHTL

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-WNW-2-22	E235S.NO3-T	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	× EHTL
Anions and Nutrients : Nitrate in Seawater by IC (Trace Level)										
HDPE MP06-ENE-2-22	E235S.NO3-T	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	72 hrs	99 hrs	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MLP-3	E235S.NO2-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.NO2-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.NO2-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.NO2-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.NO2-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.NO2-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	× EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.NO2-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	× EHTL

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.NO2-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	3 days	5 days	✗ EHTL
Anions and Nutrients : Nitrite in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.NO2-L	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	72 hrs	99 hrs	✗ EHTL
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MLP-3	E235S.SO4-L	15-Aug-2022	19-Aug-2022	28 days	4 days	✓	20-Aug-2022	24 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-ENE-1-22	E235S.SO4-L	15-Aug-2022	19-Aug-2022	28 days	4 days	✓	20-Aug-2022	24 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-North-1-22	E235S.SO4-L	15-Aug-2022	19-Aug-2022	28 days	4 days	✓	20-Aug-2022	24 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-Source-1-22	E235S.SO4-L	15-Aug-2022	19-Aug-2022	28 days	4 days	✓	20-Aug-2022	24 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP05-WNW-1-22	E235S.SO4-L	15-Aug-2022	19-Aug-2022	28 days	4 days	✓	20-Aug-2022	24 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-ENE-2-22	E235S.SO4-L	15-Aug-2022	19-Aug-2022	28 days	4 days	✓	20-Aug-2022	24 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-North-2-22	E235S.SO4-L	15-Aug-2022	19-Aug-2022	28 days	4 days	✓	20-Aug-2022	24 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-Source-2-22	E235S.SO4-L	15-Aug-2022	19-Aug-2022	28 days	4 days	✓	20-Aug-2022	24 days	1 days	✓
Anions and Nutrients : Sulfate in Seawater by IC (Low Level)										
HDPE MP06-WNW-2-22	E235S.SO4-L	15-Aug-2022	19-Aug-2022	28 days	4 days	✓	20-Aug-2022	24 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MLP-3	E375-T	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP05-ENE-1-22	E375-T	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP05-North-1-22	E375-T	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP05-Source-1-22	E375-T	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP05-WNW-1-22	E375-T	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP06-ENE-2-22	E375-T	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP06-North-2-22	E375-T	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	20-Aug-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP06-Source-2-22	E375-T	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (lab preserved) seawater MP06-WNW-2-22	E375-T	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-WNW-2-22	E318S	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	21-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MLP-3	E318S	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-ENE-1-22	E318S	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-North-1-22	E318S	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-Source-1-22	E318S	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP05-WNW-1-22	E318S	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-ENE-2-22	E318S	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	25-Aug-2022	28 days	6 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-North-2-22	E318S	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence										
Amber glass total (sulfuric acid) seawater MP06-Source-2-22	E318S	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MLP-3	E372S	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP05-ENE-1-22	E372S	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP05-North-1-22	E372S	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP05-Source-1-22	E372S	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP05-WNW-1-22	E372S	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP06-ENE-2-22	E372S	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP06-North-2-22	E372S	15-Aug-2022	19-Aug-2022	3 days	4 days	✖ EHTL	20-Aug-2022	28 days	1 days	✓

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP06-Source-2-22	E372S	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	20-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) seawater MP06-WNW-2-22	E372S	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	21-Aug-2022	28 days	2 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MLP-3	E509S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-ENE-1-22	E509S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-North-1-22	E509S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-Source-1-22	E509S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP05-WNW-1-22	E509S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-ENE-2-22	E509S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-North-2-22	E509S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-Source-2-22	E509S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Mercury in Seawater by CVAAS										
Glass vial dissolved (hydrochloric acid) MP06-WNW-2-22	E509S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MLP-3	E469S	15-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-ENE-1-22	E469S	15-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-North-1-22	E469S	15-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-Source-1-22	E469S	15-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP05-WNW-1-22	E469S	15-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-ENE-2-22	E469S	15-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-North-2-22	E469S	15-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-Source-2-22	E469S	15-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Seawater by CRC ICPMS (HMI)										
HDPE dissolved (nitric acid) MP06-WNW-2-22	E469S	15-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MLP-3	E469S.NaSi	15-Aug-2022	21-Aug-2022	----	----		23-Aug-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-ENE-1-22	E469S.NaSi	15-Aug-2022	21-Aug-2022	----	----		23-Aug-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-North-1-22	E469S.NaSi	15-Aug-2022	21-Aug-2022	----	----		23-Aug-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-Source-1-22	E469S.NaSi	15-Aug-2022	21-Aug-2022	----	----		23-Aug-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP05-WNW-1-22	E469S.NaSi	15-Aug-2022	21-Aug-2022	----	----		23-Aug-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-ENE-2-22	E469S.NaSi	15-Aug-2022	21-Aug-2022	----	----		23-Aug-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-North-2-22	E469S.NaSi	15-Aug-2022	21-Aug-2022	----	----		23-Aug-2022	180 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-Source-2-22	E469S.NaSi	15-Aug-2022	21-Aug-2022	----	----		23-Aug-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Sodium and Silicon in Seawater by CRC ICPMS										
HDPE dissolved (nitric acid) MP06-WNW-2-22	E469S.NaSi	15-Aug-2022	21-Aug-2022	----	----		23-Aug-2022	180 days	9 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-North-1-22	E601A	15-Aug-2022	24-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E601A	15-Aug-2022	24-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E601A	15-Aug-2022	24-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	1 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E601A	15-Aug-2022	24-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-North-1-22	E601	15-Aug-2022	24-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E601	15-Aug-2022	24-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E601	15-Aug-2022	24-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E601	15-Aug-2022	24-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	1 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP05-North-1-22	E581.VH+F1	15-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	8 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP05-Source-1-22	E581.VH+F1	15-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	14 days	8 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP06-ENE-2-22	E581.VH+F1	15-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	8 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) MP06-Source-2-22	E581.VH+F1	15-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	8 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MLP-3	E358-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP05-ENE-1-22	E358-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP05-North-1-22	E358-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP05-Source-1-22	E358-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP05-WNW-1-22	E358-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP06-ENE-2-22	E358-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP06-North-2-22	E358-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP06-Source-2-22	E358-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (lab preserved) seawater MP06-WNW-2-22	E358-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	20-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MLP-3	E355-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP05-ENE-1-22	E355-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP05-North-1-22	E355-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP05-Source-1-22	E355-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP05-WNW-1-22	E355-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP06-ENE-2-22	E355-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP06-North-2-22	E355-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP06-Source-2-22	E355-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	19-Aug-2022	28 days	0 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) seawater MP06-WNW-2-22	E355-L	15-Aug-2022	19-Aug-2022	3 days	4 days	× EHTL	20-Aug-2022	28 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MLP-3	E290	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-ENE-1-22	E290	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-North-1-22	E290	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-Source-1-22	E290	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	14 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Alkalinity Species by Titration										
HDPE MP05-WNW-1-22	E290	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-ENE-2-22	E290	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-North-2-22	E290	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-Source-2-22	E290	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MP06-WNW-2-22	E290	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	14 days	5 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MLP-3	E100S	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-ENE-1-22	E100S	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-North-1-22	E100S	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP05-Source-1-22	E100S	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Seawater										
HDPE MP05-WNW-1-22	E100S	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-ENE-2-22	E100S	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-North-2-22	E100S	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-Source-2-22	E100S	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Physical Tests : Conductivity in Seawater										
HDPE MP06-WNW-2-22	E100S	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE MP06-ENE-2-22	E108	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	0.25 hrs	14.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MLP-3	E108	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	0.25 hrs	23.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-ENE-1-22	E108	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	0.25 hrs	23.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-North-1-22	E108	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	0.25 hrs	23.25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Physical Tests : pH by Meter										
HDPE MP05-Source-1-22	E108	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	0.25 hrs	23.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP05-WNW-1-22	E108	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	0.25 hrs	23.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-North-2-22	E108	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	0.25 hrs	23.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-Source-2-22	E108	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	0.25 hrs	23.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MP06-WNW-2-22	E108	15-Aug-2022	19-Aug-2022	----	----		20-Aug-2022	0.25 hrs	23.25 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MLP-3	E162S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-ENE-1-22	E162S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-North-1-22	E162S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-Source-1-22	E162S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP05-WNW-1-22	E162S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-ENE-2-22	E162S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-North-2-22	E162S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-Source-2-22	E162S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry (Seawater)										
HDPE MP06-WNW-2-22	E162S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MLP-3	E160S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-ENE-1-22	E160S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-North-1-22	E160S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-Source-1-22	E160S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP05-WNW-1-22	E160S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-ENE-2-22	E160S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-North-2-22	E160S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-Source-2-22	E160S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry (Seawater)										
HDPE MP06-WNW-2-22	E160S	15-Aug-2022	----	----	----		22-Aug-2022	7 days	7 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MLP-3	E121	15-Aug-2022	----	----	----		19-Aug-2022	3 days	4 days	× EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-ENE-1-22	E121	15-Aug-2022	----	----	----		19-Aug-2022	3 days	4 days	× EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-North-1-22	E121	15-Aug-2022	----	----	----		19-Aug-2022	3 days	4 days	× EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-Source-1-22	E121	15-Aug-2022	----	----	----		19-Aug-2022	3 days	4 days	× EHTL

Matrix: **Water**

Evaluation: ✘ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Turbidity by Nephelometry										
HDPE MP05-WNW-1-22	E121	15-Aug-2022	----	----	----		19-Aug-2022	3 days	4 days	✘ EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-North-2-22	E121	15-Aug-2022	----	----	----		19-Aug-2022	3 days	4 days	✘ EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-Source-2-22	E121	15-Aug-2022	----	----	----		19-Aug-2022	3 days	4 days	✘ EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-WNW-2-22	E121	15-Aug-2022	----	----	----		19-Aug-2022	3 days	4 days	✘ EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE MP06-ENE-2-22	E121	15-Aug-2022	----	----	----		19-Aug-2022	72 hrs	93 hrs	✘ EHTL
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-North-1-22	E641A	15-Aug-2022	24-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	0 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP05-Source-1-22	E641A	15-Aug-2022	24-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	0 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-ENE-2-22	E641A	15-Aug-2022	24-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	0 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) MP06-Source-2-22	E641A	15-Aug-2022	24-Aug-2022	14 days	9 days	✓	25-Aug-2022	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MLP-3	E508S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-ENE-1-22	E508S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-North-1-22	E508S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-Source-1-22	E508S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP05-WNW-1-22	E508S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-ENE-2-22	E508S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-North-2-22	E508S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-Source-2-22	E508S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓
Total Metals : Total Mercury in Seawater by CVAAS										
Glass vial total (hydrochloric acid) MP06-WNW-2-22	E508S	15-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MLP-3	E468S	15-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-ENE-1-22	E468S	15-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-North-1-22	E468S	15-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-Source-1-22	E468S	15-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP05-WNW-1-22	E468S	15-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-ENE-2-22	E468S	15-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-North-2-22	E468S	15-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-Source-2-22	E468S	15-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓
Total Metals : Total Metals in Seawater by CRC ICPMS (HMI)										
HDPE total (nitric acid) MP06-WNW-2-22	E468S	15-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MLP-3	E468S.NaSi	15-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	8 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-ENE-1-22	E468S.NaSi	15-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	8 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-North-1-22	E468S.NaSi	15-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	8 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-Source-1-22	E468S.NaSi	15-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	8 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP05-WNW-1-22	E468S.NaSi	15-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	8 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-ENE-2-22	E468S.NaSi	15-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	8 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-North-2-22	E468S.NaSi	15-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	8 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-Source-2-22	E468S.NaSi	15-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	8 days	✓
Total Metals : Total Sodium and Silicon in Seawater by CRC ICPMS										
HDPE total (nitric acid) MP06-WNW-2-22	E468S.NaSi	15-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP05-North-1-22	E611A	15-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	8 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP05-Source-1-22	E611A	15-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	14 days	8 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP06-ENE-2-22	E611A	15-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	8 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MP06-Source-2-22	E611A	15-Aug-2022	23-Aug-2022	----	----		23-Aug-2022	14 days	8 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	609806	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	609613	2	28	7.1	5.0	✓
Bromide in Seawater by IC	E235S.Br	609811	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	613877	2	20	10.0	5.0	✓
Chloride in Seawater by IC	E235S.Cl	609810	1	9	11.1	5.0	✓
Conductivity in Seawater	E100S	609805	1	9	11.1	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	616169	1	20	5.0	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	609591	1	9	11.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	609608	2	11	18.1	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	609592	1	9	11.1	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	609809	1	9	11.1	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	609812	1	9	11.1	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	609808	1	9	11.1	5.0	✓
pH by Meter	E108	609803	1	20	5.0	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	609807	1	9	11.1	5.0	✓
TDS by Gravimetry (Seawater)	E162S	613312	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	609612	2	11	18.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	609614	2	11	18.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	615799	1	20	5.0	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	612344	3	22	13.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	609609	2	11	18.1	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	609658	2	11	18.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	612345	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	609716	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	613878	2	16	12.5	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	609806	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	609613	2	28	7.1	5.0	✓
BC PHCs - EPH by GC-FID	E601A	617222	1	11	9.0	5.0	✓
Bromide in Seawater by IC	E235S.Br	609811	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	613877	2	20	10.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	617223	1	6	16.6	5.0	✓
Chloride in Seawater by IC	E235S.Cl	609810	1	9	11.1	5.0	✓
Conductivity in Seawater	E100S	609805	1	9	11.1	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	616169	1	20	5.0	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	609591	1	9	11.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	609608	2	11	18.1	5.0	✓

Matrix: **Water**

Evaluation: ✘ = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	609592	1	9	11.1	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	609809	1	9	11.1	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	609812	1	9	11.1	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	609808	1	9	11.1	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	617221	1	17	5.8	5.0	✓
pH by Meter	E108	609803	1	20	5.0	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	609807	1	9	11.1	5.0	✓
TDS by Gravimetry (Seawater)	E162S	613312	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	609612	2	11	18.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	609614	2	11	18.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	615799	1	20	5.0	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	612344	3	22	13.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	609609	2	11	18.1	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	609658	2	11	18.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	612345	1	20	5.0	5.0	✓
TSS by Gravimetry (Seawater)	E160S	612774	2	28	7.1	5.0	✓
Turbidity by Nephelometry	E121	609716	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	613878	2	16	12.5	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	609806	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	609613	2	28	7.1	5.0	✓
BC PHCs - EPH by GC-FID	E601A	617222	1	11	9.0	5.0	✓
Bromide in Seawater by IC	E235S.Br	609811	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	613877	2	20	10.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	617223	1	6	16.6	5.0	✓
Chloride in Seawater by IC	E235S.Cl	609810	1	9	11.1	5.0	✓
Conductivity in Seawater	E100S	609805	1	9	11.1	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	616169	1	20	5.0	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	609591	1	9	11.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	609608	2	11	18.1	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	609592	1	9	11.1	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	609809	1	9	11.1	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	609812	1	9	11.1	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	609808	1	9	11.1	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	617221	2	17	11.7	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	609807	1	9	11.1	5.0	✓
TDS by Gravimetry (Seawater)	E162S	613312	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	609612	2	11	18.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	609614	2	11	18.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	615799	1	20	5.0	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	612344	3	22	13.6	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	609609	2	11	18.1	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	609658	2	11	18.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	612345	1	20	5.0	5.0	✓
TSS by Gravimetry (Seawater)	E160S	612774	2	28	7.1	5.0	✓
Turbidity by Nephelometry	E121	609716	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	613878	2	16	12.5	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	609613	2	28	7.1	5.0	✓
Bromide in Seawater by IC	E235S.Br	609811	1	9	11.1	5.0	✓
BTEX by Headspace GC-MS	E611A	613877	2	20	10.0	5.0	✓
Chloride in Seawater by IC	E235S.Cl	609810	1	9	11.1	5.0	✓
Dissolved Mercury in Seawater by CVAAS	E509S	616169	1	20	5.0	5.0	✓
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S	609591	1	9	11.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	609608	2	11	18.1	5.0	✓
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi	609592	1	9	11.1	5.0	✓
Fluoride in Seawater by IC (Low Level)	E235S.F-L	609809	1	9	11.1	5.0	✓
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T	609812	1	9	11.1	5.0	✓
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L	609808	1	9	11.1	5.0	✓
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L	609807	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	609612	2	11	18.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence	E318S	609614	2	11	18.1	5.0	✓
Total Mercury in Seawater by CVAAS	E508S	615799	1	20	5.0	5.0	✓
Total Metals in Seawater by CRC ICPMS (HMI)	E468S	612344	2	22	9.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	609609	2	11	18.1	5.0	✓
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S	609658	2	11	18.1	5.0	✓
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi	612345	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	613878	2	16	12.5	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Seawater	E100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.
pH by Meter	E108 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 Vancouver - Environmental	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TSS by Gravimetry (Seawater)	E160S Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry (Seawater)	E162S Vancouver - Environmental	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Seawater by IC	E235S.Br Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Seawater by IC	E235S.Cl Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Seawater by IC (Low Level)	E235S.F-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Seawater by IC (Low Level)	E235S.NO2-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Seawater by IC (Trace Level)	E235S.NO3-T Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Sulfate in Seawater by IC (Low Level)	E235S.SO4-L Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence	E318S Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus in Seawater by Colourimetry (0.002 mg/L)	E372S Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total Metals in Seawater by CRC ICPMS (HMI)	E468S Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Seawater samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS (HMI Mode). This method is compliant with digestion requirements of the British Columbia Environmental Laboratory Manual.
Total Sodium and Silicon in Seawater by CRC ICPMS	E468S.NaSi Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Seawater samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. This method is compliant with digestion requirements of the British Columbia Environmental Laboratory Manual.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals in Seawater by CRC ICPMS (HMI)	E469S Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Seawater samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS (HMI Mode).
Dissolved Sodium and Silicon in Seawater by CRC ICPMS	E469S.NaSi Vancouver - Environmental	Water	APHA 3030B/EPA 6020B (mod)	Seawater samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.
Total Mercury in Seawater by CVAAS	E508S Vancouver - Environmental	Water	EPA 1631E (mod)	Seawater samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Mercury in Seawater by CVAAS	E509S Vancouver - Environmental	Water	APHA 3030B/EPA 1631E (mod)	Seawater samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Vancouver - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BC PHCs - EPH by GC-FID	E601A Vancouver - Environmental	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hexane LVI GC-MS	E641A Vancouver - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Salinity in Water (calculation)	EC100S Vancouver - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a seawater sample. Conductivity measurements are temperature-compensated to 25°C. Salinity in Practical Salinity Units is calculated.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
F1-BTEX	EC580 Vancouver - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
VPH: VH-BTEX-Styrene	EC580A Vancouver - Environmental	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.
LEPH and HEPH: EPH-PAH	EC600A Vancouver - Environmental	Water	BC MOE Lab Manual (LEPH and HEPH) (mod)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in Seawater	EP318S Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Mercury Water Filtration	EP509 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 Vancouver - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Vancouver - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	:	**VA22B9293**	Page	:	1 of 29
Client	:	Golder Associates Ltd.	Laboratory	:	Vancouver - Environmental
Contact	:	Elaine Irving	Account Manager	:	Amber Springer
Address	:	200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	:	8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	----	Telephone	:	+1 604 253 4188
Project	:	166372401/64000/03	Date Samples Received	:	18-Aug-2022 08:20
PO	:		Date Analysis Commenced	:	19-Aug-2022
C-O-C number	:	21-06	Issue Date	:	30-Aug-2022 03:53
Sampler	:	TT/MR/DV			
Site	:	----			
Quote number	:	VA22-GOLD100-028			
No. of samples received	:	9			
No. of samples analysed	:	9			

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Anshim Anshim	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Benjamin Oke	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Vancouver Organics, Burnaby, British Columbia
Parnian Sane	Analyst	Vancouver Metals, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 609716)											
FJ2202165-001	Anonymous	turbidity	----	E121	0.10	NTU	1.39	1.45	3.95%	15%	----
Physical Tests (QC Lot: 609803)											
FJ2202158-001	Anonymous	pH	----	E108	0.10	pH units	8.33	8.33	0.00%	4%	----
Physical Tests (QC Lot: 609805)											
VA22B9293-003	MP05-ENE-1-22	conductivity	----	E100S	2.0	µS/cm	18900	18900	0.0529%	20%	----
Physical Tests (QC Lot: 609806)											
VA22B9293-003	MP05-ENE-1-22	alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	73.1	72.9	0.274%	20%	----
Physical Tests (QC Lot: 613312)											
VA22B9293-001	MP05-Source-1-22	solids, total dissolved [TDS]	----	E162S	80	mg/L	11300	11600	2.95%	20%	----
Anions and Nutrients (QC Lot: 609612)											
VA22B9293-001	MP05-Source-1-22	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0147	0.0147	0.00005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 609613)											
VA22B9293-001	MP05-Source-1-22	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0232	0.0250	0.0018	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 609614)											
VA22B9293-001	MP05-Source-1-22	Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	0.118	0.201	0.083	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 609658)											
VA22B9293-001	MP05-Source-1-22	phosphorus, total	7723-14-0	E372S	0.0040	mg/L	0.0159	0.0156	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 609807)											
VA22B9293-001	MP05-Source-1-22	sulfate (as SO4)	14808-79-8	E235S.SO4-L	3.0	mg/L	780	780	0.0365%	20%	----
Anions and Nutrients (QC Lot: 609808)											
VA22B9293-001	MP05-Source-1-22	nitrite (as N)	14797-65-0	E235S.NO2-L	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 609809)											
VA22B9293-001	MP05-Source-1-22	fluoride	16984-48-8	E235S.F-L	0.20	mg/L	0.36	0.36	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 609810)											
VA22B9293-001	MP05-Source-1-22	chloride	16887-00-6	E235S.Cl	50	mg/L	5670	5630	0.785%	20%	----
Anions and Nutrients (QC Lot: 609811)											
VA22B9293-001	MP05-Source-1-22	bromide	24959-67-9	E235S.Br	5.0	mg/L	17.5	16.7	0.8	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 609812)											
VA22B9293-001	MP05-Source-1-22	nitrate (as N)	14797-55-8	E235S.NO3-T	0.010	mg/L	0.448	0.433	3.58%	20%	----
Anions and Nutrients (QC Lot: 610455)											
VA22B8737-018	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0560	0.0544	2.80%	20%	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
					Laboratory Duplicate (DUP) Report						
Anions and Nutrients (QC Lot: 610458)											
VA22B8899-001	Anonymous	phosphorus, total	7723-14-0	E372S	0.0040	mg/L	0.0065	0.0065	0.00004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 610459)											
VA22B8899-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0058	0.0058	0.00001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 610460)											
VA22B8899-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318S	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 609608)											
VA22B9293-001	MP05-Source-1-22	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.29	1.46	0.17	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 609609)											
VA22B9293-001	MP05-Source-1-22	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.58	1.57	0.01	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 610456)											
VA22B8899-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.65	1.65	0.004	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 610457)											
VA22B8899-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.05	0.80	0.25	Diff <2x LOR	----
Total Metals (QC Lot: 612344)											
VA22B8946-030	Anonymous	aluminum, total	7429-90-5	E468S	0.0050	mg/L	0.0306	0.0318	0.0012	Diff <2x LOR	----
		antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E468S	0.00040	mg/L	0.00180	0.00184	0.00005	Diff <2x LOR	----
		barium, total	7440-39-3	E468S	0.0010	mg/L	0.0088	0.0092	0.0004	Diff <2x LOR	----
		beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E468S	0.30	mg/L	3.62	3.70	2.04%	20%	----
		cadmium, total	7440-43-9	E468S	0.000010	mg/L	0.000091	0.000081	0.000010	Diff <2x LOR	----
		calcium, total	7440-70-2	E468S	1.0	mg/L	382	410	6.98%	20%	----
		cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, total	7440-50-8	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E468S	0.010	mg/L	0.038	0.041	0.003	Diff <2x LOR	----
		lead, total	7439-92-1	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E468S	0.020	mg/L	0.153	0.149	0.004	Diff <2x LOR	----
		magnesium, total	7439-95-4	E468S	1.0	mg/L	991	1010	1.86%	20%	----
		manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00505	0.00518	2.66%	20%	----
		molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00977	0.0102	4.57%	20%	----
		nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 612344) - continued											
VA22B8946-030	Anonymous	phosphorus, total	7723-14-0	E468S	0.050	mg/L	0.093	0.116	0.022	Diff <2x LOR	----
		potassium, total	7440-09-7	E468S	1.0	mg/L	370	384	3.81%	20%	----
		rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.104	0.105	0.943%	20%	----
		selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		strontium, total	7440-24-6	E468S	0.010	mg/L	6.89	7.28	5.42%	20%	----
		sulfur, total	7704-34-9	E468S	5.0	mg/L	884	941	6.31%	20%	----
		tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E468S	0.000050	mg/L	0.00259	0.00256	1.42%	20%	----
		vanadium, total	7440-62-2	E468S	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Total Metals (QC Lot: 612345)											
VA22B8946-030	Anonymous	silicon, total	7440-21-3	E468S.NaSi	1.0	mg/L	1.8	1.8	0.08	Diff <2x LOR	----
		sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	9380	9310	0.710%	20%	----
Total Metals (QC Lot: 614609)											
VA22B9206-015	Anonymous	aluminum, total	7429-90-5	E468S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Total Metals (QC Lot: 614666)											
VA22B9293-007	MP06-North-2-22	aluminum, total	7429-90-5	E468S	0.0050	mg/L	<0.0050	0.0064	0.0014	Diff <2x LOR	----
		antimony, total	7440-36-0	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E468S	0.00040	mg/L	0.00161	0.00156	0.00005	Diff <2x LOR	----
		barium, total	7440-39-3	E468S	0.0010	mg/L	0.0084	0.0084	0.00002	Diff <2x LOR	----
		beryllium, total	7440-41-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E468S	0.30	mg/L	3.44	3.56	3.44%	20%	----
		cadmium, total	7440-43-9	E468S	0.000010	mg/L	0.000022	0.000026	0.000004	Diff <2x LOR	----
		calcium, total	7440-70-2	E468S	1.0	mg/L	351	375	6.67%	20%	----
		cesium, total	7440-46-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
					Laboratory Duplicate (DUP) Report						
Total Metals (QC Lot: 614666) - continued											
VA22B9293-007	MP06-North-2-22	chromium, total	7440-47-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, total	7440-50-8	E468S	0.00050	mg/L	0.00059	0.00059	0.000003	Diff <2x LOR	----
		gallium, total	7440-55-3	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, total	7439-89-6	E468S	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, total	7439-92-1	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, total	7439-93-2	E468S	0.020	mg/L	0.129	0.134	0.005	Diff <2x LOR	----
		magnesium, total	7439-95-4	E468S	1.0	mg/L	1060	1090	2.65%	20%	----
		manganese, total	7439-96-5	E468S	0.00020	mg/L	0.00063	0.00066	0.00004	Diff <2x LOR	----
		molybdenum, total	7439-98-7	E468S	0.00010	mg/L	0.00998	0.0102	1.70%	20%	----
		nickel, total	7440-02-0	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E468S	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E468S	1.0	mg/L	378	390	3.32%	20%	----
		rhenium, total	7440-15-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, total	7440-17-7	E468S	0.0050	mg/L	0.104	0.109	4.77%	20%	----
		selenium, total	7782-49-2	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		silver, total	7440-22-4	E468S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		strontium, total	7440-24-6	E468S	0.010	mg/L	6.95	7.11	2.23%	20%	----
		sulfur, total	7704-34-9	E468S	5.0	mg/L	939	958	1.99%	20%	----
		tellurium, total	13494-80-9	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E468S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, total	7440-31-5	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E468S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, total	7440-33-7	E468S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E468S	0.000050	mg/L	0.00274	0.00265	3.28%	20%	----
		vanadium, total	7440-62-2	E468S	0.00050	mg/L	0.00152	0.00145	0.00007	Diff <2x LOR	----
		yttrium, total	7440-65-5	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E468S	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E468S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Total Metals (QC Lot: 615799)											
VA22B9226-027	Anonymous	mercury, total	7439-97-6	E508S	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 609591)											
VA22B9293-001	MP05-Source-1-22	aluminum, dissolved	7429-90-5	E469S	0.0050	mg/L	0.0061	<0.0050	0.0011	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 609591) - continued											
VA22B9293-001	MP05-Source-1-22	arsenic, dissolved	7440-38-2	E469S	0.00040	mg/L	0.00052	0.00054	0.00002	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E469S	0.0010	mg/L	0.0083	0.0082	0.00007	Diff <2x LOR	----
		beryllium, dissolved	7440-41-7	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E469S	0.30	mg/L	1.31	1.29	0.02	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E469S	0.000010	mg/L	0.000014	0.000013	0.000001	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E469S	1.0	mg/L	142	143	0.552%	20%	----
		cesium, dissolved	7440-46-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E469S	0.00020	mg/L	0.00037	0.00039	0.00002	Diff <2x LOR	----
		gallium, dissolved	7440-55-3	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E469S	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E469S	0.020	mg/L	0.050	0.049	0.0008	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E469S	1.0	mg/L	336	335	0.327%	20%	----
		manganese, dissolved	7439-96-5	E469S	0.00010	mg/L	0.00229	0.00240	4.81%	20%	----
		molybdenum, dissolved	7439-98-7	E469S	0.00010	mg/L	0.00363	0.00367	1.21%	20%	----
		nickel, dissolved	7440-02-0	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E469S	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E469S	1.0	mg/L	121	122	0.609%	20%	----
		rhenium, dissolved	7440-15-5	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E469S	0.0050	mg/L	0.0342	0.0352	0.0009	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E469S	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		strontium, dissolved	7440-24-6	E469S	0.010	mg/L	2.45	2.42	1.20%	20%	----
		sulfur, dissolved	7704-34-9	E469S	5.0	mg/L	281	284	1.29%	20%	----
		tellurium, dissolved	13494-80-9	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E469S	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E469S	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E469S	0.000050	mg/L	0.00415	0.00413	0.361%	20%	----
		vanadium, dissolved	7440-62-2	E469S	0.00050	mg/L	0.00051	0.00051	0.000005	Diff <2x LOR	----

Sub-Matrix: **Water**

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 609591) - continued											
VA22B9293-001	MP05-Source-1-22	yttrium, dissolved	7440-65-5	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E469S	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E469S	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 609592)											
VA22B9293-001	MP05-Source-1-22	silicon, dissolved	7440-21-3	E469S.NaSi	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	3140	3060	2.62%	20%	----
Dissolved Metals (QC Lot: 616169)											
VA22B9226-026	Anonymous	mercury, dissolved	7439-97-6	E509S	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 613870)											
VA22B9293-001	MP05-Source-1-22	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 613877)											
VA22B9293-002	MP05-North-1-22	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 613871)											
VA22B9293-001	MP05-Source-1-22	F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----
		VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----
Hydrocarbons (QC Lot: 613878)											
VA22B9293-002	MP05-North-1-22	F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----
		VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 609716)						
turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 609805)						
conductivity	----	E100S	2	µS/cm	<2.0	----
Physical Tests (QCLot: 609806)						
alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 612774)						
solids, total suspended [TSS]	----	E160S	2	mg/L	<2.0	----
Physical Tests (QCLot: 612775)						
solids, total suspended [TSS]	----	E160S	2	mg/L	<2.0	----
Physical Tests (QCLot: 613312)						
solids, total dissolved [TDS]	----	E162S	10	mg/L	<10	----
Anions and Nutrients (QCLot: 609612)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 609613)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 609614)						
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 609658)						
phosphorus, total	7723-14-0	E372S	0.002	mg/L	<0.0040	----
Anions and Nutrients (QCLot: 609807)						
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 609808)						
nitrite (as N)	14797-65-0	E235S.NO2-L	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 609809)						
fluoride	16984-48-8	E235S.F-L	0.2	mg/L	<0.20	----
Anions and Nutrients (QCLot: 609810)						
chloride	16887-00-6	E235S.Cl	50	mg/L	<50	----
Anions and Nutrients (QCLot: 609811)						
bromide	24959-67-9	E235S.Br	5	mg/L	<5.0	----
Anions and Nutrients (QCLot: 609812)						
nitrate (as N)	14797-55-8	E235S.NO3-T	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 610455)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 610458)						
phosphorus, total	7723-14-0	E372S	0.002	mg/L	<0.0040	----
Anions and Nutrients (QCLot: 610459)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 610460)						
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	<0.050	----
Organic / Inorganic Carbon (QCLot: 609608)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 609609)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 610456)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 610457)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 612344)						
aluminum, total	7429-90-5	E468S	0.005	mg/L	<0.0050	----
antimony, total	7440-36-0	E468S	0.001	mg/L	<0.0010	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	<0.00040	----
barium, total	7440-39-3	E468S	0.001	mg/L	<0.0010	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	<0.00050	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	<0.00050	----
boron, total	7440-42-8	E468S	0.3	mg/L	<0.30	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	<0.000010	----
calcium, total	7440-70-2	E468S	1	mg/L	<1.0	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	<0.00050	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	<0.000050	----
copper, total	7440-50-8	E468S	0.0005	mg/L	<0.00050	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E468S	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E468S	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E468S	0.02	mg/L	<0.020	----
magnesium, total	7439-95-4	E468S	1	mg/L	<1.0	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	<0.00020	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	<0.00010	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	<0.050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 612344) - continued						
potassium, total	7440-09-7	E468S	1	mg/L	<1.0	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	<0.00050	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	<0.0050	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	<0.00050	----
silver, total	7440-22-4	E468S	0.0001	mg/L	<0.00010	----
strontium, total	7440-24-6	E468S	0.01	mg/L	<0.010	----
sulfur, total	7704-34-9	E468S	5	mg/L	<5.0	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	<0.00050	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	<0.000050	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	<0.00050	----
tin, total	7440-31-5	E468S	0.001	mg/L	<0.0010	----
titanium, total	7440-32-6	E468S	0.005	mg/L	<0.0050	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	<0.0010	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	<0.000050	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	# 0.00056	MB-LOR
yttrium, total	7440-65-5	E468S	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E468S	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 612345)						
silicon, total	7440-21-3	E468S.NaSi	1	mg/L	<1.0	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	<2.5	----
Total Metals (QCLot: 614609)						
aluminum, total	7429-90-5	E468S	0.005	mg/L	<0.0050	----
antimony, total	7440-36-0	E468S	0.001	mg/L	<0.0010	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	<0.00040	----
barium, total	7440-39-3	E468S	0.001	mg/L	<0.0010	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	<0.00050	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	<0.00050	----
boron, total	7440-42-8	E468S	0.3	mg/L	<0.30	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	<0.000010	----
calcium, total	7440-70-2	E468S	1	mg/L	<1.0	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	<0.00050	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	<0.000050	----
copper, total	7440-50-8	E468S	0.0005	mg/L	<0.00050	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	<0.00050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 614609) - continued						
iron, total	7439-89-6	E468S	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E468S	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E468S	0.02	mg/L	<0.020	----
magnesium, total	7439-95-4	E468S	1	mg/L	<1.0	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	<0.00020	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	<0.00010	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E468S	1	mg/L	<1.0	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	<0.00050	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	<0.0050	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	<0.00050	----
silver, total	7440-22-4	E468S	0.0001	mg/L	<0.00010	----
strontium, total	7440-24-6	E468S	0.01	mg/L	<0.010	----
sulfur, total	7704-34-9	E468S	5	mg/L	<5.0	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	<0.00050	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	<0.000050	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	<0.00050	----
tin, total	7440-31-5	E468S	0.001	mg/L	<0.0010	----
titanium, total	7440-32-6	E468S	0.005	mg/L	<0.0050	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	<0.0010	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	<0.000050	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	<0.00050	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E468S	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 614666)						
aluminum, total	7429-90-5	E468S	0.005	mg/L	<0.0050	----
antimony, total	7440-36-0	E468S	0.001	mg/L	<0.0010	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	<0.00040	----
barium, total	7440-39-3	E468S	0.001	mg/L	<0.0010	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	<0.00050	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	<0.00050	----
boron, total	7440-42-8	E468S	0.3	mg/L	<0.30	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	<0.000010	----
calcium, total	7440-70-2	E468S	1	mg/L	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 614666) - continued						
cesium, total	7440-46-2	E468S	0.0005	mg/L	<0.00050	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	<0.000050	----
copper, total	7440-50-8	E468S	0.0005	mg/L	<0.00050	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E468S	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E468S	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E468S	0.02	mg/L	<0.020	----
magnesium, total	7439-95-4	E468S	1	mg/L	<1.0	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	<0.00020	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	<0.00010	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E468S	1	mg/L	<1.0	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	<0.00050	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	<0.0050	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	<0.00050	----
silver, total	7440-22-4	E468S	0.0001	mg/L	<0.00010	----
strontium, total	7440-24-6	E468S	0.01	mg/L	<0.010	----
sulfur, total	7704-34-9	E468S	5	mg/L	<5.0	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	<0.00050	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	<0.000050	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	<0.00050	----
tin, total	7440-31-5	E468S	0.001	mg/L	<0.0010	----
titanium, total	7440-32-6	E468S	0.005	mg/L	<0.0050	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	<0.0010	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	<0.000050	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	<0.00050	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E468S	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	<0.00050	----
Total Metals (QCLot: 615799)						
mercury, total	7439-97-6	E508S	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 609591)						
aluminum, dissolved	7429-90-5	E469S	0.005	mg/L	<0.0050	----
antimony, dissolved	7440-36-0	E469S	0.001	mg/L	<0.0010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 609591) - continued						
arsenic, dissolved	7440-38-2	E469S	0.0004	mg/L	<0.00040	----
barium, dissolved	7440-39-3	E469S	0.001	mg/L	<0.0010	----
beryllium, dissolved	7440-41-7	E469S	0.0005	mg/L	<0.00050	----
bismuth, dissolved	7440-69-9	E469S	0.0005	mg/L	<0.00050	----
boron, dissolved	7440-42-8	E469S	0.3	mg/L	<0.30	----
cadmium, dissolved	7440-43-9	E469S	0.00001	mg/L	<0.000010	----
calcium, dissolved	7440-70-2	E469S	1	mg/L	<1.0	----
cesium, dissolved	7440-46-2	E469S	0.0005	mg/L	<0.00050	----
chromium, dissolved	7440-47-3	E469S	0.0005	mg/L	<0.00050	----
cobalt, dissolved	7440-48-4	E469S	0.00005	mg/L	<0.000050	----
copper, dissolved	7440-50-8	E469S	0.0002	mg/L	<0.00020	----
gallium, dissolved	7440-55-3	E469S	0.0005	mg/L	<0.00050	----
iron, dissolved	7439-89-6	E469S	0.01	mg/L	<0.010	----
lead, dissolved	7439-92-1	E469S	0.00005	mg/L	<0.000050	----
lithium, dissolved	7439-93-2	E469S	0.02	mg/L	<0.020	----
magnesium, dissolved	7439-95-4	E469S	1	mg/L	<1.0	----
manganese, dissolved	7439-96-5	E469S	0.0001	mg/L	<0.00010	----
molybdenum, dissolved	7439-98-7	E469S	0.0001	mg/L	<0.00010	----
nickel, dissolved	7440-02-0	E469S	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E469S	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E469S	1	mg/L	<1.0	----
rhenium, dissolved	7440-15-5	E469S	0.0005	mg/L	<0.00050	----
rubidium, dissolved	7440-17-7	E469S	0.005	mg/L	<0.0050	----
selenium, dissolved	7782-49-2	E469S	0.0005	mg/L	<0.00050	----
silver, dissolved	7440-22-4	E469S	0.0001	mg/L	<0.00010	----
strontium, dissolved	7440-24-6	E469S	0.01	mg/L	<0.010	----
sulfur, dissolved	7704-34-9	E469S	5	mg/L	<5.0	----
tellurium, dissolved	13494-80-9	E469S	0.0005	mg/L	<0.00050	----
thallium, dissolved	7440-28-0	E469S	0.00005	mg/L	<0.000050	----
thorium, dissolved	7440-29-1	E469S	0.0005	mg/L	<0.00050	----
tin, dissolved	7440-31-5	E469S	0.001	mg/L	<0.0010	----
titanium, dissolved	7440-32-6	E469S	0.005	mg/L	<0.0050	----
tungsten, dissolved	7440-33-7	E469S	0.001	mg/L	<0.0010	----
uranium, dissolved	7440-61-1	E469S	0.00005	mg/L	<0.000050	----
vanadium, dissolved	7440-62-2	E469S	0.0005	mg/L	<0.00050	----
yttrium, dissolved	7440-65-5	E469S	0.0005	mg/L	<0.00050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 609591) - continued						
zinc, dissolved	7440-66-6	E469S	0.001	mg/L	<0.0010	----
zirconium, dissolved	7440-67-7	E469S	0.0005	mg/L	<0.00050	----
Dissolved Metals (QCLot: 609592)						
silicon, dissolved	7440-21-3	E469S.NaSi	1	mg/L	<1.0	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	<2.5	----
Dissolved Metals (QCLot: 616169)						
mercury, dissolved	7439-97-6	E509S	0.000005	mg/L	<0.0000050	----
Volatile Organic Compounds (QCLot: 613870)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 613877)						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 613871)						
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 613878)						
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 617222)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	----
EPH (C19-C32)	----	E601A	250	µg/L	<250	----
Hydrocarbons (QCLot: 617223)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
F3 (C16-C34)	----	E601	250	µg/L	<250	----
F4 (C34-C50)	----	E601	250	µg/L	<250	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 617221)						
acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
acridine	260-94-6	E641A	0.01	µg/L	<0.010	----
anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
quinoline	91-22-5	E641A	0.05	µg/L	<0.050	----

Qualifiers

Qualifier	*Description*
MB-LOR	*Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.*

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 609716)									
turbidity	----	E121	0.1	NTU	200 NTU	99.6	85.0	115	----
Physical Tests (QCLot: 609803)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 609805)									
conductivity	----	E100S	2	µS/cm	146.9 µS/cm	99.0	80.0	120	----
Physical Tests (QCLot: 609806)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	103	85.0	115	----
Physical Tests (QCLot: 612774)									
solids, total suspended [TSS]	----	E160S	2	mg/L	150 mg/L	105	85.0	115	----
Physical Tests (QCLot: 612775)									
solids, total suspended [TSS]	----	E160S	2	mg/L	150 mg/L	98.0	85.0	115	----
Physical Tests (QCLot: 613312)									
solids, total dissolved [TDS]	----	E162S	10	mg/L	1000 mg/L	99.8	85.0	115	----
Anions and Nutrients (QCLot: 609612)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	91.6	80.0	120	----
Anions and Nutrients (QCLot: 609613)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.3	85.0	115	----
Anions and Nutrients (QCLot: 609614)									
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	4 mg/L	97.0	75.0	125	----
Anions and Nutrients (QCLot: 609658)									
phosphorus, total	7723-14-0	E372S	0.002	mg/L	0.05 mg/L	98.8	80.0	120	----
Anions and Nutrients (QCLot: 609807)									
sulfate (as SO4)	14808-79-8	E235S.SO4-L	3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 609808)									
nitrite (as N)	14797-65-0	E235S.NO2-L	0.01	mg/L	0.5 mg/L	96.0	90.0	110	----
Anions and Nutrients (QCLot: 609809)									
fluoride	16984-48-8	E235S.F-L	0.2	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 609810)									
chloride	16887-00-6	E235S.Cl	50	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 609811)									
bromide	24959-67-9	E235S.Br	5	mg/L	0.5 mg/L	98.7	85.0	115	----
Anions and Nutrients (QCLot: 609812)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
					Laboratory Control Sample (LCS) Report				
Anions and Nutrients (QCLot: 609812) - continued									
nitrate (as N)	14797-55-8	E235S.NO3-T	0.01	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 610455)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 610458)									
phosphorus, total	7723-14-0	E372S	0.002	mg/L	0.05 mg/L	89.9	80.0	120	----
Anions and Nutrients (QCLot: 610459)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	92.4	80.0	120	----
Anions and Nutrients (QCLot: 610460)									
Kjeldahl nitrogen, total [TKN]	----	E318S	0.05	mg/L	4 mg/L	92.6	75.0	125	----
Organic / Inorganic Carbon (QCLot: 609608)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	99.6	80.0	120	----
Organic / Inorganic Carbon (QCLot: 609609)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	98.2	80.0	120	----
Organic / Inorganic Carbon (QCLot: 610456)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	97.7	80.0	120	----
Organic / Inorganic Carbon (QCLot: 610457)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	98.4	80.0	120	----
Total Metals (QCLot: 612344)									
aluminum, total	7429-90-5	E468S	0.005	mg/L	2 mg/L	106	80.0	120	----
antimony, total	7440-36-0	E468S	0.001	mg/L	1 mg/L	115	80.0	120	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	1 mg/L	103	80.0	120	----
barium, total	7440-39-3	E468S	0.001	mg/L	0.25 mg/L	108	80.0	120	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	0.1 mg/L	96.8	80.0	120	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	1 mg/L	110	80.0	120	----
boron, total	7440-42-8	E468S	0.3	mg/L	10 mg/L	89.2	80.0	120	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	0.1 mg/L	103	80.0	120	----
calcium, total	7440-70-2	E468S	1	mg/L	50 mg/L	99.8	80.0	120	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	0.05 mg/L	102	80.0	120	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
copper, total	7440-50-8	E468S	0.0005	mg/L	0.25 mg/L	103	80.0	120	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	0.25 mg/L	105	80.0	120	----
iron, total	7439-89-6	E468S	0.01	mg/L	1 mg/L	102	80.0	120	----
lead, total	7439-92-1	E468S	0.00005	mg/L	0.5 mg/L	105	80.0	120	----
lithium, total	7439-93-2	E468S	0.02	mg/L	0.25 mg/L	96.6	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Total Metals (QCLot: 612344) - continued									
magnesium, total	7439-95-4	E468S	1	mg/L	50 mg/L	93.4	80.0	120	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	10 mg/L	100	80.0	120	----
potassium, total	7440-09-7	E468S	1	mg/L	50 mg/L	103	80.0	120	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	0.1 mg/L	99.5	80.0	120	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	0.1 mg/L	110	80.0	120	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	1 mg/L	106	80.0	120	----
silver, total	7440-22-4	E468S	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
strontium, total	7440-24-6	E468S	0.01	mg/L	0.25 mg/L	109	80.0	120	----
sulfur, total	7704-34-9	E468S	5	mg/L	50 mg/L	105	80.0	120	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	0.1 mg/L	113	80.0	120	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	1 mg/L	113	80.0	120	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	0.1 mg/L	93.9	80.0	120	----
tin, total	7440-31-5	E468S	0.001	mg/L	0.5 mg/L	101	80.0	120	----
titanium, total	7440-32-6	E468S	0.005	mg/L	0.25 mg/L	98.4	80.0	120	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	0.005 mg/L	98.3	80.0	120	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	0.1 mg/L	96.1	80.0	120	----
zinc, total	7440-66-6	E468S	0.003	mg/L	0.5 mg/L	106	80.0	120	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	0.1 mg/L	98.7	80.0	120	----
Total Metals (QCLot: 612345)									
silicon, total	7440-21-3	E468S.NaSi	1	mg/L	10 mg/L	113	80.0	120	----
sodium, total	7440-23-5	E468S.NaSi	2.5	mg/L	50 mg/L	108	80.0	120	----
Total Metals (QCLot: 614609)									
aluminum, total	7429-90-5	E468S	0.005	mg/L	2 mg/L	102	80.0	120	----
antimony, total	7440-36-0	E468S	0.001	mg/L	1 mg/L	108	80.0	120	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	1 mg/L	104	80.0	120	----
barium, total	7440-39-3	E468S	0.001	mg/L	0.25 mg/L	100	80.0	120	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	0.1 mg/L	97.7	80.0	120	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	1 mg/L	113	80.0	120	----
boron, total	7440-42-8	E468S	0.3	mg/L	10 mg/L	88.2	80.0	120	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	0.1 mg/L	108	80.0	120	----
calcium, total	7440-70-2	E468S	1	mg/L	50 mg/L	97.4	80.0	120	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	0.05 mg/L	97.6	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 614609) - continued									
chromium, total	7440-47-3	E468S	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
copper, total	7440-50-8	E468S	0.0005	mg/L	0.25 mg/L	107	80.0	120	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	0.25 mg/L	106	80.0	120	----
iron, total	7439-89-6	E468S	0.01	mg/L	1 mg/L	104	80.0	120	----
lead, total	7439-92-1	E468S	0.00005	mg/L	0.5 mg/L	107	80.0	120	----
lithium, total	7439-93-2	E468S	0.02	mg/L	0.25 mg/L	99.0	80.0	120	----
magnesium, total	7439-95-4	E468S	1	mg/L	50 mg/L	101	80.0	120	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	10 mg/L	102	80.0	120	----
potassium, total	7440-09-7	E468S	1	mg/L	50 mg/L	102	80.0	120	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	0.1 mg/L	102	80.0	120	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	0.1 mg/L	110	80.0	120	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	1 mg/L	108	80.0	120	----
silver, total	7440-22-4	E468S	0.0001	mg/L	0.1 mg/L	97.9	80.0	120	----
strontium, total	7440-24-6	E468S	0.01	mg/L	0.25 mg/L	97.1	80.0	120	----
sulfur, total	7704-34-9	E468S	5	mg/L	50 mg/L	102	80.0	120	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	0.1 mg/L	107	80.0	120	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	1 mg/L	114	80.0	120	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	0.1 mg/L	97.9	80.0	120	----
tin, total	7440-31-5	E468S	0.001	mg/L	0.5 mg/L	102	80.0	120	----
titanium, total	7440-32-6	E468S	0.005	mg/L	0.25 mg/L	98.3	80.0	120	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	0.1 mg/L	101	80.0	120	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	0.005 mg/L	103	80.0	120	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	0.1 mg/L	95.9	80.0	120	----
zinc, total	7440-66-6	E468S	0.003	mg/L	0.5 mg/L	107	80.0	120	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	0.1 mg/L	93.9	80.0	120	----
Total Metals (QCLot: 614666)									
aluminum, total	7429-90-5	E468S	0.005	mg/L	2 mg/L	107	80.0	120	----
antimony, total	7440-36-0	E468S	0.001	mg/L	1 mg/L	109	80.0	120	----
arsenic, total	7440-38-2	E468S	0.0004	mg/L	1 mg/L	105	80.0	120	----
barium, total	7440-39-3	E468S	0.001	mg/L	0.25 mg/L	103	80.0	120	----
beryllium, total	7440-41-7	E468S	0.0005	mg/L	0.1 mg/L	97.8	80.0	120	----
bismuth, total	7440-69-9	E468S	0.0005	mg/L	1 mg/L	101	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Total Metals (QCLot: 614666) - continued									
boron, total	7440-42-8	E468S	0.3	mg/L	10 mg/L	88.8	80.0	120	----
cadmium, total	7440-43-9	E468S	0.00001	mg/L	0.1 mg/L	105	80.0	120	----
calcium, total	7440-70-2	E468S	1	mg/L	50 mg/L	98.2	80.0	120	----
cesium, total	7440-46-2	E468S	0.0005	mg/L	0.05 mg/L	95.3	80.0	120	----
chromium, total	7440-47-3	E468S	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
cobalt, total	7440-48-4	E468S	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
copper, total	7440-50-8	E468S	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
gallium, total	7440-55-3	E468S	0.0005	mg/L	0.25 mg/L	110	80.0	120	----
iron, total	7439-89-6	E468S	0.01	mg/L	1 mg/L	106	80.0	120	----
lead, total	7439-92-1	E468S	0.00005	mg/L	0.5 mg/L	105	80.0	120	----
lithium, total	7439-93-2	E468S	0.02	mg/L	0.25 mg/L	96.5	80.0	120	----
magnesium, total	7439-95-4	E468S	1	mg/L	50 mg/L	102	80.0	120	----
manganese, total	7439-96-5	E468S	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
molybdenum, total	7439-98-7	E468S	0.0001	mg/L	0.25 mg/L	98.2	80.0	120	----
nickel, total	7440-02-0	E468S	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
phosphorus, total	7723-14-0	E468S	0.05	mg/L	10 mg/L	114	80.0	120	----
potassium, total	7440-09-7	E468S	1	mg/L	50 mg/L	108	80.0	120	----
rhenium, total	7440-15-5	E468S	0.0005	mg/L	0.1 mg/L	98.9	80.0	120	----
rubidium, total	7440-17-7	E468S	0.005	mg/L	0.1 mg/L	106	80.0	120	----
selenium, total	7782-49-2	E468S	0.0005	mg/L	1 mg/L	108	80.0	120	----
silver, total	7440-22-4	E468S	0.0001	mg/L	0.1 mg/L	97.9	80.0	120	----
strontium, total	7440-24-6	E468S	0.01	mg/L	0.25 mg/L	98.5	80.0	120	----
sulfur, total	7704-34-9	E468S	5	mg/L	50 mg/L	104	80.0	120	----
tellurium, total	13494-80-9	E468S	0.0005	mg/L	0.1 mg/L	110	80.0	120	----
thallium, total	7440-28-0	E468S	0.00005	mg/L	1 mg/L	112	80.0	120	----
thorium, total	7440-29-1	E468S	0.0005	mg/L	0.1 mg/L	90.6	80.0	120	----
tin, total	7440-31-5	E468S	0.001	mg/L	0.5 mg/L	101	80.0	120	----
titanium, total	7440-32-6	E468S	0.005	mg/L	0.25 mg/L	103	80.0	120	----
tungsten, total	7440-33-7	E468S	0.001	mg/L	0.1 mg/L	101	80.0	120	----
uranium, total	7440-61-1	E468S	0.00005	mg/L	0.005 mg/L	96.3	80.0	120	----
vanadium, total	7440-62-2	E468S	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
yttrium, total	7440-65-5	E468S	0.0005	mg/L	0.1 mg/L	96.4	80.0	120	----
zinc, total	7440-66-6	E468S	0.003	mg/L	0.5 mg/L	109	80.0	120	----
zirconium, total	7440-67-7	E468S	0.0005	mg/L	0.1 mg/L	92.9	80.0	120	----
Total Metals (QCLot: 615799)									
mercury, total	7439-97-6	E508S	0.000005	mg/L	0.0001 mg/L	101	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Dissolved Metals (QCLot: 609591)									
aluminum, dissolved	7429-90-5	E469S	0.005	mg/L	2 mg/L	100	80.0	120	----
antimony, dissolved	7440-36-0	E469S	0.001	mg/L	1 mg/L	102	80.0	120	----
arsenic, dissolved	7440-38-2	E469S	0.0004	mg/L	1 mg/L	98.8	80.0	120	----
barium, dissolved	7440-39-3	E469S	0.001	mg/L	0.25 mg/L	95.4	80.0	120	----
beryllium, dissolved	7440-41-7	E469S	0.0005	mg/L	0.1 mg/L	95.4	80.0	120	----
bismuth, dissolved	7440-69-9	E469S	0.0005	mg/L	1 mg/L	106	80.0	120	----
boron, dissolved	7440-42-8	E469S	0.3	mg/L	10 mg/L	90.8	80.0	120	----
cadmium, dissolved	7440-43-9	E469S	0.00001	mg/L	0.1 mg/L	96.2	80.0	120	----
calcium, dissolved	7440-70-2	E469S	1	mg/L	50 mg/L	96.2	80.0	120	----
cesium, dissolved	7440-46-2	E469S	0.0005	mg/L	0.05 mg/L	93.6	80.0	120	----
chromium, dissolved	7440-47-3	E469S	0.0005	mg/L	0.25 mg/L	99.6	80.0	120	----
cobalt, dissolved	7440-48-4	E469S	0.00005	mg/L	0.25 mg/L	98.1	80.0	120	----
copper, dissolved	7440-50-8	E469S	0.0002	mg/L	0.25 mg/L	99.4	80.0	120	----
gallium, dissolved	7440-55-3	E469S	0.0005	mg/L	0.25 mg/L	103	80.0	120	----
iron, dissolved	7439-89-6	E469S	0.01	mg/L	1 mg/L	98.3	80.0	120	----
lead, dissolved	7439-92-1	E469S	0.00005	mg/L	0.5 mg/L	104	80.0	120	----
lithium, dissolved	7439-93-2	E469S	0.02	mg/L	0.25 mg/L	94.8	80.0	120	----
magnesium, dissolved	7439-95-4	E469S	1	mg/L	50 mg/L	90.3	80.0	120	----
manganese, dissolved	7439-96-5	E469S	0.0001	mg/L	0.25 mg/L	99.6	80.0	120	----
molybdenum, dissolved	7439-98-7	E469S	0.0001	mg/L	0.25 mg/L	95.8	80.0	120	----
nickel, dissolved	7440-02-0	E469S	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
phosphorus, dissolved	7723-14-0	E469S	0.05	mg/L	10 mg/L	104	80.0	120	----
potassium, dissolved	7440-09-7	E469S	1	mg/L	50 mg/L	102	80.0	120	----
rhenium, dissolved	7440-15-5	E469S	0.0005	mg/L	0.1 mg/L	93.1	80.0	120	----
rubidium, dissolved	7440-17-7	E469S	0.005	mg/L	0.1 mg/L	104	80.0	120	----
selenium, dissolved	7782-49-2	E469S	0.0005	mg/L	1 mg/L	106	80.0	120	----
silver, dissolved	7440-22-4	E469S	0.0001	mg/L	0.1 mg/L	94.6	80.0	120	----
strontium, dissolved	7440-24-6	E469S	0.01	mg/L	0.25 mg/L	100	80.0	120	----
sulfur, dissolved	7704-34-9	E469S	5	mg/L	50 mg/L	101	80.0	120	----
tellurium, dissolved	13494-80-9	E469S	0.0005	mg/L	0.1 mg/L	106	80.0	120	----
thallium, dissolved	7440-28-0	E469S	0.00005	mg/L	1 mg/L	109	80.0	120	----
thorium, dissolved	7440-29-1	E469S	0.0005	mg/L	0.1 mg/L	94.5	80.0	120	----
tin, dissolved	7440-31-5	E469S	0.001	mg/L	0.5 mg/L	94.9	80.0	120	----
titanium, dissolved	7440-32-6	E469S	0.005	mg/L	0.25 mg/L	93.0	80.0	120	----
tungsten, dissolved	7440-33-7	E469S	0.001	mg/L	0.1 mg/L	100	80.0	120	----
uranium, dissolved	7440-61-1	E469S	0.00005	mg/L	0.005 mg/L	98.3	80.0	120	----
vanadium, dissolved	7440-62-2	E469S	0.0005	mg/L	0.5 mg/L	97.4	80.0	120	----
yttrium, dissolved	7440-65-5	E469S	0.0005	mg/L	0.1 mg/L	87.3	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 609591) - continued									
zinc, dissolved	7440-66-6	E469S	0.001	mg/L	0.5 mg/L	104	80.0	120	----
zirconium, dissolved	7440-67-7	E469S	0.0005	mg/L	0.1 mg/L	90.6	80.0	120	----
silicon, dissolved	7440-21-3	E469S.NaSi	1	mg/L	10 mg/L	99.4	80.0	120	----
sodium, dissolved	7440-23-5	E469S.NaSi	2.5	mg/L	50 mg/L	102	80.0	120	----
mercury, dissolved	7439-97-6	E509S	0.000005	mg/L	0.0001 mg/L	109	80.0	120	----
Volatile Organic Compounds (QCLot: 613870)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	98.9	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	97.4	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	94.0	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	95.7	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	94.2	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	98.4	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	98.7	70.0	130	----
Volatile Organic Compounds (QCLot: 613877)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	89.1	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	77.3	70.0	130	----
methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	98.6	70.0	130	----
styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	89.1	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	80.9	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	102	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	83.0	70.0	130	----
Hydrocarbons (QCLot: 613871)									
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	91.3	70.0	130	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	84.2	70.0	130	----
Hydrocarbons (QCLot: 613878)									
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	114	70.0	130	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	114	70.0	130	----
Hydrocarbons (QCLot: 617222)									
EPH (C10-C19)	----	E601A	250	µg/L	7790 µg/L	107	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	4078 µg/L	112	70.0	130	----
Hydrocarbons (QCLot: 617223)									
F2 (C10-C16)	----	E601	100	µg/L	4510 µg/L	110	70.0	130	----
F3 (C16-C34)	----	E601	250	µg/L	7394 µg/L	115	70.0	130	----
F4 (C34-C50)	----	E601	250	µg/L	5957 µg/L	94.2	70.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 617221)									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.5 µg/L	90.6	60.0	130	----
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5 µg/L	92.5	60.0	130	----
acridine	260-94-6	E641A	0.01	µg/L	0.5 µg/L	93.9	60.0	130	----
anthracene	120-12-7	E641A	0.01	µg/L	0.5 µg/L	96.0	60.0	130	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5 µg/L	91.5	60.0	130	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5 µg/L	90.6	60.0	130	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.5 µg/L	87.2	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5 µg/L	106	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5 µg/L	112	60.0	130	----
chrysene	218-01-9	E641A	0.01	µg/L	0.5 µg/L	108	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5 µg/L	96.6	60.0	130	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.5 µg/L	100	60.0	130	----
fluorene	86-73-7	E641A	0.01	µg/L	0.5 µg/L	96.7	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5 µg/L	94.2	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5 µg/L	89.0	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5 µg/L	86.3	60.0	130	----
naphthalene	91-20-3	E641A	0.05	µg/L	0.5 µg/L	90.3	50.0	130	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.5 µg/L	93.9	60.0	130	----
pyrene	129-00-0	E641A	0.01	µg/L	0.5 µg/L	98.1	60.0	130	----
quinoline	91-22-5	E641A	0.05	µg/L	0.5 µg/L	108	60.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 609612)										
VA22B9293-002	MP05-North-1-22	phosphorus, total dissolved	7723-14-0	E375-T	0.0438 mg/L	0.05 mg/L	87.7	70.0	130	----
Anions and Nutrients (QCLot: 609613)										
VA22B9293-002	MP05-North-1-22	ammonia, total (as N)	7664-41-7	E298	0.0940 mg/L	0.1 mg/L	94.0	75.0	125	----
Anions and Nutrients (QCLot: 609614)										
VA22B9293-002	MP05-North-1-22	Kjeldahl nitrogen, total [TKN]	----	E318S	1.98 mg/L	2.5 mg/L	79.1	70.0	130	----
Anions and Nutrients (QCLot: 609658)										
VA22B9293-002	MP05-North-1-22	phosphorus, total	7723-14-0	E372S	0.0887 mg/L	0.1 mg/L	88.7	70.0	130	----
Anions and Nutrients (QCLot: 609807)										
VA22B9293-002	MP05-North-1-22	sulfate (as SO4)	14808-79-8	E235S.SO4-L	1020 mg/L	1000 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 609808)										
VA22B9293-002	MP05-North-1-22	nitrite (as N)	14797-65-0	E235S.NO2-L	4.87 mg/L	5 mg/L	97.5	75.0	125	----
Anions and Nutrients (QCLot: 609809)										
VA22B9293-002	MP05-North-1-22	fluoride	16984-48-8	E235S.F-L	10.4 mg/L	10 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 609810)										
VA22B9293-002	MP05-North-1-22	chloride	16887-00-6	E235S.Cl	10100 mg/L	10000 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 609811)										
VA22B9293-002	MP05-North-1-22	bromide	24959-67-9	E235S.Br	52.4 mg/L	50 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 609812)										
VA22B9293-002	MP05-North-1-22	nitrate (as N)	14797-55-8	E235S.NO3-T	7.63 mg/L	7.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 610455)										
VA22B8737-019	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0988 mg/L	0.1 mg/L	98.8	75.0	125	----
Anions and Nutrients (QCLot: 610458)										
VA22B8899-002	Anonymous	phosphorus, total	7723-14-0	E372S	0.0890 mg/L	0.1 mg/L	89.0	70.0	130	----
Anions and Nutrients (QCLot: 610459)										
VA22B8899-002	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0463 mg/L	0.05 mg/L	92.6	70.0	130	----
Anions and Nutrients (QCLot: 610460)										
VA22B8899-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318S	2.47 mg/L	2.5 mg/L	98.7	70.0	130	----
Organic / Inorganic Carbon (QCLot: 609608)										

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Organic / Inorganic Carbon (QCLot: 609608) - continued										
VA22B9293-002	MP05-North-1-22	carbon, dissolved organic [DOC]	----	E358-L	5.30 mg/L	5 mg/L	106	70.0	130	----
Organic / Inorganic Carbon (QCLot: 609609)										
VA22B9293-002	MP05-North-1-22	carbon, total organic [TOC]	----	E355-L	5.10 mg/L	5 mg/L	102	70.0	130	----
Organic / Inorganic Carbon (QCLot: 610456)										
VA22B8899-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.13 mg/L	5 mg/L	103	70.0	130	----
Organic / Inorganic Carbon (QCLot: 610457)										
VA22B8899-002	Anonymous	carbon, total organic [TOC]	----	E355-L	5.15 mg/L	5 mg/L	103	70.0	130	----
Total Metals (QCLot: 612344)										
VA22B8946-031	Anonymous	aluminum, total	7429-90-5	E468S	0.421 mg/L	0.4 mg/L	105	70.0	130	----
		antimony, total	7440-36-0	E468S	0.0385 mg/L	0.04 mg/L	96.3	70.0	130	----
		arsenic, total	7440-38-2	E468S	0.0371 mg/L	0.04 mg/L	92.7	70.0	130	----
		barium, total	7440-39-3	E468S	0.0380 mg/L	0.04 mg/L	95.0	70.0	130	----
		beryllium, total	7440-41-7	E468S	0.0810 mg/L	0.08 mg/L	101	70.0	130	----
		bismuth, total	7440-69-9	E468S	0.0162 mg/L	0.02 mg/L	81.3	70.0	130	----
		boron, total	7440-42-8	E468S	ND mg/L	0.2 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E468S	0.00682 mg/L	0.008 mg/L	85.2	70.0	130	----
		calcium, total	7440-70-2	E468S	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E468S	0.0186 mg/L	0.02 mg/L	92.9	70.0	130	----
		chromium, total	7440-47-3	E468S	0.0769 mg/L	0.08 mg/L	96.1	70.0	130	----
		cobalt, total	7440-48-4	E468S	0.0356 mg/L	0.04 mg/L	89.0	70.0	130	----
		copper, total	7440-50-8	E468S	0.0330 mg/L	0.04 mg/L	82.6	70.0	130	----
		gallium, total	7440-55-3	E468S	0.00493 mg/L	0.005 mg/L	98.7	70.0	130	----
		iron, total	7439-89-6	E468S	3.80 mg/L	4 mg/L	94.9	70.0	130	----
		lead, total	7439-92-1	E468S	0.0336 mg/L	0.04 mg/L	83.9	70.0	130	----
		lithium, total	7439-93-2	E468S	0.176 mg/L	0.2 mg/L	88.1	70.0	130	----
		magnesium, total	7439-95-4	E468S	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E468S	0.0397 mg/L	0.04 mg/L	99.2	70.0	130	----
		molybdenum, total	7439-98-7	E468S	0.0404 mg/L	0.04 mg/L	101	70.0	130	----
		nickel, total	7440-02-0	E468S	0.0685 mg/L	0.08 mg/L	85.6	70.0	130	----
		phosphorus, total	7723-14-0	E468S	22.1 mg/L	20 mg/L	110	70.0	130	----
		potassium, total	7440-09-7	E468S	ND mg/L	8 mg/L	ND	70.0	130	----
		rhenium, total	7440-15-5	E468S	0.00435 mg/L	0.005 mg/L	87.1	70.0	130	----
		rubidium, total	7440-17-7	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		selenium, total	7782-49-2	E468S	0.0738 mg/L	0.08 mg/L	92.3	70.0	130	----
		silver, total	7440-22-4	E468S	0.00699 mg/L	0.008 mg/L	87.4	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 612344) - continued										
VA22B8946-031	Anonymous	strontium, total	7440-24-6	E468S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E468S	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E468S	0.0694 mg/L	0.08 mg/L	86.7	70.0	130	----
		thallium, total	7440-28-0	E468S	0.00696 mg/L	0.008 mg/L	87.0	70.0	130	----
		thorium, total	7440-29-1	E468S	0.0359 mg/L	0.04 mg/L	89.8	70.0	130	----
		tin, total	7440-31-5	E468S	0.0365 mg/L	0.04 mg/L	91.2	70.0	130	----
		titanium, total	7440-32-6	E468S	0.0819 mg/L	0.08 mg/L	102	70.0	130	----
		tungsten, total	7440-33-7	E468S	0.0374 mg/L	0.04 mg/L	93.6	70.0	130	----
		uranium, total	7440-61-1	E468S	0.00684 mg/L	0.008 mg/L	85.6	70.0	130	----
		vanadium, total	7440-62-2	E468S	0.201 mg/L	0.2 mg/L	100	70.0	130	----
		yttrium, total	7440-65-5	E468S	0.00512 mg/L	0.005 mg/L	102	70.0	130	----
		zinc, total	7440-66-6	E468S	0.672 mg/L	0.8 mg/L	84.0	70.0	130	----
		zirconium, total	7440-67-7	E468S	0.0825 mg/L	0.08 mg/L	103	70.0	130	----
Total Metals (QCLot: 612345)										
VA22B8946-031	Anonymous	silicon, total	7440-21-3	E468S.NaSi	498 mg/L	500 mg/L	99.6	70.0	130	----
		sodium, total	7440-23-5	E468S.NaSi	ND mg/L	100 mg/L	ND	70.0	130	----
Total Metals (QCLot: 614609)										
VA22B9224-039	Anonymous	copper, total	7440-50-8	E468S	0.0415 mg/L	0.04 mg/L	104	70.0	130	----
Total Metals (QCLot: 615799)										
VA22B9226-028	Anonymous	mercury, total	7439-97-6	E508S	0.000102 mg/L	0.0001 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 609591)										
VA22B9293-002	MP05-North-1-22	aluminum, dissolved	7429-90-5	E469S	0.419 mg/L	0.4 mg/L	105	70.0	130	----
		antimony, dissolved	7440-36-0	E469S	0.0387 mg/L	0.04 mg/L	96.7	70.0	130	----
		arsenic, dissolved	7440-38-2	E469S	0.0388 mg/L	0.04 mg/L	97.0	70.0	130	----
		barium, dissolved	7440-39-3	E469S	0.0374 mg/L	0.04 mg/L	93.5	70.0	130	----
		beryllium, dissolved	7440-41-7	E469S	0.0766 mg/L	0.08 mg/L	95.8	70.0	130	----
		bismuth, dissolved	7440-69-9	E469S	0.0173 mg/L	0.02 mg/L	86.4	70.0	130	----
		boron, dissolved	7440-42-8	E469S	ND mg/L	0.2 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E469S	0.00736 mg/L	0.008 mg/L	92.1	70.0	130	----
		calcium, dissolved	7440-70-2	E469S	ND mg/L	8 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E469S	0.0189 mg/L	0.02 mg/L	94.4	70.0	130	----
		chromium, dissolved	7440-47-3	E469S	0.0784 mg/L	0.08 mg/L	98.0	70.0	130	----
		cobalt, dissolved	7440-48-4	E469S	0.0378 mg/L	0.04 mg/L	94.6	70.0	130	----
		copper, dissolved	7440-50-8	E469S	0.0360 mg/L	0.04 mg/L	90.0	70.0	130	----
		gallium, dissolved	7440-55-3	E469S	0.00520 mg/L	0.005 mg/L	104	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 609591) - continued										
VA22B9293-002	MP05-North-1-22	iron, dissolved	7439-89-6	E469S	3.90 mg/L	4 mg/L	97.6	70.0	130	----
		lead, dissolved	7439-92-1	E469S	0.0359 mg/L	0.04 mg/L	89.8	70.0	130	----
		lithium, dissolved	7439-93-2	E469S	0.181 mg/L	0.2 mg/L	90.6	70.0	130	----
		magnesium, dissolved	7439-95-4	E469S	ND mg/L	2 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E469S	0.0404 mg/L	0.04 mg/L	101	70.0	130	----
		molybdenum, dissolved	7439-98-7	E469S	0.0407 mg/L	0.04 mg/L	102	70.0	130	----
		nickel, dissolved	7440-02-0	E469S	0.0732 mg/L	0.08 mg/L	91.4	70.0	130	----
		phosphorus, dissolved	7723-14-0	E469S	22.2 mg/L	20 mg/L	111	70.0	130	----
		potassium, dissolved	7440-09-7	E469S	ND mg/L	8 mg/L	ND	70.0	130	----
		rhenium, dissolved	7440-15-5	E469S	0.00446 mg/L	0.005 mg/L	89.3	70.0	130	----
		rubidium, dissolved	7440-17-7	E469S	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
		selenium, dissolved	7782-49-2	E469S	0.0786 mg/L	0.08 mg/L	98.2	70.0	130	----
		silver, dissolved	7440-22-4	E469S	0.00720 mg/L	0.008 mg/L	90.1	70.0	130	----
		strontium, dissolved	7440-24-6	E469S	ND mg/L	0.04 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E469S	ND mg/L	40 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E469S	0.0723 mg/L	0.08 mg/L	90.4	70.0	130	----
		thallium, dissolved	7440-28-0	E469S	0.00738 mg/L	0.008 mg/L	92.2	70.0	130	----
		thorium, dissolved	7440-29-1	E469S	0.0385 mg/L	0.04 mg/L	96.2	70.0	130	----
		tin, dissolved	7440-31-5	E469S	0.0383 mg/L	0.04 mg/L	95.7	70.0	130	----
		titanium, dissolved	7440-32-6	E469S	0.0814 mg/L	0.08 mg/L	102	70.0	130	----
		tungsten, dissolved	7440-33-7	E469S	0.0393 mg/L	0.04 mg/L	98.2	70.0	130	----
		uranium, dissolved	7440-61-1	E469S	0.00720 mg/L	0.008 mg/L	90.0	70.0	130	----
		vanadium, dissolved	7440-62-2	E469S	0.204 mg/L	0.2 mg/L	102	70.0	130	----
		yttrium, dissolved	7440-65-5	E469S	0.00516 mg/L	0.005 mg/L	103	70.0	130	----
		zinc, dissolved	7440-66-6	E469S	0.726 mg/L	0.8 mg/L	90.8	70.0	130	----
		zirconium, dissolved	7440-67-7	E469S	0.0822 mg/L	0.08 mg/L	103	70.0	130	----
Dissolved Metals (QCLot: 609592)										
VA22B9293-002	MP05-North-1-22	silicon, dissolved	7440-21-3	E469S.NaSi	474 mg/L	500 mg/L	94.9	70.0	130	----
		sodium, dissolved	7440-23-5	E469S.NaSi	ND mg/L	100 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 616169)										
VA22B9226-027	Anonymous	mercury, dissolved	7439-97-6	E509S	0.0000960 mg/L	0.0001 mg/L	96.0	70.0	130	----
Volatile Organic Compounds (QCLot: 613870)										
VA22B9293-001	MP05-Source-1-22	benzene	71-43-2	E611A	93.3 µg/L	100 µg/L	93.3	60.0	140	----
		ethylbenzene	100-41-4	E611A	90.6 µg/L	100 µg/L	90.6	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	89.7 µg/L	100 µg/L	89.7	60.0	140	----
		styrene	100-42-5	E611A	90.8 µg/L	100 µg/L	90.8	60.0	140	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 613870) - continued										
VA22B9293-001	MP05-Source-1-22	toluene	108-88-3	E611A	87.9 µg/L	100 µg/L	87.9	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	183 µg/L	200 µg/L	91.4	60.0	140	----
		xylene, o-	95-47-6	E611A	93.0 µg/L	100 µg/L	93.0	60.0	140	----
Volatile Organic Compounds (QCLot: 613877)										
VA22B9293-002	MP05-North-1-22	benzene	71-43-2	E611A	96.8 µg/L	100 µg/L	96.8	60.0	140	----
		ethylbenzene	100-41-4	E611A	87.2 µg/L	100 µg/L	87.2	60.0	140	----
		methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	97.2 µg/L	100 µg/L	97.2	60.0	140	----
		styrene	100-42-5	E611A	95.5 µg/L	100 µg/L	95.5	60.0	140	----
		toluene	108-88-3	E611A	90.8 µg/L	100 µg/L	90.8	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	200 µg/L	200 µg/L	99.8	60.0	140	----
		xylene, o-	95-47-6	E611A	90.8 µg/L	100 µg/L	90.8	60.0	140	----
Hydrocarbons (QCLot: 613871)										
VA22B9293-001	MP05-Source-1-22	F1 (C6-C10)	----	E581.VH+F1	5620 µg/L	6310 µg/L	89.0	60.0	140	----
		VHw (C6-C10)	----	E581.VH+F1	5180 µg/L	6310 µg/L	82.1	60.0	140	----
Hydrocarbons (QCLot: 613878)										
VA22B9293-006	MP06-Source-2-22	F1 (C6-C10)	----	E581.VH+F1	6780 µg/L	6310 µg/L	107	60.0	140	----
		VHw (C6-C10)	----	E581.VH+F1	6790 µg/L	6310 µg/L	108	60.0	140	----

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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 21 - 06

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Golder Associates Ltd.
Contact:	Elaine Irving/Connor Pettern
Phone:	1-604-297-2030/1-604-296-4200
	Company address below will appear on the final report
Street:	Suite 200 - 2920 Virtual Way
City/Province:	Vancouver, BC
Postal Code:	V5M 0C4
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: elaine.irving@wsp.com

Email 2: connor.pettern@wsp.com

Email 3: trish.tomliens@wsp.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax:

Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:

Job #: GOLD 100-028

PO / AFE: 166372401/64000/03

LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: | PO#

Major/Minor Code: | Routing Code:

Requisitioner:

Location:

ALS Lab Work Order # (ALS use only): 9293

ALS Contact: Amber Springer

Sampler: TT/MR/DV

Environmental Division
Vancouver
Work Order Reference
VA22B9293
Telephone : +1 604 253 4188

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	General (alkalinity, turbidity, conduc	Anions, TOC, DOC, Hardness, Salir	pH, TSS, TDS, Ammonia, TKN)	Dissolved Metals	Total Metals	Dissolved Mercury	Total Mercury	Nutrients (including total phosphoru	Petroleum hydrocarbons (MTBE)	Petroleum hydrocarbons (BTEX,F1)	Hydrocarbons (LEPH/HEPH)	PAH, F2-F4			SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes
									F/P	P	F/P	P	P	P	P	P	P					
1	MP05-Source-1-22	15-Aug-22	10:55	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
2	MP05-North-1-22	15-Aug-22	11:05	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
3	MP05-ENE-1-22	15-Aug-22	11:15	Seawater	6	R	R	R	R	R	R	R	R									
4	MP05-WNW-1-22	15-Aug-22	10:50	Seawater	6	R	R	R	R	R	R	R	R									
5	MLP-3	15-Aug-22		Seawater	6	R	R	R	R	R	R	R	R									
6	MP06-Source-2-22	15-Aug-22	10:30	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
7	MP06-North-2-22	15-Aug-22	10:10	Seawater	6	R	R	R	R	R	R	R	R									
8	MP06-ENE-2-22	15-Aug-22	10:20	Seawater	10	R	R	R	R	R	R	R	R	R	R	R	R					
9	MP06-WNW-2-22	15-Aug-22	10:40	Seawater	6	R	R	R	R	R	R	R	R									

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please refer to quote for all analyses.

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☑ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C:

FINAL COOLER TEMPERATURES °C: 15

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Patricia Lambert	Date: 16 Aug 2022	Time: 9:06	Received by:	Date:	Time:	Received by: JC	Date: AUG 18 2022	Time: 820 am

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION   WHITE - LABORATORY COPY   YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

AUG 2020 FRONT

APPENDIX 2C

Water Screening Table

Appendix 2C - Table 1: Water Quality Screening
Table for Marine Environmental Effects Monitoring Program 2022

Parameter	CCME AQUATIC MARINE WATER - LONG TERM	CCME AQUATIC MARINE WATER - SHORT TERM	Station	MP-05																			
			Sample Name			MP-05 ENE					MP-05 North					MP-05-Source					MP-05 WNW		
			Sample Date	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022
			FIELD_SDG	VA22B8083-003	YL2201196-003	VA22B8597-003	YL2201255-003	VA22B9293-003	VA22B8083-002	YL2201196-002	VA22B8597-002	YL2201255-002	VA22B9293-002	VA22B8083-001	YL2201196-001	VA22B8597-001	YL2201255-001	VA22B9293-001	VA22B8083-004	YL2201196-004	VA22B8597-004	YL2201255-004	VA22B9293-004
			SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
			Unit																				
Anions + Nutrients																							
Alkalinity, Total as CaCO3			mg/L	64.8	64.4	66.1	108	73.1	63.1	65.3	65.6	112	74.1	64.9	65.8	69.7	110	83.2	64.4	65.1	67.1	109	75.4
Total Kjeldahl Nitrogen			mg/L	<0.050	<0.050	<0.050	0.098	<0.050	<0.050	0.051	0.069	0.102	0.077	<0.050	0.143	<0.050	0.066	0.118	0.056	<0.050	<0.050	0.125	0.100
Ammonia (as N)			mg/L	<0.0050	<0.0050	<0.0050	0.0059	<0.0050	<0.0050	<0.0050	<0.0050	0.0075	<0.0050	<0.0050	0.0072	<0.0050	0.0067	0.0232	<0.0050	<0.0050	<0.0050	0.0055	<0.0050
Bromide (Br)			mg/L	7.3	5.1	6.5	59.1	19.4	8.7	6.5	7.4	57.5	19.1	8.6	<5.0	<5.0	60.0	17.5	8.0	6.2	7.0	56.6	21.2
Chloride (Cl)			mg/L	2190	1680	1960	16600	6410	2510	2050	2220	16400	6360	2350	1560	1390	17000	5670	2160	2040	2040	16100	6960
Fluoride (F)			mg/L	<0.20	<0.20	<0.20	0.78	0.38	<0.20	<0.20	<0.20	0.77	0.40	<0.20	<0.20	<0.20	0.68	0.36	<0.20	<0.20	<0.20	0.78	0.45
Nitrate (as N)	**339**	**45**	mg/L	<0.010	<0.010	<0.010	<0.010	0.031	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	0.066	0.016	0.448	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrite (as N)			mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphorus, Total			mg/L	0.0060	0.0096	0.0063	0.0256	0.0124	0.0090	0.0127	0.0057	0.0209	0.0093	0.0081	0.0116	0.0127	0.0242	0.0159	0.0052	0.0081	0.0065	0.0248	0.0100
Sulfate (SO4)			mg/L	302	239	276	2320	867	348	288	309	2330	922	316	224	194	2240	780	302	293	279	2320	949
Carbons																							
Dissolved Organic Carbon			mg/L	1.25	0.92	1.11	1.06	1.23	1.10	1.16	1.18	0.84	1.15	1.12	1.25	1.10	0.99	1.29	0.92	1.26	1.18	1.07	1.24
Field + Physical																							
pH	**7.0 - 8.7**		pH units	7.87	7.95	7.94	7.99	7.95	7.85	7.94	7.93	7.99	7.97	7.89	7.94	7.94	7.99	8.00	7.78	7.96	7.94	7.99	7.98
Conductivity			µS/cm	6610	5680	6210	45600	18900	7570	6680	7140	46100	19800	6960	5300	4630	45300	16900	7020	6870	6640	45400	20500
Hardness, Calcium Carbonate (Dissolved)			mg/L	762	567	563	5090	1870	839	708	672	5180	2010	751	538	484	5030	1740	749	723	623	5230	2100
Total Dissolved Solids			mg/L	4030	3380	3750	38200	13300	4720	4200	4330	38700	13900	4210	3370	2680	36400	11300	4440	4230	3860	37100	13100
Total Suspended Solids			mg/L	2.1	<2.0	<2.0	2.0	8.6	<2.0	5.0	<2.0	<2.0	<2.0	4.3	<2.0	<2.0	3.2	<2.0	6.5	<2.0	<2.0	<2.0	2.7
Turbidity			NTU	0.60	0.26	0.37	0.14	1.82	0.46	0.30	0.37	0.15	0.51	3.30	0.22	0.58	0.12	1.13	1.90	0.19	0.33	0.12	0.35
Salinity			PSU	3.7	3.1	3.4	30.9	11.5	4.3	3.7	4.0	31.3	12.1	3.9	2.9	2.5	30.7	10.2	3.9	3.8	3.7	30.8	12.6
Total Organic Carbon			mg/L	0.87	0.80	0.82	0.91	0.90	0.99	0.95	0.91	1.02	0.93	1.00	1.03	1.31	1.37	1.58	1.00	0.68	0.94	1.09	1.07
Dissolved Organic Carbon			mg/L	1.25	0.92	1.11	1.06	1.23	1.10	1.16	1.18	0.84	1.15	1.12	1.25	1.10	0.99	1.29	0.92	1.26	1.18	1.07	1.24
Hydrocarbons																							
Acenaphthene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Acenaphthylene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Acridine			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Anthracene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Benz(a)anthracene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Benzo(a)pyrene			µg/L	-	-	-	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	-	-	-	-
Benzo(g,h,i)perylene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Benzo(k)fluoranthene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Chrysene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Dibenz(a,h)anthracene			µg/L	-	-	-	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	-	-	-	-
Fluoranthene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Benzo(b,j) fluoranthene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Fluorene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Naphthalene	**1.4**		µg/L	-	-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	-	-	-
Phenanthrene			µg/L	-	-	-	< 0.020	-	< 0.020	< 0.020	< 0.020	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	-	-	-	-	-
Pyrene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Quinoline			µg/L	-	-	-	< 0.050	-	< 0.050	< 0.050	< 0.050	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	-	-	-
1- & 2-Methylnaphthalene			µg/L	-	-	-	< 0.015	-	< 0.015	< 0.015	< 0.015	-	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	-	-	-	-	-
2-methylnaphthalene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
PAH, Low Molecular Weight			µg/L	-	-	-	< 0.06	-	< 0.06	< 0.06	< 0.06	-	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	-	-	-	-	-
PAH, High Molecular Weight			µg/L	-	-	-	< 0.03	-	< 0.03	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	-	-	-	-
VPH (C6-C10)			µg/L	-	-	-	< 100	-	< 100	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)			µg/L	-	-	-	< 100	-	< 100	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)			µg/L	-	-	-	< 100	-	< 100	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)			µg/L	-	-	-	< 250	-	< 250	< 250	< 250	-	< 250	< 250	< 250	< 250	< 250	< 250	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)			µg/L	-	-	-	< 250	-	< 250	< 250	< 250	-	< 250	< 250	< 250	< 250	< 250	< 250	-	-	-	-	-
1-Methylnaphthalene			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Benzo[b,j,k]fluoranthene			µg/L	-	-	-	< 0.015	-	< 0.015	< 0.015	< 0.015	-	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	-	-	-	-	-
Volatile Hydrocarbons (C6-C10)			µg/L	-	-	-	< 100	-	< 100	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)			µg/L	-	-	-	< 100	-	< 100	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
PAHs, total (EPA16)			µg/L	-	-	-	< 0.065	-	< 0.065	< 0.065	< 0.065	-	< 0.065	< 0.065	< 0.065	< 0.065	< 0.065	< 0.065	-	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)			µg/L	-	-	-	< 0.010	-	< 0.010	< 0.010	< 0.010	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Metals, Dissolved																							
Aluminum			mg/L	<0.0050	<0.0050	<0.0050	<0.0050	0.0061	<0.0050	<0.0050	<0.0050	<0.0050	0.0053	<0.0050	<0.0050	<0.0050	<0.0050	0.0061	0.0050	<0.0050	<0.0050	<0.0050	0.0057
Antimony			mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic	**0.0125**		mg/L	<0.00040	<0.00040	<0.00040	0.00148	0.00057	<0.00040	<0.00040	<0.00040	0.00155	0.00063	<0.00040	<0.00040	<0.00040	0.00152	0.00052	<0.00040	<0.00040	<0.00040	0.00144	0.00063
Barium			mg/L	0.0040	0.0037	0.0036	0.0082	0.0081	0.0039	0.0039	0.0040	0.0083	0.0082	0.0039	0.0035	0.0035	0.0085	0.0083	0.0040	0.0041	0.0038	0.0086	0.0082
Beryllium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron			mg/L	0.54	0.39	0.36	3.53	1.38	0.63	0.50	0.43	3.52	1.49	0.53	0.38	<0.30	3.51	1.31	0.52	0.47	0.37	3.58	1.55
Cadmium	**0.00012**		mg/L	<0.000010	<0.000010	<0.000010	0.000018	<0.000010	<0.000010	<0.000010	<0.000010	0.000019	0.000016	<0.000010	<0.000010	<0.000010	0.000019	0.000014	<0.000010	<0.000010	<0.000010	0.000020	0.000015
Calcium			mg/L	57.9	47.2	47.4	405	144	65.6	57.6	54.6	407	159	59.9	47.2	42.9	389	142	61.0	55.5	50.0	414	166
Cesium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt			mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Copper			mg/L	0.00059	0.00031	0.00058	0.00036	0.00045	0.00062	0.00052	0.00059	0.00037	0.00042	0.00050	0.00030	0.00088	0.00058	0.00037	0.00048	0.00051	0.00066	0.00036	0.00028
Gallium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron			mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lead			mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium			mg/L	0.020	<0.020	<0.020	0.155	0.056	0.024	<0.020	<0.020	0.158	0.059	0.021	<0.020	<0.020	0.159	0.050	0.021	<0.020	<0.020	0.158	0.062
Magnesium			mg/L	150	109	108	991	367	164	137	130	1010	391	146	102	91.4	986	336	145	142	121	1020	409
Manganese			mg/L	0.00073	0.00058	0.00068	0.00062	0.00080	0.00068	0.00063	0.00079	0.00072	0.00078	0.00084	0.00065	0.00067	0.00101	0.00229	0.00079	0.00062	0.00073	0.00063	0.00077
Mercury	**0.000016**		mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum			mg/L	0.00123	0.00109	0.00106	0.0102	0.00367	0.00156	0.00121	0.00128	0.0102	0.00397	0.00137	0.00098	0.00089	0.00978	0.00363	0.00131	0.00130	0.00119	0.0104	0.00417
Nickel			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus			mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium			mg/L	47.6	35.3	35.4	369	129	50.6	44.1	44.8	383	141	45.7	32.0	28.2	366	121	49.0	46.1	40.0	379	148
Rubidium			mg/L	0.0137	0.0099	0.0108	0.104	0.0369	0.0142	0.0124	0.0132	0.108	0.0395	0.0135	0.0094	0.0088	0.105	0.0342	0.0142	0.0134	0.0119	0.108	0.0422
Selenium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silicon			mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver		**0.0075**	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium			mg/L	1200	917	982	9410	3260	1300	1140	1180	9530	3560	1240	877	737	9440	3140	1090	1140	1100	9570	3590
Strontium			mg/L	0.878	0.716	0.702	7.01	2.56	1.00	0.841	0.886	7.20	2.77	0.932	0.637	0.558	6.87	2.45	0.916	0.858	0.797	7.20	2.92
Sulphur (Colloidal)			mg/L	113	82.1	81.2	978	314	123	104	99.5	1020	330	108	75.1	62.7	939	281	104	100	93.1	1000	336
Tellurium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thallium			mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Thorium-232			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tin			mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium			mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten			mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium			mg/L	0.000889	0.000722	0.000992	0.00254	0.00144	0.000743	0.000967	0.000942	0.00252	0.00147	0.00113	0.000801	0.000899	0.00301	0.00415	0.000729	0.000799	0.000888	0.00254	0.00150
Vanadium			mg/L	<0.00050	<0.00050	<0.00050	0.00121	0.00056	<0.00050	<0.00050	<0.00050	0.00128	0.00060	<0.00050	<0.00050	<0.00050	0.00124	0.00051	<0.00050	<0.00050	<0.00050	0.00128	0.00061
Zinc			mg/L	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	0.0012	<0.0010	<0.0010	0.0013	0.0014	0.0012	<0.0010	<0.0010
Zirconium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Parameter	CCME AQUATIC MARINE WATER - LONG TERM	CCME AQUATIC MARINE WATER - SHORT TERM	Station	MP-06																			
			Sample Name			MP-06 ENE					MP-06 North					MP-06 Source					MP-06 WNW		
			Sample Date	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022
			FIELD_SDG	VA22B8083-008	YL2201196-008	VA22B8597-008	YL2201255-008	VA22B9293-008	VA22B8083-007	YL2201196-007	VA22B8597-007	YL2201255-007	VA22B9293-007	VA22B8083-006	YL2201196-006	VA22B8597-006	YL2201255-006	VA22B9293-006	VA22B8083-009	YL2201196-009	VA22B8597-009	YL2201255-009	VA22B9293-009
			SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
			Unit																				
Anions + Nutrients																							
Alkalinity, Total as CaCO3			mg/L	105	112	114	114	112	112	112	117	114	112	65.0	64.0	65.5	110	76.8	81.7	111	65.8	112	78.1
Total Kjeldahl Nitrogen			mg/L	0.117	0.073	0.126	0.080	0.121	0.131	0.121	0.142	0.104	0.128	<0.050	0.064	<0.050	0.124	0.068	0.081	0.212	0.088	0.108	0.054
Ammonia (as N)			mg/L	0.0268	0.0130	0.0133	0.0172	0.0132	0.0236	0.0121	0.0287	0.0113	0.0099	<0.0050	0.0066	<0.0050	0.0054	<0.0050	0.0115	0.0185	<0.0050	0.0092	<0.0050
Bromide (Br)			mg/L	55.3	57.1	61.6	64.6	58.3	62.6	53.8	61.5	58.5	59.1	7.4	8.3	8.8	58.5	20.6	34.2	58.9	10.5	62.3	23.1
Chloride (Cl)			mg/L	15900	18300	17800	18400	17700	17800	17200	18000	16600	17800	2150	2620	2650	16300	6680	9890	18800	3270	17600	7490
Fluoride (F)			mg/L	0.93	1.00	0.89	0.80	<0.20	0.83	0.90	0.76	0.79	<0.20	<0.20	<0.20	<0.20	0.79	<0.20	0.73	1.00	0.23	0.78	<0.20
Nitrate (as N)	**339**	**45**	mg/L	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.058	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrite (as N)			mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phosphorus, Total			mg/L	0.0255	0.0273	0.0272	0.0262	0.0285	0.0268	0.0285	0.0295	0.0266	0.0258	0.0062	0.0081	0.0058	0.0263	0.0089	0.0154	0.0319	0.0056	0.0262	0.0090
Sulfate (SO4)			mg/L	2250	2510	2450	2480	<3.0	2460	2410	2460	2500	<3.0	298	369	373	2370	<3.0	1470	2430	460	2360	<3.0
Carbons																							
Dissolved Organic Carbon			mg/L	1.38	1.20	1.45	1.24	1.33	1.32	0.96	1.60	1.30	1.20	1.10	1.11	1.19	0.94	1.04	1.39	1.20	1.06	1.13	1.07
Field + Physical																							
pH	**7.0 - 8.7**		pH units	8.00	7.97	7.97	7.97	8.02	7.99	7.96	7.95	7.97	8.01	7.87	7.87	7.91	7.99	8.01	7.94	7.94	7.90	7.98	8.01
Conductivity			µS/cm	42100	48900	47300	48000	47300	46100	48800	47500	48200	47600	6490	8510	8390	45800	19700	28600	48600	10200	46700	21900
Hardness, Calcium Carbonate (Dissolved)			mg/L	4500	5660	5560	5460	5440	5560	6100	5580	5410	5390	737	837	765	5000	1980	3110	5930	811	5390	2120
Total Dissolved Solids			mg/L	39600	48400	31200	40300	37200	42800	49100	25000	39800	31300	3920	5360	5000	38000	14600	25700	47400	6220	39100	14600
Total Suspended Solids			mg/L	3.8	6.3	<2.0	<2.0	<2.0	<2.0	12.2	<2.0	2.2	2.5	<2.0	2.3	2.3	<2.0	<2.0	2.1	<2.0	<2.0	3.4	<2.0
Turbidity			NTU	0.18	<0.10	0.10	<0.10	<0.10	0.10	<0.10	0.11	0.19	<0.10	0.46	0.25	1.20	0.17	0.37	0.34	<0.10	0.42	0.17	0.42
Salinity			PSU	27.8	32.2	31.2	32.8	31.7	30.7	32.2	31.3	32.9	31.9	3.6	4.8	4.7	31.1	12.0	18.1	32.0	5.8	31.8	13.5
Total Organic Carbon			mg/L	0.99	0.99	0.90	1.03	1.17	0.93	0.73	0.93	0.91	1.04	0.75	0.76	0.83	1.18	0.92	1.08	1.33	0.84	1.00	0.89
Dissolved Organic Carbon			mg/L	1.38	1.20	1.45	1.24	1.33	1.32	0.96	1.60	1.30	1.20	1.10	1.11	1.19	0.94	1.04	1.39	1.20	1.06	1.13	1.07
Hydrocarbons																							
Acenaphthene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Acenaphthylene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Acridine			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Anthracene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Benz(a)anthracene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Benzo(a)pyrene			µg/L	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	-	-	-	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	-	-	-	-
Benzo(g,h,i)perylene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Benzo(k)fluoranthene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Chrysene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Dibenz(a,h)anthracene			µg/L	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	-	-	-	-	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	-	-	-	-	-
Fluoranthene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Benzo(b,j) fluoranthene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Fluorene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Naphthalene	**1.4**		µg/L	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	-	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	-	-	-
Phenanthrene			µg/L	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	-	-	-	-	-	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	-	-	-	-	-
Pyrene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Quinoline			µg/L	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	-	-	-	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	-	-	-	-	-
1- & 2-Methylnaphthalene			µg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	-	-	-	-	-	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	-	-	-	-	-
2-methylnaphthalene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	0.013	< 0.010	-	-	-	-	-
PAH, Low Molecular Weight			µg/L	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	-	-	-	-	-	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	-	-	-	-	-
PAH, High Molecular Weight			µg/L	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	-	-	-	-	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	-	-	-	-	-
VPH (C6-C10)			µg/L	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
Petroleum Hydrocarbons - F1 (C6-C10)			µg/L	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
Petroleum Hydrocarbons - F2 (C10-C16)			µg/L	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
Petroleum Hydrocarbons - F3 (C16-C34)			µg/L	< 250	< 250	< 250	< 250	< 250	-	-	-	-	-	< 250	< 250	< 250	< 250	< 250	-	-	-	-	-
Petroleum Hydrocarbons - F4 (C34-C50)			µg/L	< 250	< 250	< 250	< 250	< 250	-	-	-	-	-	< 250	< 250	< 250	< 250	< 250	-	-	-	-	-
1-Methylnaphthalene			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Benzo[b,j,k]fluoranthene			µg/L	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	-	-	-	-	-	< 0.015	< 0.015	< 0.015	< 0.015	< 0.015	-	-	-	-	-
Volatile Hydrocarbons (C6-C10)			µg/L	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)			µg/L	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
PAHs, total (EPA16)			µg/L	< 0.065	< 0.065	< 0.065	< 0.065	< 0.065	-	-	-	-	-	< 0.065	< 0.065	< 0.065	< 0.065	< 0.065	-	-	-	-	-
Benzo(a)pyrene Total Potency Equivalence (TPE)			µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-	-	-	-	-
Metals, Dissolved																							
Aluminum			mg/L	<0.0050	<0.0125	<0.0125	<0.0050	<0.0050	<0.0050	<0.0050	<0.0125	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0052
Antimony			mg/L	<0.0010	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic	**0.0125**		mg/L	0.00121	0.00154	0.00147	0.00172	0.00157	0.00150	0.00157	0.00146	0.00157	0.00164	0.00044	<0.00040	<0.00040	0.00147	0.00062	0.00096	0.00149	<0.00040	0.00154	0.00066
Barium			mg/L	0.0077	0.0080	0.0082	0.0085	0.0082	0.0082	0.0088	0.0082	0.0085	0.0083	0.0039	0.0039	0.0039	0.0082	0.0070	0.0068	0.0088	0.0041	0.0082	0.0073
Beryllium			mg/L	<0.00050	<0.00125	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth			mg/L	<0.00050	<0.00125	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron			mg/L	2.38	3.70	3.48	3.78	3.73	3.73	2.95	3.51	3.67	3.52	0.49	0.57	0.47	3.57	1.42	1.80	2.85	0.44	3.76	1.58
Cadmium	**0.00012**		mg/L	<0.000010	<0.000025	0.000026	0.000028	0.000026	0.000014	0.000018	<0.000025	0.000026	0.000025	<0.000010	<0.000010	<0.000010	0.000027	0.000010	<0.000010	0.000017	<0.000010	0.000018	0.000013
Calcium			mg/L	311	355	379	438	414	363	414	389	419	361	54.4	64.7	60.8	418	152	213	414	64.3	428	169
Cesium			mg/L	<0.00050	<0.00125	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium			mg/L	<0.00050	<0.00125	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt			mg/L	<0.000050	<0.000100	<0.000100	0.000051	<0.000050	<0.000050	<0.000050	<0.000100	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Copper			mg/L	0.00056	<0.00050	0.00112	0.00151	0.00070	0.00090	0.00064	0.00062	0.00060	0.00081	0.00097	0.00068	0.00038	0.00050	0.00042	0.00067	0.00061	0.00045	0.00047	0.00029
Gallium			mg/L	<0.00050	<0.00125	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron			mg/L	<0.010	<0.025	<0.025	<0.010	<0.010	<0.010	<0.010	<0.025	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lead			mg/L	0.000061	<0.000100	<0.000100	0.000244	<0.000050	0.000095	<0.000050	<0.000100	<0.000050	<0.000050	0.000098	<0.000050	<0.000050	<0.000050	<0.000050	0.000103	<0.000050	<0.000050	<0.000050	<0.000050
Lithium			mg/L	0.103	0.165	0.133	0.163	0.155	0.175	0.132	0.135	0.160	0.140	<0.020	0.024	<0.020	0.156	0.057	0.076	0.127	<0.020	0.162	0.063
Magnesium			mg/L	903	1160	1120	1060	1070	1130	1230	1120	1060	1090	146	164	149	962	389	626	1190	158	1050	412
Manganese			mg/L	0.00049	0.00032	0.00042	0.00036	0.00052	0.00074	0.00035	0.00045	0.00034	0.00043	0.00083	0.00070	0.00067	0.00060	0.00084	0.00076	0.00071	0.00064	0.00056	0.00082
Mercury	**0.000016**		mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum			mg/L	0.00911	0.0101	0.0102	0.0110	0.0103	0.00995	0.0104	0.00983	0.0103	0.00965	0.00125	0.00159	0.00154	0.0104	0.00375	0.00639	0.0102	0.00177	0.0106	0.00422
Nickel			mg/L	<0.00050	<0.00125	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus			mg/L	<0.050	<0.125	<0.125	<0.050	<0.050	<0.050	<0.050	<0.125	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium			mg/L	322	392	386	398	403	370	448	382	407	384	44.4	55.5	51.2	362	139	210	429	55.9	388	151
Rubidium			mg/L	0.0942	0.111	0.106	0.112	0.108	0.108	0.114	0.107	0.113	0.110	0.0129	0.0158	0.0155	0.105	0.0405	0.0628	0.110	0.0189	0.109	0.0421
Selenium			mg/L	<0.00050	<0.00125	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silicon			mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver		**0.0075**	mg/L	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium			mg/L	8340	9980	9640	9720	9280	9680	10200	9720	9750	3.8	1140	1420	1410	9440	3310	5720	9940	1760	9680	3710
Strontium			mg/L	6.54	7.14	7.55	7.71	7.43	7.21	7.71	7.47	7.33	6.88	0.801	1.08	1.02	7.23	2.68	4.46	7.65	1.26	7.26	2.95
Sulphur (Colloidal)			mg/L	834	928	946	1060	973	955	1110	965	1110	967	110	128	126	997	318	561	1040	128	1080	349
Tellurium			mg/L	<0.00050	<0.00125	<0.00125	0.00051	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thallium			mg/L	<0.000050	<0.000100	<0.000100	<0.000050	<0.000050	<0.000050	<0.000050	<0.000100	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Thorium-232			mg/L	<0.00050	<0.00125	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tin			mg/L	<0.0010	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium			mg/L	<0.0050	<0.0125	<0.0125	<0.0050	<0.0050	<0.0050	<0.0050	<0.0125	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten			mg/L	<0.0010	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium			mg/L	0.00237	0.00269	0.00259	0.00265	0.00258	0.00267	0.00251	0.00273	0.00250	0.00274	0.000841	0.000835	0.00182	0.00255	0.00142	0.00171	0.00239	0.000843	0.00255	0.00148
Vanadium			mg/L	0.00118	0.00131	<0.00125	0.00131	0.00148	0.00133	0.00140	<0.00125	0.00138	0.00150	<0.00050	<0.00050	<0.00050	0.00120	0.00061	0.00080	0.00131	<0.00050	0.00129	0.00060
Zinc			mg/L	0.0013	<0.0025	<0.0025	0.0015	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0010	0.0030	0.0015	0.0014	<0.0010	<0.0010	0.0012	0.0021	<0.0010	<0.0010	<0.0010
Zirconium			mg/L	<0.00050	<0.00125	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

Appendix 2C - Table 1: Water Quality Screening
Table for Marine Environmental Effects Monitoring Program 2022

Station				MP-05																			
Sample Name				MP-05 ENE					MP-05 North					MP-05-Source					MP-05 WNW				
Sample Date				02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022
FIELD_SDG				VA22B8083-003	YL2201196-003	VA22B8597-003	YL2201255-003	VA22B9293-003	VA22B8083-002	YL2201196-002	VA22B8597-002	YL2201255-002	VA22B9293-002	VA22B8083-001	YL2201196-001	VA22B8597-001	YL2201255-001	VA22B9293-001	VA22B8083-004	YL2201196-004	VA22B8597-004	YL2201255-004	VA22B9293-004
SAMPLE_TYPE_CODE				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CCME AQUATIC MARINE WATER - LONG TERM	CCME AQUATIC MARINE WATER - SHORT TERM	Unit																				
Metals, Total																							
Aluminum			mg/L	0.0480	0.0127	0.0163	0.0054	0.0642	0.0279	0.0155	0.0131	0.0058	0.0397	0.0451	0.0174	0.0170	0.0071	0.0622	0.0577	0.0145	0.0127	0.0074	0.0358
Antimony			mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic	**0.0125**		mg/L	<0.00040	<0.00040	<0.00040	0.00155	0.00067	<0.00040	<0.00040	<0.00040	0.00167	0.00070	<0.00040	<0.00040	<0.00040	0.00156	0.00066	<0.00040	<0.00040	<0.00040	0.00160	0.00069
Barium			mg/L	0.0041	0.0037	0.0042	0.0089	0.0088	0.0040	0.0036	0.0040	0.0092	0.0087	0.0041	0.0035	0.0038	0.0094	0.0102	0.0041	0.0038	0.0042	0.0090	0.0079
Beryllium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron			mg/L	0.51	0.46	0.41	3.78	1.43	0.53	0.52	0.48	3.83	1.50	0.52	0.41	0.32	3.80	1.26	0.54	0.58	0.44	3.88	1.51
Cadmium	**0.00012**		mg/L	<0.000010	<0.000010	0.000024	0.000017	0.000014	<0.000010	<0.000010	<0.000010	0.000021	0.000015	<0.000010	<0.000010	<0.000010	0.000020	0.000012	<0.000010	<0.000010	0.000010	0.000022	0.000016
Calcium			mg/L	57.7	50.6	56.0	434	149	64.0	56.5	61.7	436	156	59.1	48.3	45.9	433	135	59.1	59.6	57.9	433	163
Cesium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium	**0.0015**		mg/L	<0.00050	<0.00050	**0.00165**	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt			mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000061	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000152	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Copper			mg/L	0.0236	0.00188	0.00809	<0.00050	0.00108	0.00382	<0.00050	0.00210	0.00079	0.00066	0.00304	0.00549	0.00332	0.00138	0.00076	0.00326	0.00212	0.00236	0.00197	<0.00050
Gallium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron			mg/L	0.037	<0.010	0.049	<0.010	0.096	0.027	0.010	<0.010	<0.010	0.047	0.052	0.020	0.017	<0.010	0.077	0.063	0.012	<0.010	<0.010	0.047
Lead			mg/L	<0.000050	<0.000050	0.00125	<0.000050	0.000083	<0.000050	0.000071	<0.000050	<0.000050	0.000078	<0.000050	<0.000050	0.000101	0.000057	0.000088	<0.000050	0.000101	0.000132	<0.000050	0.000054
Lithium			mg/L	<0.020	<0.020	<0.020	0.159	0.059	0.020	<0.020	<0.020	0.163	0.061	<0.020	<0.020	<0.020	0.163	0.048	0.020	0.020	<0.020	0.166	0.063
Magnesium			mg/L	131	112	124	1140	359	141	127	149	1180	370	134	98.9	97.1	1170	305	140	135	141	1150	384
Manganese			mg/L	0.00123	0.00073	0.00123	0.00087	0.00282	0.00106	0.00079	0.00094	0.00102	0.00191	0.00145	0.00105	0.00105	0.00134	0.0126	0.00156	0.00083	0.00089	0.00093	0.00187
Mercury	**0.000016**		mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum			mg/L	0.00129	0.00101	0.00122	0.0107	0.00374	0.00150	0.00128	0.00138	0.0112	0.00392	0.00136	0.00096	0.00093	0.0105	0.00419	0.00135	0.00132	0.00126	0.0108	0.00423
Nickel			mg/L	<0.00050	<0.00050	0.00073	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus			mg/L	0.0060	0.0096	0.0063	0.0256	0.0124	0.0090	0.0127	0.0057	0.0209	0.0093	0.0081	0.0116	0.0127	0.0242	0.0159	0.0052	0.0081	0.0065	0.0248	0.0100
Potassium			mg/L	43.5	35.4	40.2	402	134	48.9	41.5	47.2	414	137	44.9	31.2	30.4	403	115	45.9	43.3	44.1	409	143
Rubidium			mg/L	0.0133	0.0104	0.0114	0.106	0.0391	0.0151	0.0122	0.0135	0.109	0.0404	0.0139	0.0092	0.0089	0.108	0.0338	0.0135	0.0126	0.0127	0.109	0.0415
Selenium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silicon			mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver		**0.0075**	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium			mg/L	1180	920	1050	9460	3560	1330	1120	1230	9920	3750	1230	876	803	9280	2800	1200	1160	1110	9560	3650
Strontium			mg/L	0.848	0.657	0.796	7.52	2.58	0.998	0.809	0.945	7.82	2.76	0.883	0.600	0.589	7.40	2.16	0.952	0.842	0.833	7.69	2.91
Sulphur (Colloidal)			mg/L	100	83.9	95.9	1060	318	118	98.6	111	1090	330	106	74.8	70.0	1060	262	107	103	102	1100	339
Tellurium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thallium			mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Thorium-232			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tin			mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium			mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten			mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium			mg/L	0.000906	0.000750	0.00102	0.00255	0.00151	0.000741	0.00101	0.000900	0.00253	0.00153	0.00116	0.000801	0.000824	0.00281	0.0223	0.000754	0.000802	0.000854	0.00249	0.00158
Vanadium			mg/L	<0.00050	<0.00050	<0.00050	0.00133	<0.00100	<0.00050	<0.00050	<0.00050	0.00141	<0.00100	<0.00050	<0.00050	<0.00050	0.00139	<0.00100	<0.00050	<0.00050	<0.00050	0.00135	<0.00100
Zinc			mg/L	<0.0030	<0.0030	0.0062	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
VHCs																							
Volatile Hydrocarbons (C6-C10)			µg/L	-	-	-	< 100	-	< 100	< 100	< 100		< 100	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)			µg/L	-	-	-	< 100	-	< 100	< 100	< 100		< 100	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
VOCs + BTEX																							
Benzene	**110**		µg/L	-	-	-	< 0.50	-	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-
Ethylbenzene	**25**		µg/L	-	-	-	< 0.50	-	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-
Styrene			µg/L	-	-	-	< 0.50	-	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-
Toluene	**215**		µg/L	-	-	-	< 0.50	-	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-
Xylenes, Total			µg/L	-	-	-	< 0.50	-	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-
o-Xylene			µg/L	-	-	-	< 0.30	-	< 0.30	< 0.30	< 0.30		< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	-	-	-	-	-
m,p-Xylenes			µg/L	-	-	-	< 0.40	-	< 0.40	< 0.40	< 0.40		< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	-	-	-	-	-
Methyl tert-Butyl Ether	**5000**		µg/L	-	-	-	< 0.50	-	< 0.50	< 0.50	< 0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-
SUM OF BTEX			µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Extractable Petroleum Hydrocarbons (C16-50)			µg/L	-	-	-	-	-	< 400	< 400	< 400	-	-	< 400	< 400	< 400	-	-	-	-	-	-	-
Total Extractable Petroleum Hydrocarbons (C10-C50)			µg/L	-	-	-	-	-	< 400	< 400	< 400	-	-	< 400	< 400	< 400	-	-	-	-	-	-	-

Station				MP-06																			
Sample Name				MP-06 ENE					MP-06 North					MP-06 Source					MP-06 WNW				
Sample Date				02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022	02-Aug-2022	06-Aug-2022	08-Aug-2022	13-Aug-2022	15-Aug-2022
FIELD_SDG				VA22B8083-008	YL2201196-008	VA22B8597-008	YL2201255-008	VA22B9293-008	VA22B8083-007	YL2201196-007	VA22B8597-007	YL2201255-007	VA22B9293-007	VA22B8083-006	YL2201196-006	VA22B8597-006	YL2201255-006	VA22B9293-006	VA22B8083-009	YL2201196-009	VA22B8597-009	YL2201255-009	VA22B9293-009
SAMPLE_TYPE_CODE				N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	CCME AQUATIC MARINE WATER - LONG TERM	CCME AQUATIC MARINE WATER - SHORT TERM	Unit																				
Metals, Total																							
Aluminum			mg/L	0.0110	0.0113	0.0099	0.0064	0.0052	0.0080	0.0098	0.0104	0.0074	<0.0050	0.0431	0.0148	0.0227	0.0055	0.0329	0.0278	0.0119	0.0094	0.0060	0.0346
Antimony			mg/L	<0.0010	<0.0010	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic	**0.0125**		mg/L	0.00126	0.00161	0.00153	0.00169	0.00161	0.00137	0.00167	0.00160	0.00162	0.00161	<0.00040	<0.00040	<0.00040	0.00159	0.00067	0.00092	0.00168	<0.00040	0.00170	0.00072
Barium			mg/L	0.0081	0.0088	0.0087	0.0086	0.0088	0.0080	0.0090	0.0084	0.0089	0.0084	0.0039	0.0040	0.0042	0.0089	0.0072	0.0072	0.0091	0.0042	0.0090	0.0082
Beryllium			mg/L	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth			mg/L	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron			mg/L	1.77	4.50	3.31	4.12	3.85	3.74	4.49	3.31	4.11	3.44	0.50	0.68	0.58	3.93	1.43	1.38	4.51	0.55	4.18	1.65
Cadmium	**0.00012**		mg/L	0.000012	0.000026	<0.000025	0.000022	0.000028	0.000019	0.000022	0.000032	0.000026	0.000022	<0.000010	<0.000010	0.000012	0.000031	0.000013	<0.000010	0.000026	<0.000010	0.000027	0.000015
Calcium			mg/L	271	433	384	451	436	308	432	396	462	351	58.3	68.4	70.1	436	154	186	440	66.0	457	174
Cesium			mg/L	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium	**0.0015**		mg/L	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt			mg/L	<0.000050	<0.000050	<0.000100	<0.000050	<0.000050	<0.000050	<0.000050	<0.000100	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Copper			mg/L	0.00808	0.00332	0.00756	0.00191	0.00160	0.00543	0.00771	0.00401	0.00148	0.00059	0.0107	0.00171	0.00326	0.00180	0.00099	0.00223	0.00533	0.00168	0.00118	<0.00050
Gallium			mg/L	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron			mg/L	0.014	<0.010	<0.025	<0.010	<0.010	<0.010	<0.010	<0.025	<0.010	<0.010	0.041	0.011	0.029	<0.010	0.045	0.023	<0.010	<0.010	<0.010	0.042
Lead			mg/L	0.00126	<0.000050	0.000224	0.000055	<0.000050	<0.000050	0.000067	<0.000100	<0.000050	<0.000050	0.000070	0.000050	0.000163	<0.000050	0.000064	0.000056	0.000051	<0.000050	<0.000050	0.000051
Lithium			mg/L	0.073	0.173	0.133	0.173	0.156	0.180	0.169	0.136	0.179	0.129	<0.020	0.025	0.022	0.164	0.058	0.055	0.170	<0.020	0.177	0.065
Magnesium			mg/L	718	1280	1200	1170	1040	1160	1290	1200	1210	1060	132	170	182	1150	368	517	1250	187	1170	433
Manganese			mg/L	0.00117	0.00068	0.00068	0.00064	0.00076	0.00081	0.00068	0.00068	0.00066	0.00063	0.00127	0.00091	0.00126	0.00090	0.00190	0.00108	0.00100	0.00079	0.00081	0.00195
Mercury	**0.000016**		mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum			mg/L	0.00875	0.0112	0.0103	0.0112	0.0108	0.00934	0.0110	0.0104	0.0118	0.00998	0.00130	0.00159	0.00160	0.0110	0.00385	0.00553	0.0108	0.00186	0.0115	0.00454
Nickel			mg/L	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus			mg/L	0.0255	0.0273	0.0272	0.0262	0.0285	0.0268	0.0285	0.0295	0.0266	0.0258	0.0062	0.0081	0.0058	0.0263	0.0089	0.0154	0.0319	0.0056	0.0262	0.0090
Potassium			mg/L	275	447	408	419	405	298	449	404	433	378	43.8	53.9	57.4	404	137	189	440	61.8	424	157
Rubidium			mg/L	0.103	0.107	0.106	0.114	0.109	0.114	0.109	0.110	0.118	0.104	0.0131	0.0153	0.0160	0.110	0.0390	0.0632	0.108	0.0193	0.118	0.0456
Selenium			mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silicon			mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver		**0.0075**	mg/L	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium			mg/L	8640	9780	10200	10100	9730	9540	10000	9830	10300	9790	1170	1430	1500	9820	3480	5710	9780	1810	9880	4110
Strontium			mg/L	6.44	7.75	7.53	8.00	7.67	6.88	7.70	7.54	8.29	6.95	0.850	1.07	1.13	7.52	2.67	3.96	7.62	1.26	8.05	3.09
Sulphur (Colloidal)			mg/L	696	1120	983	1120	964	760	1100	982	1130	939	103	131	140	1040	323	466	1130	142	1130	376
Tellurium			mg/L	<0.00050	<0.00050	<0.00125	<0.00050	0.00055	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thallium			mg/L	<0.000050	<0.000050	<0.000100	<0.000050	<0.000050	<0.000050	<0.000050	<0.000100	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Thorium-232			mg/L	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tin			mg/L	<0.0010	<0.0010	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium			mg/L	<0.0050	<0.0050	<0.0125	<0.0050	<0.0050	<0.0050	<0.0050	<0.0125	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten			mg/L	<0.0010	<0.0010	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium			mg/L	0.00244	0.00248	0.00256	0.00266	0.00262	0.00259	0.00256	0.00265	0.00263	0.00274	0.000919	0.000820	0.00185	0.00264	0.00146	0.00159	0.00259	0.000862	0.00267	0.00159
Vanadium			mg/L	0.00116	0.00150	0.00126	0.00142	<0.00200	0.00129	0.00156	0.00133	0.00146	0.00152	<0.00050	<0.00050	<0.00050	0.00136	<0.00100	0.00082	0.00152	<0.00050	0.00148	<0.00100
Zinc			mg/L	<0.0030	<0.0030	<0.0050	<0.0030	<0.0030	<0.0030	<0.0030	<0.0050	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium			mg/L	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00125	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
VHCs																							
Volatile Hydrocarbons (C6-C10)			µg/L	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)			µg/L	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-	< 100	< 100	< 100	< 100	< 100	-	-	-	-	-
VOCs + BTEX																							
Benzene	**110**		µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-
Ethylbenzene	**25**		µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-
Styrene			µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-
Toluene	**215**		µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-
Xylenes, Total			µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-
o-Xylene			µg/L	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	-	-	-	-	-	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	-	-	-	-	-
m,p-Xylenes			µg/L	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	-	-	-	-	-	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	-	-	-	-	-
Methyl tert-Butyl Ether	**5000**		µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	-	-	-	-	-
SUM OF BTEX			µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Extractable Petroleum Hydrocarbons (C16-50)			µg/L	< 400	< 400	< 400	-	-	-	-	-	-	-	< 400	< 400	< 400	-	-	-	-	-	-	-
Total Extractable Petroleum Hydrocarbons (C10-C50)			µg/L	< 400	< 400	< 400	-	-	-	-	-	-	-	< 400	< 400	< 400	-	-	-	-	-	-	-

Notes:
(VI) - hexavalent chromium
BTEX - Benzene, Toluene, Ethylene and Xylene; F1, F2, F3. F4 - Fractions of hydrocarbons; CCME - Canadian Council of Ministers for the Environment; MP-05 - monitoring stations west of the ore dock, downstream from the MP-05 discharge in a radial design; MP-06 - monitoring stations east of the ore dock; N - nitrogen; NTU - Nephelometric Turbidity Units; pH - scale of acidity; VOC - volatile organic carbons; µm - microgram per liter; µS/cm - milliSiemens per centimeter; % - percentage; "-" - no value; < - less than detection limit

CCME AQUATIC MARINE WATER - LONG TERM GUIDELINE EXCEEDANCE
CCME AQUATIC MARINE WATER - SHORT TERM GUIDELINE EXCEEDANCE

APPENDIX 2D

RPD Table

1.0 QAQC RESULTS

This appendix describes the QAQC results for surface water sampled for the 2022 MEEMP conducted at Milne Port and in Milne Inlet during the 2022 open-water season. Water quality samples were collected during five sampling events scheduled between 2 August and 15 August 2022, to monitor for potential changes in water quality associated with site drainage and treated effluent discharges to the marine environment (including iron ore stockpile run-off). Samples were collected to align with the confirmed active site discharges.

Most chemical analyses on surface water samples were completed within the sample hold time requirements, with the exception of some hold time exceedances for parameters such as DOC, anions, and nutrients (nitrite, nitrate), TDS, and turbidity. Although some sample hold time exceedances were documented, the hold times for the parameters in question are relatively short. Given the remote location of the site, such exceedances were unavoidable. The data should still be comparable to previous yearly measurements as similar issues with hold time exceedances have been encountered.

ALS is certified by the Canadian Association for Laboratory Accreditation (CALA) for the analyses conducted. The analytical laboratory also incorporated and reported the results of internal QA/QC checks. These were used to assess the reliability and reproducibility of the data. Reports from the laboratory are provided in Appendix 2B and were reviewed by Golder. Data reported by the laboratory were considered reliable according to the accredited laboratory QA/QC assessment.

From the field blanks collected during the field program, measured concentrations were generally all less than the analytical detection limit (Table 1). All parameters met QAQC requirements, with the exception of field blank MLP-3 (sampled 15 August 2022) which had nitrate and zinc concentrations greater than 5-times the detection limit. Sample detection limits were increased by ALS for dissolved hardness, TDS, and total phosphorus.

To demonstrate that the samples and analytical results can be considered valid, representative, and reproducible, five field duplicate samples were collected. The RPD between field duplicate sample results was used to assess duplicate sample data. The RPD is a measure of the variability between two outcomes from the same procedure or process and is calculated as:

$$RPD = \frac{absolute\ value\ (sample\ concentration - duplicate\ concentration)}{mean\ concentration} \times 100$$

An RPD less than 20% for inorganic parameters in water is considered acceptable (BC ENV 2020). The QA/QC results of field RPDs are provided in Appendix D. Only a single sample exceeded RPD data quality objectives:

- Duplicate A and its sample pair MP-06 Source (sampled 2 August 2022) had RPD percentages of:
  - 85% for Turbidity
  - 23% for Total Aluminum
  - 102% for Total Copper
  - 24% for Total Iron
  - 37% for Total Uranium
  - 38% for Dissolved Uranium

The QA/QC results indicate that the water chemistry data collected during the 2022 MEEMP were of acceptable quality.

Table 1 - Results of Water Quality QAQC Blank Sample Results
Milne Port, 2022

Sample ID / Date Sampled / Laboratory ID	Units	Reported Detection Limit (RDL)	MLP-1-22 02-Aug-2022 VA22B8083-005	MLP-2 08-Aug-2022 VA22B8597-005	MLP-3 15-Aug-2022 VA22B9293-005
Field and Physical[1]					
Alkalinity, Total as CaCO3	mg/L	1.0	4.7	4.6	7.8
Conductivity	µS/cm	2.0	22.9	21.8	42.3
Hardness, Calcium Carbonate (Dissolved)	mg/L	0.50	<1.00	<1.00	9.06
pH	pH Units	0.10	6.76	6.83	7.24
Total Dissolved Solids	mg/L	10	35	12	26
Total Suspended Solids	mg/L	2.0	<2.0	<2.0	<2.0
Turbidity	NTU	0.10	<0.10	<0.10	<0.10
Salinity	PSU	1.0	<1.0	<1.0	<1.0
Anions and Nutrients					
Total Kjeldahl Nitrogen	mg/L	0.050	<0.050	<0.050	<0.050
Ammonia (as N)	mg/L	0.0050	<0.0050	<0.0050	<0.0050
Bromide (Br)	mg/L	5.0	<5.0	<5.0	<5.0
Chloride (Cl)	mg/L	50	<50	<50	<50
Fluoride (F)	mg/L	0.20	<0.20	<0.20	<0.20
Nitrate (as N)	mg/L	0.010	0.034	0.034	**0.055**
Nitrite (as N)	mg/L	0.010	<0.010	<0.010	<0.010
Sulfate (SO4)	mg/L	3.0	<3.0	<3.0	<3.0
Total Organic Carbon	mg/L	0.50	<0.50	0.53	<0.50
Dissolved Organic Carbon	mg/L	0.50	<0.50	<0.50	<0.50
Metals, Total					
Aluminum	mg/L	0.0050	<0.0050	<0.0050	<0.0050
Antimony	mg/L	0.0010	<0.0010	<0.0010	<0.0010
Arsenic	mg/L	0.00040	<0.00040	<0.00040	<0.00040
Barium	mg/L	0.0010	<0.0010	<0.0010	<0.0010
Beryllium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Bismuth	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Boron	mg/L	0.30	<0.30	<0.30	<0.30
Cadmium	mg/L	0.000010	<0.000010	<0.000010	<0.000010
Calcium	mg/L	1.0	<1.0	<1.0	<1.0
Cesium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Chromium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Cobalt	mg/L	0.000050	<0.000050	<0.000050	<0.000050
Copper	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Gallium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Iron	mg/L	0.010	<0.010	<0.010	<0.010
Lead	mg/L	0.000050	<0.000050	<0.000050	<0.000050
Lithium	mg/L	0.020	<0.020	<0.020	<0.020
Magnesium	mg/L	1.0	<1.0	<1.0	2.3
Manganese	mg/L	0.00020	<0.00020	<0.00020	<0.00020
Mercury	mg/L	0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.00010	<0.00010	<0.00010	<0.00010
Nickel	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Phosphorus	mg/L	0.050	<0.050	<0.050	<0.050
Potassium	mg/L	1.0	<1.0	<1.0	<1.0
Rubidium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Rhenium	mg/L	0.0050	<0.0050	<0.0050	<0.0050
Selenium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Silicon	mg/L	1.0	<1.0	<1.0	<1.0
Silver	mg/L	0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	2.5	4.2	2.6	3.9
Strontium	mg/L	0.010	<0.010	<0.010	<0.010
Sulphur (Colloidal)	mg/L	5.0	<5.0	<5.0	<5.0
Tellurium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Thallium	mg/L	0.000050	<0.000050	<0.000050	<0.000050
Thorium-232	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Tin	mg/L	0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	0.0050	<0.0050	<0.0050	<0.0050
Tungsten	mg/L	0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.000050	<0.000050	<0.000050	<0.000050
Vanadium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Yttrium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Zinc	mg/L	0.0030	0.0033	0.0038	**0.0140**
Zirconium	mg/L	0.00050	<0.00050	<0.00050	<0.00050

Sample ID / Date Sampled / Laboratory ID	Units	Reported Detection Limit (RDL)	MLP-1-22 02-Aug-2022 VA22B8083-005	MLP-2 08-Aug-2022 VA22B8597-005	MLP-3 15-Aug-2022 VA22B9293-005
Metals, Dissolved					
Aluminum (Al)	mg/L	0.0050	<0.0050	<0.0050	<0.0050
Antimony (Sb)	mg/L	0.0010	<0.0010	<0.0010	<0.0010
Arsenic (As)	mg/L	0.00040	<0.00040	<0.00040	<0.00040
Barium (Ba)	mg/L	0.0010	<0.0010	<0.0010	<0.0010
Beryllium (Be)	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Boron (B)	mg/L	0.30	<0.30	<0.30	<0.30
Cadmium (Cd)	mg/L	0.000010	<0.000010	<0.000010	<0.000010
Calcium (Ca)	mg/L	1.0	<1.0	<1.0	<1.0
Cesium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Chromium (Cr)	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Cobalt (Co)	mg/L	0.000050	<0.000050	<0.000050	<0.000050
Copper (Cu)	mg/L	0.00020	<0.00020	<0.00020	<0.00020
Gallium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Iron (Fe)	mg/L	0.010	<0.010	<0.010	<0.010
Lead (Pb)	mg/L	0.000050	<0.000050	<0.000050	<0.000050
Lithium (Li)	mg/L	0.020	<0.020	<0.020	<0.020
Magnesium (Mg)	mg/L	1.0	<1.0	<1.0	2.2
Manganese (Mn)	mg/L	0.00010	<0.00010	<0.00010	<0.00010
Mercury (Hg)	mg/L	0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)	mg/L	0.00010	<0.00010	<0.00010	<0.00010
Nickel (Ni)	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Phosphorus (P)	mg/L	0.050	<0.050	<0.050	<0.050
Potassium (K)	mg/L	1.0	<1.0	<1.0	<1.0
Rhenium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Rubidium	mg/L	0.0050	<0.0050	<0.0050	<0.0050
Selenium (Se)	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Silicon	mg/L	1.0	<1.0	<1.0	<1.0
Silver (Ag)	mg/L	0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)	mg/L	2.5	3.2	<2.5	<2.5
Strontium (Sr)	mg/L	0.010	<0.010	<0.010	<0.010
Sulfur (S)	mg/L	5.0	<5.0	<5.0	<5.0
Tellurium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Thallium (Tl)	mg/L	0.000050	<0.000050	<0.000050	<0.000050
Thorium-232	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Tin (Sn)	mg/L	0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)	mg/L	0.0050	<0.0050	<0.0050	<0.0050
Tungsten (W)	mg/L	0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)	mg/L	0.000050	<0.000050	<0.000050	<0.000050
Vanadium (V)	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Yttrium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)	mg/L	0.0010	0.0030	0.0047	**0.0138**
Zirconium	mg/L	0.00050	<0.00050	<0.00050	<0.00050
VOCs and BTEX					
Benzene	µg/L	0.5	<0.50	-	-
Ethylbenzene	µg/L	0.5	<0.50	-	-
Methyl tert-Butyl Ether	µg/L	0.5	<0.50	-	-
Styrene	µg/L	0.5	<0.50	-	-
Toluene	µg/L	0.5	<0.50	-	-
o-Xylene	µg/L	0.3	<0.40	-	-
m,p-Xylenes	µg/L	0.4	<0.30	-	-
Xylenes, Total	µg/L	0.5	<0.50	-	-
SUM OF BTEX	µg/L	1	-	-	-
Hydrocarbons					
Petroleum Hydrocarbons - F1 (C6-C10)	µg/L	100	<100	-	-
Petroleum Hydrocarbons - F2 (C10-C16)	µg/L	100	<100	-	-
Petroleum Hydrocarbons - F3 (C16-C34)	µg/L	250	<250	-	-
Petroleum Hydrocarbons - F4 (C34-C50)	µg/L	250	<250	-	-
Acenaphthene	µg/L	0.01	<0.010	-	-
Acenaphthylene	µg/L	0.01	<0.010	-	-
Acridine	µg/L	0.01	<0.010	-	-
Anthracene	µg/L	0.01	<0.010	-	-
Benz(a)anthracene	µg/L	0.01	<0.010	-	-
Benzo(a)pyrene	µg/L	0.05	<0.0050	-	-
Benzo(b,j) fluoranthene	µg/L	0.01	<0.010	-	-
Benzo[b,j,k]fluoranthene	µg/L	0.015	<0.015	-	-
Benzo(g,h,i)perylene	µg/L	0.01	<0.010	-	-
Benzo(k)fluoranthene	µg/L	0.01	<0.010	-	-
Chrysene	µg/L	0.01	<0.010	-	-
Dibenz(a,h)anthracene	µg/L	0.05	<0.0050	-	-
Fluoranthene	µg/L	0.01	<0.010	-	-
Fluorene	µg/L	0.01	<0.010	-	-
Indeno(1,2,3-c,d)pyrene	µg/L	0.01	<0.010	-	-
methylnaphthalene, 1-	µg/L	0.01	<0.010	-	-
methylnaphthalene, 2-	µg/L	0.01	<0.010	-	-
Naphthalene	µg/L	0.05	<0.050	-	-
Phenanthrene	µg/L	0.02	<0.020	-	-
Pyrene	µg/L	0.01	<0.010	-	-
Quinoline	µg/L	0.05	<0.050	-	-
VHCs					
Volatile Hydrocarbons (C6-C10)	µg/L	100	-	-	-
Volatile Petroleum Hydrocarbons (C6-C10)	µg/L	100	-	-	-
SUM OF BTEX	µg/L	1	-	-	-

Notes:

µg/L = micrograms per litre; cm = centimeter; RDL = reported detection limit; < = less than detection limit; VHC = volatile hydrocarbons; VOCs = volatile organic compounds;
BTEX = benzen, toluene, ethylbenzene and xylene

Bolded values indicate parameter concentrations that are greater than 5-times the detection limit.

[1] Assessment doesn't apply to field and physical parameters

Table 2 - Results of Water Quality QAQC Duplicate Sample Results
Milne Port, 2022

Sample ID	Units	MP06-Source-2-22	DUP-A	Reported Detection Limit	Mean	Relative Percent Difference (RPD)	Difference Factor (DF)	MP05-Source-1-22	Dup-B	Reported Detection Limit	Mean	Relative Percent Difference (RPD)	Difference Factor (DF)	MP06-Source-2-22	Dup-C	Reported Detection Limit	Mean	Relative Percent Difference (RPD)	Difference Factor (DF)
Date Sampled		02-Aug-2022	02-Aug-2022					06-Aug-2022	06-Aug-2022					13-Aug-2022	13-Aug-2022				
Laboratory ID		VA22B8083-006	VA22B8083-010					YL2201196-001	YL2201196-005					YL2201255-006	YL2201255-005				
QA/QC		FDA	FD					FDA	FD					FDA	FD				
Field and Physical																			
Alkalinity, Total as CaCO3	mg/L	65	66	1.0	65	1%	NA	66	66	1.0	66	0%	NA	110	110	1.0	110	0%	NA
Conductivity	uS/cm	6490	6450	2.0	6470	1%	NA	5300	5340	2.0	5320	1%	NA	45800	45900	2.0	45850	0%	NA
Hardness, Calcium Carbonate (Dissolved	mg/L	737	689	1.0	713	7%	NA	538	523	1.0	531	3%	NA	5000	5240	1.0	5120	5%	NA
pH	pH Units	7.9	7.9	0.1	7.9	0%	NA	7.9	8.0	0.1	8.0	0%	NA	8.0	8.0	0.1	8.0	0%	NA
Total Dissolved Solids	mg/L	3920	4000	10	3960	2%	NA	3370	3340	10	3355	1%	NA	38000	34400	10	36200	10%	NA
Total Suspended Solids	mg/L	<2.0	3.2	2.0	NC	NC	NC	<2.0	3.1	2.0	NC	NC	NC	<2.0	2.1	2.0	NC	NC	NC
Turbidity	NTU	0.46	1.1	0.1	0.8	**85%**	NA	0.22	0.22	0.1	0.22	NA	0	0.17	0.18	0.1	0.18	NA	0.10
Salinity	PSU	3.6	3.6	1.0	3.6	NA	0	2.9	2.9	1.0	2.9	NA	0	31	31	1.0	31	0%	NA
Anions and Nutrients																			
Total Kjeldahl Nitrogen	mg/L	<0.050	<0.050	0.05	NC	NC	NC	0.14	0.09	0.05	0.12	NA	1.0	0.12	0.1	0.05	0.11	NA	0.42
Ammonia (as N)	mg/L	<0.0050	<0.0050	0.005	NC	NC	NC	0.0072	0.006	0.005	0.0066	NA	0.24	0.0054	0.0059	0.005	0.0057	NA	0.10
Bromide (Br)	mg/L	7.4	8.0	5.0	7.7	NA	0.12	<5.0	5.1	5.0	NC	NC	NC	59	56	5.0	57	5%	NA
Chloride (Cl)	mg/L	2150	2100	50	2125	2%	NA	1560	1590	50	1575	2%	NA	16300	15800	50	16050	3%	NA
Fluoride (F)	mg/L	<0.20	<0.20	0.2	NC	NC	NC	<0.20	<0.20	0.2	NC	NC	NC	0.79	0.78	0.2	0.79	NA	0.05
Nitrate (as N)	mg/L	<0.010	0.01	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC
Nitrite (as N)	mg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC
Sulfate (SO4)	mg/L	298	295	3.0	297	1%	NA	224	216	3.0	220	4%	NA	2370	2370	3.0	2370	0%	NA
Total Organic Carbon	mg/L	1.1	1.3	0.5	1.2	NA	0.34	1.3	0.86	0.5	1.1	NA	0.78	0.94	1.0	0.5	0.98	NA	0.14
Dissolved Organic Carbon	mg/L	0.75	0.97	0.5	0.86	NA	0.44	1.0	0.97	0.5	1.0	NA	0.12	1.2	1.2	0.5	1.2	NA	0.06
Metals, Total																			
Aluminum	mg/L	0.043	0.054	0.005	0.049	**23%**	NA	0.017	0.019	0.005	0.018	NA	0.22	0.0055	0.0051	0.005	0.0053	NA	0.08
Antimony	mg/L	<0.0010	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC
Arsenic	mg/L	<0.00040	<0.00040	0.0004	NC	NC	NC	<0.00040	<0.00040	0.0004	NC	NC	NC	0.0016	0.0016	0.0004	0.0016	NA	0.05
Barium	mg/L	0.0039	0.0039	0.001	0.0039	NA	0	0.0035	0.0036	0.001	0.0036	NA	0.10	0.0089	0.0086	0.001	0.0088	3%	NA
Beryllium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Bismuth	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Boron	mg/L	0.5	0.47	0.3	0.49	NA	0.1	0.41	0.43	0.3	0.42	NA	0.067	3.9	3.9	0.3	3.9	1%	NA
Cadmium	mg/L	<0.000010	<0.000010	0.00001	NC	NC	NC	<0.000010	<0.000010	0.00001	NC	NC	NC	0.000031	0.000026	0.00001	0.000029	NA	0.5
Calcium	mg/L	58	57	1.0	58	2%	NA	48	49	1.0	49	1%	NA	436	438	1.0	437	0%	NA
Cesium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Chromium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Cobalt	mg/L	<0.000050	<0.000050	0.00005	NC	NC	NC	<0.000050	<0.000050	0.00005	NC	NC	NC	<0.000050	<0.000050	0.00005	NC	NC	NC
Copper	mg/L	0.011	0.0035	0.0005	0.0071	**102%**	NA	0.0055	0.0065	0.0005	0.006	17%	NA	0.0018	<0.00050	0.0005	NC	NC	NC
Gallium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Iron	mg/L	0.041	0.052	0.01	0.047	**24%**	NA	0.02	0.022	0.01	0.021	NA	0.2	<0.010	<0.010	0.01	NC	NC	NC
Lead	mg/L	0.00007	0.000064	0.00005	0.000067	NA	0.12	<0.000050	0.000084	0.00005	NC	NC	NC	<0.000050	<0.000050	0.00005	NC	NC	NC
Lithium	mg/L	<0.020	<0.020	0.02	NC	NC	NC	<0.020	<0.020	0.02	NC	NC	NC	0.16	0.17	0.02	0.16	1%	NA
Magnesium	mg/L	132	124	1.0	128	6%	NA	99	104	1.0	101	5%	NA	1150	1140	1.0	1145	1%	NA
Manganese	mg/L	0.0013	0.0014	0.0002	0.0013	10%	NA	0.0011	0.0011	0.0002	0.0011	4%	NA	0.0009	0.00086	0.0002	0.00088	NA	0.2
Mercury	mg/L	<0.0000050	<0.0000050	0.000005	NC	NC	NC	<0.0000050	<0.0000050	0.000005	NC	NC	NC	<0.0000050	<0.0000050	0.000005	NC	NC	NC
Molybdenum	mg/L	0.0013	0.0014	0.0001	0.0013	5%	NA	0.00096	0.001	0.0001	0.00099	6%	NA	0.011	0.011	0.0001	0.011	0%	NA
Nickel	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Phosphorus	mg/L	<0.050	<0.050	0.05	NC	NC	NC	<0.050	<0.050	0.05	NC	NC	NC	<0.050	<0.050	0.05	NC	NC	NC
Potassium	mg/L	44	42	1.0	43	5%	NA	31	33	1.0	32	6%	NA	404	401	1.0	403	1%	NA
Rubidium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Rhenium	mg/L	0.013	0.013	0.005	0.013	NA	0.08	0.0092	0.0097	0.005	0.0095	NA	0.1	0.11	0.11	0.005	0.11	0%	NA
Selenium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Silicon	mg/L	<1.0	<1.0	1.0	NC	NC	NC	<1.0	<1.0	1.0	NC	NC	NC	<1.0	<1.0	1.0	NC	NC	NC
Silver	mg/L	<0.00010	<0.00010	0.0001	NC	NC	NC	<0.00010	<0.00010	0.0001	NC	NC	NC	<0.00010	<0.00010	0.0001	NC	NC	NC
Sodium	mg/L	1170	1170	2.5	1170	0%	NA	876	895	2.5	886	2%	NA	9820	9920	2.5	9870	1%	NA
Strontium	mg/L	0.85	0.88	0.01	0.87	4%	NA	0.6	0.65	0.01	0.62	7%	NA	7.5	7.7	0.01	7.6	2%	NA
Sulphur (Colloidal)	mg/L	103	95	5.0	99	8%	NA	75	78	5.0	76	4%	NA	1040	1040	5.0	1040	0%	NA
Tellurium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Thallium	mg/L	<0.000050	<0.000050	0.00005	NC	NC	NC	<0.000050	<0.000050	0.00005	NC	NC	NC	<0.000050	<0.000050	0.00005	NC	NC	NC
Thorium-232	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Tin	mg/L	<0.0010	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC
Titanium	mg/L	<0.0050	<0.0050	0.005	NC	NC	NC	<0.0050	<0.0050	0.005	NC	NC	NC	<0.0050	<0.0050	0.005	NC	NC	NC
Tungsten	mg/L	<0.0010	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC
Uranium	mg/L	0.00092	0.0013	0.00005	0.0011	**37%**	NA	0.0008	0.00079	0.00005	0.0008	2%	NA	0.0026	0.0026	0.00005	0.0026	2%	NA
Vanadium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	0.0014	0.0013	0.0005	0.0014	NA	0.04
Yttrium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Zinc	mg/L	<0.0030	<0.0030	0.003	NC	NC	NC	<0.0030	<0.0030	0.003	NC	NC	NC	<0.0030	<0.0030	0.003	NC	NC	NC
Zirconium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC

Metals, Dissolved																			
Aluminum (Al)	mg/L	<0.0050	<0.0050	0.005	NC	NC	NC	<0.0050	<0.0050	0.005	NC	NC	NC	<0.0050	<0.0050	0.005	NC	NC	NC
Antimony (Sb)	mg/L	<0.0010	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC
Arsenic (As)	mg/L	0.00044	<0.00040	0.0004	NC	NC	NC	<0.00040	<0.00040	0.0004	NC	NC	NC	0.0014	0.0015	0.0004	0.0015	NA	0.18
Barium (Ba)	mg/L	0.0039	0.0039	0.001	0.0039	NA	0	0.0035	0.0036	0.001	0.0036	NA	0.10	0.0086	0.0086	0.001	0.0086	0%	NA
Beryllium (Be)	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Bismuth (Bi)	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Boron (B)	mg/L	0.49	0.46	0.3	0.48	NA	0.10	0.38	0.37	0.3	0.38	NA	0.033	3.6	3.6	0.3	3.6	0%	NA
Cadmium (Cd)	mg/L	<0.000010	<0.000010	0.00001	NC	NC	NC	<0.000010	<0.000010	0.00001	NC	NC	NC	0.00002	0.00002	0.00001	0.00002	NA	0
Calcium (Ca)	mg/L	54	53	1.0	54	2%	NA	47	47	1.0	47	1%	NA	414	418	1.0	416	1%	NA
Cesium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Chromium (Cr)	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Cobalt (Co)	mg/L	<0.000050	<0.000050	0.00005	NC	NC	NC	<0.000050	<0.000050	0.00005	NC	NC	NC	<0.000050	<0.000050	0.00005	NC	NC	NC
Copper (Cu)	mg/L	0.00097	0.0004	0.0002	0.00069	NA	**2.9**	0.0003	0.00032	0.0002	0.00031	NA	0.1	0.00036	0.00041	0.0002	0.00039	NA	0.25
Gallium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Iron (Fe)	mg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC
Lead (Pb)	mg/L	0.000098	0.000058	0.00005	0.000078	NA	0.8	<0.000050	<0.000050	0.00005	NC	NC	NC	<0.000050	0.000071	0.00005	NC	NC	NC
Lithium (Li)	mg/L	<0.020	<0.020	0.02	NC	NC	NC	<0.020	<0.020	0.02	NC	NC	NC	0.16	0.16	0.02	0.16	1%	NA
Magnesium (Mg)	mg/L	146	135	1.0	141	8%	NA	102	99	1.0	100	3%	NA	1020	1020	1.0	1020	0%	NA
Manganese (Mn)	mg/L	0.00083	0.00074	0.0001	0.00079	11%	NA	0.00065	0.00064	0.0001	0.00065	2%	NA	0.00063	0.00065	0.0001	0.00064	3%	NA
Mercury (Hg)	mg/L	<0.0000050	<0.0000050	0.000005	NC	NC	NC	<0.0000050	<0.0000050	0.000005	NC	NC	NC	<0.0000050	<0.0000050	0.000005	NC	NC	NC
Molybdenum (Mo)	mg/L	0.0013	0.0013	0.0001	0.0013	2%	NA	0.00098	0.00098	0.0001	0.00098	0%	NA	0.01	0.01	0.0001	0.01	0%	NA
Nickel (Ni)	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Phosphorus (P)	mg/L	<0.050	<0.050	0.05	NC	NC	NC	<0.050	<0.050	0.05	NC	NC	NC	<0.050	<0.050	0.05	NC	NC	NC
Potassium (K)	mg/L	44	44	1.0	44	2%	NA	32	33	1.0	32	3%	NA	379	388	1.0	384	2%	NA
Rhenium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Rubidium	mg/L	0.013	0.012	0.005	0.013	NA	0.16	0.0094	0.0097	0.005	0.0096	NA	0.06	0.11	0.11	0.005	0.11	0%	NA
Selenium (Se)	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Silicon	mg/L	<1.0	<1.0	1.0	NC	NC	NC	<1.0	<1.0	1.0	NC	NC	NC	<1.0	<1.0	1.0	NC	NC	NC
Silver (Ag)	mg/L	<0.00010	<0.00010	0.0001	NC	NC	NC	<0.00010	<0.00010	0.0001	NC	NC	NC	<0.00010	<0.00010	0.0001	NC	NC	NC
Sodium (Na)	mg/L	1140	1200	2.5	1170	5%	NA	877	883	2.5	880	1%	NA	9570	9460	2.5	9515	1%	NA
Strontium (Sr)	mg/L	0.8	0.82	0.01	0.81	2%	NA	0.64	0.66	0.01	0.65	3%	NA	7.2	7.2	0.01	7.2	0%	NA
Sulfur (S)	mg/L	110	103	5.0	107	7%	NA	75	76	5.0	75	1%	NA	1000	1030	5.0	1015	3%	NA
Tellurium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Thallium (Tl)	mg/L	<0.000050	<0.000050	0.00005	NC	NC	NC	<0.000050	<0.000050	0.00005	NC	NC	NC	<0.000050	<0.000050	0.00005	NC	NC	NC
Thorium-232	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Tin (Sn)	mg/L	<0.0010	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC
Titanium (Ti)	mg/L	<0.0050	<0.0050	0.005	NC	NC	NC	<0.0050	<0.0050	0.005	NC	NC	NC	<0.0050	<0.0050	0.005	NC	NC	NC
Tungsten (W)	mg/L	<0.0010	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC
Uranium (U)	mg/L	0.00084	0.0012	0.00005	0.001	**38%**	NA	0.0008	0.00075	0.00005	0.00078	6%	NA	0.0025	0.0026	0.00005	0.0026	1%	NA
Vanadium (V)	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	0.0013	0.0013	0.0005	0.0013	NA	0
Yttrium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
Zinc (Zn)	mg/L	0.003	0.0014	0.001	0.0022	NA	1.6	0.0014	<0.0010	0.001	NC	NC	NC	<0.0010	<0.0010	0.001	NC	NC	NC
Zirconium	mg/L	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC	<0.00050	<0.00050	0.0005	NC	NC	NC
VOCs and BTEX																			
Benzene	µg/L	<0.50	<0.50	0.5	NC	NC	NC	<0.50	<0.50	0.5	NC	NC	NC	<0.50		0.5	NC	NC	NC
Ethylbenzene	µg/L	<0.50	<0.50	0.5	NC	NC	NC	<0.50	<0.50	0.5	NC	NC	NC	<0.50		0.5	NC	NC	NC
Methyl tert-Butyl Ether	µg/L	<0.50	<0.50	0.5	NC	NC	NC	<0.50	<0.50	0.5	NC	NC	NC	<0.50		0.5	NC	NC	NC
Styrene	µg/L	<0.50	<0.50	0.5	NC	NC	NC	<0.50	<0.50	0.5	NC	NC	NC	<0.50		0.5	NC	NC	NC
Toluene	µg/L	<0.50	<0.50	0.5	NC	NC	NC	<0.50	<0.50	0.5	NC	NC	NC	<0.50		0.5	NC	NC	NC
o-Xylene	µg/L	<0.40	<0.40	0.4	NC	NC	NC	<0.40	<0.40	0.4	NC	NC	NC	<0.40		0.4	NC	NC	NC
m,p-Xylenes	µg/L	<0.30	<0.30	0.3	NC	NC	NC	<0.30	<0.30	0.3	NC	NC	NC	<0.30		0.3	NC	NC	NC
Xylenes, Total	µg/L	<0.50	<0.50	0.5	NC	NC	NC	<0.50	<0.50	0.5	NC	NC	NC	<0.50		0.5	NC	NC	NC
Hydrocarbons																			
Petroleum Hydrocarbons - F1 (C6-C10)	µg/L	<100	<100	100	NC	NC	NC	<100	<100	100	NC	NC	NC	<100		100	NC	NC	NC
Petroleum Hydrocarbons - F2 (C10-C16)	µg/L	<100	<100	100	NC	NC	NC	<100	<100	100	NC	NC	NC	<100		100	NC	NC	NC
Petroleum Hydrocarbons - F3 (C16-C34)	µg/L	<250	<250	250	NC	NC	NC	<250	<250	250	NC	NC	NC	<250		250	NC	NC	NC
Petroleum Hydrocarbons - F4 (C34-C50)	µg/L	<250	<250	250	NC	NC	NC	<250	<250	250	NC	NC	NC	<250		250	NC	NC	NC
Acenaphthene	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Acenaphthylene	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Acridine	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Anthracene	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Benz(a)anthracene	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Benzo(a)pyrene	µg/L	<0.0050	<0.0050	0.005	NC	NC	NC	<0.0050	<0.0050	0.005	NC	NC	NC	<0.0050		0.005	NC	NC	NC
Benzo(b,j) fluoranthene	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Benzo[b,j,k]fluoranthene	µg/L	<0.015	<0.015	0.015	NC	NC	NC	<0.015	<0.015	0.015	NC	NC	NC	<0.015		0.015	NC	NC	NC
Benzo(g,h,i)perylene	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Benzo(k)fluoranthene	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Chrysene	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Dibenz(a,h)anthracene	µg/L	<0.0050	<0.0050	0.005	NC	NC	NC	<0.0050	<0.0050	0.005	NC	NC	NC	<0.0050		0.005	NC	NC	NC
Fluoranthene	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Fluorene	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Indeno(1,2,3-c,d)pyrene	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Methylnaphthalene, 1-	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Methylnaphthalene, 2-	µg/L	<0.010	<0.010	0.01	NC	NC	NC	0.013	0.011	0.01	0.012	NA	0.2	<0.010		0.01	NC	NC	NC
Naphthalene	µg/L	<0.050	<0.050	0.05	NC	NC	NC	<0.050	<0.050	0.05	NC	NC	NC	<0.050		0.05	NC	NC	NC
Phenanthrene	µg/L	<0.020	<0.020	0.02	NC	NC	NC	<0.020	<0.020	0.02	NC	NC	NC	<0.020		0.02	NC	NC	NC
Pyrene	µg/L	<0.010	<0.010	0.01	NC	NC	NC	<0.010	<0.010	0.01	NC	NC	NC	<0.010		0.01	NC	NC	NC
Quinoline	µg/L	<0.050	<0.050	0.05	NC	NC	NC	<0.050	<0.050	0.05	NC	NC	NC	<0.050		0.05	NC	NC	NC

Notes:

DF = difference factor; FDA = field duplicate available; FD = field duplicate; Mean = average of two values; mg/kg = miligrams per kilogram; NA = not applicable; NC = not calculated; QA/QC = Quality Assurance/Quality Control; RPD = relative percent difference; < = less than detection limit; VHC = volatile hydrocarbons; VOCs = volatile organic compounds; BTEX = benzen, toluene, ethylbenzene and xylene

When different detection limits are used for the sample and duplicate results, and one detectable result is reported at a value below the detection limit of a non-detectable result, the RPD is not calculated.

Relative percent difference (RPD) = the difference between two values divided by the mean of the two values. RPD is calculated when the concentration is greater than five times the detection limit.

Acceptable RPD for in sediment is less than or equal to 20% (data quality objective)

Difference factor (DF) = absolute difference between two values divided by the method detection limit. The DF is calculated when the concentration is less than five times the detection limit.

Acceptable DF is less than or equal to 2.0.

Bold values indicate an exceedance of the acceptable RPD or DF.

APPENDIX 2E

MEEMP Annual Comparison Tables

Parameter	CCME Marine WQG for Protection of Aquatic Life[(a)]		2015 (MP-05) n = 12			2016 (MP-05) n = 20			2017 (MP-05) n = 20			2018 (MP-05) n = 20			2019 (MP-05) n = 20			2020 (MP-05 and MP-06) n = 40			2021 (MP-05 and MP-06) n = 40			2022 (MP-05 and MP-06) n = 40		
	Short Term	Long Term	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Physical																										
pH	—	7.0–8.7	7.8	7.5	7.9	7.8	7.7	7.9	7.8	7	8	8	7.9	8.1	8	7.9	8.2	8	7.9	8.1	8	7.9	8.1	7.96	7.80	8.00
Salinity (ppt)	—	Within 10% of background ppt	NR	NR	NR	NR	NR	NR	13.9	4.1	24.4	8.8	5.4	19.3	20.7	6.4	31.5	8.6	4.1	29.4	16.4	1.7	30.8	17.1	2.5	32.9
TSS (mg/L)	**<25 mg/L above background**	**<u><5 mg/L above background</u>**	1.2	0.5	2.2	1.6	1	3	4.2	< 2.0	**<u>25.5</u>**	1.4	1	4.3	1.3	< 2.0	2.9	3.4	< 2.0	7.5	2.5	< 2.0	7.9	2.9	< 2.0	12.2
Turbidity (NTU)	**<8 NTU above background**	**<u><2 NTU above background</u>**	0.2	0.1	0.9	0.4	0.1	1	1.1	0.3	**<u>9.6</u>**	0.7	0.2	**2.5**	0.3	< 0.1	0.7	0.3	< 0.1	0.7	0.5	< 0.1	1.7	0.5	< 0.10	3.3
Nutrients (mg/L)																										
Nitrate (as N)	339	45	0.04	0.03	0.2	0.16	0.05	0.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.02	< 0.01	0.3	0.02	< 0.01	0.21	0.02	< 0.01	0.45
Total Metals (µg/L)																										
Aluminum	—	—	NR	< 50	50	16	9	25	25	8	142	18	8	48	25	< 5	334	12.5	5.4	26.5	15.8	5	38.3	20.5	5	64.2
Arsenic	—	12.5	< 10	< 10	< 10	< 10	< 10	< 10	< 2	< 2	< 2	< 2	< 2	< 2	1	< 0.4	1.6	0.54	< 0.4	1.4	0.88	0.4	1.7	0.96	< 0.4	1.70
Cadmium	—	0.12	< 0.01	< 0.01	< 0.01	0.02	0.01	0.02	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.03	< 0.01	0.05	0.01	< 0.01	0.02	0.02	< 0.01	0.05	0.02	< 0.01	0.03
Chromium	—	**1.5 (Cr[VI])**	< 10	< 10	< 10	< 10	< 10	< 10	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.3	< 0.5	0.5	0.55	< 0.5	**2.4**	< 0.5	< 0.5	< 0.5	0.57	< 0.5	**1.65**
Copper	—	—	< 20	< 20	< 20	< 20	< 20	< 20	0.61	< 0.5	1	0.6	< 0.5	0.9	1.7	< 0.5	11	0.51	< 0.5	0.6	0.7	< 0.5	2.1	3.5	< 0.5	23.6
Iron	—	—	< 500	< 500	< 500	< 500	< 500	< 500	40	< 10	286	25.3	< 10	93	14	< 10	20	15.6	< 10	53	20.2	< 10	71	24.7	< 10	96
Mercury	—	**<u>0.016</u>**	0.01	0.01	**<u>0.03</u>**	< 0.013	< 0.013	< 0.013	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.003	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Silver	7.5	—	< 1	< 1	< 1	< 1	< 1	< 1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.11	< 0.1	0.25
PAHs (µg/L)																										
Naphthalene	—	1.4	NR	NR	NR	NR	NR	NR	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Notes: (a) = Guidelines taken from CMME Marine WQG for the protection of Aquatic Life (http://ceqg-rcqe.ccme.ca/download/en/221. Bold Font = max exceeding a short term guideline or mean exceeding a long term guideline; CCME = Canadian council of ministers of the environment; WQG = water quality guidelines; Min = minimum; Max = maximum; — = no guideline available; NR = not recorded; PSU = practical salinity unit; TSS = Total suspended solid; mg/L = milligrams per liter; < = less than; N = Nitrogen; CFU = colony forming unit; Cr(VI) = hexavalent chromium; PAH = polycyclic aromatic hydrocarbon; µg/L = micrograms per liter; mL = milliliter.

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REPORT

Chapter 3.0 Sediment Quality

2022 Milne Port Marine Environmental Effects Monitoring Program (MEEMP) and Non-Indigenous Species and Aquatic Invasive Species (NIS/AIS) Monitoring Program

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27 April 2023

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ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Definitions
ALS	ALS Canada Ltd.
BC	British Columbia
BC MOE	BC Ministry of Environment and Climate Change Strategy
BTEX	Benzene, ethylbenzene, toluene, and xylenes
CCME	Canadian Council of Ministers of the Environment
cm	Centimetres
DQO	Data Quality Objective
EEM	Environmental Effects Monitoring
=	Equal
FCSAP	Federal Contaminated Sites Action Plan
FEIS	Final Environmental Impact Statement
>	Greater than
ISQG	Interim Sediment Quality Guideline
<	Less than
m	Metre
m^2	Square metre
MDL	Method Detection Limit
MEEMP	Marine Environmental Effects Monitoring Program
MEWG	Marine Environment Working Group
NIRB	Nunavut Impact Review Board
NIS/AIS	Non-Indigenous Species and Aquatic Invasive Species
No.	Number
NOAA	National Oceanic and Atmospheric Administration
PAH	Polycyclic aromatic hydrocarbon
PC	Project Certificate
PEL	Probable Effect Level
%	Percent
QA/QC	Quality Assurance / Quality Control
QC	Quality Control
QIA	Qikiqtani Inuit Association
RPD	Relative Percent Difference

Acronym or Abbreviation	Definitions
SW	West Transect
TOC	Total Organic Carbon
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compound
WSQG	Working Sediment Quality Guidelines

3.0 SEDIMENT QUALITY

3.1 Introduction

The 2022 sediment sampling program for the Marine Environmental Effects Monitoring Program (MEEMP) was focused on targeted sampling at stations SW-1 through SW-4, located along the West transect. Rationale for targeted sampling at these stations dates back to 2020, where SW-2 was considered an outlier in the 2020 sediment dataset due to higher sand content and lower percent fines compared to other West transect stations accompanied by lower benthic invertebrate density and diversity metrics. Accordingly, SW-2 (and, in 2022, three adjacent stations) were flagged for targeted sampling to assess potential recovery at SW-2 and assess variability in sediment quality at these stations, both spatially and over time.

This component was developed in consideration of the monitoring requirements outlined in the PC Conditions described in Chapter 1.0, Table 1-2. Project Certificate No. 005 (PC) Conditions related to the monitoring include PC Conditions No. 76, 83(a), 84, 85, 87, and 99(a).

3.1.1 Objectives

The MEEMP objectives are outlined in Section 1.3 of Chapter 1.0 (Program Overview). The objectives specific to the 2022 sediment quality program are:

- Conduct continued targeted sampling of sediment composition and quality at station SW-2, as well adjacent West transect stations SW-1, SW-3, and SW-4, to assess potential recovery at SW-2 and increase understanding of natural variability along this section of the West transect.
- Verify predictions made in the Final Environmental Impact Statement (FEIS) and other submissions to the Nunavut Impact Review Board (NIRB) regarding effects on sediment quality, as applicable.
- Recommend any necessary and appropriate changes to the sediment quality component of the MEEMP for future years.

3.2 Study Design

3.2.1 Background

In the 2020 MEEMP Report, Golder (2021) reported that monitoring results to date have not identified Project-induced changes to sediment quality in the marine receiving environment. Given there have been three consecutive years of implementation, the joint radial benthic and sediment sampling program was not conducted in 2021 – commensurate with the lack of directional trends observed to date which indicate that the Project has not adversely impacted marine sediments in Milne Inlet. The data show that measured parameters are generally consistent with previous years, below applicable Canadian Council Ministers of the Environment (CCME) sediment quality guidelines, and do not show spatial patterns attributable to Project activities. Baffinland is committed to continued implementation of the full sampling program with an adjusted monitoring frequency of every 3 years, which is more consistent with routine biological sampling for other mining effects monitoring programs (e.g., the federal Environmental Effects Monitoring Program [EEM]). The power analysis provided in Appendix 3E of the 2021 MEEMP report (Golder 2022) confirms that in 2019 and 2020 there was adequate statistical power to be able to detect Project-related changes, despite a reduced number of stations sampled in 2019 due to logistical challenges.

In 2020, station SW-2 was identified as a potential anomaly due to coarser sediment composition and reductions in benthic infauna indicators relative to other coastal stations along the West transect. To determine whether Project activities contributed to these differences, targeted benthic infauna and sediment quality sampling was performed at station SW-2 in 2021 and 2022, with the addition of sampling at adjacent West transect stations SW-1, SW-3, and SW-4 in 2022.

3.2.2 Modifications to the Program (2022)

For a second year, the 2022 sediment quality sampling program for the MEEMP focused on targeted sampling at station SW-2, along with adjacent stations along the West transect between the Ore Dock and the mouth of Phillips Creek (SW-1, SW-3, and SW-4). The additional stations were added to better characterize natural variation and, hence, contextualize results as well as to expand monitoring for trends in sediment grain size in relation to benthic community indicators.

3.2.3 Sampling Parameters and Indicators

For marine sediment quality, parameters measured included particle size, organic carbon, nutrients, metals, volatile organic compounds (VOCs), and hydrocarbons. A sub-set of these parameters (i.e., percent fines, nutrients, metals, and hydrocarbons) were identified as sediment quality indicators to assess the potential for environmental effects from the Project. To provide early warning of environmental effects from the Project, applicable sediment quality guidelines were used as thresholds, where they exist (i.e., CCME sediment quality guidelines for the protection of aquatic life in marine environments [CCME 2014]).

3.3 Materials and Methods

3.3.1 Field Methodology

Sediment sampling was conducted at four stations along the West transect (Table 3-1; Figure 4-1) along with co-located benthic infaunal sampling (Section 4.0). The four sediment samples and one duplicate sample was submitted for the same chemical analyses performed in previous MEEMP programs as noted above (Section 3.2.3).

Table 3-1: Sediment Quality Stations at Milne Port (2022)

Station Name	UTM Coordinates (Zone 17W)		Approximate Lateral Distance Along Transect (m)	Water Depth in Chart Datum (m)
	Easting	Northing		
West Transect				
SW-1[1]	503191	7976587	129	-12.7
SW-2	503069	7976520	224	-15.3
SW-3	502975	7976472	327	-15.3
SW-4	502874	7976431	436	-15.0

Notes:
m = metre; UTM = Universal Transverse Mercator
1. Station SW-1 was sampled approximately 44 m NE of the target station location due to difficulties obtaining an acceptable grab with the coarse substrate in the area (14 grab attempts).

Sediment samples were collected using a standard Van Veen grab sampler (area of 0.1 m^2). Each grab sample was examined for acceptability based on the following criteria:

- The sampler was fully closed.
- There was adequate penetration depth (i.e., sediment volume greater than 25% full).
- The sample did not appear overfilled or disturbed, and the sample did not appear to have been collected on an angle.

The sampler did not appear to be leaking sediment at a substantial rate (i.e., the top of the sediment profile did not appear to be sloping inwards).

Upon acceptance, the overlying water in the grab was removed using a siphon tube or turkey baster, taking care to minimize the loss of sediment from the surface of the grab contents. After decanting, the sample consisted of sediment with minimal overlying water visible. For each sample collected, two terra core samples were taken from the undisturbed sediments and placed into pre-labeled methanol preserved vials for VOCs. A description of the sediment with respect to colour, particle size, depth of sediment horizon sampled, grab penetration depth and presence of non-sediment materials (e.g., shells, debris, biota) was recorded on the sediment collection log. Prior to the sample collection, a stainless-steel spoon and bowl were cleaned with laboratory-grade detergent and rinsed with de-ionized (analyte-free) water. The remaining top 5 centimetres (cm) of sediment from the grab sample was removed from the center of the grab using a stainless-steel spoon and transferred to a stainless-steel bowl. The sediment was then homogenized, and aliquots transferred to clean, laboratory supplied sampling containers. Photographs were taken of the sample in the grab and homogenized (Appendix 3A).

Sediment samples were sent to ALS Canada Ltd. (ALS) for analysis of the following parameters:

- Particle size distribution (Wentworth (2022) scale), moisture
- Organic and inorganic carbon
- Volatile organic compounds (VOCs) and BTEX (benzene, ethylbenzene, toluene, and xylenes)
- Polycyclic aromatic hydrocarbons (PAHs)
- Metals (including mercury) and pH

3.3.2 Data Analysis

Data analysis primarily involved sediment substrate characterization and screening of parameters against applicable sediment quality guidelines. Concentrations of metals and hydrocarbons were compared to CCME Interim Sediment Quality Guidelines (ISQGs) and Probable Effect Level (PELs) for the protection of aquatic life in the marine environment (CCME 2014), which apply in the Project jurisdiction. The CCME ISQGs are intended to represent concentrations below which adverse biological effects are rarely expected to occur. By comparison, the CCME PELs are intended to represent concentrations above which adverse effects are predicted to occur frequently, based on a concurrence data set with sediment chemical concentration and benthic invertebrate effects data from other sites. Notably, the Federal Contaminated Sites Action Plan (FCSAP) guidance for working harbours (FCSAP 2018) recommends use of PELs over ISQGs for screening primary contaminants of potential concern, as screening with ISQGs is considered overly conservative and does not always correlate well with observed effects under field conditions (FCSAP 2018).

To provide a screening value to inform the sediment evaluation, in the absence of a CCME guideline, metals and hydrocarbons were compared to British Columbia (BC) Working Sediment Quality Guidelines (WSQG) (British Columbia Ministry of the Environment and Climate Change Strategy [BC MOE] 2020a), and the National Oceanic and Atmospheric Administration (NOAA) sediment benchmarks (Buchman 2008)..

3.3.3 Quality Management

Of primary importance to the sediment sampling program was the collection of high-quality data, which was achieved through the consistent application of Quality Assurance / Quality Control (QA/QC) measures. These quality management procedures were applied to the field collection, data analysis, and reporting tasks for the targeted sampling in 2022 to verify that the data presented are valid and of acceptable quality to objectives outlined in Section 3.1.1.

3.3.3.1 Field QA/QC

Field staff were trained to be proficient in standardized sampling procedures, data recording using standard forms, and equipment operations applicable to the monitoring program. Field work was completed according to specified instructions and established technical procedures for standard sample collection, preservation, handling, storage, and shipping procedures.

General QA/QC tasks applicable to the sediment quality program included, but were not limited to, the following:

- Preparing geo-referenced field maps for use during the surveys to accurately document sampling locations and project-specific data collection forms to standardize the field data collection process.
- Maintaining regular communications between the Project Manager and field staff.
- Collecting and processing samples by qualified experienced personnel.
- Placing samples in appropriate clean containers in such a way that no foreign material was introduced to the sample and handled carefully so there would be no loss of material.
- Collecting a Quality Control (duplicate) sample in the field.
- Rinsing and filtering equipment including the Van Veen grab sampler, materials collection totes, field splitter and sieves with seawater between stations. Visual inspection confirmed that materials were not retained on equipment before use on the next station.
- Checking and validating field survey data sheets before leaving the station.
- Selecting accredited laboratories for sample analysis. Performance quality of selected laboratories were verified through WSP’s internal vendor approval and assessment procedures.
- Using chain-of-custody documentation to track sample shipments to the individual subcontractor laboratories.
- Packaging and shipping samples to the laboratory in accordance with required holding times and storage conditions.

3.3.3.2 Laboratory and Data Analysis QA/QC

Laboratory QA/QC reports were reviewed upon receipt to confirm adherence to sample hold times and laboratory data quality objectives (DQOs), and that the appropriate QA/QC information had been reported. Laboratory QA/QC included verification of recommended sample holding times and the analysis of laboratory control samples, laboratory duplicates, and spiked samples to assess precision and accuracy of analytical methods.

One field duplicate was sampled as a ‘split sample’ from the same discrete homogenized grab sample as the ‘original’ sample and identified as Duplicate A (blind sample). To assess variability between field duplicates, the Relative Percent Difference (RPD) was calculated as follows:

$$RPD = \left(\frac{sample - duplicate}{(sample + duplicate)/2}\right) \times 100$$

In accordance with the BC Field Sampling Manual (BC MOE 2020b) and CCME (2016), an RPD value of >50% was used to identify notable differences between original and duplicate samples. Values less than five times the Method Detection Limit (MDL) were not included in the RPD calculations because analytical variability near the MDL is higher and does not provide a good measure of variability associated with the collection of field samples.

3.4 Results

Sample photographs and sediment logs from the field program are provided in Appendix 3A and Appendix 3B, respectively. Analytical laboratory reports are provided in Appendix 3C and the compiled dataset screened to applicable sediment quality guidelines is provided in Appendix 3D, along with the QA/QC results.

3.4.1 Sediment Grain Size Composition

Sediment grain size along the West transect at Milne Port in 2022 indicates that SW-1 through SW-4 are dominated by sand (i.e., all stations were comprised of >80% sand, with the exception of SW-4 which was 63% sand (Figure 3-1)). In contrast, fines content was more variable, though generally less than 10% with the exception of SW-4 where fines content was 28%.

Figure 3-2 depicts sediment composition over time and shows that all four stations have been dominated by the sand fraction with some variability in fines content year to year. Station SW-2 has shown increases in fines content since 2020 while at SW-4 (furthest from the Ore Dock) the proportion of fines has remained relatively stable since 2019. Stations adjacent to SW-2 (SW-1 and SW-3), both showed a decrease in the proportion of fines in 2022 relative to previous years.

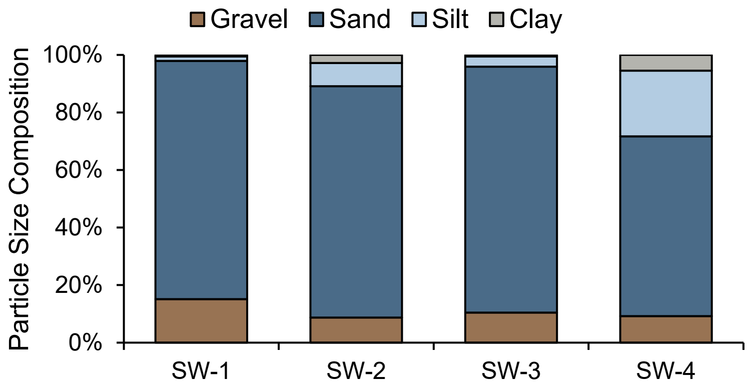

Figure 3-1: Particle size composition along the West transect at Milne Port, Baffinland (2022).

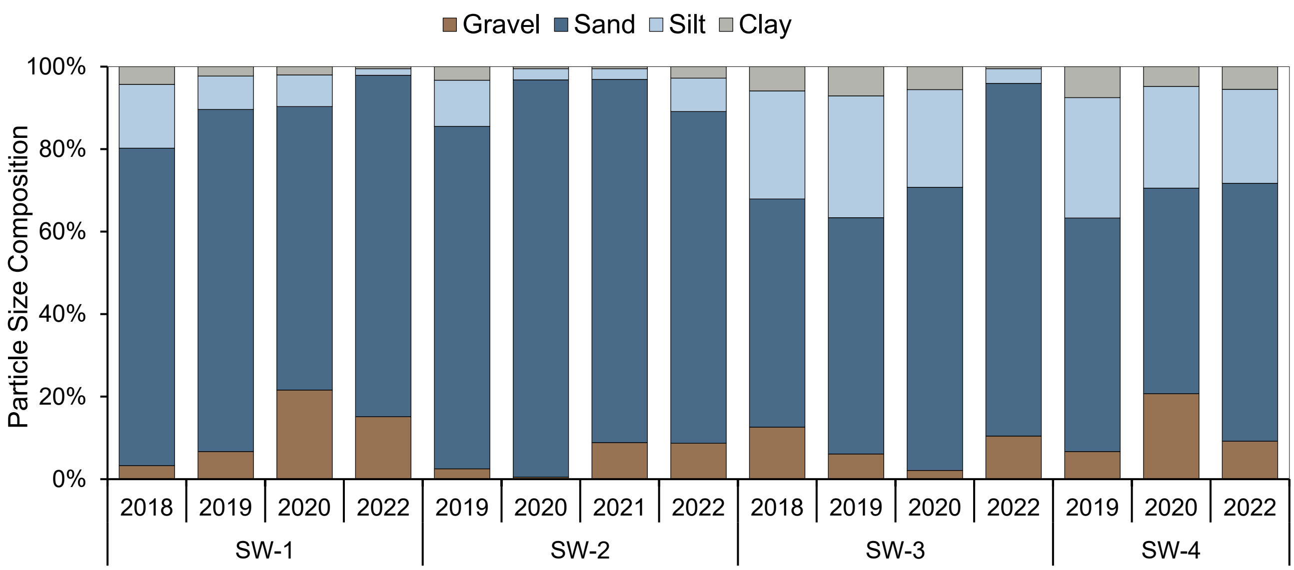

Figure 3-2: Particle size composition along the West transect at Milne Port, Baffinland (2018-2022).[1]

[1] Only SW-2 was sampled in 2021. The 2021 report erroneously reported 2018 particle size data for station SW-2, due to study design modifications in 2019, the 2018 station SW-2 became SW-3 in 2019.The data has been corrected for the 2022 particle size data analysis. Therefore, the only 2018 stations directly comparable to the 2022 sediment sampling program are SW-1 and SW-3.

3.4.2 Comparison to Sediment Quality Guidelines

In 2022, sediment metal concentrations at the four West transect stations were below applicable sediment quality guidelines for the protection of aquatic life. The one exception was the cadmium concentration at station SW-4, which slightly exceeded the threshold (i.e., by 1.02 times; Appendix 3D) and was well within ±20% of the guideline value (which represents the variability associated with the laboratory analysis), and so was not considered to be a meaningful exceedance. All VOC, BTEX, and PAH sediment concentrations were not detected (Appendix 3D).

Station SW-4 (furthest from the Ore Dock, closest to Phillips Creek) showed a higher proportion of fines in 2022 compared to SW-1, SW-2, and SW-3. Finer sediments may have contributed to metal concentrations at station SW-4 being generally higher than concentrations observed at the other three stations, although all concentrations were below applicable guidelines. Station SW-1 had the highest total organic carbon (TOC) content of the four stations sampled but the lowest fines content. Both 2022 percent fines and TOC content values were largely within the range of values documented for previous years at these stations (Table D.1; Appendix 3D).

3.4.3 Sediment Quality QA/QC Results

The 2022 sediment quality data are considered valid based on the following results of the QA/QC assessment:

- Chemical analyses on the sediment samples were completed within the sample hold time requirements
- Data reported by the laboratory are considered reliable according to the accredited laboratory QA/QC assessment. A data quality objective was marginally exceeded (laboratory control sample) for antimony (recovery = 123%, limits = 80 – 120%). Laboratory considers this DQO exceedance acceptable.

The data reported by the laboratory were considered reliable according to the accredited laboratory QA/QC assessment because there was a low variability between duplicate quality control (QC) samples except for copper and sodium (Table D.2, Appendix 3D). Observed differences between the duplicate and the original sediment sample for these parameters could be a result of heterogeneity in concentrations inherent within the sediment matrix, or ‘incomplete’ homogenization of the sediment sample such that subsampling for laboratory analysis may have introduced some variability.

Overall, the QA/QC results indicate that the sediment data collected during the 2022 sampling program are of acceptable quality to meet the objectives stated in Section 3.1.1.

3.5 Discussion

Over multiple monitoring years, the MEEMP has shown sediment grain size along the coastal transects to be naturally more variable than the offshore transects, with both sand and fines present in differing proportions depending on the station location. High variability is expected - largely driven by the interactions between sediment transport mechanisms (i.e., waves and currents), coastal topography, ice scour, and freshwater inputs from Phillips Creek. However, stations closest to the Ore Dock (i.e., SW-1, SW-2, and SW-3) have shown signs of localized disturbance that mobilized the fine sediment fraction: fines content at station SW-2 in 2022 was higher than in 2020 and 2021 while adjacent stations SW-1 and SW-3 showed a decrease in fines content in 2022. It is possible that in addition to natural factors outlined above, propeller-generated currents associated with ore carrier movements are influencing sediment dynamics, given these sites' proximity to the Ore Dock. Station SW-4 has remained the most consistent with respect to substrate composition. It is important to note, that regardless of potential propeller wash influence, these four stations have been, and continue to be, dominated by sand and continue to support diverse benthic invertebrate communities.

While changes in sediment composition at station SW-2 may have impacted the benthic community, as suggested by results documented in 2020, these impacts do not appear to be long-lasting. In 2022, the benthic community at SW-2 appeared to be stable with benthic indicators similar to those reported in 2021, showing the benthic community appeared more diverse (returning to 2019 levels) and abundant (an order of magnitude increase) compared to 2020, demonstrating the ability of these organisms to rebound and potentially reach a new, post-disturbance equilibrium (explained in greater detail in Chapter 4.0).

Propeller wash effects around the Ore Dock in Milne Port are consistent with the predictions of the FEIS and subsequent addenda, which forecasted the potential for minor and localized sediment disturbance and overall negligible residual effects on sediment quality in Milne Port (Baffinland 2012), and will be further investigated in 2023.

3.6 Conclusions and Recommendations

The 2022 sediment data indicate that sediment quality at stations SW-1 to SW-4 is consistent with previous MEEMP years: concentrations of metals and hydrocarbons continue to be below applicable CCME sediment quality guidelines, and the data do not suggest Project-related impacts.

In terms of grain size composition, these four stations are dominated by sand and have shown varying, but low, proportions of fines content over time. It is expected that sediment results at these four stations will show high spatial and temporal variability in fines content – driven by natural factors, such as ice movement and coastal sediment processes, as well potential influences of vessel propeller wash. Importantly, associated impairment of the benthic community was only documented in 2020 and only at SW-2, with performance indicators rebounding in 2021 and 2022.

Overall, monitoring results remain within predictions of the FEIS and subsequent addenda, which forecasted the potential for minor and localized sediment disturbance associated with propeller wash, which is expected to stabilize over time. All West transect stations will be sampled in 2023 as part of the full-scale joint radial benthic and sediment sampling program conducted every three years to further increase understanding of sediment grain size variability and to monitor for potential effects of Project activities on grain size distribution.

3.7 Closure

We trust this information is sufficient for your needs at this time. Should you have any questions or concerns, please do not hesitate to contact Phil Rouget, on behalf of the undersigned, at +1 250 419 4945.

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APPENDIX 3A

Photo Log

Photo 1 – Station SW-1, west of Ore Dock.

Photo 2 – Sediment sample collected in the Van Veen grab at station SW-1 on 09 August 2022.

Photo 3 – Homogenized sediment sample collected from station SW-1 on 09 August 2022.

Photo 4 – Sampling station SW-2.

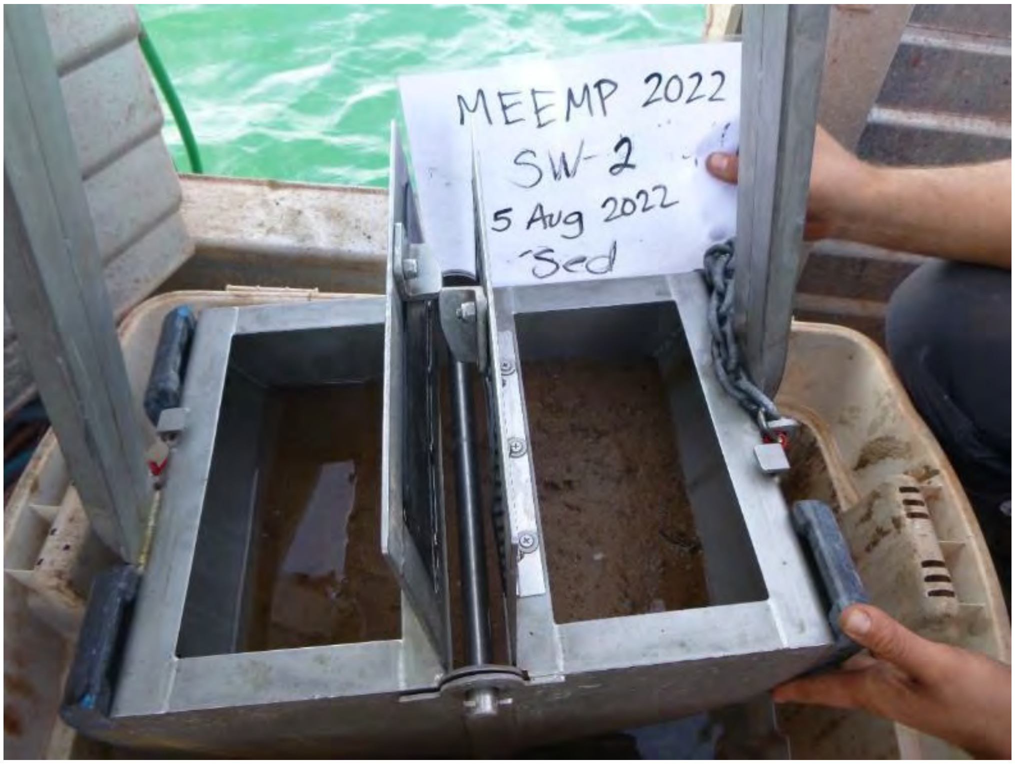

Photo 5 – Sediment sample collected in the Van Veen grab at station SW-2 on 05 August 2022.

Photo 6 – Showing striations in sediment sample collected at station SW-2 on 05 August 2022.

Photo 7 – Homogenized sediment sample collected from station SW-2 on 05 August 2022.

Photo 8 – Sediment sample collected in the Van Veen grab at station SW-3 on 07 August 2022.

Photo 9 – Station SW-4, looking east towards Ore Dock.

Photo 10 – Sediment sample collected in the Van Veen grab at station SW-4 on 07 August 2022.

Photo 11 – Homogenized sediment sample collected from station SW-4 on 07 August 2022.

APPENDIX 3B

Sediment Field Datasheets

SEDIMENT SAMPLING LOG

Project No: 1663724-~~24000~~ 01-64000-03
Project Title: Baffinland MEEMP ~~2019~~ 2022

Date: 09 Aug 2022
Inspected by: TT

Station Number (ID): SW-1
Sampling Method: VV

Weather: Clear skies, 15-17°C, 3-5kts
Lat/Longitude: ~~on~~ waypoint on Benthic log

Sampling Depth: ~~12.0m~~ 13.6m (9.5 to 11.2m)

# of Attempts to Obtain Sample: 卌 III
Time of Collection: 16:50 - 17:35

Sediment Description (including colour, type/grain size, anthropogenic debris, organic material, shell, wood, odour, HC sheen, staining, organisms/biota etc.):

Grabs 1,2,3 - rocks caught in jaws of grab

SAND, 3mm brownish sand overtop of a grey sand layer, wet, loose, 85% f-coarse sand, 15% f-coarse gravel rounded and subangular, loose plasticity, contains shell debris, polys, no odour and no sheen noted

Approx % collected in grab sample ~~5-7~~ 8 (85-90%, 12cm) %

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Photo of sample in grab and homogenized in bowl

Sample Control Number (SCN):

Analysis for:

- [x] Full Metals
- [x] PAH
- [ ] TBT
- [x] Grain Size
- [ ] Benthic
- [ ] AVS CEM
- [ ] PCB
- [ ] Dioxins and Furans
- [ ] PFOA/PFOS
- [x] Other PHC

AEC:
# of Grabs for Analysis:

Other Notes:

Sampled at 16:50

3 jars, 1 bag + 2 methanol vials

SAMPLE NUMBER: ________

SEDIMENT SAMPLING LOG

Project No: 1663724-~~24000~~01-64000
Project Title: Baffinland MEEMP-~~2010~~ 2022
Date: 05 Aug 22
Inspected by: TT
Station Number (ID): SW-2
Sampling Method: VV
Weather: Clear skies, 6kts NE
Lat/Longitude: WP RV
Sampling Depth: 16.9m
# of Attempts to Obtain Sample: ||||
Time of Collection: 16:00 - 17:15

Sediment Description (including colour, type/grain size, anthropogenic debris, organic material, shell, wood, odour, HC sheen, staining, organisms/biota etc.):

Grab 1- didn't

Top 5 cm is a brown sand layer (fine to coarse sand) some shell debris, <100% sand, wet, no sheen and no odour noted, low plasticity,

Bottom 2 cm is a wet, black silt and sand substrate, low to med plasticity, <60% fines, 40% fine sand, trace shell debris, no odour and no sheen noted

Approx % collected in grab sample 4(45-50%, 7cm) %

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Photo sed in grab, homogenized sediment

Sample Control Number (SCN):

Analysis for:

- ☑ Full Metals
- ☑ Grain Size
- ☐ PCB
- ☑ Other BTEX, F1
- ☑ PAH F2-F4
- ☐ Benthic
- ☐ Dioxins and Furans
- ☐ TBT
- ☐ AVS CEM
- ☐ PFOA/PFOS

AEC:
# of Grabs for Analysis:

Other Notes:

3 jars, 1 bag + 2 methanol vials

SAMPLE NUMBER: ________

SEDIMENT SAMPLING LOG

Project No: 1663724-~~24000~~-01-64000
Project Title: Baffinland MEEMP ~~2019~~ 2022
Date: 07 Aug 2022
Inspected by: TT
Station Number (ID): SW-3 / DUP-A
Sampling Method: VV
Weather: Clear skies, 15C, 5kts NE
Lat/Longitude: on waypoint
Sampling Depth: 16.6m
# of Attempts to Obtain Sample: 1
Time of Collection: 16:18-17:08

Sediment Description (including colour, type/grain size, anthropogenic debris, organic material, shell, wood, odour, HC sheen, staining, organisms/biota etc.):

SAND, layer of brown sand (4mm) overtop of a brownish grey sand layer, wet, loose, 100% fine sand, low plasticity, contains coarse sand, trace rounded and subangular gravel, contains polys, no odour and no sheen noted

Approx % collected in grab sample 35-40%, 6-5cm %

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):
Photo of sample in grab and bowl

Sample Control Number (SCN):

Analysis for:

- ☑ Full Metals
- ☑ Grain Size
- ☐ PCB
- ☑ Other PHC
- ~~☑ PAH~~
- ☐ Benthic
- ☐ Dioxins and Furans
- ☐ TBT
- ☐ AVS CEM
- ☐ PFOA/PFOS

AEC:
# of Grabs for Analysis:
Other Notes:

3 jars, 1 bag and 2 methanol vials

SAMPLE NUMBER: ________

SEDIMENT SAMPLING LOG

Project No: 1663724-~~24000~~ 01-64000/03
Project Title: Baffinland MEEMP ~~2019~~ 2022
Date: 07 Aug 2022
Inspected by: TT
Station Number (ID): SW-4
Sampling Method: VV
Weather: Clear skies, 5kts NE
Lat/Longitude: on waypoint
Sampling Depth: 15 m CD
# of Attempts to Obtain Sample: 1
Time of Collection: 15:25 - 16:03

Sediment Description (including colour, type/grain size, anthropogenic debris, organic material, shell, wood, odour, HC sheen, staining, organisms/biota etc.):

SAND and SILT, moist, brown low plasticity, 60% f-sand, 40% fines, contains trace coarse gravel rounded, subangular, Pectinarids, Hiatella Macoma, brittle stars, algae, scallop shells, no odour and no sheen noted

Approx % collected in grab sample 20-25%, 6.5cm %

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):
Site photos, homogenized and in grab photos

Sample Control Number (SCN):

Analysis for:

- ☑ Full Metals
- ☑ PAH
- ☐ TBT
- ☑ Grain Size
- ☐ Benthic
- ☐ AVS CEM
- ☐ PCB
- ☐ Dioxins and Furans
- ☐ PFOA/PFOS
- ☑ Other PHC

AEC:
# of Grabs for Analysis:
Other Notes:

3 jars, 1 bag and 2 methanol vials

SAMPLE NUMBER: ________

APPENDIX 3C

Sediment Quality Laboratory Data

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **VA22B8901**	Page	: 1 of 10
Client	: **Golder Associates Ltd.**	Laboratory	: Vancouver - Environmental
Contact	: Elaine Irving	Account Manager	: Amber Springer
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: 166372401/64000/03	Date Samples Received	: 15-Aug-2022 08:26
PO	: ----	Date Analysis Commenced	: 16-Aug-2022
C-O-C number	: 20-920784	Issue Date	: 23-Aug-2022 13:55
Sampler	: TT		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 6		
No. of samples analysed	: 6		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Thornton	Analyst	Metals, Burnaby, British Columbia
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
mg/kg	milligrams per kilogram
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: **Sediment**

(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	SW-1	SW-2	SW-3	SW-4	TGT-REF-1
				Client sampling date / time	09-Aug-2022 17:35	05-Aug-2022 17:15	07-Aug-2022 17:08	07-Aug-2022 16:03	10-Aug-2022 12:30
					VA22B8901-001	VA22B8901-002	VA22B8901-003	VA22B8901-004	VA22B8901-005
					Result	Result	Result	Result	Result
Physical Tests									
moisture	----	E144	0.25	%	13.8	17.9	18.5	24.7	19.0
pH (1:2 soil:water)	----	E108	0.10	pH units	9.00	8.57	8.74	7.90	8.89
Particle Size									
clay (<0.004mm)	----	EC184E	1.0	%	<1.0	2.8	<1.0	5.5	<1.0
silt (0.063mm - 0.004mm)	----	EC184E	1.0	%	1.6	8.1	3.6	22.8	7.9
sand (2.0mm - 0.063mm)	----	EC184E	1.0	%	83.2	80.4	85.9	62.5	91.8
gravel (>2mm)	----	EC184E	1.0	%	15.2	8.7	10.5	9.2	<1.0
Organic / Inorganic Carbon									
carbon, total [TC]	----	E351	0.050	%	1.44	1.75	1.13	3.79	4.54
carbon, inorganic [IC]	----	E354	0.050	%	1.30	1.55	1.04	1.98	3.43
carbon, inorganic [IC], (as CaCO3 equivalent)	----	E354	0.40	%	10.9	13.0	8.69	16.5	28.6
carbon, total organic [TOC]	----	EC356	0.050	%	<0.200	<0.236	<0.162	1.81	1.11
organic matter	----	EC356	0.10	%	<0.20	<0.24	<0.16	3.12	1.91
Metals									
aluminum	7429-90-5	E440	50	mg/kg	1080	2580	1720	4550	674
antimony	7440-36-0	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
arsenic	7440-38-2	E440	0.10	mg/kg	0.63	1.62	0.82	4.93	0.68
barium	7440-39-3	E440	0.50	mg/kg	2.30	8.35	4.69	15.7	2.05
beryllium	7440-41-7	E440	0.10	mg/kg	<0.10	0.18	0.11	0.30	<0.10
bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
boron	7440-42-8	E440	5.0	mg/kg	8.6	19.5	11.0	32.9	16.9
cadmium	7440-43-9	E440	0.020	mg/kg	<0.020	0.025	<0.020	0.388	<0.020
calcium	7440-70-2	E440	50	mg/kg	32300	35100	19200	61800	125000
chromium	7440-47-3	E440	0.50	mg/kg	5.32	9.46	6.71	15.9	4.19
cobalt	7440-48-4	E440	0.10	mg/kg	0.88	1.57	1.15	3.06	0.52
copper	7440-50-8	E440	0.50	mg/kg	1.21	2.61	5.66	4.88	0.66
iron	7439-89-6	E440	50	mg/kg	9750	7140	4890	13800	4110
lead	7439-92-1	E440	0.50	mg/kg	1.09	2.36	1.31	3.69	1.12
lithium	7439-93-2	E440	2.0	mg/kg	4.9	11.3	6.9	19.8	2.8
magnesium	7439-95-4	E440	20	mg/kg	13200	18200	9400	27400	14500

Analytical Results

Sub-Matrix: Sediment
(Matrix: Soil/Solid)

Analyte	CAS Number	Method	LOR	Unit	SW-1	SW-2	SW-3	SW-4	TGT-REF-1
				Client sampling date / time	09-Aug-2022 17:35	05-Aug-2022 17:15	07-Aug-2022 17:08	07-Aug-2022 16:03	10-Aug-2022 12:30
					VA22B8901-001	VA22B8901-002	VA22B8901-003	VA22B8901-004	VA22B8901-005
					Result	Result	Result	Result	Result
Metals									
manganese	7439-96-5	E440	1.0	mg/kg	45.4	63.8	45.1	143	36.9
mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	0.0090	<0.0050
molybdenum	7439-98-7	E440	0.10	mg/kg	0.22	0.22	0.14	0.42	<0.10
nickel	7440-02-0	E440	0.50	mg/kg	4.08	4.65	3.50	8.57	1.52
phosphorus	7723-14-0	E440	50	mg/kg	124	214	153	499	200
potassium	7440-09-7	E440	100	mg/kg	380	1160	840	2240	240
selenium	7782-49-2	E440	0.20	mg/kg	<0.20	<0.20	<0.20	0.22	<0.20
silver	7440-22-4	E440	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
sodium	7440-23-5	E440	50	mg/kg	574	1720	1560	4470	680
strontium	7440-24-6	E440	0.50	mg/kg	17.4	20.8	13.0	64.2	72.1
sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	<1000	<1000	<1000
thallium	7440-28-0	E440	0.050	mg/kg	<0.050	<0.050	<0.050	0.106	<0.050
tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0
titanium	7440-32-6	E440	1.0	mg/kg	86.2	135	121	269	70.9
tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
uranium	7440-61-1	E440	0.050	mg/kg	0.299	0.419	0.278	0.599	0.414
vanadium	7440-62-2	E440	0.20	mg/kg	5.65	9.84	5.55	17.0	6.61
zinc	7440-66-6	E440	2.0	mg/kg	4.2	8.2	6.5	16.1	2.7
zirconium	7440-67-7	E440	1.0	mg/kg	1.2	2.5	1.3	3.0	1.1
Volatile Organic Compounds [Fuels]									
benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	----
ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	<0.015	<0.015	----
toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	<0.050	<0.050	----
xylene, m+p-	179601-23-1	E611A	0.050	mg/kg	<0.050	<0.050	<0.050	<0.050	----
xylene, o-	95-47-6	E611A	0.050	mg/kg	<0.050	<0.050	<0.050	<0.050	----
xylenes, total	1330-20-7	E611A	0.075	mg/kg	<0.075	<0.075	<0.075	<0.075	----
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	E611A	0.10	%	103	96.9	85.8	81.0	----
difluorobenzene, 1,4-	540-36-3	E611A	0.10	%	118	110	97.3	92.8	----
Hydrocarbons									
F1 (C6-C10)	----	E581.VH+F1	5.0	mg/kg	<5.0	<5.0	<5.0	<5.0	----

Analytical Results

Sub-Matrix: **Sediment**

(Matrix: **Soil/Solid**)

				Client sample ID	SW-1	SW-2	SW-3	SW-4	TGT-REF-1
				Client sampling date / time	09-Aug-2022 17:35	05-Aug-2022 17:15	07-Aug-2022 17:08	07-Aug-2022 16:03	10-Aug-2022 12:30
Analyte	CAS Number	Method	LOR	Unit	VA22B8901-001	VA22B8901-002	VA22B8901-003	VA22B8901-004	VA22B8901-005
					Result	Result	Result	Result	Result
Hydrocarbons									
F1-BTEX	----	EC580	5.0	mg/kg	<5.0	<5.0	<5.0	<5.0	----
F2 (C10-C16)	----	E601.SG	30	mg/kg	<30	<30	<30	<30	----
F3 (C16-C34)	----	E601.SG	50	mg/kg	<50	<50	<50	<50	----
F4 (C34-C50)	----	E601.SG	50	mg/kg	<50	<50	<50	<50	----
chromatogram to baseline at nC50	n/a	E601.SG	-	-	Yes	Yes	Yes	Yes	----
Hydrocarbons Surrogates									
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601.SG	1.0	%	91.4	82.2	83.3	85.4	----
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%	106	97.6	102	100	----
Polycyclic Aromatic Hydrocarbons									
acenaphthene	83-32-9	E641A-L	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
acenaphthylene	208-96-8	E641A-L	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
acridine	260-94-6	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
anthracene	120-12-7	E641A-L	0.0040	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
benz(a)anthracene	56-55-3	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
benzo(a)pyrene	50-32-8	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
benzo(b+j)fluoranthene	n/a	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
benzo(b+j+k)fluoranthene	n/a	E641A-L	0.015	mg/kg	<0.015	<0.015	<0.015	<0.015	<0.015
benzo(g,h,i)perylene	191-24-2	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
benzo(k)fluoranthene	207-08-9	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
chrysene	218-01-9	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
dibenz(a,h)anthracene	53-70-3	E641A-L	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
fluoranthene	206-44-0	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
fluorene	86-73-7	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
methylnaphthalene, 1-	90-12-0	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
methylnaphthalene, 1+2-	----	E641A-L	0.015	mg/kg	<0.015	<0.015	<0.015	<0.015	<0.015
methylnaphthalene, 2-	91-57-6	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
naphthalene	91-20-3	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
phenanthrene	85-01-8	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
pyrene	129-00-0	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010
quinoline	91-22-5	E641A-L	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010

Analytical Results

Sub-Matrix: **Sediment**

(Matrix: **Soil/Solid**)

				Client sample ID	SW-1	SW-2	SW-3	SW-4	TGT-REF-1
				Client sampling date / time	09-Aug-2022 17:35	05-Aug-2022 17:15	07-Aug-2022 17:08	07-Aug-2022 16:03	10-Aug-2022 12:30
Analyte	CAS Number	Method	LOR	Unit	VA22B8901-001	VA22B8901-002	VA22B8901-003	VA22B8901-004	VA22B8901-005
					Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons									
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L	0.020	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020
IACR (CCME)	----	E641A-L	0.150	-	<0.150	<0.150	<0.150	<0.150	<0.150
IACR AB (coarse)	----	E641A-L	0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10
IACR AB (fine)	----	E641A-L	0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10
PAHs, total (BC Sched 3.4)	n/a	E641A-L	0.040	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040
PAHs, total (EPA 16 - DAS)	n/a	E641A-L	0.140	mg/kg	<0.140	<0.140	<0.140	<0.140	<0.140
PAHs, total (EPA 16)	n/a	E641A-L	0.040	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040
Polycyclic Aromatic Hydrocarbons Surrogates									
acridine-d9	34749-75-2	E641A-L	0.1	%	84.2	81.9	87.2	81.1	87.1
chrysene-d12	1719-03-5	E641A-L	0.1	%	85.9	82.2	85.8	80.9	86.6
naphthalene-d8	1146-65-2	E641A-L	0.1	%	86.5	82.5	87.8	81.7	87.4
phenanthrene-d10	1517-22-2	E641A-L	0.1	%	85.6	81.7	86.4	80.5	86.4

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Sediment**

(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	DUP-A	----	----	----	----
				Client sampling date / time	07-Aug-2022	----	----	----	----
					VA22B8901-006	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
moisture	----	E144	0.25	%	22.2	----	----	----	----
pH (1:2 soil:water)	----	E108	0.10	pH units	8.82	----	----	----	----
Particle Size									
clay (<0.004mm)	----	EC184E	1.0	%	1.0	----	----	----	----
silt (0.063mm - 0.004mm)	----	EC184E	1.0	%	2.8	----	----	----	----
sand (2.0mm - 0.063mm)	----	EC184E	1.0	%	89.0	----	----	----	----
gravel (>2mm)	----	EC184E	1.0	%	7.2	----	----	----	----
Organic / Inorganic Carbon									
carbon, total [TC]	----	E351	0.050	%	1.16	----	----	----	----
carbon, inorganic [IC]	----	E354	0.050	%	1.05	----	----	----	----
carbon, inorganic [IC], (as CaCO3 equivalent)	----	E354	0.40	%	8.75	----	----	----	----
carbon, total organic [TOC]	----	EC356	0.050	%	<0.165	----	----	----	----
organic matter	----	EC356	0.10	%	<0.16	----	----	----	----
Metals									
aluminum	7429-90-5	E440	50	mg/kg	1380	----	----	----	----
antimony	7440-36-0	E440	0.10	mg/kg	<0.10	----	----	----	----
arsenic	7440-38-2	E440	0.10	mg/kg	0.72	----	----	----	----
barium	7440-39-3	E440	0.50	mg/kg	4.58	----	----	----	----
beryllium	7440-41-7	E440	0.10	mg/kg	<0.10	----	----	----	----
bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	----	----	----	----
boron	7440-42-8	E440	5.0	mg/kg	8.9	----	----	----	----
cadmium	7440-43-9	E440	0.020	mg/kg	<0.020	----	----	----	----
calcium	7440-70-2	E440	50	mg/kg	20700	----	----	----	----
chromium	7440-47-3	E440	0.50	mg/kg	5.24	----	----	----	----
cobalt	7440-48-4	E440	0.10	mg/kg	0.98	----	----	----	----
copper	7440-50-8	E440	0.50	mg/kg	1.38	----	----	----	----
iron	7439-89-6	E440	50	mg/kg	3700	----	----	----	----
lead	7439-92-1	E440	0.50	mg/kg	1.10	----	----	----	----
lithium	7439-93-2	E440	2.0	mg/kg	6.2	----	----	----	----
magnesium	7439-95-4	E440	20	mg/kg	9680	----	----	----	----
manganese	7439-96-5	E440	1.0	mg/kg	42.3	----	----	----	----
mercury	7439-97-6	E510	0.0050	mg/kg	<0.0050	----	----	----	----

Analytical Results

Sub-Matrix: **Sediment**

(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	DUP-A	----	----	----	----
				Client sampling date / time	07-Aug-2022	----	----	----	----
					VA22B8901-006	--------	--------	--------	--------
					Result	----	----	----	----
Metals									
molybdenum	7439-98-7	E440	0.10	mg/kg	0.11	----	----	----	----
nickel	7440-02-0	E440	0.50	mg/kg	2.82	----	----	----	----
phosphorus	7723-14-0	E440	50	mg/kg	189	----	----	----	----
potassium	7440-09-7	E440	100	mg/kg	670	----	----	----	----
selenium	7782-49-2	E440	0.20	mg/kg	<0.20	----	----	----	----
silver	7440-22-4	E440	0.10	mg/kg	<0.10	----	----	----	----
sodium	7440-23-5	E440	50	mg/kg	742	----	----	----	----
strontium	7440-24-6	E440	0.50	mg/kg	13.2	----	----	----	----
sulfur	7704-34-9	E440	1000	mg/kg	<1000	----	----	----	----
thallium	7440-28-0	E440	0.050	mg/kg	<0.050	----	----	----	----
tin	7440-31-5	E440	2.0	mg/kg	<2.0	----	----	----	----
titanium	7440-32-6	E440	1.0	mg/kg	99.9	----	----	----	----
tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	----	----	----	----
uranium	7440-61-1	E440	0.050	mg/kg	0.267	----	----	----	----
vanadium	7440-62-2	E440	0.20	mg/kg	4.65	----	----	----	----
zinc	7440-66-6	E440	2.0	mg/kg	5.0	----	----	----	----
zirconium	7440-67-7	E440	1.0	mg/kg	1.2	----	----	----	----
Volatile Organic Compounds [Fuels]									
benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	----	----	----	----
ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----	----	----	----
toluene	108-88-3	E611A	0.050	mg/kg	<0.050	----	----	----	----
xylene, m+p-	179601-23-1	E611A	0.050	mg/kg	<0.050	----	----	----	----
xylene, o-	95-47-6	E611A	0.050	mg/kg	<0.050	----	----	----	----
xylenes, total	1330-20-7	E611A	0.075	mg/kg	<0.075	----	----	----	----
Volatile Organic Compounds Surrogates									
bromofluorobenzene, 4-	460-00-4	E611A	0.10	%	89.0	----	----	----	----
difluorobenzene, 1,4-	540-36-3	E611A	0.10	%	98.9	----	----	----	----
Hydrocarbons									
F1 (C6-C10)	----	E581.VH+F1	5.0	mg/kg	<5.0	----	----	----	----
F1-BTEX	----	EC580	5.0	mg/kg	<5.0	----	----	----	----
F2 (C10-C16)	----	E601.SG	30	mg/kg	<30	----	----	----	----
F3 (C16-C34)	----	E601.SG	50	mg/kg	<50	----	----	----	----

Analytical Results

Sub-Matrix: **Sediment**

(Matrix: **Soil/Solid)**

					Client sample ID	DUP-A	----	----	----	----
					Client sampling date / time	07-Aug-2022	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*		VA22B8901-006	--------	--------	--------	--------
						Result	----	----	----	----
Hydrocarbons										
F4 (C34-C50)	----	E601.SG	50	mg/kg		<50	----	----	----	----
chromatogram to baseline at nC50	n/a	E601.SG	-	-		Yes	----	----	----	----
Hydrocarbons Surrogates										
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	E601.SG	1.0	%		83.8	----	----	----	----
dichlorotoluene, 3,4-	97-75-0	E581.VH+F1	1.0	%		90.7	----	----	----	----
Polycyclic Aromatic Hydrocarbons										
acenaphthene	83-32-9	E641A-L	0.0050	mg/kg		<0.0050	----	----	----	----
acenaphthylene	208-96-8	E641A-L	0.0050	mg/kg		<0.0050	----	----	----	----
acridine	260-94-6	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
anthracene	120-12-7	E641A-L	0.0040	mg/kg		<0.0040	----	----	----	----
benz(a)anthracene	56-55-3	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
benzo(a)pyrene	50-32-8	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
benzo(b+j)fluoranthene	n/a	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
benzo(b+j+k)fluoranthene	n/a	E641A-L	0.015	mg/kg		<0.015	----	----	----	----
benzo(g,h,i)perylene	191-24-2	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
benzo(k)fluoranthene	207-08-9	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
chrysene	218-01-9	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
dibenz(a,h)anthracene	53-70-3	E641A-L	0.0050	mg/kg		<0.0050	----	----	----	----
fluoranthene	206-44-0	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
fluorene	86-73-7	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
methylnaphthalene, 1-	90-12-0	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
methylnaphthalene, 1+2-	----	E641A-L	0.015	mg/kg		<0.015	----	----	----	----
methylnaphthalene, 2-	91-57-6	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
naphthalene	91-20-3	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
phenanthrene	85-01-8	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
pyrene	129-00-0	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
quinoline	91-22-5	E641A-L	0.010	mg/kg		<0.010	----	----	----	----
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L	0.020	mg/kg		<0.020	----	----	----	----
IACR (CCME)	----	E641A-L	0.150	-		<0.150	----	----	----	----
IACR AB (coarse)	----	E641A-L	0.10	-		<0.10	----	----	----	----
IACR AB (fine)	----	E641A-L	0.10	-		<0.10	----	----	----	----

Analytical Results

Sub-Matrix: **Sediment**

(Matrix: **Soil/Solid**)

				Client sample ID	DUP-A	----	----	----	----
				Client sampling date / time	07-Aug-2022	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**VA22B8901-006**	--------	--------	--------	--------
					Result	----	----	----	----
Polycyclic Aromatic Hydrocarbons									
PAHs, total (BC Sched 3.4)	n/a	E641A-L	0.040	mg/kg	<0.040	----	----	----	----
PAHs, total (EPA 16 - DAS)	n/a	E641A-L	0.140	mg/kg	<0.140	----	----	----	----
PAHs, total (EPA 16)	n/a	E641A-L	0.040	mg/kg	<0.040	----	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
acridine-d9	34749-75-2	E641A-L	0.1	%	84.2	----	----	----	----
chrysene-d12	1719-03-5	E641A-L	0.1	%	83.9	----	----	----	----
naphthalene-d8	1146-65-2	E641A-L	0.1	%	84.6	----	----	----	----
phenanthrene-d10	1517-22-2	E641A-L	0.1	%	84.2	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA22B8901**	Page	: 1 of 13
Client	: **Golder Associates Ltd.**	Laboratory	: Vancouver - Environmental
Contact	: Elaine Irving	Account Manager	: Amber Springer
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: 166372401/64000/03	Date Samples Received	: 15-Aug-2022 08:26
PO	: ----	Issue Date	: 23-Aug-2022 13:55
C-O-C number	: 20-920784		
Sampler	: TT		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 6		
No. of samples analysed	: 6		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Metals	QC-MRG2-605701002	----	antimony	7440-36-0	E440	123 % MES	80.0-120%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Glass soil jar/Teflon lined cap DUP-A	E601.SG	07-Aug-2022	17-Aug-2022	14 days	10 days	✓	19-Aug-2022	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Glass soil jar/Teflon lined cap SW-3	E601.SG	07-Aug-2022	17-Aug-2022	14 days	10 days	✓	19-Aug-2022	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Glass soil jar/Teflon lined cap SW-4	E601.SG	07-Aug-2022	17-Aug-2022	14 days	10 days	✓	19-Aug-2022	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Glass soil jar/Teflon lined cap SW-2	E601.SG	05-Aug-2022	17-Aug-2022	14 days	12 days	✓	19-Aug-2022	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Glass soil jar/Teflon lined cap SW-1	E601.SG	09-Aug-2022	17-Aug-2022	14 days	8 days	✓	19-Aug-2022	40 days	2 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial SW-1	E581.VH+F1	09-Aug-2022	18-Aug-2022	----	----		20-Aug-2022	40 days	11 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial DUP-A	E581.VH+F1	07-Aug-2022	16-Aug-2022	----	----		20-Aug-2022	40 days	13 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial SW-3	E581.VH+F1	07-Aug-2022	16-Aug-2022	----	----		20-Aug-2022	40 days	13 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial SW-4	E581.VH+F1	07-Aug-2022	16-Aug-2022	----	----		20-Aug-2022	40 days	13 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil methanol vial SW-2	E581.VH+F1	05-Aug-2022	16-Aug-2022	----	----		20-Aug-2022	40 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap DUP-A	E510	07-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap SW-3	E510	07-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap SW-4	E510	07-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	28 days	10 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap SW-2	E510	05-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap TGT-REF-1	E510	10-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	28 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap SW-1	E510	09-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	28 days	8 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap DUP-A	E440	07-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap SW-3	E440	07-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap SW-4	E440	07-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap SW-2	E440	05-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap TGT-REF-1	E440	10-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap SW-1	E440	09-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	180 days	8 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag DUP-A	E351	07-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag SW-1	E351	09-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag SW-2	E351	05-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	180 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag SW-3	E351	07-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag SW-4	E351	07-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag TGT-REF-1	E351	10-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag DUP-A	E354	07-Aug-2022	----	----	----		19-Aug-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag SW-1	E354	09-Aug-2022	----	----	----		19-Aug-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag SW-2	E354	05-Aug-2022	----	----	----		19-Aug-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag SW-3	E354	07-Aug-2022	----	----	----		19-Aug-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag SW-4	E354	07-Aug-2022	----	----	----		19-Aug-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag TGT-REF-1	E354	10-Aug-2022	----	----	----		19-Aug-2022	----	----	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap DUP-A	E144	07-Aug-2022	----	----	----		17-Aug-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap SW-1	E144	09-Aug-2022	----	----	----		17-Aug-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap SW-2	E144	05-Aug-2022	----	----	----		17-Aug-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap SW-3	E144	07-Aug-2022	----	----	----		17-Aug-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap SW-4	E144	07-Aug-2022	----	----	----		17-Aug-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap TGT-REF-1	E144	10-Aug-2022	----	----	----		17-Aug-2022	----	----	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap DUP-A	E108	07-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	30 days	10 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap SW-3	E108	07-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	30 days	10 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap SW-4	E108	07-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	30 days	10 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap SW-2	E108	05-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	30 days	12 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap TGT-REF-1	E108	10-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap SW-1	E108	09-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	30 days	8 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap DUP-A	E641A-L	07-Aug-2022	17-Aug-2022	14 days	10 days	✓	18-Aug-2022	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap SW-3	E641A-L	07-Aug-2022	17-Aug-2022	14 days	10 days	✓	18-Aug-2022	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap SW-4	E641A-L	07-Aug-2022	17-Aug-2022	14 days	10 days	✓	18-Aug-2022	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap SW-2	E641A-L	05-Aug-2022	17-Aug-2022	14 days	12 days	✓	18-Aug-2022	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap TGT-REF-1	E641A-L	10-Aug-2022	17-Aug-2022	14 days	7 days	✓	18-Aug-2022	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap SW-1	E641A-L	09-Aug-2022	17-Aug-2022	14 days	8 days	✓	18-Aug-2022	40 days	1 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial SW-1	E611A	09-Aug-2022	18-Aug-2022	----	----		20-Aug-2022	40 days	11 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial DUP-A	E611A	07-Aug-2022	16-Aug-2022	----	----		20-Aug-2022	40 days	13 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial SW-3	E611A	07-Aug-2022	16-Aug-2022	----	----		20-Aug-2022	40 days	13 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial SW-4	E611A	07-Aug-2022	16-Aug-2022	----	----		20-Aug-2022	40 days	13 days	✓
Volatile Organic Compounds [Fuels] : BTEX by Headspace GC-MS										
Glass soil methanol vial SW-2	E611A	05-Aug-2022	16-Aug-2022	----	----		20-Aug-2022	40 days	15 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
BTEX by Headspace GC-MS	E611A	609190	2	19	10.5	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601.SG	605698	1	5	20.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	605701	1	20	5.0	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	605702	1	20	5.0	5.0	✓
Moisture Content by Gravimetry	E144	605707	1	16	6.2	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	605699	1	16	6.2	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	605703	1	20	5.0	5.0	✓
Total Carbon by Combustion	E351	611750	1	10	10.0	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	610692	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	605207	2	25	8.0	5.0	✓
Laboratory Control Samples (LCS)							
BTEX by Headspace GC-MS	E611A	609190	2	19	10.5	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601.SG	605698	1	5	20.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	605701	2	20	10.0	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	605702	2	20	10.0	10.0	✓
Moisture Content by Gravimetry	E144	605707	1	16	6.2	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	605699	1	16	6.2	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	605703	1	20	5.0	5.0	✓
Total Carbon by Combustion	E351	611750	2	10	20.0	10.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	610692	2	20	10.0	10.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	605207	2	25	8.0	5.0	✓
Method Blanks (MB)							
BTEX by Headspace GC-MS	E611A	609190	2	19	10.5	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601.SG	605698	1	5	20.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	605701	1	20	5.0	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	605702	1	20	5.0	5.0	✓
Moisture Content by Gravimetry	E144	605707	1	16	6.2	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	605699	1	16	6.2	5.0	✓
Total Carbon by Combustion	E351	611750	1	10	10.0	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	610692	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	605207	2	25	8.0	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	609190	2	19	10.5	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601.SG	605698	1	5	20.0	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	605699	1	16	6.2	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	605207	2	25	8.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by “mod”).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter (1:2 Soil:Water Extraction)	E108 Vancouver - Environmental	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally 20 ± 5°C), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at <60 ºC) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Moisture Content by Gravimetry	E144 Vancouver - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Total Carbon by Combustion	E351 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2 (mod)	Total Carbon is determined by the high temperature combustion method with measurement by an infrared detector.
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 20.2	Total Inorganic Carbon is determined by acetic acid pH standard curve, where a known quantity of acetic acid is consumed by reaction with carbonates in the soil. The pH of the resulting solution is measured and compared against a standard curve relating pH to weight of carbonate.
Metals in Soil/Solid by CRC ICPMS	E440 Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 Vancouver - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
VH and F1 by Headspace GC-FID	E581.VH+F1 Vancouver - Environmental	Soil/Solid	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry’s law.
CCME PHCs - F2-F4 by GC-FID	E601.SG Vancouver - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	Sample extracts are subjected to in-situ silica gel treatment prior to analysis by GC-FID for CCME hydrocarbon fractions (F2-F4).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
BTEX by Headspace GC-MS	E611A Vancouver - Environmental	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L Vancouver - Environmental	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are extracted with hexane/acetone and analyzed by GC-MS. If reported, IACR (index of additive cancer risk, unitless) and B(a)P toxic potency equivalent (in soil concentration units) are calculated as per CCME PAH Soil Quality Guidelines fact sheet (2010) or ABT1.
Particle Size Analysis (Pipette) - MMER Classification	EC184E Saskatoon - Environmental	Soil/Solid	Metal Mining Technical Guidance for Environmental Effects Monitoring (2012)	The particle size determination is performed by various methods to generate a Grain Size curve. The data from the curve is then used to produce particle size ranges based on the Metal Mining Effluent Regulations (MMER) classification system for Environmental Effects Monitoring.
Total Organic Carbon (Calculated) in soil	EC356 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2	Total Organic Carbon (TOC) is calculated by the difference between total carbon (TC) and total inorganic carbon (TIC).
F1-BTEX	EC580 Vancouver - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Digestion for Metals and Mercury	EP440 Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
VOCs Methanol Extraction for Headspace Analysis	EP581 Vancouver - Environmental	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry 's law.
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601 Vancouver - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.
Dry and Grind	EPP442 Saskatoon - Environmental	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.

QUALITY CONTROL REPORT

Work Order	: **VA22B8901**	Page	: 1 of 15
Client	: Golder Associates Ltd.	Laboratory	: Vancouver - Environmental
Contact	: Elaine Irving	Account Manager	: Amber Springer
Address	: 200-2920 Virtual Way Vancouver BC Canada V5M 0C4	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: 166372401/64000/03	Date Samples Received	: 15-Aug-2022 08:26
PO	: ----	Date Analysis Commenced	: 16-Aug-2022
C-O-C number	: 20-920784	Issue Date	: 23-Aug-2022 13:55
Sampler	: TT		
Site	: ----		
Quote number	: VA22-GOLD100-028		
No. of samples received	: 6		
No. of samples analysed	: 6		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Thornton	Analyst	Vancouver Metals, Burnaby, British Columbia
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Hedy Lai	Team Leader - Inorganics	Saskatoon Inorganics, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 605703)											
VA22B8161-008	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	7.14	7.12	0.3%	5%	----
Physical Tests (QC Lot: 605707)											
VA22B8901-001	SW-1	moisture	----	E144	0.25	%	13.8	14.9	7.22%	20%	----
Organic / Inorganic Carbon (QC Lot: 610692)											
CG2210771-001	Anonymous	carbon, inorganic [IC]	----	E354	0.050	%	2.12	2.13	0.281%	20%	----
Organic / Inorganic Carbon (QC Lot: 611750)											
VA22B8901-001	SW-1	carbon, total [TC]	----	E351	0.050	%	1.44	1.45	0.798%	20%	----
Metals (QC Lot: 605701)											
VA22B8161-008	Anonymous	mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 605702)											
VA22B8161-008	Anonymous	aluminum	7429-90-5	E440	50	mg/kg	19600	19500	0.586%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	0.36	0.37	0.01	Diff <2x LOR	----
		arsenic	7440-38-2	E440	0.10	mg/kg	8.24	8.51	3.23%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	97.4	98.4	1.10%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.30	0.29	0.003	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		boron	7440-42-8	E440	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	0.154	0.153	0.385%	30%	----
		calcium	7440-70-2	E440	50	mg/kg	5170	4730	8.94%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	34.1	37.1	8.44%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	10.8	10.3	5.20%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	32.3	31.3	3.17%	30%	----
		iron	7439-89-6	E440	50	mg/kg	28100	24700	12.9%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	5.71	5.63	1.37%	40%	----
		lithium	7439-93-2	E440	2.0	mg/kg	8.9	9.0	0.06	Diff <2x LOR	----
		magnesium	7439-95-4	E440	20	mg/kg	7320	7220	1.26%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	530	507	4.56%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	1.64	2.36	35.7%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	23.7	24.1	1.53%	30%	----
		phosphorus	7723-14-0	E440	50	mg/kg	738	742	0.603%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	850	840	0.296%	40%	----

Sub-Matrix: **Soil/Solid**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Metals (QC Lot: 605702) - continued											
VA22B8161-008	Anonymous	selenium	7782-49-2	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		sodium	7440-23-5	E440	50	mg/kg	457	397	14.1%	40%	----
		strontium	7440-24-6	E440	0.50	mg/kg	31.8	31.0	2.53%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.082	0.080	0.002	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		titanium	7440-32-6	E440	1.0	mg/kg	1020	982	4.01%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.050	mg/kg	0.462	0.409	12.2%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	69.5	58.9	16.4%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	67.9	67.8	0.212%	30%	----
		zirconium	7440-67-7	E440	1.0	mg/kg	2.4	2.6	0.2	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 605208)											
VA22B8901-002	SW-2	benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 609190)											
FJ2202141-017	Anonymous	benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 605207)											
VA22B8901-002	SW-2	F1 (C6-C10)	----	E581.VH+F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 605698)											
VA22B8901-001	SW-1	F2 (C10-C16)	----	E601.SG	30	mg/kg	<30	<30	0	Diff <2x LOR	----
		F3 (C16-C34)	----	E601.SG	50	mg/kg	<50	<50	0	Diff <2x LOR	----
		F4 (C34-C50)	----	E601.SG	50	mg/kg	<50	<50	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 609189)											
FJ2202141-017	Anonymous	F1 (C6-C10)	----	E581.VH+F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 605699)											
VA22B8901-001	SW-1	acenaphthene	83-32-9	E641A-L	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Polycyclic Aromatic Hydrocarbons (QC Lot: 605699) - continued											
VA22B8901-001	SW-1	acenaphthylene	208-96-8	E641A-L	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		acridine	260-94-6	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		anthracene	120-12-7	E641A-L	0.0040	mg/kg	<0.0040	<0.0040	0	Diff <2x LOR	----
		benz(a)anthracene	56-55-3	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		benzo(a)pyrene	50-32-8	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		benzo(b+j)fluoranthene	n/a	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		benzo(g,h,i)perylene	191-24-2	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		benzo(k)fluoranthene	207-08-9	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		chrysene	218-01-9	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		dibenz(a,h)anthracene	53-70-3	E641A-L	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		fluoranthene	206-44-0	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		fluorene	86-73-7	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		methylnaphthalene, 1-	90-12-0	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		methylnaphthalene, 2-	91-57-6	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		naphthalene	91-20-3	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		phenanthrene	85-01-8	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		pyrene	129-00-0	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		quinoline	91-22-5	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 605707)						
moisture	----	E144	0.25	%	<0.25	----
Organic / Inorganic Carbon (QCLot: 610692)						
carbon, inorganic [IC]	----	E354	0.05	%	<0.050	----
Organic / Inorganic Carbon (QCLot: 611750)						
carbon, total [TC]	----	E351	0.05	%	<0.050	----
Metals (QCLot: 605701)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 605702)						
aluminum	7429-90-5	E440	50	mg/kg	<50	----
antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	----
boron	7440-42-8	E440	5	mg/kg	<5.0	----
cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
calcium	7440-70-2	E440	50	mg/kg	<50	----
chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
iron	7439-89-6	E440	50	mg/kg	<50	----
lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
lithium	7439-93-2	E440	2	mg/kg	<2.0	----
magnesium	7439-95-4	E440	20	mg/kg	<20	----
manganese	7439-96-5	E440	1	mg/kg	<1.0	----
molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
phosphorus	7723-14-0	E440	50	mg/kg	<50	----
potassium	7440-09-7	E440	100	mg/kg	<100	----
selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
sodium	7440-23-5	E440	50	mg/kg	<50	----
strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 605702) - continued						
sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
tin	7440-31-5	E440	2	mg/kg	<2.0	----
titanium	7440-32-6	E440	1	mg/kg	<1.0	----
tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
zinc	7440-66-6	E440	2	mg/kg	<2.0	----
zirconium	7440-67-7	E440	1	mg/kg	<1.0	----
Volatile Organic Compounds (QCLot: 605208)						
benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Volatile Organic Compounds (QCLot: 609190)						
benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Hydrocarbons (QCLot: 605207)						
F1 (C6-C10)	----	E581.VH+F1	5	mg/kg	<5.0	----
Hydrocarbons (QCLot: 605698)						
F2 (C10-C16)	----	E601.SG	25	mg/kg	<25	----
F3 (C16-C34)	----	E601.SG	50	mg/kg	<50	----
F4 (C34-C50)	----	E601.SG	50	mg/kg	<50	----
Hydrocarbons (QCLot: 609189)						
F1 (C6-C10)	----	E581.VH+F1	5	mg/kg	<5.0	----
Polycyclic Aromatic Hydrocarbons (QCLot: 605699)						
acenaphthene	83-32-9	E641A-L	0.005	mg/kg	<0.0050	----
acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	<0.0050	----
acridine	260-94-6	E641A-L	0.01	mg/kg	<0.010	----
anthracene	120-12-7	E641A-L	0.004	mg/kg	<0.0040	----
benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	<0.010	----
benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	<0.010	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 605699) - continued						
benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	<0.010	----
benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	<0.010	----
benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	<0.010	----
chrysene	218-01-9	E641A-L	0.01	mg/kg	<0.010	----
dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	<0.0050	----
fluoranthene	206-44-0	E641A-L	0.01	mg/kg	<0.010	----
fluorene	86-73-7	E641A-L	0.01	mg/kg	<0.010	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	<0.010	----
methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	<0.010	----
methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	<0.010	----
naphthalene	91-20-3	E641A-L	0.01	mg/kg	<0.010	----
phenanthrene	85-01-8	E641A-L	0.01	mg/kg	<0.010	----
pyrene	129-00-0	E641A-L	0.01	mg/kg	<0.010	----
quinoline	91-22-5	E641A-L	0.01	mg/kg	<0.010	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 605703)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.5	95.0	105	----
Physical Tests (QCLot: 605707)									
moisture	----	E144	0.25	%	50 %	100	90.0	110	----
Organic / Inorganic Carbon (QCLot: 610692)									
carbon, inorganic [IC]	----	E354	0.05	%	0.5 %	96.8	90.0	110	----
Organic / Inorganic Carbon (QCLot: 611750)									
carbon, total [TC]	----	E351	0.05	%	48 %	99.4	90.0	110	----
Metals (QCLot: 605701)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	101	80.0	120	----
Metals (QCLot: 605702)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	106	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	# 123	80.0	120	MES
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	108	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	108	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	107	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	104	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	109	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	110	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	108	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	106	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	106	80.0	120	----
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	105	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	107	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	109	80.0	120	----
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	102	80.0	120	----
magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	110	80.0	120	----
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	106	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	111	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	102	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	112	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	108	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	109	80.0	120	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Metals (QCLot: 605702) - continued									
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	99.3	80.0	120	----
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	114	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	107	80.0	120	----
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	108	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	111	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	108	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	102	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	109	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	112	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	107	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	112	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	110	80.0	120	----
Volatile Organic Compounds (QCLot: 605208)									
benzene	71-43-2	E611A	0.005	mg/kg	2.5 mg/kg	114	70.0	130	----
ethylbenzene	100-41-4	E611A	0.015	mg/kg	2.5 mg/kg	108	70.0	130	----
toluene	108-88-3	E611A	0.05	mg/kg	2.5 mg/kg	102	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	5 mg/kg	111	70.0	130	----
xylene, o-	95-47-6	E611A	0.03	mg/kg	2.5 mg/kg	109	70.0	130	----
Volatile Organic Compounds (QCLot: 609190)									
benzene	71-43-2	E611A	0.005	mg/kg	2.5 mg/kg	123	70.0	130	----
ethylbenzene	100-41-4	E611A	0.015	mg/kg	2.5 mg/kg	121	70.0	130	----
toluene	108-88-3	E611A	0.05	mg/kg	2.5 mg/kg	120	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	5 mg/kg	123	70.0	130	----
xylene, o-	95-47-6	E611A	0.03	mg/kg	2.5 mg/kg	122	70.0	130	----
Hydrocarbons (QCLot: 605207)									
F1 (C6-C10)	----	E581.VH+F1	5	mg/kg	93.6 mg/kg	88.4	70.0	130	----
Hydrocarbons (QCLot: 605698)									
F2 (C10-C16)	----	E601.SG	25	mg/kg	618.75 mg/kg	115	70.0	130	----
F3 (C16-C34)	----	E601.SG	50	mg/kg	1242.49 mg/kg	105	70.0	130	----
F4 (C34-C50)	----	E601.SG	50	mg/kg	993.9 mg/kg	94.4	70.0	130	----
Hydrocarbons (QCLot: 609189)									
F1 (C6-C10)	----	E581.VH+F1	5	mg/kg	93.6 mg/kg	91.0	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 605699)									
acenaphthene	83-32-9	E641A-L	0.005	mg/kg	0.5 mg/kg	99.7	60.0	130	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 605699) - continued									
acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	0.5 mg/kg	98.5	60.0	130	----
acridine	260-94-6	E641A-L	0.01	mg/kg	0.5 mg/kg	94.2	60.0	130	----
anthracene	120-12-7	E641A-L	0.004	mg/kg	0.5 mg/kg	103	60.0	130	----
benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	0.5 mg/kg	100	60.0	130	----
benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	0.5 mg/kg	97.6	60.0	130	----
benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	0.5 mg/kg	100	60.0	130	----
benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	0.5 mg/kg	99.8	60.0	130	----
benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	0.5 mg/kg	97.2	60.0	130	----
chrysene	218-01-9	E641A-L	0.01	mg/kg	0.5 mg/kg	102	60.0	130	----
dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	0.5 mg/kg	97.5	60.0	130	----
fluoranthene	206-44-0	E641A-L	0.01	mg/kg	0.5 mg/kg	98.2	60.0	130	----
fluorene	86-73-7	E641A-L	0.01	mg/kg	0.5 mg/kg	98.3	60.0	130	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	0.5 mg/kg	95.7	60.0	130	----
methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	0.5 mg/kg	98.7	60.0	130	----
methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	0.5 mg/kg	96.1	60.0	130	----
naphthalene	91-20-3	E641A-L	0.01	mg/kg	0.5 mg/kg	94.7	50.0	130	----
phenanthrene	85-01-8	E641A-L	0.01	mg/kg	0.5 mg/kg	99.7	60.0	130	----
pyrene	129-00-0	E641A-L	0.01	mg/kg	0.5 mg/kg	103	60.0	130	----
quinoline	91-22-5	E641A-L	0.01	mg/kg	0.5 mg/kg	90.6	60.0	130	----

Qualifiers

Qualifier	*Description*
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 605208)										
VA22B8901-002	SW-2	benzene	71-43-2	E611A	2.53 mg/kg	4.6875 mg/kg	90.5	60.0	140	----
		ethylbenzene	100-41-4	E611A	2.55 mg/kg	4.6875 mg/kg	91.2	60.0	140	----
		toluene	108-88-3	E611A	2.49 mg/kg	4.6875 mg/kg	88.8	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	5.16 mg/kg	9.375 mg/kg	92.1	60.0	140	----
		xylene, o-	95-47-6	E611A	2.55 mg/kg	4.6875 mg/kg	90.9	60.0	140	----
Volatile Organic Compounds (QCLot: 609190)										
FJ2202141-017	Anonymous	benzene	71-43-2	E611A	1.82 mg/kg	3.125 mg/kg	93.2	60.0	140	----
		ethylbenzene	100-41-4	E611A	1.87 mg/kg	3.125 mg/kg	95.9	60.0	140	----
		toluene	108-88-3	E611A	1.85 mg/kg	3.125 mg/kg	94.8	60.0	140	----
		xylene, m+p-	179601-23-1	E611A	3.48 mg/kg	6.25 mg/kg	89.4	60.0	140	----
		xylene, o-	95-47-6	E611A	1.87 mg/kg	3.125 mg/kg	96.1	60.0	140	----
Hydrocarbons (QCLot: 605207)										
VA22B8901-003	SW-3	F1 (C6-C10)	----	E581.VH+F1	104 mg/kg	187.5 mg/kg	79.9	60.0	140	----
Hydrocarbons (QCLot: 605698)										
VA22B8901-002	SW-2	F2 (C10-C16)	----	E601.SG	520 mg/kg	618.75 mg/kg	109	60.0	140	----
		F3 (C16-C34)	----	E601.SG	983 mg/kg	1242.49 mg/kg	102	60.0	140	----
		F4 (C34-C50)	----	E601.SG	656 mg/kg	993.9 mg/kg	85.4	60.0	140	----
Hydrocarbons (QCLot: 609189)										
FJ2202141-019	Anonymous	F1 (C6-C10)	----	E581.VH+F1	128 mg/kg	187.5 mg/kg	82.0	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 605699)										
VA22B8901-002	SW-2	acenaphthene	83-32-9	E641A-L	0.406 mg/kg	0.5 mg/kg	103	50.0	140	----
		acenaphthylene	208-96-8	E641A-L	0.402 mg/kg	0.5 mg/kg	102	50.0	140	----
		acridine	260-94-6	E641A-L	0.402 mg/kg	0.5 mg/kg	102	50.0	140	----
		anthracene	120-12-7	E641A-L	0.422 mg/kg	0.5 mg/kg	107	50.0	140	----
		benz(a)anthracene	56-55-3	E641A-L	0.411 mg/kg	0.5 mg/kg	104	50.0	140	----
		benzo(a)pyrene	50-32-8	E641A-L	0.406 mg/kg	0.5 mg/kg	103	50.0	140	----
		benzo(b+j)fluoranthene	n/a	E641A-L	0.408 mg/kg	0.5 mg/kg	103	50.0	140	----
		benzo(g,h,i)perylene	191-24-2	E641A-L	0.411 mg/kg	0.5 mg/kg	104	50.0	140	----
		benzo(k)fluoranthene	207-08-9	E641A-L	0.402 mg/kg	0.5 mg/kg	102	50.0	140	----
		chrysene	218-01-9	E641A-L	0.419 mg/kg	0.5 mg/kg	106	50.0	140	----
		dibenz(a,h)anthracene	53-70-3	E641A-L	0.408 mg/kg	0.5 mg/kg	103	50.0	140	----

Sub-Matrix: **Soil/Solid**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%) MS	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 605699) - continued										
VA22B8901-002	SW-2	fluoranthene	206-44-0	E641A-L	0.404 mg/kg	0.5 mg/kg	102	50.0	140	----
		fluorene	86-73-7	E641A-L	0.404 mg/kg	0.5 mg/kg	102	50.0	140	----
		indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.393 mg/kg	0.5 mg/kg	99.4	50.0	140	----
		methylnaphthalene, 1-	90-12-0	E641A-L	0.405 mg/kg	0.5 mg/kg	102	50.0	140	----
		methylnaphthalene, 2-	91-57-6	E641A-L	0.391 mg/kg	0.5 mg/kg	98.9	50.0	140	----
		naphthalene	91-20-3	E641A-L	0.392 mg/kg	0.5 mg/kg	99.2	50.0	140	----
		phenanthrene	85-01-8	E641A-L	0.409 mg/kg	0.5 mg/kg	103	50.0	140	----
		pyrene	129-00-0	E641A-L	0.422 mg/kg	0.5 mg/kg	107	50.0	140	----
		quinoline	91-22-5	E641A-L	0.378 mg/kg	0.5 mg/kg	95.7	50.0	140	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 610692)									
	RM	carbon, inorganic [IC]	----	E354	0.383 %	119	80.0	120	----
Organic / Inorganic Carbon (QCLot: 611750)									
	RM	carbon, total [TC]	----	E351	1.4 %	97.8	80.0	120	----
Metals (QCLot: 605701)									
	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	99.2	70.0	130	----
Metals (QCLot: 605702)									
	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	115	70.0	130	----
	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	114	70.0	130	----
	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	109	70.0	130	----
	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	112	70.0	130	----
	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	116	70.0	130	----
	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	135	40.0	160	----
	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	108	70.0	130	----
	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	113	70.0	130	----
	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	120	70.0	130	----
	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	108	70.0	130	----
	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	108	70.0	130	----
	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	109	70.0	130	----
	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	109	70.0	130	----
	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	110	70.0	130	----
	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	111	70.0	130	----
	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	115	70.0	130	----
	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	108	70.0	130	----
	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	105	70.0	130	----
	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	107	70.0	130	----
	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	121	70.0	130	----
	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	118	70.0	130	----
	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	108	70.0	130	----
	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	110	40.0	160	----

Sub-Matrix:

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report: RM Target Concentration	Recovery (%) RM	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Metals (QCLot: 605702) - continued									
	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	101	70.0	130	----
	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	121	70.0	130	----
	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	118	70.0	130	----
	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	114	70.0	130	----
	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	112	70.0	130	----
	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	90.0	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

ALS www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 920784

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	GOLDER ASSOCIATES LTD
Contact:	Elaine Irving / Connor Pettern
Phone:	+604-297-2030 / 1-604-296-4200
	Company address below will appear on the final report
Street:	Suite 200 - 2920 Virtual Way
City/Province:	Vancouver, BC
Postal Code:	V5M 0C4
Invoice To	Same as Report To ☒ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☒ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax

Email 2

Email 3

Invoice Recipients

Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax

Email 2

Turnaround Time (TAT) Requested

☒ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #:

Job #: GOLD 100-028

PO / AFE: 16037240/64000/03

LSD:

ALS Lab Work Order # (ALS use only): 8901

Oil and Gas Required Fields (client use)

AFE/Cost Center: | PO#

Major/Minor Code: | Routing Code:

Requisitioner:

Location:

ALS Contact: Amber Springer | Sampler: TT

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Particle Size	Moisture	PAH	TOC, TIC	Metals	BTEX/F1	F2-F4	PHC	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	SW-1	09-AUG-22	17:35	Sediment	6	X	X	X	X	X	X	X	X			
	SW-2	05-AUG-22	17:15	Sediment	6	X	X	X	X	X	X	X	X			
	SW-3	07-AUG-22	17:08	Sediment	6	X	X	X	X	X	X	X	X			
	SW-4	07-AUG-22	16:03	Sediment	6	X	X	X	X	X	X	X	X			
	TGT-REF-1	10-AUG-22	12:30	Sediment	6	X	X	X	X	X	X	X	X			
	DUP-A	07-AUG-22		Sediment	6	X	X	X	X	X	X	X	X			

Environmental Division
Vancouver
Work Order Reference
VA22B8901

Telephone : +1 604 253 4188

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☒ NO

Are samples for human consumption/ use? ☐ YES ☒ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☒ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C | FINAL COOLER TEMPERATURES °C: 20°C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: N.O'Brien	Date: 11 AUG 2022	Time: 0730	Received by:	Date:	Time:	Received by: RL	Date: 8/15/22	Time: 8:26

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION   WHITE - LABORATORY COPY   YELLOW - CLIENT COPY

AUG 2020 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

APPENDIX 3D

Sediment Screening Table and QA/QC Results

Table D.1 - Sediment Analytical Results for Milne Port West Transect Sampling Stations
Baffinland 2018-2022

Sample ID / Date Sampled / Time Sampled / Laboratory Sample ID / QA/QC / Parent Sample ID	Lowest Detection Limits	Units	CCME [1] ISQG	CCME [1] PEL	NOAA Sediment Benchmarks T_{20}	NOAA TEL	NOAA ERL	NOAA T_{50}	NOAA PEL	NOAA ERM	NOAA AET	Eco Tox EqP(@1% TOC)
Physical Parameters												
Moisture	0.25	%	-	-	-	-	-	-	-	-	-	-
pH (1:2 soil:water)	0.1	pH units	-	-	-	-	-	-	-	-	-	-
Particle Size												
clay (<0.004mm)	1	%	-	-	-	-	-	-	-	-	-	-
silt (0.063mm - 0.004mm)	1	%	-	-	-	-	-	-	-	-	-	-
sand (2.0mm - 0.063mm)	1	%	-	-	-	-	-	-	-	-	-	-
gravel (>2mm)	1	%	-	-	-	-	-	-	-	-	-	-
Organic / Inorganic Carbon												
carbon, inorganic	0.05	%	-	-	-	-	-	-	-	-	-	-
carbon, total	0.05	%	-	-	-	-	-	-	-	-	-	-
carbon, total organic	0.05	%	-	-	-	-	-	-	-	-	-	-
carbon, inorganic (as CaCO3 equivalent)	0.4	%	-	-	-	-	-	-	-	-	-	-
organic matter	0.1	%	-	-	-	-	-	-	-	-	-	-
Metals												
Aluminum	50	mg/kg	-	-	-	-	-	-	-	-	18000	-
Antimony	0.1	mg/kg	-	-	0.63	-	-	2.4	-	-	9.3	-
Arsenic	0.1	mg/kg	7.24	41.6	7.4	7.24	8.2	20	41.6	70	35	-
Barium	0.5	mg/kg	-	-	-	130.1	-	-	-	-	48	-
Beryllium	0.1	mg/kg	-	-	-	-	-	-	-	-	-	-
Bismuth	0.2	mg/kg	-	-	-	-	-	-	-	-	-	-
Boron	5	mg/kg	-	-	-	-	-	-	-	-	-	-
Cadmium	0.02	mg/kg	0.7	4.2	0.38	0.68	1.2	1.4	4.21	9.6	3	-
Calcium	50	mg/kg	-	-	-	-	-	-	-	-	-	-
Chromium	0.5	mg/kg	52.3	160	49	52.3	81	141	160	370	62	-
Cobalt	0.1	mg/kg	-	-	-	-	-	-	-	-	10	-
Copper	0.5	mg/kg	18.7	108	32	18.7	34	94	108	270	390	-
Iron	50	mg/kg	-	-	-	-	-	-	-	-	220000	-
Lead	0.5	mg/kg	30.2	112	30	30.24	46.7	94	112	218	400	-
Lithium	2	mg/kg	-	-	-	-	-	-	-	-	-	-
Magnesium	20	mg/kg	-	-	-	-	-	-	-	-	-	-
Manganese	1	mg/kg	-	-	-	-	-	-	-	-	260	-
Mercury	0.005	mg/kg	0.13	0.7	0.14	0.13	0.15	0.48	0.7	0.71	0.41	-
Molybdenum	0.1	mg/kg	-	-	-	-	-	-	-	-	-	-
Nickel	0.5	mg/kg	30[(a)]	50[(a)]	15	15.9	20.9	47	42.8	51.6	110	-
Phosphorus	50	mg/kg	-	-	-	-	-	-	-	-	-	-
Potassium	100	mg/kg	-	-	-	-	-	-	-	-	-	-
Selenium	0.2	mg/kg	-	-	-	-	-	-	-	-	1	-
Silver	0.1	mg/kg	1[(a)]	2.2[(a)]	0.23	0.73	1	1.1	1.77	3.7	3.1	-
Sodium	50	mg/kg	-	-	-	-	-	-	-	-	-	-
Strontium	0.5	mg/kg	-	-	-	-	-	-	-	-	-	-
Sulfur	1000	mg/kg	-	-	-	-	-	-	-	-	-	-
Thallium	0.05	mg/kg	-	-	-	-	-	-	-	-	-	-
Tin	2	mg/kg	-	-	-	0.048	-	-	-	-	3.4	-
Titanium	1	mg/kg	-	-	-	-	-	-	-	-	-	-
Tungsten	0.5	mg/kg	-	-	-	-	-	-	-	-	-	-
Uranium	0.05	mg/kg	-	-	-	-	-	-	-	-	-	-
Vanadium	0.2	mg/kg	-	-	-	-	-	-	-	-	57	-
Zinc	2	mg/kg	124	271	94	124	150	245	271	410	410	-
Zirconium	1	mg/kg	-	-	-	-	-	-	-	-	-	-
VOCs												
benzene	0.0050	mg/kg	-	-	-	-	-	-	-	-	-	0.06
ethylbenzene	0.015	mg/kg	-	-	-	-	-	-	-	-	0.004	3.6
toluene	0.050	mg/kg	-	-	-	-	-	-	-	-	-	0.67
styrene												
xylene, m+p-	0.050	mg/kg	-	-	-	-	-	-	-	-	-	0.025
xylene, o-	0.050	mg/kg	-	-	-	-	-	-	-	-	-	-
xylenes, total	0.075	mg/kg	-	-	-	-	-	-	-	-	0.004	-
Hydrocarbons												
F1 (C6-C10)	5.0	mg/kg	-	-	-	-	-	-	-	-	-	-
F1-BTEX	5.0	mg/kg	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	30	mg/kg	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	50	mg/kg	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)	50	mg/kg	-	-	-	-	-	-	-	-	-	-
PAHs												
acenaphthene	0.0050	mg/kg	0.00671	0.0889	0.019	0.007	0.016	0.116	0.089	0.500	0.130	-
acenaphthylene	0.0050	mg/kg	-	-	-	-	-	-	-	-	-	-
acridine	0.0100	mg/kg	-	-	-	-	-	-	-	-	-	-
anthracene	0.0040	mg/kg	0.0469	0.245	0.034	0.0469	0.0853	0.29	0.245	1.1	0.28	-
benz(a)anthracene	0.010	mg/kg	0.0748	0.693	0.061	0.0748	0.261	0.466	0.693	1.6	0.96	-
benzo(a)pyrene	0.010	mg/kg	0.0888	0.763	0.069	0.0888	0.43	0.52	0.763	1.6	1.1	-
benzo(b+j)fluoranthene	0.010	mg/kg	-	-	0.13	-	-	1.107	-	-	1.8	-
benzo(b+j+k)fluoranthene	0.015	mg/kg	-	-	-	-	-	-	-	-	-	-
benzo(g,h,i)perylene	0.010	mg/kg	0.31[(a)]	0.78[(a)]	-	-	-	-	-	-	-	-
benzo(k)fluoranthene	0.010	mg/kg	2.3[(a)]	4.5[(a)]	0.07	-	-	0.537	-	-	1.8	-
chrysene	0.010	mg/kg	0.108	0.846	0.082	0.108	0.384	0.65	0.846	2.8	0.95	-
dibenz(a,h)anthracene	0.0050	mg/kg	0.00622	0.135	0.019	0.00622	0.0634	0.113	0.135	0.26	0.23	-
fluoranthene	0.010	mg/kg	0.113	1.494	0.119	0.113	0.6	1.034	1.494	5.1	1.3	-
fluorene	0.010	mg/kg	0.0212	0.144	0.019	0.0212	0.019	0.114	0.144	0.54	0.12	0.54
indeno(1,2,3-c,d)pyrene	0.010	mg/kg	0.34[(a)]	0.88[(a)]	0.068	-	-	0.488	-	-	0.6	-
methylnaphthalene, 1+2-	0.015	mg/kg	-	-	-	-	-	-	-	-	-	-
methylnaphthalene, 1-	0.010	mg/kg	-	-	0.021	-	-	0.094	-	-	-	-
methylnaphthalene, 2-	0.010	mg/kg	0.0202	0.201	0.021	0.0202	0.07	0.128	0.201	0.67	0.064	-
naphthalene	0.010	mg/kg	0.0346	0.391	0.03	0.0346	0.16	0.217	0.391	2.1	0.23	0.48
phenanthrene	0.010	mg/kg	0.0867	0.544	0.068	0.0867	0.24	0.455	0.544	1.5	0.66	-
pyrene	0.010	mg/kg	0.153	1.398	0.125	0.153	0.665	0.932	1.398	2.6	2.4	-
quinoline	0.010	mg/kg	-	-	-	-	-	-	-	-	-	-
B(a)P total potency equivalents [B(a)P TPE]	0.020	mg/kg	-	-	-	-	-	-	-	-	-	-
IACR (CCME)	0.150	-	-	-	-	-	-	-	-	-	-	-
IACR AB (coarse)	0.10	-	-	-	-	-	-	-	-	-	-	-
IACR AB (fine)	0.10	-	-	-	-	-	-	-	-	-	-	-
PAHs, total (BC Sched 3.4)	0.040	mg/kg	-	-	-	-	-	-	-	-	-	-
PAHs, total (EPA 16 - DAS)	0.140	mg/kg	-	-	-	-	-	-	-	-	-	-
PAHs, total (EPA 16)	0.040	mg/kg	-	-	-	-	-	-	-	-	-	-

Sample ID	SW-1-1	SW-1-2	SW-1-3	SW-3-1 [2]	SW-3-2 [2]	SW-3-3 [2]	SW-3-1	SW-3-2	SW-3-3	SW-4-1	SW-4-2	SW-4-3
Date Sampled	11-Aug-2018	11-Aug-2018	11-Aug-2018	11-Aug-2018	11-Aug-2018	11-Aug-2018	11-Aug-2018	11-Aug-2018	11-Aug-2018	11-Aug-2018	11-Aug-2018	11-Aug-2018
Time Sampled	13:35	13:40	13:45	12:55	13:00	13:05	12:35	12:40	12:45	11:40	11:45	11:50
Laboratory Sample ID	L2148903-1	L2148903-2	L2148903-3	L2148903-4	L2148903-5	L2148903-6	L2148903-7	L2148903-8	L2148903-9	L2148903-10	L2148903-11	L2148903-12
QA/QC	N	N	N	N	N	N	N	N	N	N	N	N
Parent Sample ID												
Physical Parameters												
Moisture	22.2			23.1	-	-	26.9			21.4		
pH (1:2 soil:water)	8.2	8.41	8.3	8.21	8.22	8.22	7.99	8.08	8.25	8.12	8.23	8.06
Particle Size												
clay (<0.004mm)	7.6	<1.0	4.3	5.3	6.7	5.6	7.6	7.4	6.7	4.5	4.1	4.8
silt (0.063mm - 0.004mm)	28.6	2	15.8	23.4	26.8	28.3	40.5	39.9	35	35.3	33.2	32.3
sand (2.0mm - 0.063mm)	60.8	95.4	74.9	62.6	49.9	53.3	46.9	51.4	55.6	55.7	60.3	59.7
gravel (>2mm)	3	1.9	5	8.7	16.5	12.7	5	1.3	2.7	4.4	2.5	3.3
Organic / Inorganic Carbon												
carbon, inorganic	1.13	0.608	0.934	1.14	1.31	1.35	1.25	1.19	1.14	0.983	1.12	1.08
carbon, total				-	-	-						
carbon, total organic		0.44	1.56	2.07	2.54	2.72	3.24	3.09	2.95	3.38	3.1	3.32
carbon, inorganic (as CaCO3 equivalent)				-	-	-						
organic matter				-	-	-						
Metals												
Aluminum	4810	898	3770	4480	5110	5300	5840	5580	4320	4600	4500	4560
Antimony	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Arsenic	3.93	0.47	3.51	4.54	3.85	4.43	10.6	9.63	4.33	4.39	4.37	4.93
Barium	15.6	2.38	11.8	15	16.4	18	20.2	18.7	14.7	14.9	15.7	15.2
Beryllium	0.3	<0.10	0.24	0.28	0.29	0.32	0.37	0.34	0.27	0.4	0.28	0.28
Bismuth	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Boron	32.7	7.4	23.9	30.2	34.5	35	44.5	38.6	29.8	41.6	30.8	31.4
Cadmium	0.048	<0.020	0.022	0.034	0.084	0.041	0.029	0.029	0.056	<0.020	<0.020	0.026
Calcium	63800	16800	45600	60500	70400	66900	88500	75200	69700	110000	75000	74700
Chromium	17.8	3.57	12.5	16.2	17.1	17.7	21.7	19.2	15.5	17.6	16.9	16.4
Cobalt	2.92	0.58	2.32	2.83	2.92	3.1	3.63	3.47	2.59	3.08	2.97	3.13
Copper	5.63	0.96	4.25	4.71	5.6	5.76	7.22	6.35	4.97	6.1	5.77	6.47
Iron	11900	2230	10700	12700	10900	12800	16300	14900	10800	13900	13000	14000
Lead	4.31	0.93	3.37	3.78	4.42	4.49	4.86	4.54	3.75	5.2	3.77	3.7
Lithium	22.5	4.4	16.5	20.7	22.1	23.6	29	25.6	20.2	33	23.3	23.4
Magnesium	34700	9730	23100	30900	32900	33800	48500	39900	32700	46300	39700	40300
Manganese	113	24.2	100	118	117	125	158	148	110	149	136	156
Mercury	0.009	<0.0050	0.0061	0.007	0.0097	0.0094	0.0085	0.009	0.0071	0.0071	0.0084	0.007
Molybdenum	0.37	0.12	0.3	0.38	0.33	0.39	0.54	0.35	0.28	0.68	0.3	0.39
Nickel	9.31	1.9	6.85	8.54	9.29	9.62	11	10.3	8.08	9.06	8.79	8.64
Phosphorus	394	109	361	402	463	506	1020	1040	494	668	640	720
Potassium	2210	410	1660	2170	2320	2320	2770	2430	1930	2080	2020	2080
Selenium	0.21	<0.20	<0.20	<0.20	0.22	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Silver	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sodium	4070	854	2700	3380	4410	2850	5560	4420	2720	3520	4050	4820
Strontium	41.8	9.54	29.9	45.6	76.9	46.8	66.1	57.7	47.6	65.4	44.2	46.9
Sulfur	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Thallium	0.096	<0.050	0.076	0.093	0.094	0.102	0.11	0.099	0.075	0.119	0.081	0.085
Tin	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Titanium	256	55.4	209	288	256	278	321	276	228	261	253	250
Tungsten	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Uranium	0.687	0.162	0.62	0.617	0.694	0.746	0.774	0.753	0.662	0.907	0.742	0.713
Vanadium	19.3	3.44	14.2	17.1	19.3	19.6	23.2	21	16.5	16.4	15.9	15.8
Zinc	14.3	2.8	12.1	13.5	14.3	15.6	15.6	15.3	11.7	12.5	11.8	12.7
Zirconium	4.9	1	3.6	4.4	4.1	4.4	5.9	5.2	4.3	6.7	4.4	3.5
VOCs												
benzene	<0.0050			<0.0050	-	-	<0.0050			<0.0050		
ethylbenzene	<0.015			<0.015	-	-	<0.015			<0.015		
toluene	<0.050			<0.050	-	-	<0.050			<0.050		
styrene	<0.050						<0.050			<0.050		
xylene, m+p-	<0.050			<0.050	-	-	<0.050			<0.050		
xylene, o-	<0.050			<0.050	-	-	<0.050			<0.050		
xylenes, total	<0.075			<0.075	-	-	<0.075			<0.075		
Hydrocarbons												
F1 (C6-C10)				-	-	-						
F1-BTEX				-	-	-						
F2 (C10-C16)				-	-	-						
F3 (C16-C34)				-	-	-						
F4 (C34-C50)				-	-	-						
PAHs												
acenaphthene	<0.0050			<0.0050	-	-	<0.0050			<0.0050		
acenaphthylene	<0.0050			-	-	-	<0.0050			<0.0050		
acridine				-	-	-						
anthracene	<0.0040			<0.0040	-	-	<0.0040			<0.0040		
benz(a)anthracene	<0.010			<0.010	-	-	<0.010			<0.010		
benzo(a)pyrene	<0.010			<0.010	-	-	<0.010			<0.010		
benzo(b+j)fluoranthene	<0.010			<0.010	-	-	<0.010			<0.010		
benzo(b+j+k)fluoranthene	<0.015			<0.015	-	-	<0.015			<0.015		
benzo(g,h,i)perylene	<0.010			<0.010	-	-	<0.010			<0.010		
benzo(k)fluoranthene	<0.010			<0.010	-	-	<0.010			<0.010		
chrysene	<0.010			<0.010	-	-	<0.010			<0.010		
dibenz(a,h)anthracene	<0.0050			<0.0050	-	-	<0.0050			<0.0050		
fluoranthene	<0.010			<0.010	-	-	<0.010			<0.010		
fluorene	<0.010			<0.010	-	-	<0.010			<0.010		
indeno(1,2,3-c,d)pyrene	<0.010			<0.010	-	-	<0.010			<0.010		
methylnaphthalene, 1+2-				-	-	-						
methylnaphthalene, 1-	<0.050			<0.050	-	-	<0.050			<0.050		
methylnaphthalene, 2-	<0.010			<0.010	-	-	<0.010			<0.010		
naphthalene	<0.010			<0.010	-	-	<0.010			<0.010		
phenanthrene	<0.010			<0.010	-	-	<0.010			<0.010		
pyrene	<0.010			<0.010	-	-	<0.010			<0.010		
quinoline	<0.050			<0.050	-	-	<0.050			<0.050		
B(a)P total potency equivalents [B(a)P TPE]	<0.020			<0.020	-	-	<0.020			<0.020		
IACR (CCME)	<0.15			<0.15	-	-	<0.15			<0.15		
IACR AB (coarse)				-	-	-						
IACR AB (fine)				-	-	-						
PAHs, total (BC Sched 3.4)				-	-	-						
PAHs, total (EPA 16 - DAS)				-	-	-						
PAHs, total (EPA 16)				-	-	-						

Sample ID	SW-1	SW-2	SW-3	SW-4	SW-1	SW-2	SW-3	SW-4	SW-2	SW-1	SW-2	SW-3	SW-4
Date Sampled	27-Sep-2019	27-Sep-2019	27-Sep-2019	27-Sep-2019	5-Aug-2020	5-Aug-2020	5-Aug-2020	6-Aug-2020	14-Aug-2021	09-Aug-2022	05-Aug-2022	07-Aug-2022	07-Aug-2022
Time Sampled	8:50	10:25	11:35	14:30	0:00	0:00	0:00	0:00	13:15	17:35	17:15	17:08	16:03
Laboratory Sample ID	L2359868-1	L2359868-3	L2359868-4	L2359868-5	L2487428-1	L2487428-2	L2487428-3	L2487428-4	VA21B7543-004	VA22B8901-001	VA22B8901-002	VA22B8901-003	VA22B8901-004
QA/QC	N	N	N	N	N	N	N	N	FDA	N	N	FDA	N
Parent Sample ID													
Physical Parameters													
Moisture	16.4	22.6	26.3	24.6	17.2	18.10	20.50	21.90	14.7	13.8	17.9	18.5	24.7
pH (1:2 soil:water)	8.48	8.25	8	8.19	8.37	8.98	8.51	8.41	8.90	9	8.57	8.74	7.9
Particle Size													
clay (<0.004mm)	2.3	3.3	7.1	7.5	2	<1.0	5.6	4.8	<1.0	<1.0	2.8	<1.0	5.5
silt (0.063mm - 0.004mm)	8.1	11.2	29.5	29.2	7.7	2.7	23.7	24.6	2.6	1.6	8.1	3.6	22.8
sand (2.0mm - 0.063mm)	82.9	83	57.3	56.6	68.7	95.7	68.7	49.8	88.5	83.2	80.4	85.9	62.5
gravel (>2mm)	6.7	2.5	6.1	6.7	21.6	<1.0	2.1	20.7	8.9	15.2	8.7	10.5	9.2
Organic / Inorganic Carbon													
carbon, inorganic	1.02	0.947	1.69	1.66	1.62	1.04	1.67	1.87	0.936	1.3	1.55	1.04	1.98
carbon, total	1.87	2.22	4.58	4.19	3.63	2.1	4.2	5.0	1.27	1.44	1.75	1.13	3.79
carbon, total organic	0.85	1.27	2.89	2.53	2.01	1.06	2.53	3.08	0.334	<0.200	<0.236	<0.162	1.81
carbon, inorganic (as CaCO3 equivalent)	8.52	7.89	14.1	13.8	13.5	8.63	13.90	15.60	7.80	10.9	13	8.69	16.5
organic matter		-				-			0.58	<0.20	<0.24	<0.16	3.12
Metals													
Aluminum	1840	2570	4490	5040	2250	1710	4510	4150	8860	1080	2580	1720	4550
Antimony	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Arsenic	1.76	2.6	3.9	4.45	2.56	0.51	3.11	3.64	2.83	0.63	1.62	0.82	4.93
Barium	7.12	9.26	15.3	16.8	8.76	5.11	15.50	14.00	32.2	2.3	8.35	4.69	15.7
Beryllium	0.12	0.17	0.28	0.31	0.15	0.10	0.27	0.27	0.56	<0.10	0.18	0.11	0.3
Bismuth	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Boron	10.8	16	29.1	32.7	15.6	9.9	28.5	29.5	35.1	8.6	19.5	11	32.9
Cadmium	<0.020	<0.020	0.023	0.031	<0.020	<0.020	0.038	0.036	0.098	<0.020	0.025	<0.020	**0.388**
Calcium	26200	36100	62700	66000	32600	22100	64700	70800	9550	32300	35100	19200	61800
Chromium	7.03	10.2	16.5	17.6	8.55	7.02	16.90	15.50	16.0	5.32	9.46	6.71	15.9
Cobalt	1.23	1.72	2.82	3.05	1.6	1.23	3.12	2.73	4.28	0.88	1.57	1.15	3.06
Copper	2.35	3.15	5.38	5.67	2.78	1.54	5.56	5.43	9.24	1.21	2.61	5.66	4.88
Iron	6750	8500	12300	13300	8360	3610	11300	11800	14400	9750	7140	4890	13800
Lead	1.75	2.35	4.51	4.24	2.1	1.26	3.73	3.77	7.33	1.09	2.36	1.31	3.69
Lithium	7.5	11.1	19.9	21.8	9.2	6.9	18.2	18.3	17.8	4.9	11.3	6.9	19.8
Magnesium	13600	20700	32900	37600	16100	12200	30300	34800	10000	13200	18200	9400	27400
Manganese	56.3	80	124	134	70.6	43.8	119.0	113.0	99.4	45.4	63.8	45.1	143
Mercury	<0.0050	<0.0050	0.0087	0.0087	<0.0050	<0.0050	0.0073	0.0071	<0.0050	<0.0050	<0.0050	<0.0050	0.009
Molybdenum	0.14	0.2	0.34	0.34	0.18	0.20	0.32	2.13	1.66	0.22	0.22	0.14	0.42
Nickel	3.91	5.3	9.14	9.48	4.81	4.56	9.57	8.59	11.2	4.08	4.65	3.5	8.57
Phosphorus	204	340	438	431	265	135	308	416	483	124	214	153	499
Potassium	820	1240	2020	2240	1040	770	2040	1770	2590	380	1160	840	2240
Selenium	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.22
Silver	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sodium	2110	2300	3370	3920	3130	2150	3940	3600	6770	574	1720	1560	4470
Strontium	18.6	23.8	38	41	19.7	14.0	40.3	44.1	26.6	17.4	20.8	13	64.2
Sulfur	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	2500	<1000	<1000	<1000	<1000
Thallium	<0.050	0.053	0.092	0.088	0.05	<0.050	0.098	0.081	0.115	<0.050	<0.050	<0.050	0.106
Tin	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Titanium	119	172	280	264	150	136	289	220	256	86.2	135	121	269
Tungsten	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Uranium	0.314	0.45	0.717	0.692	0.413	0.250	0.616	0.609	1.78	0.299	0.419	0.278	0.599
Vanadium	7.57	10.4	17.6	19.5	9.14	6.10	17.90	17.00	22.3	5.65	9.84	5.55	17
Zinc	8.2	8.9	13.8	14.1	11.7	5.9	16.1	13.4	26.9	4.2	8.2	6.5	16.1
Zirconium	1.9	2.9	4.5	4.8	2.3	1.7	4.3	3.9	8.6	1.2	2.5	1.3	3
VOCs													
benzene	<0.0050	<0.0050	<0.0050	<0.0050		< 0.0050			<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
ethylbenzene	<0.015	<0.015	<0.015	<0.015		< 0.050			<0.015	<0.015	<0.015	<0.015	<0.015
toluene	<0.050	<0.050	<0.050	<0.050		< 0.015			<0.050	<0.050	<0.050	<0.050	<0.050
styrene	<0.050	<0.050	<0.050	<0.050									
xylene, m+p-	<0.050	<0.050	<0.050	<0.050		< 0.050			<0.050	<0.050	<0.050	<0.050	<0.050
xylene, o-	<0.050	<0.050	<0.050	<0.050		< 0.050			<0.050	<0.050	<0.050	<0.050	<0.050
xylenes, total	<0.075	<0.075	<0.075	<0.075		< 0.075			<0.075	<0.075	<0.075	<0.075	<0.075
Hydrocarbons													
F1 (C6-C10)		<10				< 10			<5.0	<5.0	<5.0	<5.0	<5.0
F1-BTEX		-				< 10			<5.0	<5.0	<5.0	<5.0	<5.0
F2 (C10-C16)		-				< 30			<30	<30	<30	<30	<30
F3 (C16-C34)		-				< 50			<50	<50	<50	<50	<50
F4 (C34-C50)		-				< 50			<50	<50	<50	<50	<50
PAHs													
acenaphthene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
acenaphthylene	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.0050
acridine		-							-	<0.010	<0.010	<0.010	<0.010
anthracene	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
benz(a)anthracene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
benzo(a)pyrene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
benzo(b+j)fluoranthene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
benzo(b+j+k)fluoranthene	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
benzo(g,h,i)perylene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
benzo(k)fluoranthene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
chrysene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
dibenz(a,h)anthracene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
fluoranthene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
fluorene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
indeno(1,2,3-c,d)pyrene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
methylnaphthalene, 1+2-									<0.015	<0.015	<0.015	<0.015	<0.015
methylnaphthalene, 1-	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
methylnaphthalene, 2-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
naphthalene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
phenanthrene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
pyrene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
quinoline	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	<0.010	<0.010	<0.010
B(a)P total potency equivalents [B(a)P TPE]	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
IACR (CCME)	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.150	<0.150	<0.150	<0.150	<0.150
IACR AB (coarse)		-				-			<0.10	<0.10	<0.10	<0.10	<0.10
IACR AB (fine)		-				-			<0.10	<0.10	<0.10	<0.10	<0.10
PAHs, total (BC Sched 3.4)		-				-			<0.040	<0.040	<0.040	<0.040	<0.040
PAHs, total (EPA 16 - DAS)		-				-			<0.140	<0.140	<0.140	<0.140	<0.140
PAHs, total (EPA 16)		-				-			<0.040	<0.040	<0.040	<0.040	<0.040

Notes

[1] Canadian Council of Ministers of the Environment (CCME). 1999. Canadian Sediment Quality Guidelines for the Protection of Aquatic Life. In: Canadian Environmental Quality Guidleines, 1999, Canadian Council of Ministers of the Environment, Winnipeg, MB.

[(a)] Guideline value substituted with the BC ENV Working Sediment Guideline in the absence of an applicable CCME Sediment Guideline

[2] The 2021 report erroneously reported particle size results for SW-2 but the sampling station reported coincides with the SW-3 station. The error was due to the 2019 study design modifications.

AB = Alberta; B(a)P TPE) = Benzo[a]pyrene Total Potency Equivalents; BC ENV = British Columbia Ministry of Environment; BTEX = benzene, toluene, ethylbenzene, and xylene; $CaCO_3$ = calcium carbonate; CCME = Canadian Council of Miniters of the Environment; DAS = Disposal at Sea; EPA = United States Environmental Protection Agency; F1-F4 = petroleum hydrcarbon fractions; IACR = index of additive cancer risk; ISQG = interim sediment quality guidelines; mg/kg = miligram per kilogram; mm = millimetre; NOAA = National Oceanic and Atmospheric Administration; PAH = polycyclic aromatic hydrocarbons; PEL = Probable Effect Levels; pH = scale of acidity; % - percentage; REL = Effect Range Low; SWQG = working sediment quality guidelines; T20 = Concentrations corresponding to 20% probability of observing toxicity; TEL= Threshold Effects Levels; T50 = Concentrations corresponding to 50% probably of observing toxicity; VOC = volatile organic carbons; < = below detection limit; > = greater than; "-" = no value or no result available

Value	Greater than CCME ISQG guideline
Value	Greater than CCME ISQG and PEL guidelines
Value	Greater than NOAA sediment Benchmarks T_{20} guideline
Value	Greater than NOAA sediment Benchmarks TEL guideline
Value	Greater than NOAA sediment Benchmarks ERLguideline
Value	Greater than NOAA sediment Benchmarks T_{50} guideline
Value	Greater than NOAA sediment Benchmarks PEL guideline
Value	Greater than NOAA sediment Benchmarks ERM guideline
Value	Greater than NOAA sediment Benchmarks AET guideline

Sample ID	Lowest Detection Limits	SW-2	DUP A	Relative Percent Difference (RPD)	SW-3	DUP-A	Relative Percent Difference (RPD)
Date Sampled		14-Aug-2021	14-Aug-2021		07-Aug-2022	07-Aug-2022	
Time Sampled		13:15	00:00		17:08	00:00	
Laboratory Sample ID		VA21B7543-004	VA21B7543-005		VA22B8901-003	VA22B8901-006	
QA/QC		FDA	FD		FDA	FD	
Parent Sample ID			SW-2			SW-3	
Physical Parameters							
Moisture	0.25	14.7	14.4	2%	18.5	22.2	18%
pH (1:2 soil:water)	0.1	8.90	8.89	0%	8.74	8.82	1%
Particle Size							
clay (<0.004mm)	1	<1.0	<1.0	NA	<1.0	1	NA
silt (0.063mm - 0.004mm)	1	2.6	2.2	NA	3.6	2.8	NA
sand (2.0mm - 0.063mm)	1	88.5	87.2	1%	85.9	89	4%
gravel (>2mm)	1	8.9	10.6	17%	10.5	7.2	37%
Organic / Inorganic Carbon							
carbon, inorganic	0.05	0.936	0.811	14%	1.04	1.05	1%
carbon, total	0.05	1.27	1.11	13%	1.13	1.16	3%
carbon, total organic	0.05	0.334	0.299	11%	<0.162	<0.165	NA
carbon, inorganic (as CaCO3 equivalent)	0.4	7.80	6.76	14%	8.69	8.75	1%
organic matter	0.1	0.58	0.52	11%	<0.16	<0.16	NA
Metals							
Aluminum	50	8860	1450	**144%**	1720	1380	22%
Antimony	0.1	<0.10	<0.10	NA	<0.10	<0.10	NA
Arsenic	0.1	2.83	0.44	**146%**	0.82	0.72	13%
Barium	0.5	32.2	4.46	**151%**	4.69	4.58	2%
Beryllium	0.1	0.56	<0.10	NA	0.11	<0.10	NA
Bismuth	0.2	<0.20	<0.20	NA	<0.20	<0.20	NA
Boron	5	35.1	9.1	**118%**	11	8.9	NA
Cadmium	0.02	0.098	<0.020	NA	<0.020	<0.020	NA
Calcium	50	9550	23500	**84%**	19200	20700	8%
Chromium	0.5	16.0	5.70	**95%**	6.71	5.24	25%
Cobalt	0.1	4.28	0.97	**126%**	1.15	0.98	16%
Copper	0.5	9.24	1.16	**155%**	5.66	1.38	**122%**
Iron	50	14400	3050	**130%**	4890	3700	28%
Lead	0.5	7.33	1.06	**149%**	1.31	1.1	NA
Lithium	2	17.8	6.2	**97%**	6.9	6.2	NA
Magnesium	20	10000	11200	11%	9400	9680	3%
Manganese	1	99.4	39.4	**86%**	45.1	42.3	6%
Mercury	0.005	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA
Molybdenum	0.1	1.66	0.11	**175%**	0.14	0.11	NA
Nickel	0.5	11.2	2.99	**116%**	3.5	2.82	22%
Phosphorus	50	483	80	**143%**	153	189	NA
Potassium	100	2590	740	**111%**	840	670	23%
Selenium	0.2	<0.20	<0.20	NA	<0.20	<0.20	NA
Silver	0.1	<0.10	<0.10	NA	<0.10	<0.10	NA
Sodium	50	6770	1520	**127%**	1560	742	**71%**
Strontium	0.5	26.6	15.2	**55%**	13	13.2	2%
Sulfur	1000	2500	<1000	NA	<1000	<1000	NA
Thallium	0.05	0.115	<0.050	NA	<0.050	<0.050	NA
Tin	2	<2.0	<2.0	NA	<2.0	<2.0	NA
Titanium	1	256	110	**80%**	121	99.9	19%
Tungsten	0.5	<0.50	<0.50	NA	<0.50	<0.50	NA
Uranium	0.05	1.78	0.213	**157%**	0.278	0.267	4%
Vanadium	0.2	22.3	4.91	**128%**	5.55	4.65	18%
Zinc	2	26.9	4.8	**139%**	6.5	5	NA
Zirconium	1	8.6	1.5	**141%**	1.3	1.2	NA
VOCs							
benzene	0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA
ethylbenzene	0.015	<0.015	<0.015	NA	<0.015	<0.015	NA
toluene	0.050	<0.050	<0.050	NA	<0.050	<0.050	NA
xylene, m+p-	0.050	<0.050	<0.050	NA	<0.050	<0.050	NA
xylene, o-	0.050	<0.050	<0.050	NA	<0.050	<0.050	NA
xylenes, total	0.075	<0.075	<0.075	NA	<0.075	<0.075	NA
Hydrocarbons							
F1 (C6-C10)	5.0	<5.0	<5.0	NA	<5.0	<5.0	NA
F1-BTEX	5.0	<5.0	<5.0	NA	<5.0	<5.0	NA
F2 (C10-C16)	30	<30	<30	NA	<30	<30	NA
F3 (C16-C34)	50	<50	<50	NA	<50	<50	NA
F4 (C34-C50)	50	<50	<50	NA	<50	<50	NA
PAHs							
acenaphthene	0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA
acenaphthylene	0.0050	-	-	NA	<0.0050	<0.0050	NA
acridine	0.010	-	-	NA	<0.010	<0.010	NA
anthracene	0.0040	<0.0040	<0.0040	NA	<0.0040	<0.0040	NA
benz(a)anthracene	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
benzo(a)pyrene	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
benzo(b+j)fluoranthene	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
benzo(b+j+k)fluoranthene	0.015	<0.015	<0.015	NA	<0.015	<0.015	NA
benzo(g,h,i)perylene	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
benzo(k)fluoranthene	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
chrysene	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
dibenz(a,h)anthracene	0.0050	<0.0050	<0.0050	NA	<0.0050	<0.0050	NA
fluoranthene	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
fluorene	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
indeno(1,2,3-c,d)pyrene	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
methylnaphthalene, 1+2-	0.015	<0.015	<0.015	NA	<0.015	<0.015	NA
methylnaphthalene, 1-	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
methylnaphthalene, 2-	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
naphthalene	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
phenanthrene	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
pyrene	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
quinoline	0.010	<0.010	<0.010	NA	<0.010	<0.010	NA
B(a)P total potency equivalents [B(a)P TPE]	0.020	<0.020	<0.020	NA	<0.020	<0.020	NA
IACR (CCME)	0.150	<0.150	<0.150	NA	<0.150	<0.150	NA
IACR AB (coarse)	0.10	<0.10	<0.10	NA	<0.10	<0.10	NA
IACR AB (fine)	0.10	<0.10	<0.10	NA	<0.10	<0.10	NA
PAHs, total (BC Sched 3.4)	0.040	<0.040	<0.040	NA	<0.040	<0.040	NA
PAHs, total (EPA 16 - DAS)	0.140	<0.140	<0.140	NA	<0.140	<0.140	NA
PAHs, total (EPA 16)	0.040	<0.040	<0.040	NA	<0.040	<0.040	NA

Notes

AB = Alberta; B(a)P TPE) = Benzo[a]pyrene Total Potency Equivalents; BC = British Columbia; BTEX = benzene, toluene, ethylbenzene, and xylene; $CaCO_3$ = calcium carbonate; CCME = Canadian Council of Ministers of the Environment; DAS = Disposal at Sea; EPA = United States Environmental Protection Agency; F1-F4 = petroleum hydrcarbon fractions; FDA = field duplicate available; IACR = index of additive cancer risk; ID = identification; mg/kg = miligram per kilogram; mm = millimetre; NA = not applicable; PAH = Polycyclic Aromatic Hydrocarbons; QA/QC = quality assurance / quality control; RPD = Relative Percent Difference; % = percent, < = below detection limit; > = greater than; - = no data

Bold values indicate an exceedance of the acceptable RPD of 50%.

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REPORT

Chapter 4.0 Benthic Infauna

2022 Milne Port Marine Environmental Effects Monitoring Program (MEEMP) and Non-Indigenous Species and Aquatic Invasive Species (NIS/AIS) Monitoring Program

Submitted to:

Baffinland Iron Mines Corporation

2275 Upper Middle Road East, Suite 300
Oakville, ON L6H 0C3

Submitted by:

WSP Canada Inc.

3600 Uptown Boulevard, Suite 301, Victoria, British Columbia, V8Z 0B9, Canada

1663724-430d-R-Rev0-64000

28 April 2023

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FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Definitions
Biologica	Biologica Environmental Services Ltd.
cm	Centimetre
FEIS	Final Environmental Impact Statement
HDPE	High-density polyethylene
L	Litre
mm	Millimetre
m^2	Square metres
MEEMP	Marine Environmental Effects Monitoring Program
NIRB	Nunavut Impact Review Board
NIS/AIS	Non-Indigenous and Aquatic Invasive Species
Org/m^2	Organisms per squared meter
PC	Project Certificate
p_i	Proportion of the i^{th} taxon
%	Percent
QA/QC	Quality Assurance/Quality Control
QIA	Qikiqtani Inuit Association
S	Total number of taxa
SDI	Simpson's Diversity Index
SEI	Simpson's Evenness Index
SW	West Transect
x	Magnification factor
±	Plus or minus

4.0 BENTHIC INFAUNA

4.1 Introduction

The 2022 benthic infaunal sampling program for the Marine Environmental Effects Monitoring Program (MEEMP) focused on targeted sampling stations SW-1 through SW-4, located along the West transect between the Ore Dock and the mouth of Phillips Creek. Rationale for targeted sampling at these stations dates back to 2020, where SW-2 was considered an outlier in the 2020 data in terms of sediment and benthic community composition.

The 2020 data suggested that there may have been localized physical disturbance at station SW-2, potentially due at least in part to propeller-generated currents from tug-assisted berthing activities. Based on 2021 results the benthic infauna community appeared to rebound from this disturbance, evidenced by substantial increases in monitoring metrics such as density, taxa richness and diversity. Accordingly, this station (and, in 2022, surrounding stations) were flagged for targeted sampling to continue to monitor at SW-2 for signs of recovery and characterize variability in benthic infauna present at stations surrounding SW-2.

This component was developed in consideration of the monitoring requirements outlined in the Project Certificate (PC) 005 Conditions described in Chapter 1.0, Table 1-2. PC Conditions related to the benthic infaunal monitoring include PC Conditions Nos. 76, 87, 99(a), 99(c), and 126.

4.1.1 Objectives

The MEEMP objectives are outlined in Section 1.3 of Chapter 1.0 (Program Overview). The objectives specific to the 2022 benthic infaunal sampling program are:

- Conduct targeted sampling of benthic infauna communities at station SW-2, as well as nearby stations SW-1, SW-3, and SW-4 to better understand natural variability and the localized physical disturbance at SW-2 in 2020.
- Monitor for signs of recovery in the benthic community at SW-2 relative to values observed in 2020.
- Verify predictions made in the Final Environmental Impact Statement (FEIS) and subsequent addenda to the Nunavut Impact Review Board (NIRB) regarding effects on benthic infauna communities, as applicable.
- Recommend any necessary and appropriate changes to the benthic infauna component of the MEEMP for future years.

4.2 Study Design

4.2.1 Background

After three consecutive years of implementation, the joint radial benthic and sediment sampling program was not conducted in 2021; rather, targeted sampling effort focused on a single station, SW-2, from which anomalous results in benthic community indices were reported. The decision to scale-back the program was based on the lack of directional trends observed to date across all indicators (with the exception of SW-2), which indicated that the Project has not adversely impacted benthic communities in Milne Inlet. While it is recognized that the radial sampling program was not completed to its full extent in 2019 due to logistical challenges, the power analysis (Appendix 3E in MEEMP 2021; Golder 2022) confirms that in 2019 and 2020 there was adequate statistical power to be able to detect potential Project-related changes. Baffinland is committed to continued implementation of the full-scale radial benthic and sediment sampling program with an adjusted monitoring frequency of every 3 years, which is consistent with routine biological sampling for other mining effects monitoring programs (e.g., the federal Environmental Effects Monitoring Program). The next monitoring year for the full-scale joint radial benthic and sediment sampling program will be in 2023.

In 2020, station SW-2 stood out as an outlier with substantially reduced performance indicators (e.g., density, diversity) and a coarser sediment composition relative to other stations along the West transect and compared to previous years. While it is plausible that this result simply reflects the variability inherent in a dynamic environment, it may also reflect localized physical disturbance at station SW-2 in 2020 resulting from propeller-generated currents (propeller wash) from Project vessels. The 2021 results showed increases in monitoring metrics such as density, taxa richness and diversity of the benthic community at station SW-2. Accordingly, this station (and, in 2022, surrounding stations) were flagged for targeted sampling to continue monitoring for signs of recovery and to better characterize variability in benthic infauna.

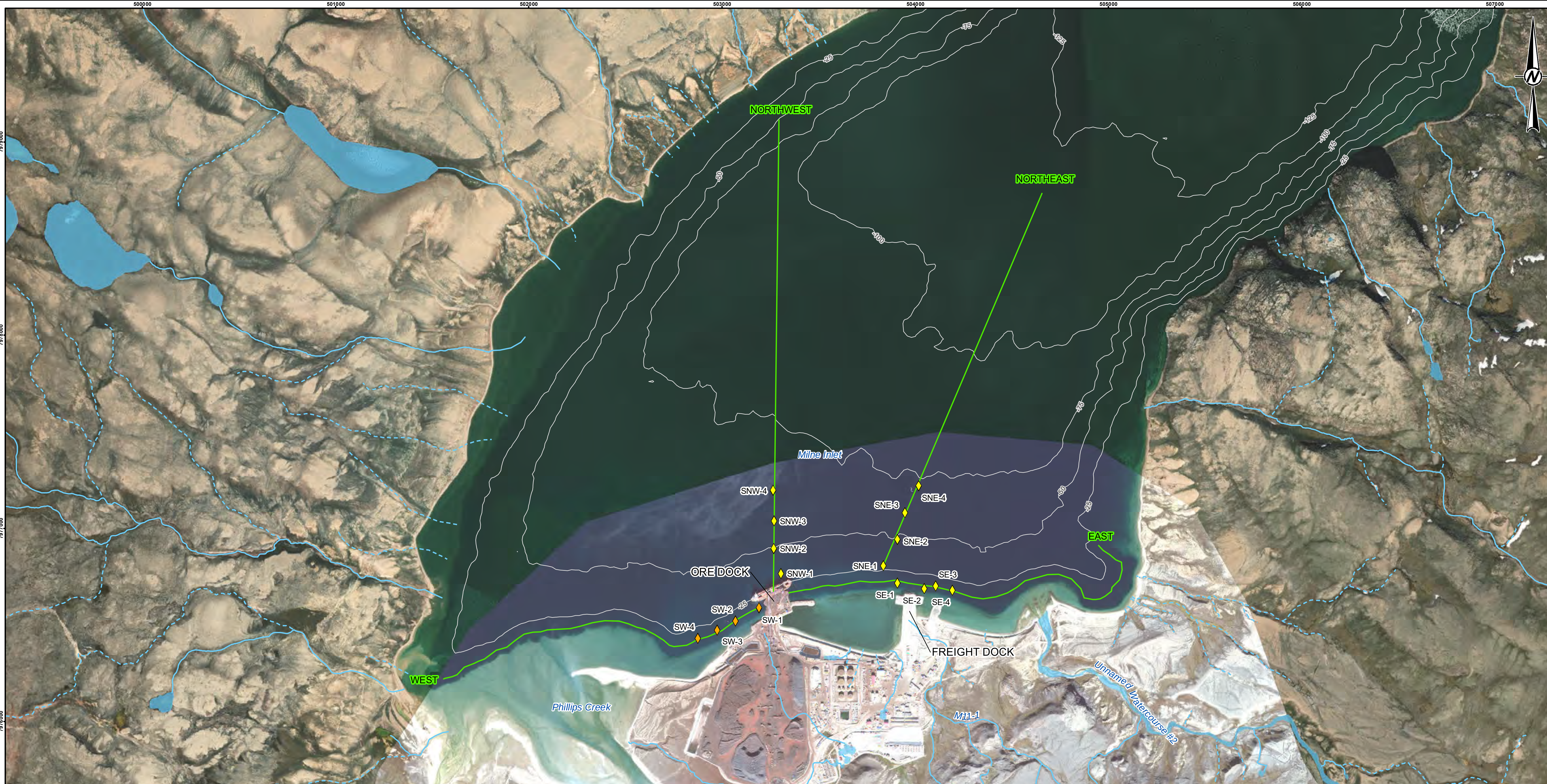
4.2.2 Modifications to the Program (2022)

For a second year, the 2022 benthic infaunal sampling program for the MEEMP focused on targeted sampling at station SW-2, along with adjacent stations along the West transect between the Ore Dock and the mouth of Phillips Creek (SW-1, SW-3, and SW-4). The additional stations were added to better characterize natural variation and, hence, contextualize results as well as to expand monitoring for the evaluation of sediment grain size in relation to benthic community indicators.

In 2022, benthic infauna samples were also collected from 12 other stations for the Non-Indigenous and Aquatic Invasive Species (NIS/AIS) monitoring program. Overall, infauna data from a total of 16 stations including SW-1, SW-2, SW-3, and SW-4 were analyzed under the NIS/AIS program (Figure 4-1; see Chapter 8.0).

4.2.3 Indicators

Indicators and thresholds for the MEEMP program are described in Section 1.4.2. Performance indicators selected to evaluate potential Project-induced changes in benthic infauna communities include density, taxa richness (number of unique taxa present), Simpson’s Diversity Index (SDI), and Simpson’s Evenness Index (SEI). These indicators are described in detail in Section 4.3.2.2.



LEGEND

◆ (yellow)	BENTHIC INFAUNA NIS/AIS MONITORING STATIONS		BATHYMETRIC CONTOUR (25 m INTERVAL)
◆ (orange)	CO-LOCATED SEDIMENT QUALITY AND BENTHIC INFAUNA STATIONS		INTERMITTENT WATERCOURSE
	BENTHIC INFAUNA AND SEDIMENT SAMPLING TRANSECT		WATERCOURSE
			WATERBODY

0 500 1,000

1:20,000 METRES

REFERENCE(S)
BATHYMETRY CREATED BY GOLDER FROM MULTIPLE DATA SOURCES. FREIGHT DOCK DATA PROVIDED BY HATCH, MARCH 4, 2020. ADDITIONAL MILNE PORT INFRASTRUCTURE DATA OBTAINED FROM CLIENT, MAY 2, 2020 AND MAY 28, 2018. HYDROGRAPHY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. MILNE PORT IMAGERY CAPTURED AUGUST 2020 © 2020 DIGITAL GLOBE, INC. ADDITIONAL IMAGERY COPYRIGHT © 20190802 ESRI AND ITS LICENSORS. SOURCE: MAXAR VIVID. USED UNDER LICENSE, ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 17 DATUM: NAD 83

CLIENT
BAFFINLAND IRON MINES CORPORATION

PROJECT
MARY RIVER PROJECT

CONSULTANT

YYYY-MM-DD	2023-04-27
DESIGNED	KSW
PREPARED	AA
REVIEWED	AL
APPROVED	AL

TITLE
MEEMP SAMPLING STATIONS FOR MARINE SEDIMENT QUALITY AND BENTHIC INFAUNA 2022

PROJECT NO.	CONTROL	REV.	FIGURE
166372401	64000-04	0	4-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

PATH: I:\2016\1663724\Mapping\MXD\64000_2022_MEEMP\166372401_64000_04_Fig4_1_Sediment_Benthic_Sampling_Rev0.mxd PRINTED ON: 2023-04-27 AT: 2:34:59 PM

4.3 Materials and Methods

4.3.1 Field Methodology

The 2022 targeted sampling program involved the collection of benthic infauna samples from SW-1, SW-2, SW-3 and SW-4 (Table 3-1 of Chapter 3.0; Figure 4-1) along with a co-located sediment sample. The benthic sample was collected as a composite of three individual grabs using a standard Van Veen sampler with a surface area of 0.1 m^2. Each grab sample was examined for acceptability using the criteria outlined in Section 3.3.1 and, upon acceptance, the three individual grab samples were split using a field splitter purpose-built for this program due to the large volume of the Van Veen sampler.

The composite material was gently rinsed with filtered seawater through a 1-cm mesh sieve to initially remove larger organisms that could otherwise become damaged when the composite material was subsequently filtered through a 0.5 mm mesh sieve. The 1-cm sieved sample was either retained as a whole sample, or further split into ½ or ¼, such that a reasonable volume would be submitted to the taxonomy laboratory. Large debris, such as gravel and cobble, were checked for encrusting fauna and included in the sample jar if potential encrusting epifauna were observed. The 1-cm mesh sieved composited material was further split in half, totalling a ¼ field split. The ¼ field split sample was retained and transferred to an aluminum sieving table. The sample was gently rinsed through a 0.5-mm mesh sieve with filtered seawater. A representative photograph was taken of the sieved sample, including a visible sample label (Appendix 4B). Remaining material on the sieve was placed in pre-labeled 1-L wide-mouth high-density polyethylene (HDPE) sample jars and preserved in a 10% buffered formalin solution. The containers were then sealed and inverted several times to promote homogenization with the formalin. Containers were labeled internally and externally with water-resistant labels. The four benthic samples were sent to Biologica Environmental Services Ltd. (Biologica) for sorting and taxonomic identifications, as per the previous MEEMP programs. Details on laboratory methods are provided in Appendix 8A-3.

4.3.2 Data Analysis

4.3.2.1 Data Screening

The four benthic samples sent to Biologica were sorted using dissecting microscopes at 10-40x magnification. The 1-cm sample fraction was processed based on the field split (no further splitting by Biologica). The fine 0.5mm sample fraction (¼ field split) was further split into another quarter (¼) by Biologica for a final 1/16 split of the composite sample, using a Caton tray. Each sample was spread evenly on a Caton grid and subsampled via sequential random quadrat sorting. Sorting continued until a minimum ¼ split was reached and taxonomic identifications were carried out to the lowest practicable level.

Taxonomy data provided by Biologica were screened for incidental organisms not considered to be part of the marine benthic community, such as freshwater, terrestrial, planktonic, and parasitic taxa. Meiofauna, such as nematodes, were removed from benthic analysis because these species often fall through the 0.5-mm mesh sieve used to separate benthic infauna from sediments in the field. Nematode species counts would thus not represent true population numbers at each station and could bias station comparisons of total abundance and species diversity. Eliminated taxa, not expected to have significant direct exposure to sediments, included Nematoda (meiofauna), Ostracoda (planktonic), and Insecta (terrestrial) taxa.

4.3.2.2 Benthic Community Performance Indicators

A description of performance indicators (organism density, taxa richness, Simpson's Diversity Index, Simpson's Evenness Index) selected to evaluate potential Project-induced changes in benthic infauna communities is provided in the following sections.

4.3.2.2.1 Organism Density

Total invertebrate density was calculated as the number of organisms per square metre (organism/m^2) for each station. The surface area of the Van Veen (0.1 m^2) was multiplied by three to account for the three composite grab samples using the following equation:

$$\frac{\textit{number of organisms [org] per station}}{\textit{(grab sampler area} \times \textit{3 composites)}}$$

4.3.2.2.2 Taxa Richness

Taxa richness is the total number of unique[1] taxa per station and provides an indication of the diversity of benthic invertebrates in an area; a higher richness value typically indicates a healthier and balanced community.

4.3.2.2.3 Simpson's Diversity Index (SDI)

Simpson's Diversity Index (SDI) measures the proportional distribution of organisms in the community. The SDI considers the abundance patterns and taxonomic richness of the community. Certain conditions may favour one taxa over another, resulting in the community being dominated by a few taxa, which is reflected in decreased diversity (Simpson 1949). The SDI value ranges between zero and one, where lower values indicate a less diverse community and higher values indicate a more diverse community. The SDI was calculated using the formula provided by Krebs (Krebs 1999):

$$SDI = 1 - \sum_{i=1}^{S} (p_i)^2$$

Where:

- SDI = Simpson's diversity index
- S = the total number of taxa
- p_i = the proportion of the i^{th} taxon

4.3.2.2.4 Simpson's Evenness Index (SEI)

Simpson's Evenness Index (SEI) is a measure of the relative abundance of the different taxa contributing to richness, or in other words, how evenly the total invertebrate density is distributed among the taxa present at the station. SEI compares the observed community to a hypothetical community, which consists of the same number of taxa that are equally abundant. The SEI is included along with the SDI to provide context as to whether richness or the distribution of total density among taxa is driving the SDI values. The SEI is also expressed as a

---

[1] Did not include higher order taxa for which there exists a lower order identification. For example, does not include *Ophiura* sp. if *Ophiura robusta* is found in the same sample.

value between one and zero, with one representing high evenness (i.e., equal numbers of all taxa present in a sample) and zero representing low evenness (i.e., a high degree of dominance by one or a few taxa). Communities with a high degree of dominance by one or a few taxa are often referred to as “stressed” and may reflect the influence of natural and/or anthropogenic stressors.

The SEI values were calculated using the following formula (Smith and Wilson 1996):

$$SEI = 1 \,/ \sum_{i=1}^{S} (p_i)^2 / S$$

Where:

- SEI = Simpson’s evenness index
- S = the total number of taxa
- p_i = the proportion of the i^{th} taxon

4.3.3 Quality Management

Quality assurance and quality control (QA/QC) procedures were applied to the field collection, data analysis, and reporting tasks within the benthic infauna component to verify that the data presented were valid and of acceptable quality to address objectives stated in Section 4.1.1.

4.3.3.1 Field QA/QC

QA/QC measures undertaken to confirm benthic infauna sample integrity are the same as those described for sediment quality as noted in Section 3.3.3.1. Each grab sample was examined for acceptability based on the following criteria:

- The sampler was fully closed.
- There was adequate penetration depth (i.e., sediment volume greater than 25% full).
- The sample did not appear overfilled or disturbed, and the sample did not appear to have been collected on an angle.

The sampler did not appear to be leaking sediment at a substantial rate (i.e., the top of the sediment profile did not appear to be sloping inwards).

4.3.3.2 Laboratory and Data Analysis QA/QC

Biologica's laboratory QA/QC measures included an assessment of sorting recovery, identification error, and precision/accuracy of sub-sampling. Laboratory procedures included sample sorting measures, spot-checks of portions of samples by a second sorter to ensure all organisms have been removed from the sample, preliminary counting of major groups, and collaborative identification to accurately identify species to their lowest practicable level. Further detailed discussion of the laboratory QA/QC procedures used by Biologica and the findings of their QA/QC assessment are provided in their laboratory reports in Appendix 8A-2 and 8A-3.

Benthic data received from Biologica were reviewed upon receipt to verify that specified laboratory data quality objectives were met. No inconsistencies were noted that required follow up with the laboratory. Screening of the benthic data and calculation of the benthic indicators were reviewed by a second biologist for accuracy.

4.4 Results

This section describes results for the benthic infaunal samples collected from four stations (SW-1 through SW-4) along the West transect; results from the co-located sediment samples are discussed in Chapter 3.0. A summary of benthic infauna indicators from 2019[2] to 2022 is provided in Figure 4-2, Figure 4-3 and Appendix 4A – Tables 1 through 4. Representative photographs from the field program are provided in Appendix 3A and 4B. Benthic field logs are presented in Appendix 4C. Laboratory results and methods are provided in Appendices 8A-2 and 8A-3, respectively.

The benthic infauna community present at each of the four stations sampled along the West transect has shown temporal and spatial variability for all indicators (density, taxa richness, SDI and SEI) between 2019 to 2022 (Figure 4-2 and Figure 4-3):

- **Total Density** - With the exception of SW-4 in 2021 (40,723 org./m^2) and SW-2 in 2020 (130 org./m^2), infauna densities at the four stations have spanned a broadly comparable range since 2019 (i.e., 5,513 to 26,842 org./m^2) (Figure 4-2A). Within that range, higher estimates tended to occur in 2019 at SW-3 and SW-4. Since 2019, densities at SW-2 have been towards the lower end of the overall range observed at these stations. The highest benthic densities have been observed at SW-4 (furthest from the Ore-dock) in the most recent years (2021 and 2022). The range seen at these stations since 2019, with the exception of SW-4 in 2021 and SW-2 in 2020, is comparable to the range in densities for all 15 stations sampled along the West transect in 2020 (3,819 to 18,715 org./m^2) (Golder 2021).
- **Taxa Richness** – Figure 4-2B shows that richness at SW-1 is trending downwards from 55 taxa in 2019 to 25 taxa in 2022. SW-2 decreased substantially in 2020 to just 6 taxa but has since rebounded to 36 taxa in 2021 and 38 taxa in 2022. Richness at SW-3 has been lower in more recent years compared to 2019; whereas SW-4 has maintained similar richness levels. With the exception of SW-2 in 2020, richness values documented at these four stations (since 2019) are largely within the range observed for all 15 stations sampled along the West transect in 2020 (24 to 65 taxa) (Golder 2021).

[2] 2018 data for stations SW-1 and SW-3 has been removed as it is not directly comparable due to the change in sampling methodology that was implemented for the 2019 monitoring program.

- **Simpson's Diversity Index** – SDI has been consistently high (>0.85) and stable for most stations from 2019 to 2022, with the exception of two stations (Figure 4-3A), SW-2 and SW-1. SW-2 decreased to 0.66 in the year 2020 but has since recovered to the same level as 2019 (0.94 SDI) and diversity was the lowest at SW-1 in 2022 compared to earlier years (0.74 SDI). For all stations and most years, diversity has been within the range documented for all stations sampled along the West transect in 2020 (ranging 0.85 to 0.93 SDI) (Golder 2021).
- **Simpson's Evenness Index -** All four stations had an uneven distribution of organisms across the taxa that were present (SEI less than or equal to 0.49), meaning that the communities are dominated by a few taxa. The SEI values at these four stations since 2019 are largely within the SEI range documented for the 15 stations sampled along the West transect in 2020 (0.1 to 0.49 SEI) (Golder 2021). Of the four stations sampled between 2019 and 2022, SW-2 had the highest values of SEI for the years 2020 to 2022, meaning taxa were most evenly distributed at this station.

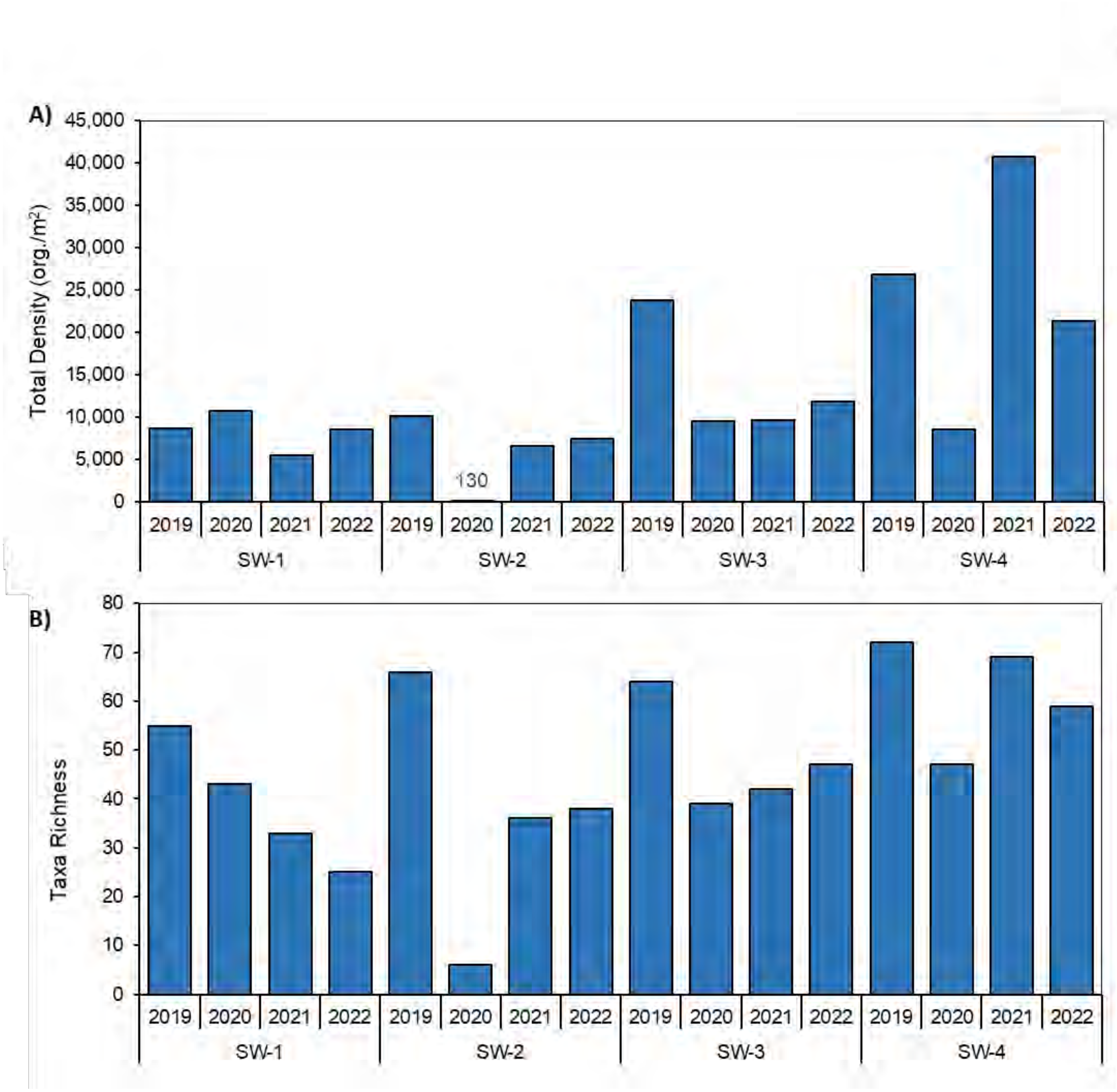


Figure 4-2: Total Density (organisms [org.]/m^2) (A) and Taxa Richness (B) of Benthic Infauna at Four Stations Along the West Transect, 2019 – 2022.

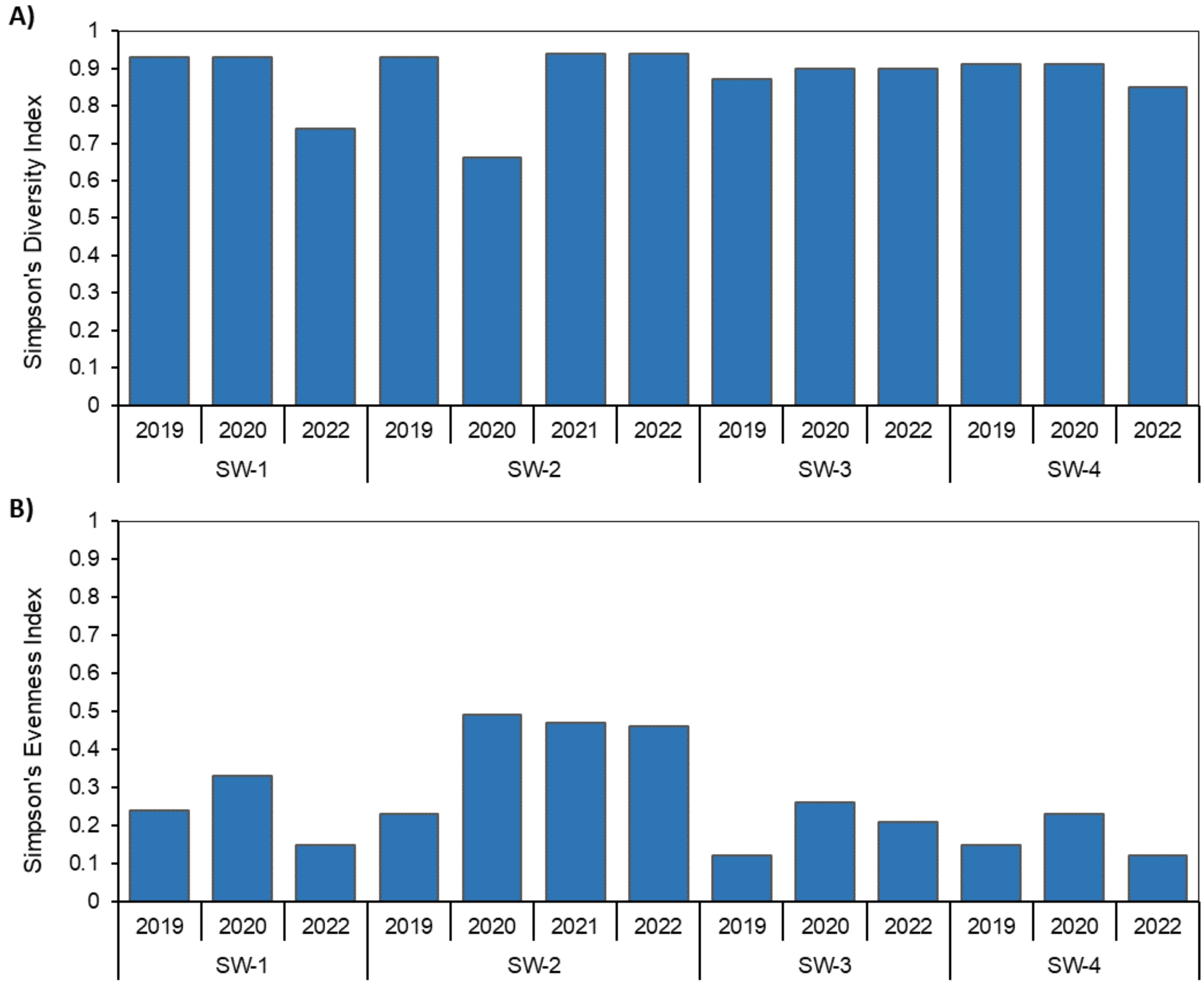


Figure 4-3: Simpson's Diversity Index (A) and Simpson's Evenness Index (B) of Benthic Infauna at Four Stations Along the West Transect in 2019 – 2022[3].

3

4.5 Discussion

Visual evaluation of benthic community indicators between 2019 and 2022 showed variability across stations and between years for the four stations on the West transect. Within this time series, anomalous results were recorded in 2020 at SW-2 in the form of substantially reduced total density, taxa richness, diversity, and greater evenness, relative to previous years and relative to adjacent stations. The benthic community at SW-2 seems to have rebounded from the impacts associated with changes in grain size in 2020, showing substantially more diversity (returned to 2019 levels) and higher density and taxa richness (order of magnitude increases) in the two years following the localized physical disturbance event. Higher variability in performance indicators is expected given that benthic infaunal communities are inherently dynamic and continually changing in response to various types and scales of disturbance (Thistle 1981, Zajac and Whitlatch 1982a, b). Moreover, these organisms have life history characteristics that make them resilient to disturbance, including:

- short generation time – life cycles are often less than one year (Warwick 1984);
- broadcast spawning – releasing sperm and eggs into the water column (Crimaldi and Zimmer 2014); and
- a larval (planktonic) phase, whereby they can disperse tens or even thousands of kilometres from their source (Pechenik 1999).

Station SW-1 is closest to the Ore Dock and adjacent to SW-2. In 2022 a decrease in sediment fines content along with decreases in richness, diversity, and evenness were observed relative to previous years at this location. However, values remain substantially higher than those observed at SW-2 in 2020. Further, total density was within the same range as historically observed for SW-1 through SW-4 from 2019 to 2022, as well as the same range observed along the 15 stations sampled on the West transect in 2020. These results may simply reflect natural spatial and temporal variability, though the potential influence of propeller wash on sediment and benthic dynamics at this station cannot be discounted; however, the magnitude of the effect is not as high as that observed at SW-2 in 2020. Further from the Ore Dock at SW-3 and SW-4, benthic community indicators have been largely within the range observed along the 15 stations sampled on the West transect in 2020, with diverse, uneven communities at variable densities.

4.6 Conclusions and Recommendations

Monitoring results from 2022 remain within predictions of the FEIS and subsequent addenda, which forecasted the potential for minor and localized sediment disturbance associated with propeller wash and associated short-term effects on benthic infaunal invertebrate community indicators. To date, 2020 was the only instance where reduced fines content was accompanied by a substantial reduction in benthic density, richness and diversity. Overall, the results indicate that benthic communities in Milne Port remain healthy and diverse. Sampling will continue in 2023 as part of the full-scale joint radial benthic and sediment sampling program conducted every three years and will further increase understanding of benthic infauna community variability and monitor for potential effects of Project activities.

4.7 Closure

We trust this information is sufficient for your needs at this time. Should you have any questions or concerns, please do not hesitate to contact Phil Rouget, on behalf of the undersigned, at +1 250 419 4945.

WSP CANADA INC.

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https://golderassociates.sharepoint.com/sites/11206g/deliverables (do not use)/issued to client_for wp/400-499/1663724-430d-r-rev0-64000/1663724-430d-r-rev0-64000-2022 meemp_4.0 benthic infauna_28apr_23.docx

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APPENDIX 4A

Benthic Indicator Data Tables

APPENDIX 4A
Benthic Infauna Indicator Tables
Milne Inlet, Nu

Table 1: Total Density (Org./m^2)				
Year	SW-1	SW-2	SW-3	SW-4
2018	23,729 ± 2,155	N/A	13,818 ± 2,506	N/A
2019	8,665	10,184	23,804	26,842
2020	10,781	130	9,597	8,629
2021	5,513	6,623	9,727	40,723
2022	8,537	7,430	11,840	21,353

Table 3: Simpson's Diversity Index				
Year	SW-1	SW-2	SW-3	SW-4
2018	NC	NC	NC	NC
2019	0.93	0.93	0.87	0.91
2020	0.93	0.66	0.9	0.91
2021	NC	0.94	NC	NC
2022	0.74	0.94	0.9	0.85

Note: "NC" = Not Calculated

Table 2: Taxa Richness				
Year	SW-1	SW-2	SW-3	SW-4
2018	57 ± 6	N/A	61 ± 4	N/A
2019	55	66	64	72
2020	43	6	39	47
2021	33	36	42	69
2022	25	38	47	59

Table 4: Simpson's Evenness Index				
Year	SW-1	SW-2	SW-3	SW-4
2018	NC	NC	NC	NC
2019	0.24	0.23	0.12	0.15
2020	0.33	0.49	0.26	0.23
2021	NC	0.47	NC	NC
2022	0.15	0.46	0.21	0.12

Note: "NC" = Not Calculated

APPENDIX 4B

Photographs

Photo 1: Benthic sample on 1.0 cm sieve, collected at station SW-1 on 09 August 2022.

Photo 2: Benthic sample (¼ field split) on 0.5 mm sieve, collected at station SW-1 on 09 August 2022.

Photo 3: Benthic sample on 1.0 cm sieve, collected at station SW-2 on 13 August 2022.

Photo 4: Benthic sample (¼ field split) on 0.5 mm sieve, collected at station SW-2 on 13 August 2022.

Photo 5: Benthic sample on 1.0 cm sieve, collected at station SW-3 on 7 August 2022.

Photo 6: Benthic sample (¼ field split) on 0.5 mm sieve, collected at station SW-3 on 7 August 2022.

Photo 7: Benthic sample on 1.0 cm sieve, collected at station SW-4 on 7 August 2022.

Photo 8: Benthic sample (¼ field split) on 0.5 mm sieve, collected at station SW-3 on 7 August 2022.

APPENDIX 4C

Benthic Infauna Field Logs

BENTHIC SAMPLING LOG

Project No:	1663724-01-64000-03	Project Title:	Baffinland MEEMP 2022
Date:	09 Aug 2022	Inspected by:	TT
Station Number (ID):	SW-1	Sampling Method:	VV 3 composites Macro - whole 1/4 split
Weather:	Clear skies, 15-17°C, 3-5kts	Lat/Longitude:	~~on waypoint~~ Waypoint 243m away 71°53'358N 080°54.481W
Sampling Depth:	~~12.0m~~ 13.6m (9.5 to 11.2m)		
# of Attempts to Obtain Sample:	~~||||~~ |	Time of Collection:	15:50 - 17:52

Sediment Description (including colour, type/grain size, anthropogenic debris, organic material, shell, wood, odour, HC sheen, staining, organisms/biota etc.):

Grabs 1+2 - rocks caught in jaws of grab

Macro - 10 Hiatella removed for FH
Abundant H. artica and Astarte, gravel, some algae, 1.0cm gravel, shell debris, some polys

Approx % collected in grab sample 3 (75-80%), 5 (45-55%), 6 (75-80%) %

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for:

- ☐ Full Metals
- ☐ Grain Size
- ☐ PCB
- ☐ Other
- ☐ PAH
- ☑ Benthic
- ☐ Dioxins and Furans
- ☐ TBT
- ☐ AVS CEM
- ☐ PFOA/PFOS

AEC: ____ # of Grabs for Analysis: ____

Other Notes:

SAMPLE NUMBER: ________

BENTHIC SAMPLING LOG

Project No:	166372401-64000	Project Title:	Baffinland MEEMP 2022
Date:	13 Aug 2022	Inspected by:	TT
Station Number (ID):	SW-2	Sampling Method:	VV 3 composites Macro whole 1/4 split
Weather:	Overcast, 4°C, 6kts S	Lat/Longitude:	on waypoint 71°53.322 mins N 80°54.693 mins W
Sampling Depth:	TT ~~16.0m~~ 13.0m		
# of Attempts to Obtain Sample:	~~||||~~ |	Time of Collection:	11:10 -

Sediment Description (including colour, type/grain size, anthropogenic debris, organic material, shell, wood, odour, HC sheen, staining, organisms/biota etc.):

1+2 - rock caught in jaws, grab 4 rock caught in jaws
Macro - BLACK Clay, some tan-coloured silt, shell debris, no smell, poly tubes

Approx % collected in grab sample 3 (25-35%), 5 (55-60%), 6 (35-40%) %

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Site photos, Macro photo

Sample Control Number (SCN):

Analysis for:

- ☐ Full Metals
- ☐ Grain Size
- ☐ PCB
- ☐ Other
- ☐ PAH
- ☑ Benthic
- ☐ Dioxins and Furans
- ☐ TBT
- ☐ AVS CEM
- ☐ PFOA/PFOS

AEC: ______ # of Grabs for Analysis: ______

Other Notes:

SAMPLE NUMBER: ________

166372461-64000-03
Project: BIM MEEMP 2022

Benthic Infauna Datasheet

Date: 09 Aug 22
Personnel: TTY DH | MR

Site: SW-1
Preservation: ☑ 10% Formalin ☐ Ethanol
Processing Start: 17:05
Processing End: 1740

Observations

Substrate:
0.5 mm f-c sand, some shell debris, organic matter, poly tubes

Fauna:
H. artica, Ennucula(?), polys, amphipod

Notes:

Hiatella arctica: 10

Micro Jars: ______
Split: ☑ ¼ ☐ ½ ☐ Whole

Macro Jars: 2 jars
Split: ☐ ¼ ☐ ½ ☑ Whole

Photos: Yes

13 Aug 2022

Site: SW-2
Preservation: ☐ 10% Formalin ☐ Ethanol
Processing Start: 1200
Processing End: 1300

Observations

Substrate: Black clay & tan silt, poly tubes, shell debris
Lots of Sand

Fauna:
Polychaetes, shell worms

Notes:

Hiatella arctica: Ø

Micro Jars: 1 jar
Split: ☑ ¼ ☐ ½ ☐ Whole

Macro Jars: 1 jar
Split: ☐ ¼ ☐ ½ ☑ Whole

Photos: Yes

BENTHIC SAMPLING LOG

Project No:	1663724-01-64000-03	Project Title:	Baffinland MEEMP 2022
Date:	07 Aug 2022	Inspected by:	TT
Station Number (ID):	SW-3	Sampling Method:	VV 3 composites Macro - whole 1/4 split
Weather:	Clear skies, 15°C, 5 kts NE	Lat/Longitude:	on waypoint
Sampling Depth:	16.6m		
# of Attempts to Obtain Sample:	III	Time of Collection:	16:18 - 17:20

Sediment Description (including colour, type/grain size, anthropogenic debris, organic material, shell, wood, odour, HC sheen, staining, organisms/biota etc.):

Macro - Hiartica, poly tubes, sea spider, Macoma, some algae, Terebellid, ~~clam~~ Pectinarid

Approx % collected in grab sample ~~30-3~~ 30-40% %

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Macro photo and ploto of 1/4 split on screen

Sample Control Number (SCN):

Analysis for:
- ☐ Full Metals
- ☐ PAH
- ☐ TBT
- ☐ Grain Size
- ☐ Benthic
- ☐ AVS CEM
- ☐ PCB
- ☐ Dioxins and Furans
- ☐ PFOA/PFOS
- ☐ Other

AEC: ______ # of Grabs for Analysis: ______

Other Notes:

5 Hiatella removed for FH program
Macro whole - 1 jar
1/4 split - 1 jar

SAMPLE NUMBER: ________

BENTHIC SAMPLING LOG

Project No:	166372401-64000-03	Project Title:	Baffinland MEEMP
Date:	07 Aug 2022	Inspected by:	TT
Station Number (ID):	SW-4	Sampling Method:	VV 3 composites Macro - 1/4 split
Weather:	Clear skies, 5kts NE	Lat/Longitude:	on waypoint
Sampling Depth:	15m CD		
# of Attempts to Obtain Sample:	III	Time of Collection:	15:00 - 16:03

Sediment Description (including colour, type/grain size, anthropogenic debris, organic material, shell, wood, odour, HC sheen, staining, organisms/biota etc.):

Macro - poly tubes, Pectinarids, Semiplecten, H. arctica, cockle, Macoma, gravel, piece of fucus, brittle stars, shrimp, anemone, encrusted organisms on gravel
Clear gravel tossed overboard

Approx % collected in grab sample All 3 grabs ~ 20-25% %

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):
Site photos

Sample Control Number (SCN):

Analysis for:			
	☐ Full Metals	☐ PAH	☐ TBT
	☐ Grain Size	☐ Benthic	☐ AVS CEM
	☐ PCB	☐ Dioxins and Furans	☐ PFOA/PFOS
	☐ Other		

AEC: ____ # of Grabs for Analysis: ____

Other Notes:
~~5 Hiatella removed for TH program~~
Macro - 2 jars
1/4 split -

SAMPLE NUMBER: ________

Benthic Infauna Datasheet

166372401-64000103
Project: BIM MEEMP

Date: 07 Aug 2022
Personnel: MR4DH/TT

Site: SW-3

Preservation: ☑ 10% Formalin ☐ Ethanol

Processing Start: 17:08
Processing End: 17:20

Observations

Substrate:

Fine to coarse sand, poly tubes, shell debris, organic matter

Fauna:

H. arctica, Pectinarid, Ennucula, polys, Macoma, ~~Sem plectem~~

Notes:

Hiatella arctica: 5

Micro Jars: 1 jar
Split: ☑ ¼ ☐ ½ ☐ Whole

Macro Jars: 1 jar
Split: ☐ ¼ ☐ ½ ☑ Whole

Photos: Yes

05 Aug 22

Site: SW-4

Preservation: ☑ 10% Formalin ☐ Ethanol

Processing Start: 16:05
Processing End:

Observations

Substrate:

Silty sand, organic matter, fine shell debris, poly tubes, coarse sand,

Fauna:

Pectinarids, brittle star, ~~Nucula~~ Nuculana, amphipods, Macoma, Hiatella

Notes:

Hiatella arctica: 0

Micro Jars: 1 jar
Split: ☑ ¼ ☐ ½ ☐ Whole

Macro Jars: 2
Split: ☐ ¼ ☐ ½ ☑ Whole

Photos: Y - on screen

wsp.com

REPORT

Chapter 5.0 Substrate, Macroflora, and Benthic Epifauna

2022 Milne Port Marine Environmental Effects Monitoring Program (MEEMP) and Non-Indigenous Species and Aquatic Invasive Species (NIS/AIS) Monitoring Program

Submitted to:

Baffinland Iron Mines Corporation

2275 Upper Middle Road East, Suite 300
Oakville, ON L6H 0C3

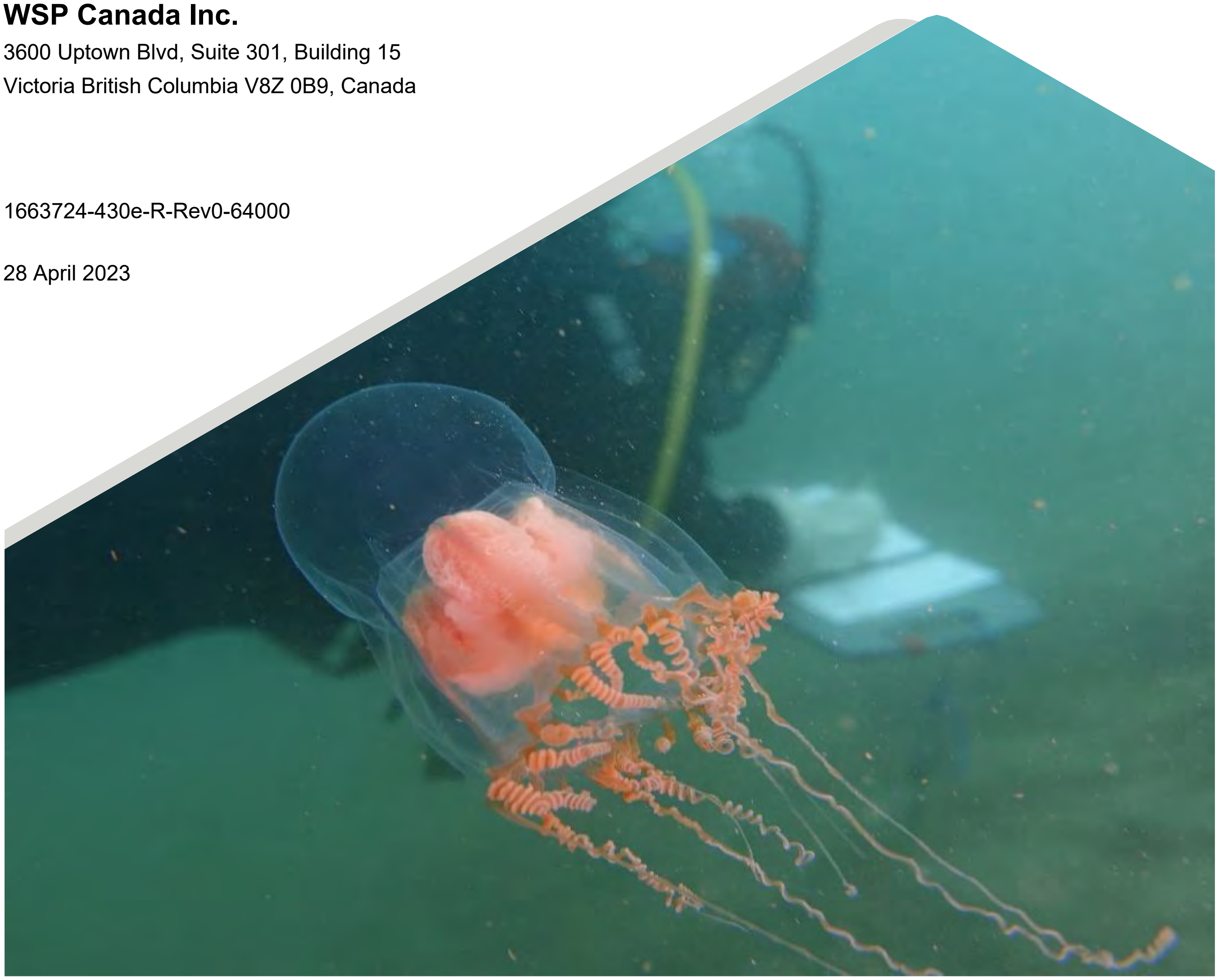
Submitted by:

WSP Canada Inc.

3600 Uptown Blvd, Suite 301, Building 15
Victoria British Columbia V8Z 0B9, Canada

1663724-430e-R-Rev0-64000

28 April 2023



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ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Definitions
ANOVA	Analysis of Variance
BACI	Before-After-Control-Impact
BC	British Columbia
CCDB	Canadian Centre for DNA Barcoding
CCME	Canadian Council of Ministers of the Environment
CD	Chart Datum
cm	centimetre
DFO	Fisheries and Oceans Canada
EEM	Environmental Effects Monitoring
FEIS	Final Environmental Impact Statement
LPL	Lowest Practical Level
m	metre
mm	millimetre
m^2	square-metre
MEEMP	Marine Environmental Effects Monitoring Program
MEWG	Marine Environment Working Group
MFEAP	Marine Foreshore Environment Assessment Procedure
mL	millilitre
N/A	Not applicable
NIS/AIS	Non-Indigenous Species/Aquatic Invasive Species
No.	Number
NS	Not significant
org/m^2	Organism per square-meter
PC	Project Certificate
Q	Quadrat
QA/QC	Quality Assurance and Quality Control
ROV	Remotely Operated Vehicle
SCUBA	Self Contained Breathing Apparatus
S_{obs}	Observed species
SD	Standard Deviation
SDI	Simpson’s Diversity Index

Acronym or Abbreviation	Definitions
UBC	University of British Columbia
UTM	Universal Trans Mercator
ZOI	Zone of Influence
>	Greater than
<	Less than
%	Percent

5.0 SUBSTRATE, MACROFLORA, AND BENTHIC EPIFAUNA

5.1 Introduction

This chapter presents the results of the substrate, macroflora, and benthic epifauna monitoring program, a component of the larger Marine Environmental Effects Monitoring Program (MEEMP) conducted at Milne Port and in Milne Inlet during the 2022 open-water season. This component was developed in consideration of the potential Project-related impacts to the marine environment as identified in the 2012 Final Environmental Impact Statement (FEIS, Baffinland 2012) and subsequent addenda as well as monitoring requirements outlined in the Project Certificate (PC) Conditions described in in Chapter 1.0, Table 1-2. PC Conditions related to the monitoring of substrate, macroflora, and epifauna included PC Conditions No. 76, 83 (a), 87, 99 (a), and 99 (c).

5.1.1 Objectives

The MEEMP objectives are outlined in Section 1.3 of Chapter 1.0 (Program Overview). Objectives specific to the substrate, macroflora, and benthic epifaunal component are as follows:

- Monitor for changes in substrate conditions or in the macrofloral and benthic epifaunal community at Milne Port and in a nearby Reference Area for the purpose of identifying potential Project-related effects.
- Verify predictions made in the FEIS, and subsequent addenda, regarding effects on Arctic Char (*Salvelinus alpinus*) habitat.
- Recommend necessary and appropriate changes to survey methodology for future years, if warranted.

5.2 Study Design

5.2.1 Background

The 2014 to 2017 MEEMP study design monitored for changes to the benthic community with epifauna[1] and epiflora[2] as indicators, using towed underwater video transect surveys. The use of epifauna and epiflora as effect indicators deviated from the standard Environmental Effects Monitoring (EEM) methodology (Environment Canada 2010; 2012) and presented a number of challenges, including 1) high temporal and spatial variability due to the mobile and transient nature of many epifaunal species, 2) typical low resolution of video survey data compared to laboratory analysis for species identification, enumeration and substrate classification, and 3) difficulty in distinguishing between live epiflora (e.g., kelp) and detrital vegetation debris using video survey methods, which can result in inaccurate results.

In 2018, a new survey design was implemented, based on a Before-After-Control-Impact (BACI) approach. A reference area had been established in 2013 and selected for its proximity to Milne Port while residing outside of the main zone of influence (ZOI) of Project activities (SEM 2014). Towed underwater video transects were replaced with five belt transects (1 m x 5 m plots) permanently installed on the seabed in each exposure (impact) and reference (control) areas. Monitoring was conducted using a remotely operated vehicle (ROV) underwater video system. In addition to informing this component of the MEEMP, taxonomic data were also used to inform

[1] benthic invertebrates living on the substrate

[2] marine vegetation attached to the substrate (e.g. kelp)

the NIS/AIS program (Chapter 8.0). In 2019, underwater video monitoring of epifauna and macroflora communities within permanent belt transects continued for a second year. The belt transects deployed in 2018 were composed of two 1 m-long, 5 cm-diameter aluminum pipes filled with concrete connected by two 5-m-long steel chains attached to both ends of the pipes (Figure 5-1). In 2019, it was determined that the flexible design was not suitable for the environment, as five of the ten deployed transects were dragged from their original position due to presumed interactions with the sea-ice during spring break-out or had become embedded in the sediment and thus obscured from video detection.

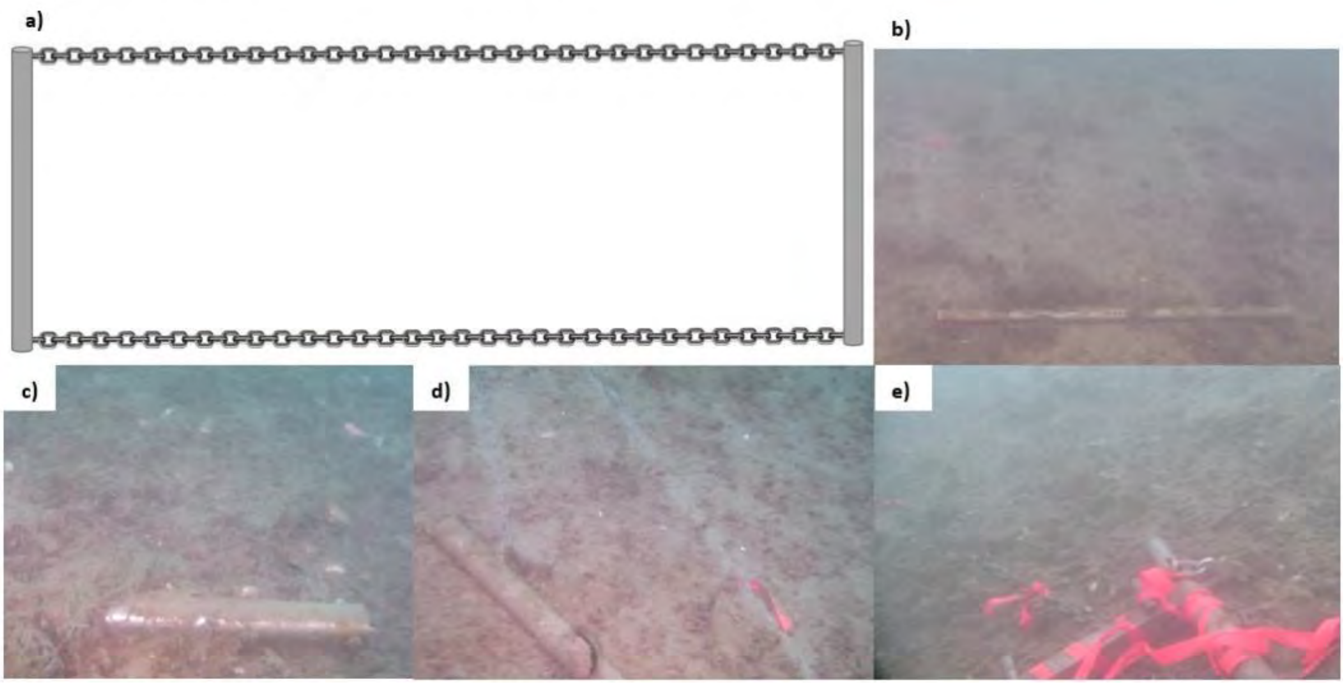

Figure 5-1: Belt Transects Used for Macroflora and Epifauna Surveys in 2018-2019. a) Diagram of Belt Transect Layout; b) Photo of Deployed Belt Transect; c, d and e) Belt Transects Embedded in Sediment and/or Shifted from Original Deployment Position

The program was modified in 2020 to replace the belt transects, which had been determined to be ineffective due to being dragged out of position. Modifications to the program in 2020 included the use of divers to undertake biophysical surveys of permanent, heavy-duty steel quadrats to improve the resolution of taxonomic identification. A total of ten 1 m x 1 m square quadrats were fabricated onsite in 2020 and installed on the sea bottom in Milne Port, five in the exposure area (Q1 through Q5) and five in the reference area (Q6 through Q10) (Figure 5-2, Figure 5-3). An additional 10 square steel quadrats were fabricated and deployed in 2021 (Q11 through Q20; five in each exposure and reference area), doubling the total number of quadrats relative to 2020.

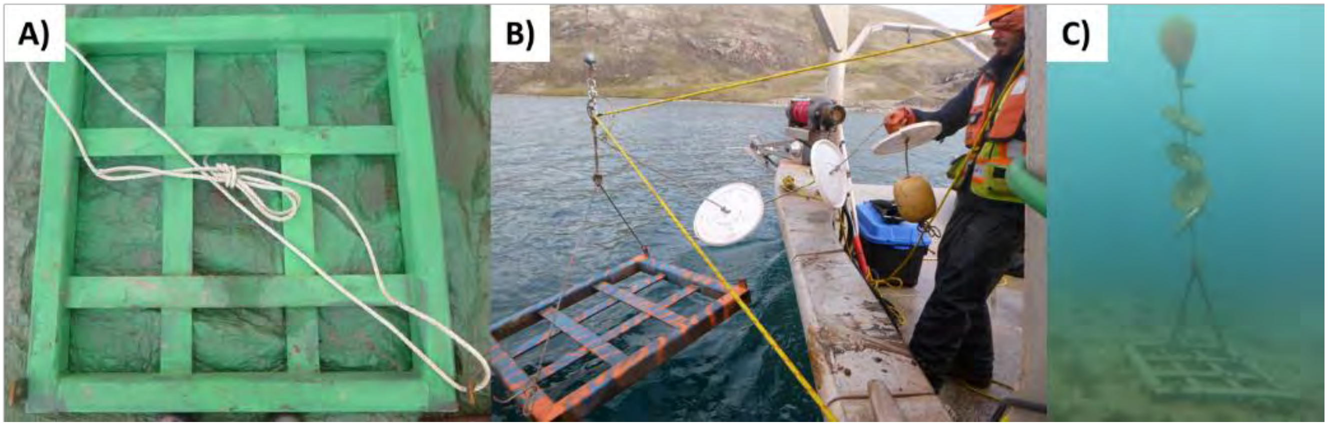

Figure 5-2: A) Example of 1 x 1 m Steel Quadrat Deployed in 2021; B) Active Deployment of Survey Quadrat; C) Underwater Photo of Quadrat (Q5) With Attached Settlement Plates for NIS/AIS Monitoring.

Additionally, starting in 2020 as part of the Chapter 8.0 NIS/AIS program, settlement substrates were co-located and deployed with the quadrats to monitor for short- and medium-term recruitment of encrusting taxa. Settlement substrates consisted of settlement plates attached to a line with a subtidal buoy, and cobble-filled settlement baskets attached to a corner of the quadrat, as described in Chapter 8.0.

In previous years, taxonomic resolution was relatively coarse because of poor visibility due to suspended particles in the water column and the use of a ROV-based underwater video survey for monitoring. Survey of the quadrats was performed by a combination of divers and ROV in 2020[3] and exclusively by divers in 2021. The rationale for discontinuing the ROV is that divers are more accurately able to distinguish unique taxa, differentiate between detrital algae or non-living organisms versus living organisms, move vegetation aside to observe the underlying substrate and marine organisms, and collect specimens from the quadrats for identification purposes.

Surveys conducted in 2020 indicated that Q9 was dominated by hard substrate (boulder) and supported different ecological communities relative to the soft substrate quadrats. Therefore, in 2021, Q9 was relocated to a different area to maintain comparability between quadrats.

5.2.2 Modifications to the Program (2022)

Six new permanent quadrats, Q21 through Q26, were deployed (three in each of the exposure and reference areas) to increase statistical power and address Marine Environment Working Group (MEWG) Comment No. 05 from the 2021 MEEMP and NIS/AIS Monitoring Program Report (Golder 2022); this modification expanded the total number of quadrats to thirteen in each area (Figure 5-3). However, the newly fabricated quadrats were larger than those fabricated in 2020 and 2021. The survey area (excluding the metal sub-grid bars, Figure 5-2) of the 2020/2021 quadrats was 0.44 m^2 while the 2022-fabricated quadrats had a survey area of 0.64 m^2. Therefore,

[3] Divers surveyed quadrats in the reference area (Q6, Q8, Q9, Q10), but were unable to survey the quadrats in the exposure area due to time constraints in the field program (these were subsequently completed using ROV-video surveys).

correction factors have been applied to quadrats during data analysis to standardize results to 1m^2. Additional quadrats, Q21 through Q26, are not co-located with Chapter 8.0 NIS/AIS settlement substrates.

During the 2021 field program, divers were unable to locate Q2 after undertaking a thorough search between the -3 and -12 m CD (Chart Datum) depth contour (Q2 was deployed at approximately -10 m CD), extending approximately 25 m to the west and east of the original location. This quadrat was assumed to have been dragged from its original position by sea-ice during the spring break-out period. A replacement quadrat (Q2) was deployed at -12 m CD in 2022 with co-located settlement substrates.

Surveys conducted in 2021 also noted that Q12 had been deployed too shallow (-6 m CD) from desired target depth (-7 to -9 m CD) and, consequently, the Q12 quadrat data was not included in analyses in 2021. Therefore, Q12 was relocated in 2022 (with co-located settlement substrates) to an increased depth to maintain comparability between quadrats, as per recommendations in Golder (2022).

5.2.3 Indicators

Effect indicators selected to evaluate potential Project-induced changes in substrate, macroflora and epifauna include taxa richness (number of unique taxa present), relative abundance, Simpson's Diversity Index (SDI), density (motile taxa) and percent cover (macroflora and sessile invertebrates). These indicators are described in detail in Section 5.3.2.1. The indicators are calculated from data collected in both reference and exposure areas and analyzed statistically to evaluate Project-related effects within the study area.

Changes in field methodologies over time (as explained in Section 5.2.1), preclude the ability to make quantitative temporal comparisons to years prior to 2021. The 2021 quadrat survey results serve as a benchmark for quantitative comparisons for 2022 surveys and future monitoring years so long as field methodologies remain consistent.

LEGEND

- PERMANENT QUADRAT LOCATION
- BATHYMETRIC CONTOUR (1 m INTERVAL)
- BATHYMETRIC CONTOUR (5 m INTERVAL)

REFERENCE(S)
BATHYMETRY CREATED BY GOLDER FROM MULTIPLE DATA SOURCES. IMAGERY COPYRIGHT © 20190802 ESRI AND ITS LICENSORS. SOURCE: MAXAR VIVID. USED UNDER LICENSE, ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 17 DATUM: NAD 83

CLIENT
BAFFINLAND IRON MINES CORPORATION

PROJECT
MARY RIVER PROJECT

CONSULTANT

YYYY-MM-DD	2023-04-27
DESIGNED	NO
PREPARED	AA
REVIEWED	AL
APPROVED	AL

TITLE
DEPLOYMENT LOCATIONS FOR THE PERMANENT QUADRATS FOR MONITORING SUBSTRATE, MACROFLORA AND BENTHIC EPIFAUNA IN MILNE PORT, 2022

PROJECT NO.	CONTROL	REV.	FIGURE
166372401	64000-04	0	5-3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
25mm

5.3 Materials and Methods

5.3.1 Field Methodology

Twenty-six 1 m x 1 m square steel quadrats[4] have been fabricated on site and lowered to the sea floor from a vessel: thirteen quadrats in each of the exposure area and reference area (Table 5-1, Figure 5-3). Ten quadrats (Q1 through Q10) were deployed and surveyed in 2020, ten additional quadrats were deployed in 2021 (Q11 through Q20), and six additional quadrats were deployed in 2022 (Q21 through Q26). Further, a replacement quadrat was deployed in 2022 at a new location to replace Q2 which had not been recovered in 2021. The quadrats were deployed from the field vessel at the locations of the previous belt transects, in water depths of approximately -5 to -16 m CD. Each quadrat was marked with fluorescent spray paint to aid in relocating them in subsequent surveys (Appendix 5B – Photo 1).

Field surveys of the quadrats were conducted in August 2022 by Golder's occupational (SCUBA-based) dive team composed of marine biologists. The dive team is certified in accordance with Canadian Standard Association Z275:4-97 and WorkSafe BC Regulations Part 24. A single diver carried out all data recording (identification and quantification of substrate type and taxa) to ensure consistency, while the second diver collected photographic records. Dive surveys were conducted from Baffinland's 30-foot Research Vessel.

Field surveys included the following components:

- Deployment of six additional steel quadrats: three in the Exposure area and three in the Reference area.
- Deployment of a new quadrat Q2 to replace Q2 not found in 2021.
- Retrieval and relocation of Q12 to deeper water.
- Subtidal dive quadrat surveys to quantitatively evaluate macroalgae, sessile and motile invertebrates and fish occurrence (commonly termed epifauna) within both the Exposure area and Reference area.
- Opportunistic observations[5] of macroalgae, fish and motile/sessile invertebrates during quadrat surveying.
- Opportunistic specimen collection of macroalgae, fish and motile/sessile invertebrates to enhance taxonomic resolution, particularly in cases where organisms may be suspected to be non-indigenous to the area.

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[4] The quadrat frames are approximately 1 x 1 m but the survey area excludes the metal sub-grid bars (see Section 5.2.2). 2020/2021-fabricated quadrats have a survey area 0.44 m^2; the 2022-fabricated quadrats have a survey area 0.64 m^2.

[5] Opportunistic observations refer to observations that were recorded during diver-collected photo or video to document presence/absence in a qualitative manner rather than quantitatively assessed during the quadrat survey.

Table 5-1: Quadrat Locations

Area	Quadrat	UTM Coordinates (17W)		Depth (-m below CD)*	Deployment Date	Survey Date (2022)
		Easting (m)	Northing (m)			
Milne Port (Exposure)	Q1	502828	7976382	10	12 August 2020	6 August
	Q2	502843	7976385	12.3	9 August 2022	9 August
	Q3	504208	7976659	11.7	12 August 2020	3 August
	Q4	504363	7976611	14	12 August 2020	6 August
	Q5	504802	7976731	12.9	12 August 2020	2 August
	Q11	502820	7976371	8.4	10 August 2021	6 August
	Q12	503034[2]	7976479[2]	11.5	6 August 2022	7 August
	Q13	504210	7976643	9.8	10 August 2021	3 August
	Q14	504350	7976589	9.4	6 August 2021	6 August
	Q15	504800	7976721	10.5	6 August 2021	2 August
	Q21	502197	7976453	6	6 August 2022	7 August
	Q22	502198	7976473	10	6 August 2022	7 August
	Q23	502823	7976365	5.8	6 August 2022	9 August
Reference Area	Q6	506563	7979107	18.3	13 August 2020	8 August
	Q7	506774	7979170	11.1	13 August 2020	4 August
	Q8	506957	7979457	11.3	13 August 2020	4 August
	Q9	506962	7979448	9.7	11 August 2021	8 August
	Q10	506584	7979115	8.8	13 August 2020	4 August
	Q16	506558[3]	7979093[3]	9.1	8 August 2021	8 August
	Q17	506774	7979163	10.2	11 August 2021	4 August
	Q18	506956	7979452	11.1	11 August 2021	4 August
	Q19	506953	7979447	11.5	11 August 2021	8 August
	Q20	506588	7979125	13.6	8 August 2021	4 August
	Q24	506939	7979398	8.1	7 August 2022	10 August
	Q25	506937	7979405	9.8	7 August 2022	10 August
	Q26	506935	7979397	9.1	7 August 2022	10 August

* Diver depth gauge was converted to meters chart datum (CD), estimated using tide table for Milne Inlet, Nunavut (https://tides.gc.ca/en/stations/05791 [accessed September 2022]). The negative (-) numbers indicate 'below' CD. [2] Q12 was relocated to deeper depths in 2022. [3] Q16 had moved to deeper depths in 2022 due to vessel anchor dragging the quadrat. Quadrat was surveyed, but data from this quadrat was dropped from analysis for being considered an outlier.

5.3.1.1 Quadrat Survey

Biophysical data within each quadrat was recorded by one diver while another diver collected representative photographs of the quadrat[6] (Appendix 5B – Photo 2). Observations were made of the quadrat as a whole[7] as opposed to surveying each sub-quadrat individually (as was done in 2021) to increase survey efficiency and remain standardized for multi-year comparisons.

Quantitative data were collected in general accordance with DFO's Marine Foreshore Environmental Assessment Procedure (Appendix 5A). Quadrat data were recorded on project-specific datasheets, and included the following information[8]:

- Substrate type was visually estimated according to the following size ranges derived from Wentworth (1922): bedrock; boulder (>256 mm diameter); cobble (64 to 256 mm); gravel (2 to 64 mm); sand (0.0625 to 2 mm); silt/mud/clay (<0.0625 mm) and relative composition (i.e., as a percent areal coverage).
- Total percent cover of detritus and debris was calculated separately from substrate composition as it was present over the existing substrate. Detritus and debris were categorized into three groups: detrital veneer, detrital macroalgae, and other debris (i.e., metal). Detrital veneer is organic and appears to consist of phytoplankton/diatoms and silt.
- Macroalgae was identified to the lowest practical level (LPL) and total areal coverage was estimated.
- Sessile invertebrates, such as clams and mussels, were identified to LPL and total areal coverage was estimated (as above).
- Motile invertebrates (e.g., urchins, limpets) and fish were identified to LPL and enumerated. Abundance was estimated if relatively large numbers (typically, numbers exceeding 100, depending on size and behaviour of organisms) of motile species were present.
- Photographs showing representative biological features and aiding in species identification were taken.

5.3.1.2 Opportunistic Specimen Collection

Opportunistic samples of epifauna and macroflora were collected to improve species identifications, which is particularly important if this sampling method is to effectively detect any species that might be non-indigenous to the area. Specimens were collected using the following protocol:

- Divers collected specimens into sealed Ziploc bags and brought these to the surface in a mesh bag.
- Discretion was used to sample only one representative individual or portion of a macroalgae to avoid over-harvesting from the quadrats which could have future implications on the community assemblage (experimental design interaction).

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[6] Underwater imagery collected using a SONY RX100 V camera in Fantasea underwater housing and Big Blue video light for all underwater surveys. The camera has high-definition video capability and still photography features.

[7] Survey area excludes the area covered by the metal sub-grid bars (Figure 5-2). Organisms on or beneath the metal sub-grid bars were excluded from quadrat data (and noted as opportunistic observations) unless they entered the survey area during the survey.

[8] Recorded data were in general accordance with Fisheries and Oceans Canada (DFO) Marine Foreshore Environment Assessment Procedure (MFEAP) (provided in Appendix A)

- Samples were placed into 120 mL clear glass jars and preserved. Macroflora samples collected for taxonomic analysis were preserved in a 10% buffered formalin solution and samples collected for DNA barcoding were preserved with 80% ethanol. This concentration has been confirmed to be appropriate for initial preservation of specimens for DNA analysis by the Canadian Centre for DNA Barcoding (T. Macdonald, Biologica Environmental Services Ltd, pers. comm.). (Upon arrival at the laboratory of Biologica Environmental Services Ltd., specimens were transferred to 90% ethanol as outlined below). The jars were then sealed and inverted several times to promote homogenization and saturation with the preservative. Jars were labeled internally and externally with water-resistant labels.
- When feasible, unpreserved macroflora samples were pressed onto cardstock paper for taxonomic identification and to maintain a catalogue of specimens identified.
- Samples were sent to Biologica Environmental Services Ltd. (Biologica) for taxonomic identifications. All ethanol-preserved samples were transferred to 95% ethanol, after spending approximately one month in 80% ethanol. Macroflora samples were analyzed using a stepwise approach; samples preserved in 10% formalin (or pressed) were first analyzed for morphological identification by an algae taxonomist (Dr. Sandra Lindstrom, University of British Columbia [UBC]). If further verification is warranted for any taxa based on uncertainties with the morphological taxonomy results, additional targeted sampling will be performed to collect specimens that would be preserved in 95% ethanol and sent for DNA verification to the Canadian Centre for DNA Barcoding (CCDB) at the University of Guelph, or other relevant specialists for barcoding. Targeted sampling efforts are planned for 2023 to collect specimens for DNA analysis. Targeted taxa include taxa on the program watchlist in addition to taxa where morphological examination is unable to reliably resolve identifications (e.g. bryozoans).

5.3.2 Data Analysis

Diver-collected quadrat data were entered into an electronic database by one biologist and verified by a second biologist to reduce transcription errors. Some taxa observed are neither epifauna nor benthic, such as pelagic taxa (mysid shrimp, sea angels), and hence considered “incidental” and not included in data analysis. Field-based identifications were updated where lab identifications of opportunistically sampled specimens resulted in improved taxonomic resolution[9].

Data analysis was based on separating biota by three assemblages, defined as taxa that share an attribute of habitat or taxonomic similarity, and representing subsets of a biological community: macroflora, sessile epifauna, and motile epifauna. Results are therefore presented by these three assemblages in Section 5.4.

Statistical analysis was based on four indicators: taxa richness (to the lowest practicable level), Simpson’s Diversity Index, organism density (motile epifauna) and percent cover (macroflora and sessile epifauna). In addition, assemblages were explored as relative abundance, by grouping related taxa into broader taxonomic classifications (e.g., grouping all fish taxa into the broader classification ‘fish’) to evaluate how proportions of these major classifications might differ between exposure and reference area. Quantitative statistical analyses were performed comparing results from 2022 and 2021. Due to inconsistent sampling methodologies in previous survey

[10] Did not include higher order taxa for which there exists a lower order identification. For example, does not include *Mya* sp. if *Mya truncata* is found in the same quadrat.

years, a quantitative statistical analysis was not possible for pre-2021 survey years. Although quadrats were placed and the present survey commenced in 2020, data collection was partly by SCUBA and the remainder by ROV in that year.

Prior to surveying Q6 and Q16, the vessel anchor had been deployed and caught on Q16, causing it to drag across the bottom to a new location in deeper water (to -9.1 m CD from the original -5.7 m CD depth). Divers observed that the sediment surface was disturbed inside and outside the quadrat (Appendix 5B – Photo 3) and the data collected during quadrat survey indicated that less silt was observed compared to 2021 and that infauna, such as clams, had been brought up to the sediment surface. Therefore, Q16 results from 2022 were considered an outlier and removed from analyses. In 2023, Q16 should be relocated to a new location at a similar depth as the original location in 2021 (-5.7 m CD) with a new quadrat name to restart the quadrat data series.

5.3.2.1 Community Indicators

Taxa Richness

Richness is defined as the total number of unique[10] taxa per quadrat. This metric provides an indication of the diversity (number of different species) in the local ecological community. A higher richness value typically indicates a healthier and more balanced community. Mean taxa richness and standard error of the mean was calculated based on number of taxa by area (Exposure, Reference).

Simpson's Diversity Index

Simpson's Diversity Index (SDI) measures the proportional distribution of organisms in the community. The SDI considers the abundance patterns and taxonomic richness of the community. Certain conditions may favour one taxon over another, resulting in the community being dominated by a few taxa, which is reflected in decreased diversity (Simpson 1949). The SDI values range between zero and one, where lower values indicate a less diverse community and higher values indicate a more diverse community. The SDI was calculated using the formula provided by Krebs (1999):

$$SDI = 1 - \sum_{i=1}^{S} (p_i)^2$$

Where:

- SDI = Simpson's Diversity Index
- S = the total number of taxa
- p_i = the proportion of the i^{th} taxon (of each unique taxon out of the total abundance of the sample)

For categorization, SDI values <0.250 were considered to have very low diversity, 0.250 to 0.499 had low diversity, 0.500 to 0.750 were moderately diverse and >0.750 were considered to have high diversity (Table 5-2). Mean SDI and standard error of the mean were calculated for each exposure and reference areas.

[10] Did not include higher order taxa for which there exists a lower order identification. For example, does not include *Mya* sp. if *Mya truncata* is found in the same quadrat.

Table 5-2: Diversity Categories for Simpson's Diversity Index (SDI) Values

SDI Value	Diversity Category
<0.250	Very Low
0.250 through 0.499	Low
0.500 through 0.750	Moderate
>0.750	High

Organism Density

For motile invertebrates and fish (collectively motile epifauna), density was standardized to organisms/m^2 using a correction factor for quadrat size (2020/2021 or 2022 quadrats) to maintain comparability. Mean density (organisms/m^2) and standard error of the mean were calculated for each exposure and reference areas.

Percent Cover

For macroalgae and sessile epifauna, mean percent areal cover (total cover) and standard error of the mean was calculated by area (exposure, reference). Relative abundance was calculated as percent cover standardized out of 100% for substrate, macroflora, sessile and motile epifauna.

5.3.2.2 Statistical Analysis

ANOVA

Differences in substrate, detritus and debris, macroalgae, and benthic epifauna indicators between the exposure and reference areas and between 2021 and 2022 survey years were analyzed using an analysis of variance (ANOVA). The ANOVA compares the means of a variable between two or more groups; specifically for these analyses, a two-way ANOVA was used as two independent variables were tested (i.e., exposure versus reference area, and 2021 versus 2022). The analysis calculates an F value, which is the test statistic based on the ratio of the between-group variation to the within-group variation, and a p-value, the probability that the outcome could have happened by chance. A large F value and small p value indicate that the variation among the group means is higher than can be accounted for by chance (Zar 2010). Percent cover, density, taxa richness, and diversity (i.e., SDI) of macroflora, sessile, and motile benthic epifauna were used as dependent variables. A p-value <0.05 is considered to indicate significance between groups. Analyses were conducted using R statistical software version 4.1.2 (R Core Team 2013).

Statistical comparisons were separated into two types of analyses based on different datasets according to a sample size of quadrats that were appropriate for each type of comparison, Between-Area and Between-Years:

- **Between-Area Analysis:** 1-Factor ANOVA comparing exposure vs. reference area based on the 2022 dataset, including all quadrats as listed in Table 5-1, except for Q16.
- **Between-Years Analysis:** 2-Factor ANOVA comparing between years 2021 and 2022, as well as between areas (exposure vs. reference). This analysis was based on a subset of the entire database, consisting of only the quadrats (Table 5-3) that were surveyed in both years. For example, since Q9 and Q19 were surveyed in 2022 but not in 2021, they were excluded from this dataset.

Table 5-3: Quadrats Included in Between-Years ANOVA Analysis

Area	Quadrat	UTM Coordinates (17W)		Depth (-m below CD)[1]	Deployment Date
		Easting (m)	Northing (m)		
Milne Port (Exposure)	Q1	502828	7976382	10	12 August 2020
	Q3	504208	7976659	11.7	12 August 2020
	Q4	504363	7976611	14	12 August 2020
	Q5	504802	7976731	12.9	12 August 2020
	Q11	502820	7976371	8.4	10 August 2021
	Q13	504210	7976643	9.8	10 August 2021
	Q14	504350	7976589	9.4	6 August 2021
	Q15	504800	7976721	10.5	6 August 2021
Reference Area	Q6	506563	7979107	18.3	13 August 2020
	Q7	506774	7979170	11.1	13 August 2020
	Q8	506957	7979457	11.3	13 August 2020
	Q10	506584	7979115	8.8	13 August 2020
	Q17	506774	7979163	10.2	11 August 2021
	Q18	506956	7979452	11.1	11 August 2021
	Q19	506953	7979447	11.5	11 August 2021
	Q20	506588	7979125	13.6	8 August 2021

Taxa Accumulation

A taxa accumulation curve was calculated for quadrats surveyed in 2022 to provide an estimate of the effort required to fully characterize the benthic community assemblage, in accordance with Baffinland's commitment made in response to DFO Technical Comment 17 on the 2020 MEEMP and NIS/AIS Monitoring Program Report (Golder 2021b). A taxa accumulation curve illustrates how the number of unique taxa (or species) increases as the number of samples are accumulated; in other words, the harder one looks (i.e., the higher the sampling effort), the more unique taxa are found. The curve reaches an asymptote when all taxa within the given community assemblage have been sampled and the community assemblage is assumed to have been fully described. The observed species (or taxa) curve (S_{obs}) is plotted and the sample (i.e., quadrat) order is randomized and permutated 999 times, resulting in an averaged curve describing a smooth relationship of the average number of species (or taxa) for each number of replicates and the standard deviation of the mean (i.e., permutations). This is equivalent to station-based rarefaction curves. Analysis was conducted using PRIMER-E statistical software version 7 (Clarke and Gorley 2014, 2015).

Power Analysis

A power analysis was conducted using the 2021 and 2022 data to estimate the sample size needed to detect Project-related change based on levels of observed variability among quadrats, in accordance with Baffinland's commitment made in response to DFO Technical Comment 16 and 17 on the 2020 MEEMP and NIS/AIS Monitoring Program Report (Golder 2021b; Appendix 5E).

5.3.3 Quality Management

Quality assurance and quality control (QA/QC) procedures were applied to the field collection, data analysis, and reporting tasks within the chapter component to verify that the data presented were valid and of acceptable quality to address objectives stated in Section 5.1.1.

5.3.3.1 Field QA/QC

QA/QC measures for quantitative and qualitative data collected during quadrat surveys included:

- Field survey data sheets were checked and cross-validated in the field.
- Taxonomic identifications, including common and species name, were verified using references[11].
- Dive survey video, photographs and datasheets were saved to a laptop computer and external hard drive at the end of each field day. Once in the office, the survey data were uploaded to an internal SharePoint site.

5.3.3.2 Laboratory and Data Analysis QA/QC

The following QA/QC measures were implemented:

- Taxa common name/species name and recorded observations were verified using references[7].
- Transcribed diver-collected data was reviewed for transcription errors by a second biologist.
- Calculations were verified by a second biologist for errors as part of the data review process.

5.4 Results

This section presents results from the 2022 quadrat sampling program at Milne Port, with a quantitative comparison to 2021 data. Representative photographs are provided in Appendix 5B. Quadrat/transect data in tabulated form are presented in Appendix 5C for 2021 and 2022. ANOVA results are presented in Appendix 5D with summary tables embedded within this report. Results of the power analysis are provided in Appendix 5E. A taxa list with common and scientific names is provided in Appendix 5F. Taxonomic results in relation to the objective of monitoring for non-indigenous species are presented in Chapter 8.0.

Q12 was relocated to deeper water in 2022 and represents the start of a new data series. Data from Q12 was therefore presented only for 2022 and not used in multi-year quantitative comparisons.

5.4.1 Substrate

Substrate Composition

Substrate, as visually estimated by the divers using a modified Wentworth scale (Wentworth, 1922), was composed predominantly of silt and sand (Figure 5-4A) for quadrats in both the exposure and reference areas, as

[11] References used during the surveys, included: Mecklenburg et al. (2007), Küpper et al. (2016), Coad and Reist (2018), Golder (2021), WoRMS (2021), Guiry and Guiry (2021)

observed in previous years (Figure 5-5A). Quadrats Q12, Q21, and Q23 within the exposure area and quadrats Q20, Q24, Q25, and Q26 within the reference area contained mainly sand (ranging 65 to 80%), while silt was more dominant in the other quadrats within both the exposure area (ranging between 45 to 80%) and reference area (ranging between 53 and 70%). Other substrate types present in small proportions within each area in 2022 included gravel (0 to 16%), cobble (0 to 10%), and shell (0 to 10%) (Figure 5-4B and C). Bedrock was not observed within the quadrats in 2022 as the limited amount visible in 2021 (only present in one quadrat) had apparently been covered with deposition of finer sediment.

Between-Area analysis using the one-factor ANOVA did not find significant differences in substrate composition between the exposure and reference area in 2022 for the (Table 5-4). The Between-Year analysis (two-factor ANOVA) found significant differences in the percent cover of substrate types interannually for sand and silt (Table 5-4; Appendix 5D – Tables 6 and 8). Sand within the exposure area was significantly higher in 2022 compared to 2021. Q20 is driving these results (i.e., inflating the mean), as it increased from 23% sand in 2021 to 80% sand in 2022[12] (Figure 5-5A). Sand was also significantly higher in the exposure area compared to the reference area, and silt was significantly higher within the reference area compared to the exposure area within the 2021 year (Golder 2021b). There were no statistical differences for the other substrate categories (cobble, gravel, shell) during the Between-Year analysis.

Detritus and Debris

A detrital veneer was present in most quadrats in 2022 (Figure 5-5B). The reference area contained a larger range of detrital veneer percent cover compared to the exposure area (0 to 60% vs 0 to 45%, respectively), but there were no statistical differences in the Between-Area analysis (Table 5-4; Appendix 5D – Table 11). When considering the subset of quadrats used in the Between-Year analysis, the reference area significantly increased in detrital veneer from 2021 to 2022 and was also significantly higher compared to the exposure area in 2022 (Table 5-4; Appendix 5D – Table 12). Different statistical results for area in 2022 between the Between-Year analysis is due to the addition of new quadrats in 2022 that had a high percentage of detrital veneer in the reference area (Q9, Q19) as well as additional new quadrats to both areas that had very low percent coverage, thus driving the difference seen in the Between-Year analysis.

Detrital (or drift) macroalgae was present in half of the quadrats (Figure 5-5B), with the reference area containing more quadrats with a higher percentage of detrital algae compared to the exposure area but there was no statistical difference. Highest percent cover was recorded in Q6, Q7, Q14, and Q20 (each with 40%). Overall, the percent detrital algae increased somewhat in 2022 compared to the previous year, but there were no statistical differences in either the Between-Area or Between-Year analysis (Table 5-4, Appendix 5D – Tables 13 to 14).

Other debris consisted of rusting metal pieces (Figure 5-4C; (Figure 5-5B) left from the suspended anchor chain maintaining the settlement plate locations (used for NIS/AIS monitoring [Chapter 8]) above the quadrat for those quadrats deployed in 2020 (Q1 through Q10)[13]. It also includes aluminum piping from the belt transects observed in Q5 that has been observed every survey year since 2020. There were no statistically significant differences for debris in either the Between-Area or Between-Year analysis (Table 5-4, Appendix 5D – Tables 15 to 16).

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[12] This quadrat correspondingly increased in silt content between the years and was an outlier in both the sand and silt 2-way ANOVA results (Figure 3 and 4 in Appendix D). When surveying Q20 in 2021, it was noted that the quadrat had travelled across the sediment surface interface over a steep slope during deployment (in 2021), causing the sediment to be disturbed and exposing some underlaying bedrock (Golder 2021b). The shift in substrate composition to conditions observed in 2022 are due to substrate settling out over time.

[13] Quadrats deployed in later years did not use chain as part of the experimental design.

Power Analysis

Power was not sufficient to detect an effect size of ±20% for any of the analysed substrate variables except for silt (Appendix 5E). An analysis based on ten samples (quadrats) would have sufficient power to detect an effect size of ±40% for sand and silt, but not any of the remaining substrate variables. An increase in effort to 25 quadrats per area would not result in sufficient power to detect a ±40% effect size for any of the remaining sediment variables.

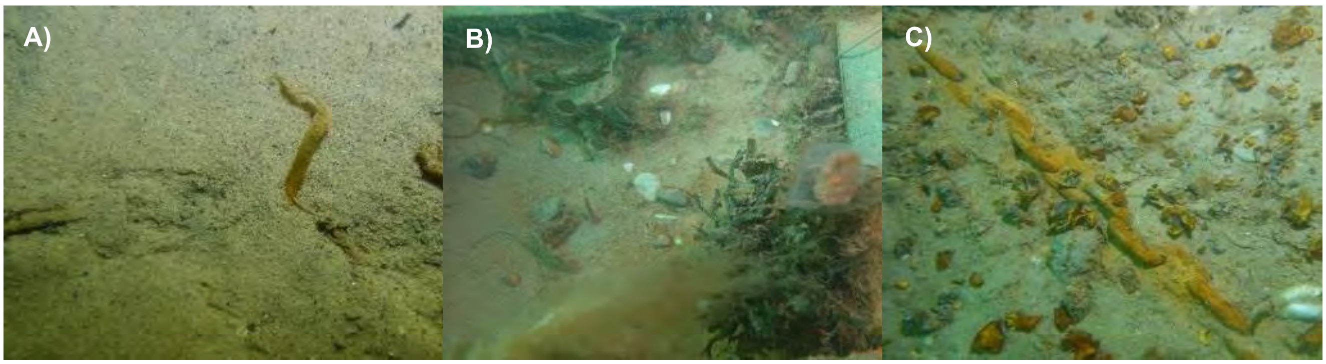


Figure 5-4: Substrate Types Observed in Survey Quadrats at Milne Port, Showing Areas Dominated By: A) Silt/Sand, B) Gravel and C) Cobble with Anthropogenic Debris (i.e., Chain).

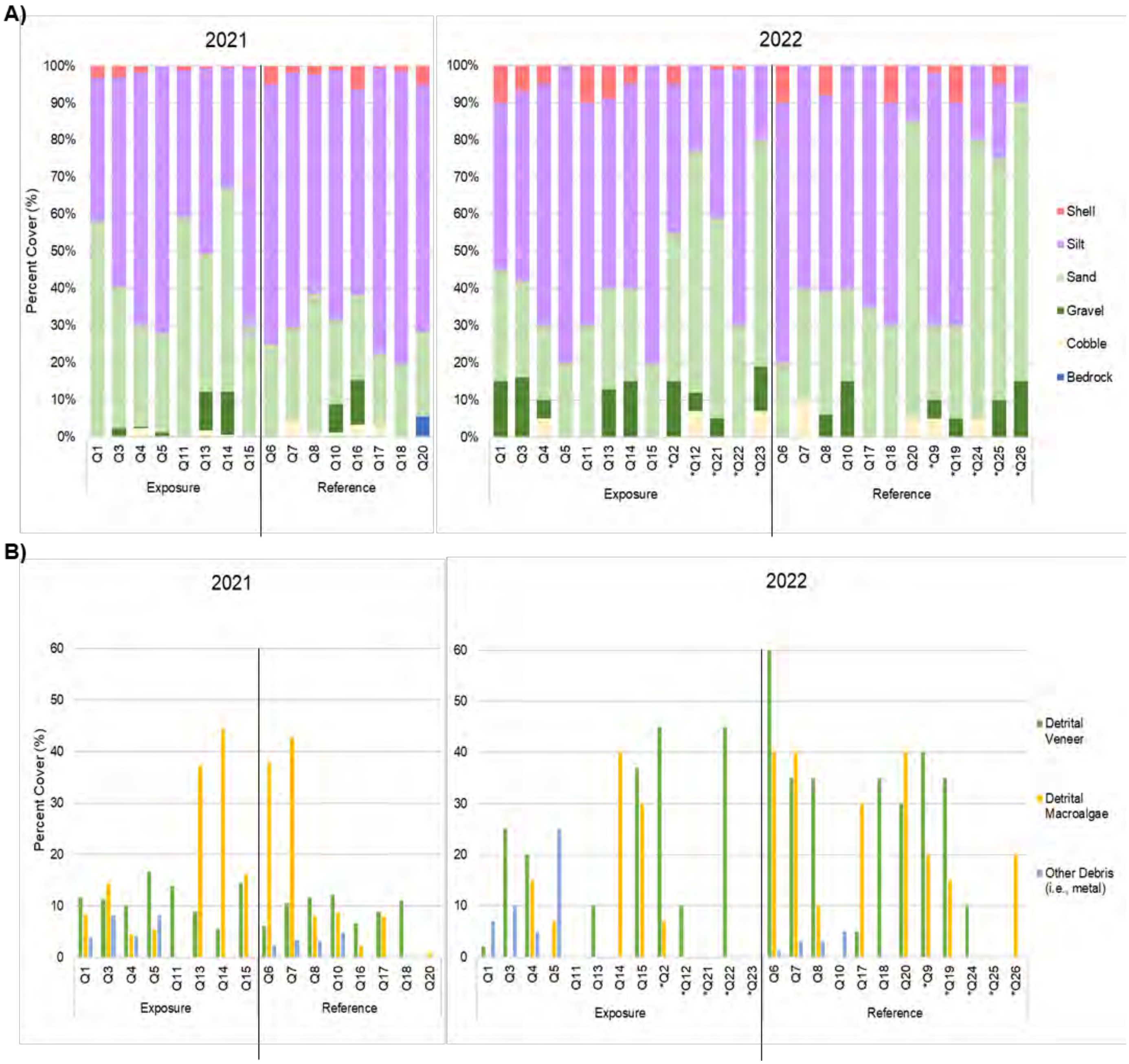


Figure 5-5: Relative Abundance of Substrate Types (A) and Total Percent Cover of Detrital Veneer, Macroalgae and other Anthropogenic Debris (B) during Quadrat Surveys in Milne Port in 2021 and 2022.

Note: * indicates quadrats that were surveyed in 2022 but not in 2021. Q16 in 2022 was removed due to disturbance.

Table 5-4: Between-Area One-Factor ANOVA and Between-Years Two-Factor ANOVA Results of Significant Differences (p-value <0.05) in Substrate Percent Cover at Milne Inlet.

Response[1]	Analysis[2]	Covariate	Independent Variable	F-value / T-ratio[3]	P-value[4]
Substrate Composition					
Cobble	Between-Area	N/A	NS	NS	NS
	Between-Years	N/A	NS	NS	NS
Gravel	Between-Area	N/A	NS	NS	NS
	Between-Years	Depth	NS	NS	NS
Sand	Between-Area	N/A	NS	NS	NS
	Between-Years	Depth	**Year:Area**	**9.314**	**0.005**
			Exposure Area: 2021 vs 2022	*2.693*	*0.012*
			2021: Exposure vs Reference Area	*2.585*	*0.016*
Silt	Between-Area	N/A	NS	NS	NS
	Between-Years	Depth	**Year:Area**	**3.681**	**0.038**
			2021: Exposure vs Reference Area	*-2.258*	*0.033*
Shell	Between-Area	N/A	NS	NS	NS
	Between-Years	N/A	NS	NS	NS
Detritus/Debris					
Detrital veneer	Between-Area	N/A	NS	NS	NS
	Between-Years	Depth	**Depth**	**5.987**	**0.022**
			Year:Area	**5.389**	**0.029**
			Reference Area: 2021 vs 2022	*4.181*	*<0.001*
			2022: Exposure vs Reference Area	*3.028*	*0.005*
Detrital algae	Between-Area	N/A	NS	NS	NS
	Between-Years	N/A	NS	NS	NS
Debris (e.g., metal)	Between-Area	N/A	NS	NS	NS
	Between-Years	Depth	NS	NS	NS

Note: Substrate composition refers to the number of substrate types per quadrat location. Residuals and intercept are not presented in this table. **Bold** indicates initial significant ANOVA analysis results. *Italics* indicate significant post-hoc test results. 'N/A' indicates no covariate was used in analyses. 'NS' indicates no significant differences were found for any variable.

[1] Bedrock was not analyzed as it was only present in one quadrat in 2021 and not observed in 2022.

[2] Analysis descriptions are provided in Section 5.3.2.2. Analyses include Between-Area [1-factor ANOVA] and Between-Years [2-factor ANOVA].

[3] F-values are presented for the initial ANOVA test, and T-ratios for post-hoc results.

[4] Only significant results (p-values < 0.05) are presented in this table. See Appendix 5D for full results.

5.4.2 Macroflora

Macroflora identified in quadrats belonged to four larger taxonomic groups: Ochrophyta (brown algae), Rhodophyta (red algae), Chlorophyceae (green algae), and Bryophyta (Appendix 5C). Opportunistic collections of unfamiliar specimens were sent to taxonomic laboratories for identification; while one specimen was resolved by Biologica and did not require further DNA barcoding verification, one aquatic bryophyte remains unresolved. The specimen has been sent to a bryophyte taxonomist (Dr. Terry MacIntosh, University of British Columbia Herbarium) for further identification[14].

Brown algae were resolved to six distinct taxa in 2022, three of which were defined to species level: sugar kelp (*Saccharina latissima*), sieve kelp (*Agarum clathratum*), and rockweed (*Fucus distichus)* (Appendix 5B – Photos 4 and 5). Three were identified to genus level - *Pylaiella* sp., acid weed (*Desmarestia* sp.), and *Battersia* sp. (Appendix 5B – Photo 6). *Battersia* sp. has not been observed in quadrats previously but has been found Milne Inlet in previous years (Golder 2021a, Golder 2021b). Two red algae species were observed - *Coccotylus truncatus* and *Savoiea arctica* (identified by taxonomy laboratory) (Appendix 5B – Photos 7 and 8). Green algae comprised one species, *Chaetomorpha melagonium* (Appendix 5B – Photo 10) while others were unidentified filamentous green algae. In 2022, an aquatic bryophyte (Bryophyta indet.) was observed in quadrat Q21 in the exposure area – taxonomic identification of this is pending (Appendix 5B – Photo 11). New quadrats Q21 and Q22 were deployed in front of Phillips Creek and a surface layer stratification was noted by divers to reach from the surface to the bottom, including the area where the quadrats were located.

Percent Cover

The most abundant macroalgae type in 2022 was brown filamentous (composed of acid weed and *Battersia* sp.) and ephemeral *Pylaiella* sp [15] (Figure 5-6B) across both areas. Rockweed was also present in both areas but was more abundant in the reference area. Sugar kelp was present in low proportions in several quadrats in both areas but was exclusive in Q25 and Q26 in the reference area. Overall, relative abundance of major algae classifications was comparable between 2021 and 2022, with the exception of rockweed, which was barely present in 2021, but had significant presence in quadrats in 2022.

Macroalgae percent cover varied among quadrats (from 1 to 100%) with the majority of quadrats ranging from 1 to 51% in both the exposure and reference areas (Figure 5-6A). Q3 in the exposure area and Q10 and Q17 in the reference area had the highest percent covers (75 to 100%). The average percent cover of the reference area was somewhat higher than that of the exposure area, but they were both within the same range (33 ± 9% and 24 ± 6% and not statistically different (Between-Area analysis) (Table 5-5; Table 5-6). Percent cover increased significantly within both areas from 2021 to 2022, but there were no differences between areas (Between-Year analysis) (Table 5-6; Appendix 5D – Tables 18).

[14] If the result is not resolved, this specimen will be sent for DNA verification.

[15] *Pylaiella* sp. was separated from brown filamentous for relative abundance analysis because ephemeral algae are transient, exist for a short period of time, and vary widely in abundance during a given period. In contrast, other brown algae are slower growing annual or perennial species whose growing characteristics do not fluctuate as much.

Diversity

Macroalgae diversity (taxa richness and SDI) was similar between the exposure and reference area in 2022. Taxa richness ranged between one to five taxa, and SDI ranged between Very Low (<0.250) to Moderate (0.500 to 0.750) (Figure 5-7). Although mean values for taxa richness and SDI were slightly higher for the exposure area compared to the reference area, the ranges overlapped and there was no significant difference between areas within 2022 (Between-Area analysis) (Table 5-5; Table 5-6). Both taxa richness and SDI means and ranges were lower for their respective areas in 2022 compared to 2021 (Figure 5-7 and Table 5-4 in Golder [2022]), however statistically significant differences were not detected during the Between-Year analysis (Table 5-6; Appendix 5D – Tables 20 and 22).

Power Analysis

Overall, these results suggest that the exposure and reference areas were comparable with respect to these indicators with some inter-annual differences between the two survey years. However, power was not sufficient to detect an effect size of ±20% between the areas for any of the macroflora variables at the collected sample size (Appendix 5E). An analysis based on ten samples (quadrats) would have sufficient power to detect an effect size of ±40% for taxa richness and SDI, but not for total percent cover. An increase in effort to 25 quadrats per area would not result in sufficient power to detect a ±40% effect size for macroflora total percent cover.

Table 5-5: Quadrat Survey Results for Macroflora - Milne Inlet (2022)

Survey Area	Quadrat	Macroalgae			
		Total Cover (%)	Taxa Richness	SDI	Dominant Taxa
Milne Port (Exposure)	Q1	10	5	0.680	Acid weed, *Pylaiella* sp.
	Q2	33	4	0.670	Acid weed, *Coccotylus truncatus*
	Q3	75	3	0.480	Acid weed, rockweed
	Q4	30	4	0.640	Acid weed, *Pylaiella* sp., red filamentous
	Q5	8	4	0.563	Acid weed, *Chaetomorpha melagonium, Savoiea arctica*
	Q11	16	5	0.570	Acid weed, sieve kelp, *Coccotylus truncatus*
	Q12	15	1	0.000	*Pylaiella* sp.
	Q13	51	4	0.577	Acid weed, *Pylaiella* sp., rockweed
	Q14	25	2	0.320	Acid weed, *Coccotylus truncatus*
	Q15	14	3	0.602	*Coccotylus truncatus, Pylaiella* sp.,
	Q21	19	2	0.332	Aquatic bryophyte, *Pylaiella* sp.
	Q22	3	2	0.444	*Pylaiella* sp., sugar kelp
	Q23	12	2	0.486	*Pylaiella* sp., acid weed
	Mean ± SE	**23.9 ± 5.5**	**3.2 ± 0.4**	**0.490 ± 0.052**	
Reference	Q6	31	2	0.062	Acid weed, *Coccotylus truncatus*
	Q7	41	3	0.430	Acid weed, *Chaetomorpha melagonium*
	Q8	16	4	0.680	*Pylaiella* sp., acid weed
	Q9	18	4	0.599	*Pylaiella* sp., *Coccotylus truncatus*
	Q10	80	3	0.398	Rockweed, acid weed
	Q17	100	4	0.679	Acid weed, rockweed, *Pylaiella* sp.
	Q18	22	3	0.579	Acid weed, rockweed
	Q19	3	2	0.444	*Coccotylus truncatus, Chaetomorpha melagonium*
	Q20	35	3	0.612	*Pylaiella* sp., rockweed
	Q24	40	5	0.664	*Pylaiella* sp., sugar kelp
	Q25	1	1	0.000	Sugar kelp
	Q26	5	1	0.000	Sugar kelp
	Mean ± SE	**32.7 ± 8.8**	**2.9 ± 0.4**	**0.429 ± 0.076**	

Note: Simpson Diversity Index (SDI) values are color-coded by category, red = very low (<0.250), blue = low (0.250 to 0.499), yellow = moderate (0.500 to 0.750).

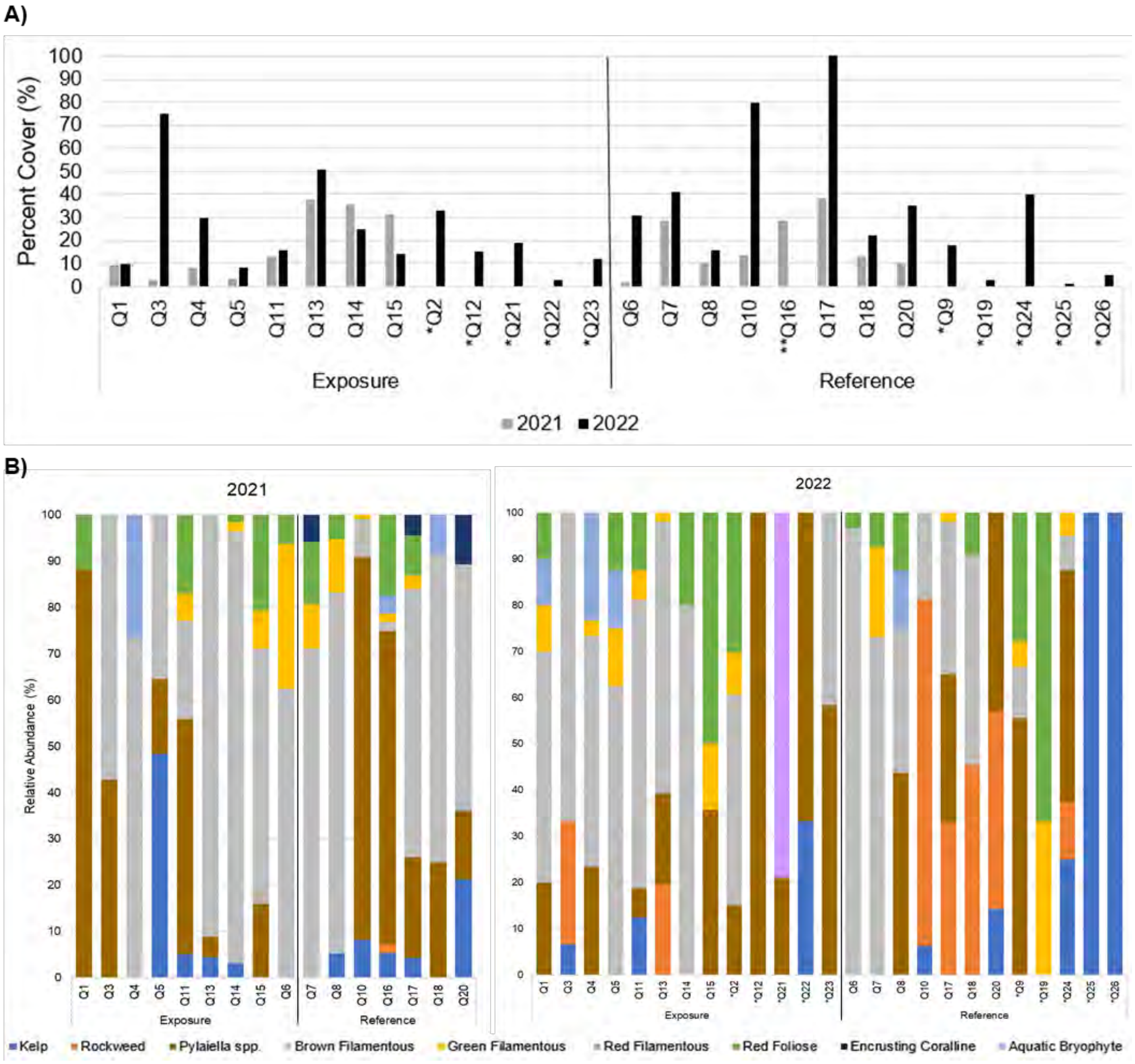
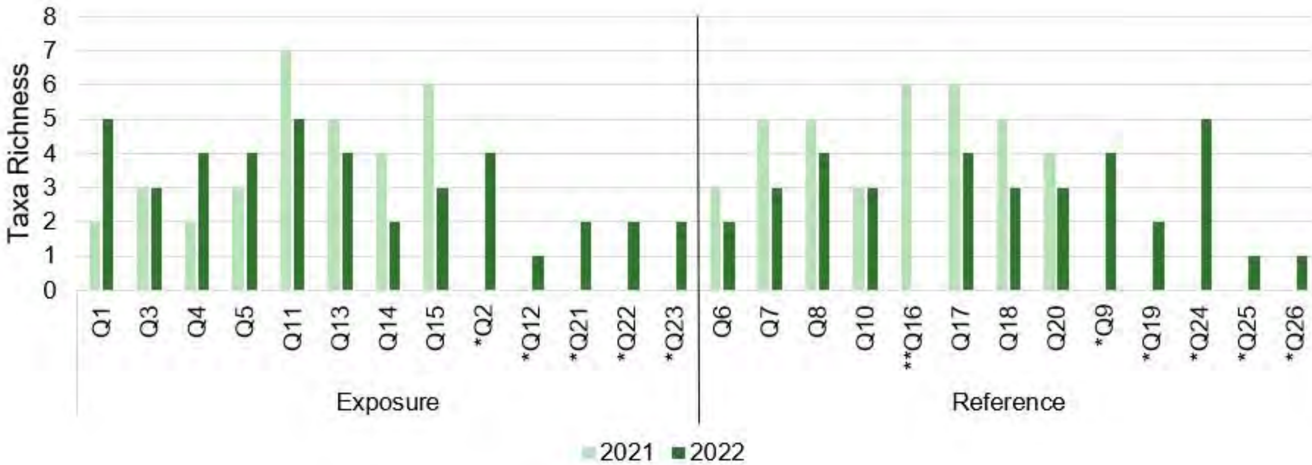


Figure 5-6: Total Percent Cover (A) and Relative Abundance (B) of Macroflora Recorded in Survey Quadrats in Milne Port in 2021 and 2022.

Note: * indicates quadrats that were surveyed in 2022 but not in 2021. **Q16 in 2022 was removed due to disturbance.

A)



B)

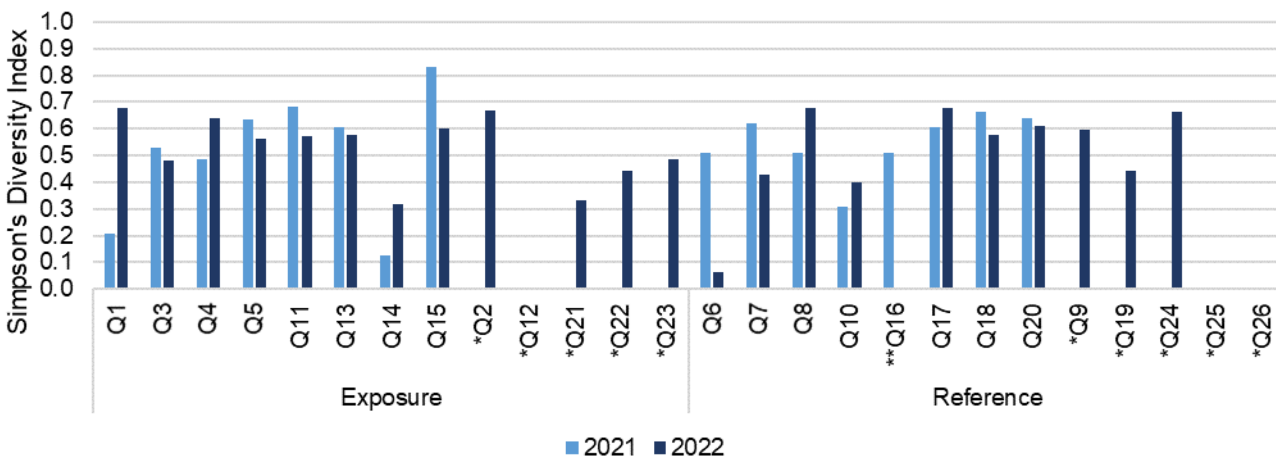


Figure 5-7: Taxa Richness (A) and Simpson's Diversity Index (B) of Macroflora Recorded in Survey Quadrats in Milne Port in 2021 and 2022.

Note: * indicates quadrats that were surveyed in 2022 but not in 2021. **Q16 in 2022 was removed due to disturbance.

Table 5-6: Between-Area One-Factor ANOVA and Between-Years Two-Factor ANOVA Results of Significant Differences (p-value <0.05) in Macroflora Summary Statistics at Milne Inlet.

Response	Analysis[1]	Covariate	Independent Variable	F-value	P-value[2]
Total Percent Cover	Between-Area	N/A	NS	NS	NS
	Between-Years	Depth	**Year**	**9.518**	**0.005**
			Depth	**3.832**	**0.062**
Taxa Richness	Between-Area	N/A	NS	NS	NS
	Between-Years	Depth	**Depth**	**5.506**	**0.027**
Simpson Diversity Index	Between-Area	N/A	NS	NS	NS
	Between-Years	N/A	NS	NS	NS

Note: Residuals and intercept are not presented in this table. **Bold** indicates initial significant ANOVA analysis results. *Italics* indicate post-hoc test results. 'N/A' indicates no covariate was used in analyses. 'NS' indicates no significant differences were found for any variable.
[1] Analysis descriptions are provided in Section 5.3.2.2. Analyses include Between-Area [1-factor ANOVA] and Between-Years [2-factor ANOVA].
[2] Only significant results (p-value < 0.05) are presented in this table. See Appendix 5D for full results.

5.4.3 Benthic Epifauna

Benthic epifauna identified in the quadrats belong to eight phyla: Annelida (worms), Arthropoda, Cnidaria, Chordata, Echinodermata, Mollusca, Nemertea, and Tunicata. Taxonomic identification of collected specimens resolved several taxa[16] which were originally noted as a unique taxa in earlier years but not identified to species, e.g., Green mussel sp. 1 presented in Golder 2021b was updated with its species name, Discord mussel (*Musculus discors*).

The majority of species identified in the quadrats belonged to the phylum Mollusca, with seven species identified: wrinkled rock-borer clam (*Hiatella arctica*), blunt gaper clam (*Mya truncata*), northern astarte clam (*Astarte borealis*), Icelandic scallop (*Chlamys islandica*), Greenland glass scallop (*Similipecten greenlandicus*), discord mussel (*Musculus discors*), and sea angel (*Clione limacina*) (Appendix 5B – Photos 21, 22, and 31). One unique taxon was resolved to genus, the Margarite snail (*Margarites* sp.). Phylum Annelida was represented by five distinct taxa, one of which was identified to species level, cone worm (*Cistenides granulata*) (Appendix 5B – Photo 15). One polynoid polychaete was identified to genus level via laboratory taxonomic analysis (*Harmothoe* sp.) and another distinct motile polychaete remains unknown (Appendix 5B – Photos 12 and 14). Two species of sabellid polychaetes (Family Sabellidae) were distinguished but were not identified[17]. Phylum Arthropoda is represented by a single unidentified shrimp (Crangonidae indet.) and mysid shrimp (Mysida Indet.) (Appendix 5B – Photo 10). The phylum Echinodermata included brittle stars (Family Ophiuridae), green urchin (*Strongylocentrotus droebachiensis*), and sea cucumber (Holothuroidea indet.), and the phylum Cnidaria was represented by burrowing anemone (Ceriantharia indet.) (Appendix 5B – Photos 7, 10, and 15). Phylum Nemertea was represented by a single unidentified ribbon worm (Nemertea indet.) (Appendix 5B – Photo 20). Phylum Chordata included one species of tunicate (*Polycarpa* sp.), and fish from the sculpin family (Cottidae; two species), Saddled Eelpout (*Lycodes mucosus*), Common Lumpfish (*Cyclopterus lumpus*), and a Fish Doctor (*Gymnelus viridis*) (Appendix 5B – Photos 16 to 19, 26 and 27).

[16] Quadrat/transect data from 2021 was updated to provide the species name, but it does not change the taxa richness and SDI results presented in Golder (2022). The updated 2021 quadrat/transect data is included in Appendix 5C.
[17] One large tube casing was collected and identified by the laboratory as *Pista maculata*.(Family Terebellidae). Since this organism was not observed to be alive in the field, it was not included in the analysis. It is possible that this species represents what has been observed as the Large Sabellid worm sp. 2 in 2021 and 2022.

5.4.3.1 Sessile Epifauna

Percent Cover

Wrinkled rock-borer clam (*Hiatella arctica*, one of the species used for fish health monitoring at Milne Inlet; Chapter 7.0) and cone worm were the dominant sessile epifauna taxa in the majority of quadrats and these results are consistent with previous years (2020 and 2021) (Table 5-7; Figure 5-8B). Total percent cover of sessile epifauna varied among quadrats in both exposure and reference areas but, on average, was slightly higher in the reference area than in the exposure area (35 ± 7% and 26 ± 7%, respectively) (Table 5-7; Figure 5-8A), though no statistically significant differences were detected between the exposure area and reference area (Between-Area analysis) nor between years (Between-Years analysis) (Table 5-8; Appendix 5D – Tables 23 to 24).

Diversity

Mean taxa richness was similar between the exposure area (3 ± 0.5 taxa) and reference area (4 ± 0.5 taxa) in 2022 (Between-Area analysis) (Figure 5-9B) but significantly reduced in 2022 compared to 2021 for both exposure areas combined (meaning the quadrats from both areas were pooled to compare their between-years means) (Table 5-8; Appendix 5D – Table 26). There was no statistical difference between areas for the Between-Year comparison. Q14 was the only quadrat to have a higher taxa richness in 2022 compared to 2021, but by only one additional unique taxon (4 and 3, respectively; Figure 5-9B). Three taxa were recorded in 2021 but not observed in 2022 quadrats: Macoma clams (*Macoma* sp.), unidentified barnacles (Balanomorpha indet.), and unidentified tunicates (Tunicata indet.). Barnacle and tunicates attach to hard-bottom substrate. Exposed bedrock and cobble were less evident in 2022 than in 2021. *Mya* sp. was the only unique taxon observed in 2022 but not in 2021. SDI ranged between very low (<0.250) to high (> 0.750) in both areas (Figure 5-9B), with no difference in mean values (0.451 ± 0.089 SDI for exposure area; 0.534 ± 0.060 SDI for reference area). SDI was very low (0.000) for Q12, Q15, Q21 and Q24 due to very low abundances of only one taxon in each quadrat. No statistically significant differences were detected for the Between-Area and Between-Year analysis for SDI (Table 5-8; Appendix 5D – Tables 27 to 28).

Power Analysis

Overall, these combined results suggest that the exposure and reference areas were comparable with respect to these indicators within each year, but there were inter-annual variations for taxa richness that were apparent across both exposure and reference area. However, the power was not sufficient to detect an effect size of ±20% between the areas for any of the sessile epifauna variables at the collected sample size (Appendix 5E). An analysis based on ten samples (quadrats) would have sufficient power to detect an effect size of ±40% for sessile epifauna taxa richness and sessile epifauna SDI, but not for sessile epifauna total percent cover. An increase in effort to 25 quadrats per area would not result in sufficient power to detect a ±40% effect size for sessile epifauna total percent cover.

Table 5-7: Quadrat Survey Results for Sessile Epifauna - Milne Inlet (2022)

Survey Area	Quadrat	Sessile Epifauna			
		Total Cover (%)	Taxa Richness	SDI	Dominant Taxa
Exposure	Q1	50	3	0.580	Cone worm, wrinkled rock-borer
	Q2	46	4	0.515	Wrinkled rock-borer, cone worm
	Q3	32	5	0.656	Wrinkled rock-borer, *Mya* sp.
	Q4	25	6	0.746	Wrinkled rock-borer, cone worm, large sabellid worm sp. 2
	Q5	13	3	0.651	Cone worm, *Mya truncata*
	Q11	25	5	0.762	Cone worm, wrinkled rock-borer
	Q12	1	1	0.000	Cone worm
	Q13	70	3	0.612	Cone worm, wrinkled rock-borer
	Q14	18	4	0.710	Cone worm, wrinkled rock-borer
	Q15	5	1	0.000	Cone worm
	Q21	1	1	0.000	*Mya* sp.
	Q22	57	4	0.631	Wrinkled rock-borer, cone worm
	Q23	0	0	0.000	No sessile epifauna observed
	Mean ± SE	**26.4 ± 6.5**	**3.1 ± 0.5**	**0.451 ± 0.089**	
Reference	Q6	38	3	0.355	Wrinkled rock-borer, Icelandic scallop, *Mya* sp.
	Q7	27	7	0.757	Wrinkled rock-borer, cone worm
	Q8	22	6	0.736	Wrinkled rock-borer, cone worm
	Q9	63	5	0.660	Wrinkled rock-borer, cone worm
	Q10	14	3	0.439	Wrinkled rock-borer, cone worm
	Q17	25	3	0.640	Wrinkled rock-borer, cone worm
	Q18	43	4	0.675	Wrinkled rock-borer, cone worm, mussel
	Q19	37	3	0.599	Wrinkled rock-borer, *Mya truncata*
	Q20	100	5	0.492	Wrinkled rock-borer, cone worm, mussel
	Q24	1	1	0.000	Northern Astarte
	Q25	30	3	0.500	Wrinkled rock-borer, cone worm, *M.* sp.
	Q26	17	4	0.561	Wrinkled rock-borer, cone worm
	Mean ± SE	**34.8 ± 7.5**	**3.9 ± 0.5**	**0.534 ± 0.060**	

Note: Simpson Diversity Index (SDI) values are color-coded by category, red = very low (<0.250), blue = low (0.250 to 0.499), yellow = moderate (0.500 to 0.750), green = high (>0.750

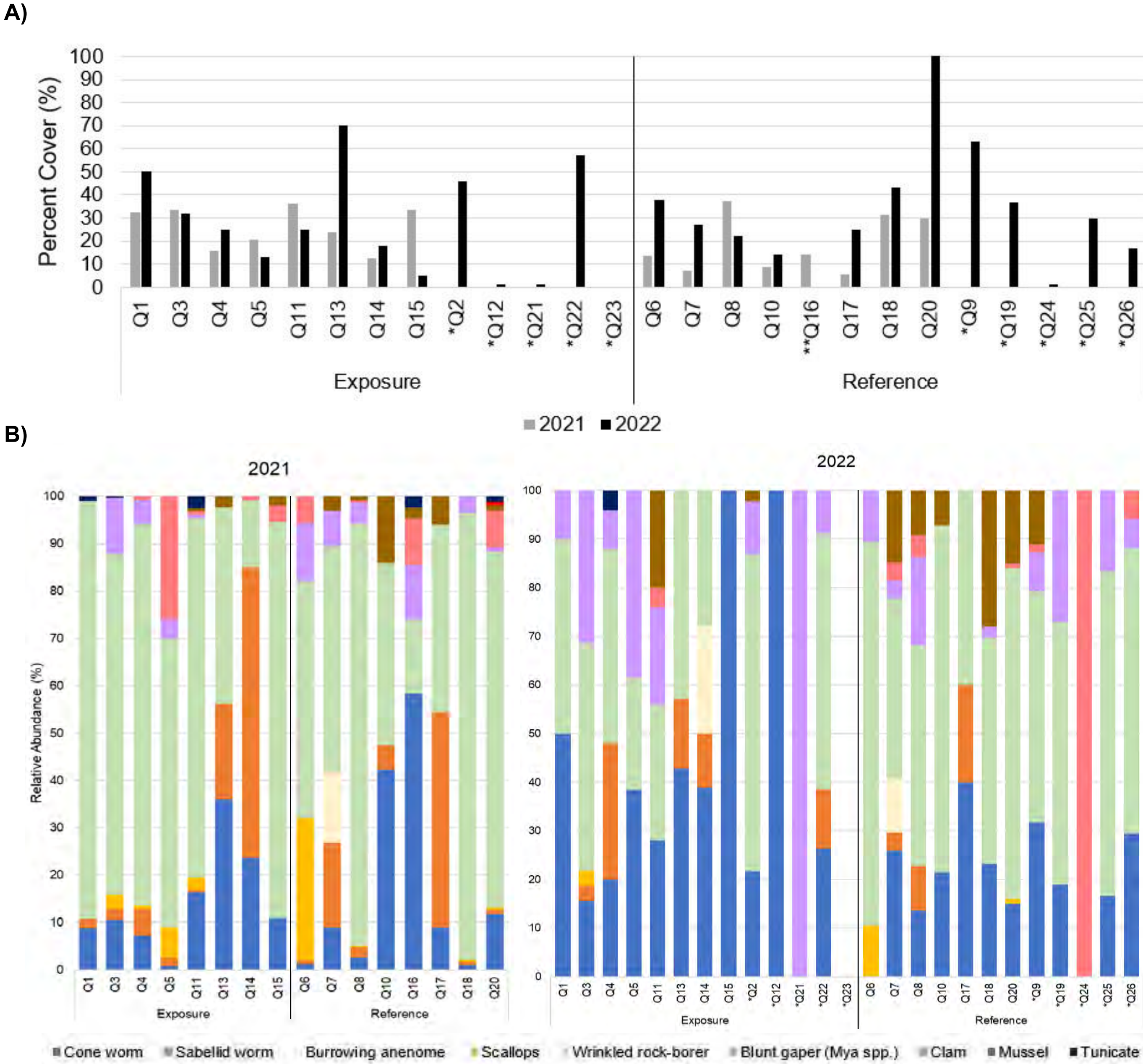
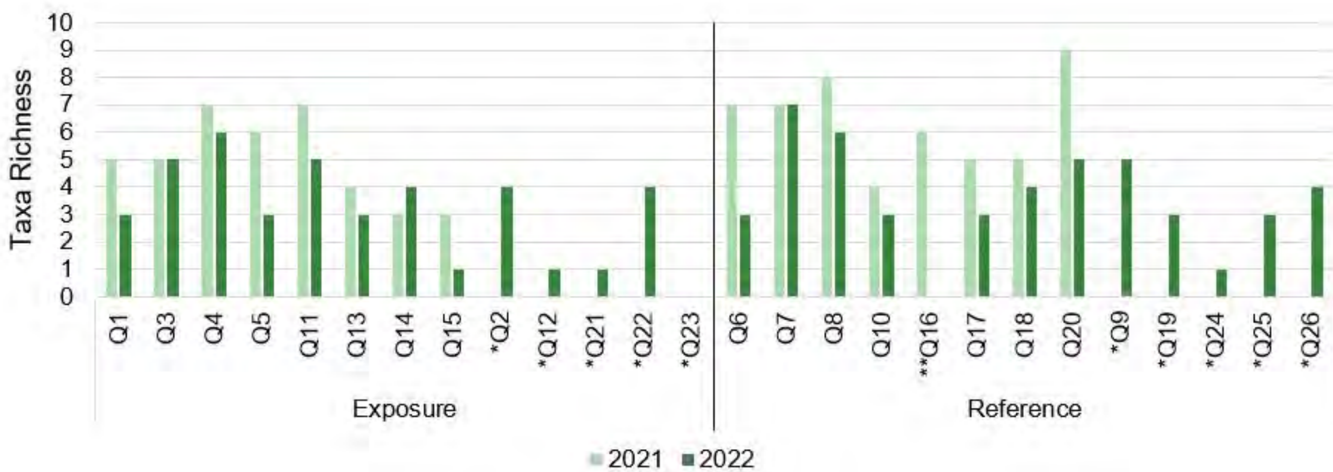


Figure 5-8: Total Percent Cover (A) and Relative Abundance (B) of Sessile Epifauna Recorded in Survey Quadrats in Milne Port in 2021 and 2022.

Note: * indicates quadrats that were surveyed in 2022 but not in 2021. **Q16 in 2022 was removed due to disturbance.

A)



B)

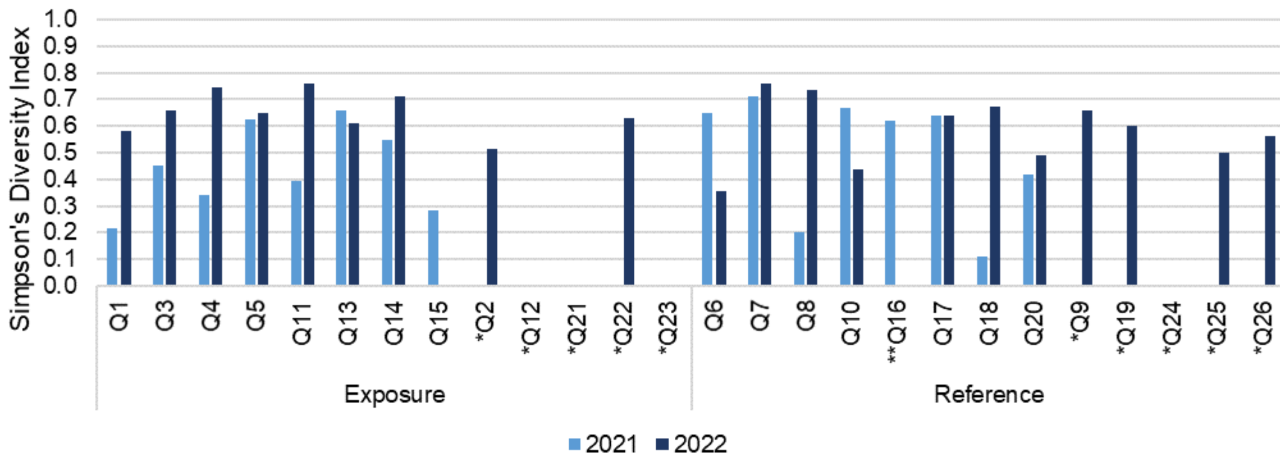


Figure 5-9: Taxa Richness (A) and Simpson's Diversity Index (B) of Sessile Epifauna Recorded in Survey Quadrats in Milne Port in 2021 and 2022.

Note: * indicates quadrats that were surveyed in 2022 but not in 2021. ** Q16 in 2022 was removed due to disturbance.

Table 5-8: Between-Area One-Factor ANOVA and Between-Years Two-Factor ANOVA Results of Significant Differences (p-value <0.05) in Sessile Epifauna Summary Statistics at Milne Inlet.

Response	Analysis[1]	Covariate	Independent Variable	F-value	P-value[2]
Total Percent Cover	Between-Area	N/A	NS	NS	NS
	Between-Years	Silt	**Silt**	**15.462**	**0.001**
Taxa Richness	Between-Area	N/A	NS	NS	NS
	Between-Years	N/A	**Year**	**7.038**	**<0.001**
Simpson Diversity Index	Between-Area	N/A	NS	NS	NS
	Between-Years	N/A	NS	NS	NS

Note: Residuals and intercept are not presented in this table. **Bold** indicates initial significant ANOVA analysis results. *Italics* indicate post-hoc test results. 'N/A' indicates no covariate was used in analyses. 'NS' indicates no significant differences were found for any variable.
[1] Analysis descriptions are provided in Section 5.3.2.2. Analyses include Between-Area [1-factor ANOVA] and Between-Years [2-factor ANOVA].
[2] Only significant results (p-value < 0.05) are presented in this table. See Appendix 5D for full results.

5.4.3.2 Motile Epifauna

Density

Motile epifauna density was generally low but within the same range for the exposure and reference areas in 2022, except for Q6 which had a higher density (115 org/m^2) than the other quadrats (Table 5-9; Figure 5-10; Appendix 5C). Five quadrats contained no motile epifauna at all (Q10, Q17, Q21, Q24, and Q26). Green urchins were dominant in the exposure area but many exposure area quadrats contained only a single taxon (Q12, Q22, Q24) (Figure 5-10). Most quadrats in the reference area contained a single organism from two to three taxa, except for Q6 which was dominated by a high density of brittle stars (Table 5-9; Figure 5-10; Figure 5-11A). There was no statistical difference found in the Between-Area nor the Between-Year analyses (Table 5-10; Appendix 5D – Tables 29 to 30).

Diversity

Diversity (taxa richness and SDI) was low overall for motile epifauna in both areas in 2022. Taxa richness was similar between the two survey areas (ranging 0 – 4 in both) (Figure 5-11A). SDI reached as high as moderate (0.500 to 0.750) in quadrats within both areas, but over half of the quadrats had a SDI of zero. These quadrats either lacked any motile epifauna (Q10, Q17, Q21, Q24, and Q26) or they contained only one or two organisms of a single taxon (Q8, Q9, Q11, Q12, Q13, Q15, Q22, Q23, and Q25) (Table 5-9; Figure 5-11B). There were no statistically significant differences for taxa richness or SDI for the Between-Area nor the Between-Year analysis (Table 5-10; Appendix 5D – Tables 31 to 34).

Power Analysis

Motile epifauna density and diversity were low for quadrats in both exposure and reference areas over the two survey years, and there were no significant differences. However, power was not sufficient to detect an effect size of ±20% between the areas for any of the motile epifauna variables (Appendix 5E). An analysis based on ten samples (quadrats) would also have insufficient power to detect an effect size of ±40% for any of the assessed motile epifauna variables. An increase in effort to 25 quadrats per area would result in sufficient power to detect a ±40% effect size for motile epifauna taxa richness, but not motile epifauna density or SDI.

Table 5-9: Quadrat Survey Results for Motile Epifauna - Milne Inlet (2022)

Survey Area	Quadrat	Motile Epifauna			
		Density (org/m^2)	Taxa Richness	SDI	Dominant Taxa
Exposure	Q1	7	3	0.667	Brittle star, green urchin, Shorthorn Sculpin
	Q2	3	2	0.500	Brittle star, Shorthorn Sculpin
	Q3	27	3	0.569	Brittle star, green urchin
	Q4	32	4	0.556	Green urchin, brittle star
	Q5	53	4	0.306	Green urchin, brittle star
	Q11	2	1	0.000	Green urchin
	Q12	2	1	0.000	Ribbon worm
	Q13	5	1	0.000	Green urchin
	Q14	14	3	0.500	Green urchin, Shorthorn Sculpin, scaled polychaete
	Q15	9	1	0.000	Green urchin
	Q21	0	0	NC	No motile epifauna observed
	Q22	3	1	0.000	Brittle star
	Q23	3	1	0.000	Shorthorn Sculpin
	Mean ± SE	**12.4 ± 4.4**	**1.9 ± 0.4**	**0.263 ± 0.083**	
Reference	Q6	115	4	0.218	Brittle star, green urchin
	Q7	11	4	0.625	Green urchin, polychaete, margarite snail, Fish Doctor
	Q8	2	1	0.000	Lumpfish
	Q9	2	1	0.000	Shorthorn Sculpin
	Q10	0	0	NC	No motile epifauna observed
	Q17	0	0	NC	No motile epifauna observed
	Q18	7	3	0.667	Brittle star, green urchin, Shorthorn Sculpin
	Q19	7	3	0.667	Margarite snail, Shorthorn Sculpin, Lumpfish
	Q20	5	2	0.500	Green urchin, margarite snail
	Q24	0	0	NC	No motile epifauna observed
	Q25	2	1	0.000	Shorthorn Sculpin
	Q26	0	0	NC	No motile epifauna observed
	Mean ± SE	**12.5 ± 9.3**	**1.6 ± 0.5**	**0.346 ± 0.115**	

Note: Simpson Diversity Index (SDI) values are color-coded by category, red = very low (<0.250), blue = low (0.250 to 0.499), yellow = moderate (0.500 to 0.750), green = high (>0.750). NC = Not calculated due to no motile taxa observed.

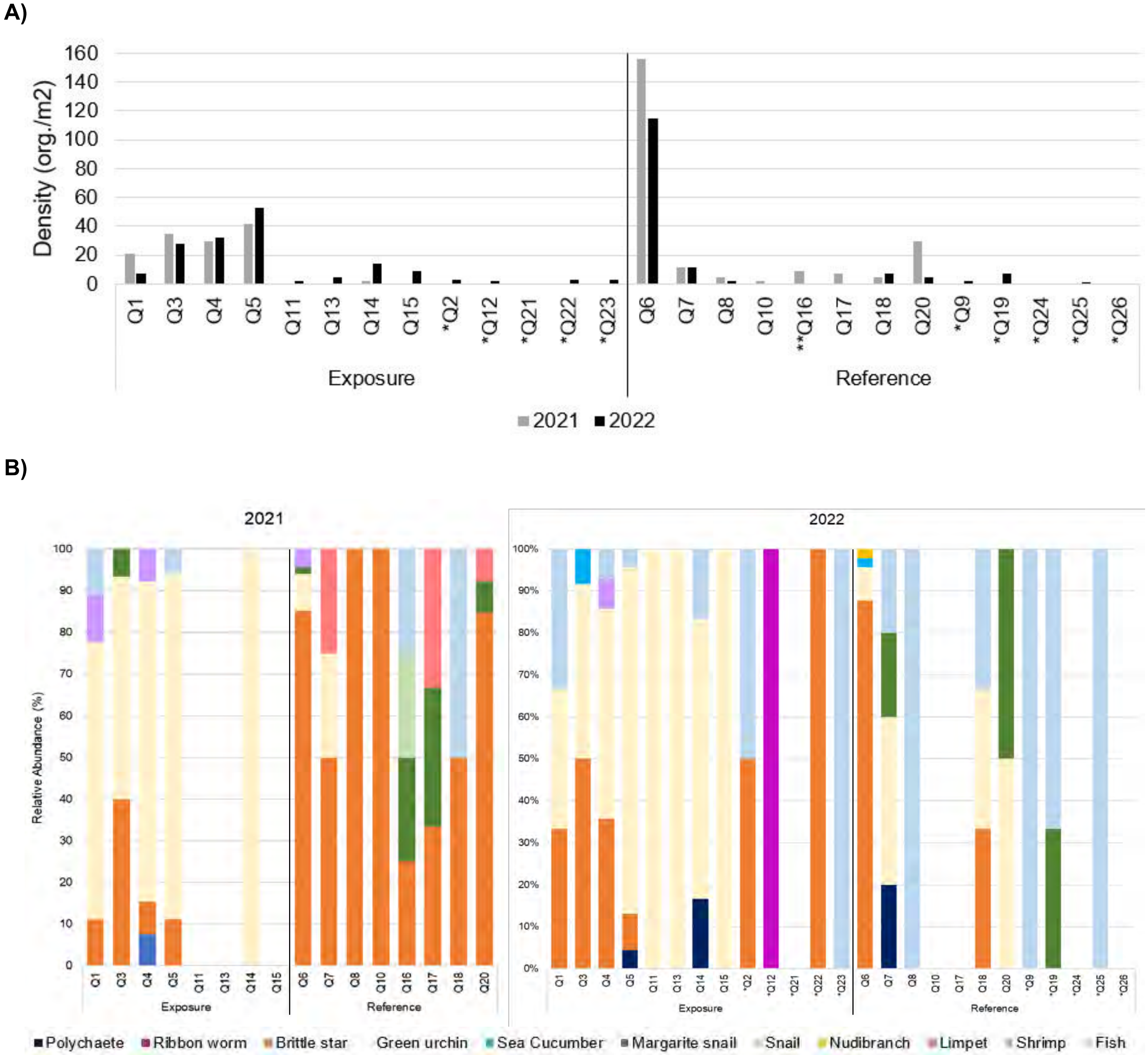


Figure 5-10: Total Percent Cover (A) and Relative Abundance (B) of Motile Epifauna Recorded in Survey Quadrats in Milne Port in 2022.

Note: * indicates quadrats that were surveyed in 2022 but not in 2021. **Q16 in 2022 was removed due to disturbance.

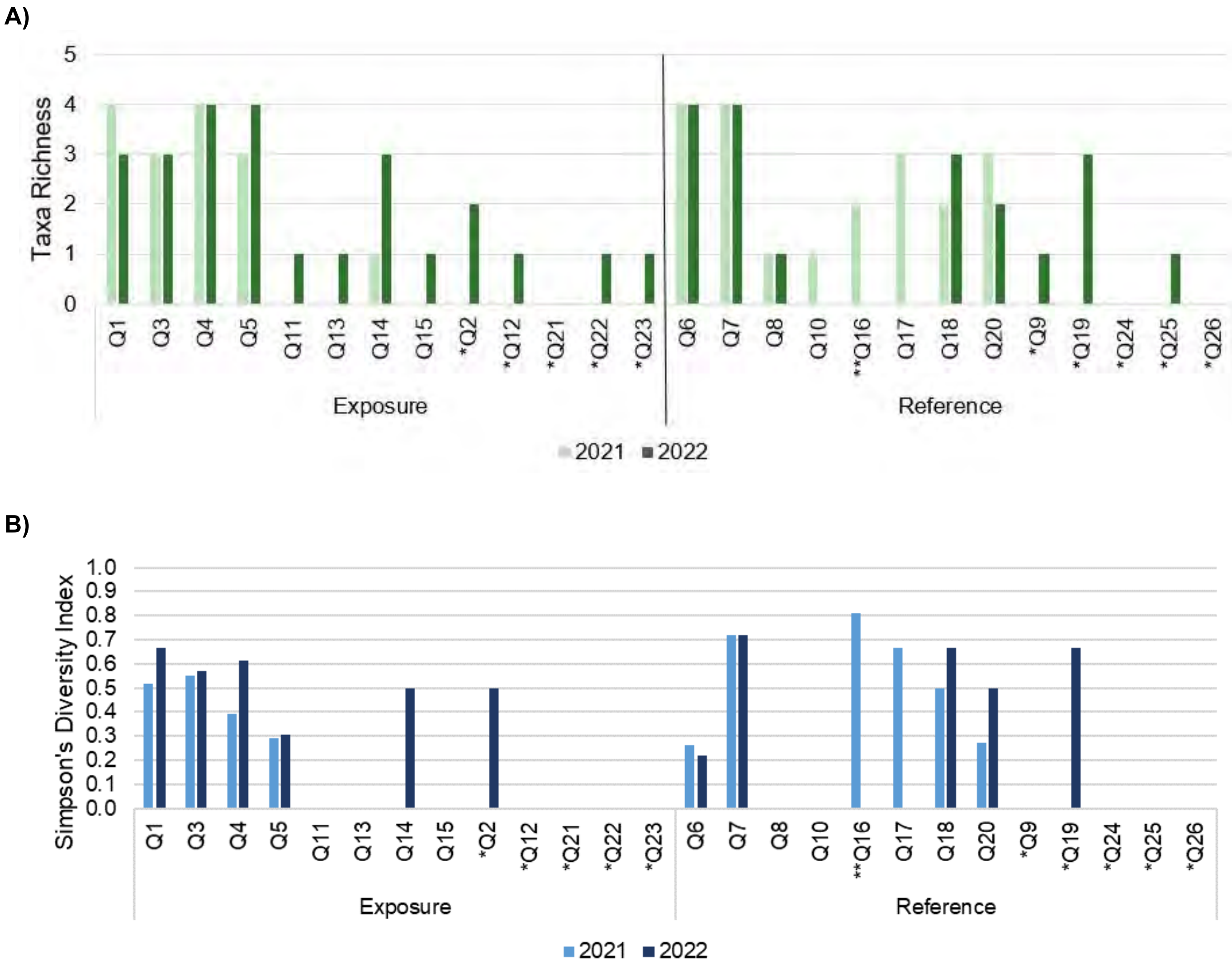


Figure 5-11: Taxa Richness (A) and Simpson's Diversity Index (B) of Motile Epifauna Recorded in Survey Quadrats in Milne Port in 2022.

Note: * indicates quadrats that were surveyed in 2022 but not in 2021. **Q16 in 2022 was removed due to disturbance.

Table 5-10: Between-Area One-Factor ANOVA and Between-Years Two-Factor ANOVA Results of Significant Differences (p-value <0.05) in Motile Epifauna Summary Statistics at Milne Inlet.

Response	Analysis[1]	Covariate	Independent Variable	F-value	P-value[2]
Density	Between-Area	N/A	NS	NS	NS
	Between-Years	Depth	**Year**	**8.438**	**0.008**
			Depth	**64.283**	**<0.001**
Taxa Richness	Between-Area	N/A	NS	NS	NS
	Between-Years	Depth	**Depth**	**20.940**	**<0.001**
Simpson Diversity Index	Between-Area	N/A	NS	NS	NS
	Between-Years	N/A	NS	NS	NS

Note: Residuals and intercept are not presented in this table. **Bold** indicates initial significant ANOVA analysis results. *Italics* indicate post-hoc test results. 'N/A' indicates no covariate was used in analyses. 'NS' indicates no significant differences were found for any variable.

[1] Analysis descriptions are provided in Section 5.3.2.2. Analyses include Between-Area [1-factor ANOVA] and Between-Years [2-factor ANOVA].

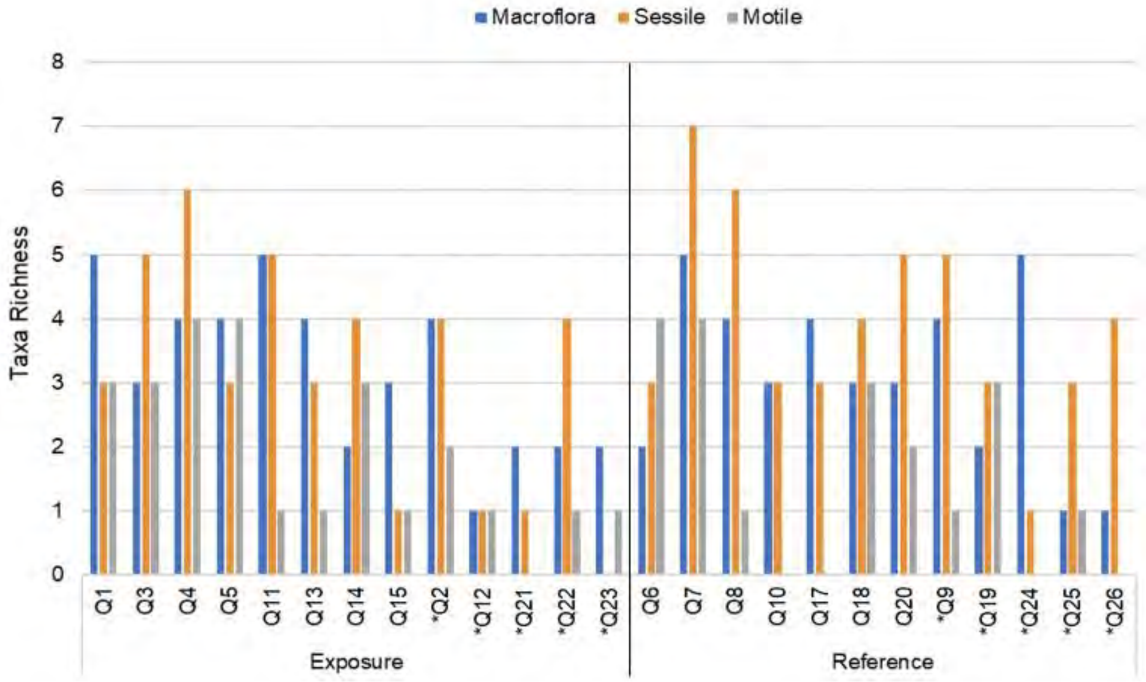
[2] Only significant results (p-value < 0.05) are presented in this table. See Appendix 5D for full results.

5.4.4 2022 Relative Diversity

Taxa richness varied among quadrats for all major assemblages (macroflora, sessile epifauna, and motile epifauna) (Figure 5-12A). Statistical analysis indicated a reduction in taxa richness for sessile epifauna between years across both exposure and reference areas but not between areas (Appendix 5D). Overall, Q7 in the reference area supports the greatest taxa richness for each of the three assemblages relative to other quadrats, which is similar to 2021 findings. In contrast, Q12 (exposure area) has the overall lowest taxa richness across all three assemblages, with just 1 taxon observed each for macroflora, sessile and motile epifauna.

SDI for macroflora and motile epifauna ranged from very low to moderate while sessile epifauna ranged from very low to high (Figure 5-12B); however, statistically significant differences in SDI were not found for any of the Between-Area or Between-Year comparisons. Overall, Q1, Q2, Q4 (in the exposure area) and Q18 (in the reference area) displayed the greatest universal diversity, where macrofauna, sessile and motile epifauna SDI values were characterized as moderate. Q12 was the only quadrat to have very low diversity values (0.00) for the three types of assemblages. Q6 stands out as having very low diversity values for macroflora and sessile epifauna, and low diversity values for motile epifauna. The high density of brittle stars reduced SDI diversity for this particular quadrat. The only quadrat with an SDI of 0 is Q12 in the exposure area.

A)



B)

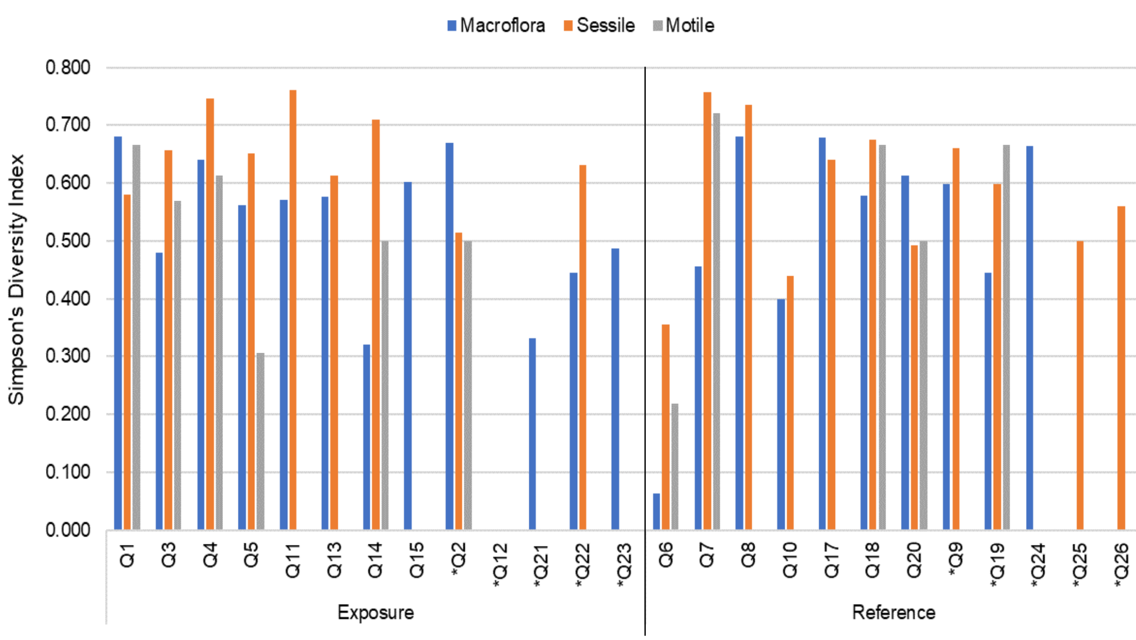


Figure 5-12: Taxa Richness (A) and Simpson's Diversity Index (SDI) (B) for Macroalgae, Sessile Epifauna, and Motile Epifauna in Milne Inlet (2022)

Note: * indicates quadrats that were surveyed in 2022 but not in 2021.

5.4.5 Sampling Effort

A taxa accumulation curve was calculated for quadrats surveyed in 2021 and 2022 to provide an estimate of the effort required to fully characterize the quadrat benthic community assemblage (macroalgae, sessile and motile epifauna) (Figure 5-9). The accumulated species (or taxa) observed curve (S_{obs}) shows the mean number of species (or taxa) for each number of permutations and standard deviation (SD) of the mean.

The taxa accumulation curve for 2022 is not as steep as the curve for 2021, reflecting the finding that taxa richness was lower in 2022 compared to the previous year. Both of the sampling effort curves approached, but did not reach, an asymptote for the number of quadrats sampled in each year. This indicates that sampling in both years did not reach levels to fully describe the overall benthic community assemblage.

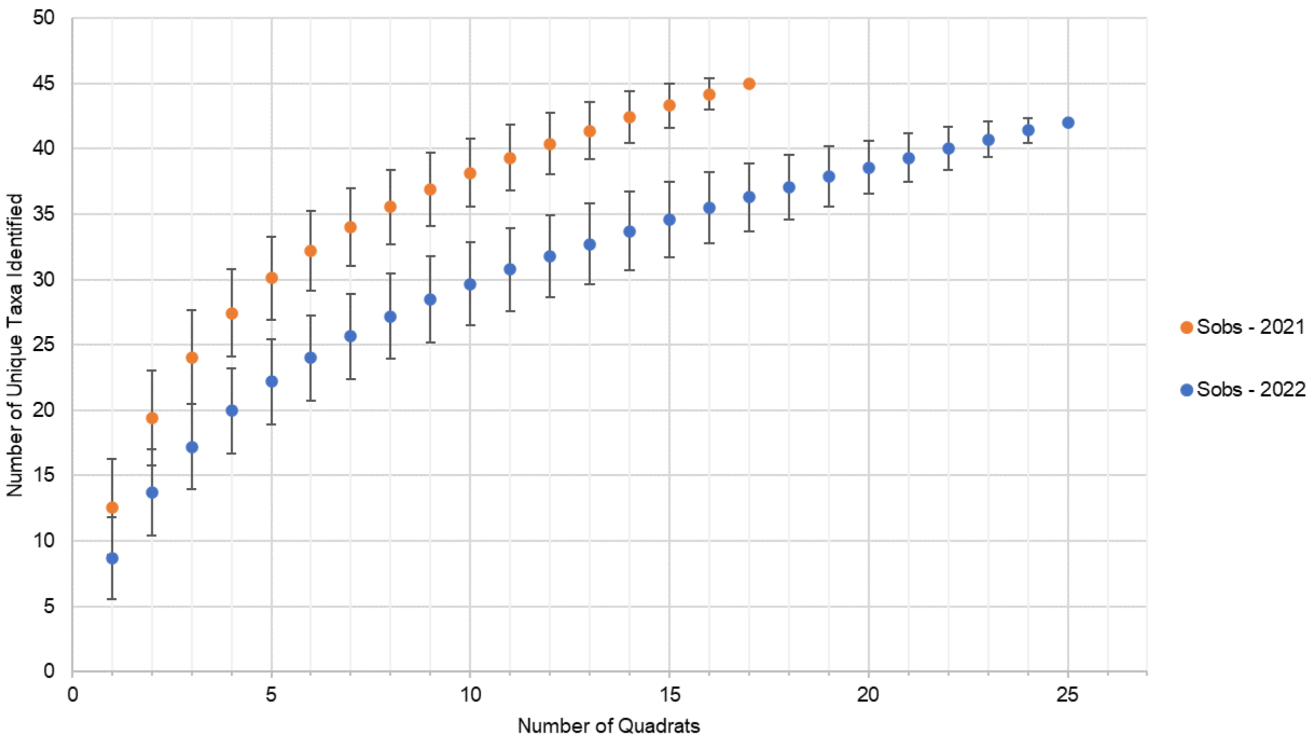


Figure 5-13: Mean Taxa Accumulation Curve for Quadrat Benthic Community Assemblage in Milne Port (2021, 2022). Error bars are Standard Deviation of the mean.

5.4.6 Opportunistic Observations

Two taxa of fish, eelpout (Zoarcidae indet.) and Shorthorn Sculpin (Appendix 5B – Photo 25 and 26) were observed residing within the hollow frame of six quadrats: Q1, Q5, and Q15 (exposure area) and Q7, Q24, and Q26 (reference area). This is the second year that eelpouts have been observed within the quadrat frames (Q1 in 2021); identification of the eelpout to species level was not possible because only part of the head was visible.

Four other fish were observed outside of the quadrat frames during surveys, including an Arctic Sculpin (*Myoxocephalus scorpioides*) (Appendix 5B – Photo 27) darting away from Q21 in the reference area, an Arctic Sculpin and a prickleback (Family Stichaeidae) (Appendix 5B – Photo 28) near Q9 in the reference area, and an Arctic Sculpin observed adjacent to Q24 in the reference area. When conducting the dive safety stop after surveying Q24/Q25/Q26 in the reference area, several sand lance (*Ammodytes* sp.) (Appendix 5B – Photo 29) were observed emerging from the sandy substrate (-3.0 CD depth, 3.0m inshore of the quadrats) as divers approached, however their elusive behaviour prevented thorough video/photo documentation.

A six-arm sea star (Class Asteroidea) (Appendix 5B – Photo 30) and two deceased brittle stars were observed outside of Q4 in the exposure area. Additionally, a number of deceased bivalves, some with blackened siphon ends, were observed within and outside of survey quadrats in both areas (Table 5-11). Some appeared to be recently deceased with soft tissue still intact (no predation), while others were fully or partially decomposed (Appendix 5B – Photo 31A and C, respectively).

Table 5-11: A Summary of Deceased Bivalves Opportunistically Observed in Milne Port (2022)

Area	Quadrats	Total Quantity Observed	Deceased Bivalve (*Scientific Name*)
Exposure	Q2, Q11	3	Discord mussel (*M. discors*)
	Q4, Q13	2	Icelandic scallop (*C. islandica*)
	Q14, Q22	10+	Greenland cockle (*Serripes greenlandicus*)
Reference	Q9, Q19	2	Icelandic scallop (*C. islandica*)
	Q25	3	Blunt gaper (*M. truncata*)

5.5 Discussion

Substrate type was similar among quadrats and between the exposure and reference areas. Substrate within the quadrats was dominated by soft silt and sand, consistent with what has been previously documented (Golder 2021b, 2022). Statistically significant interannual differences in sand and silt percent cover are attributed to a single quadrat (Q20) shifting from being predominantly silty in 2021 to predominantly sandy in 2022. This quadrat is an outlier and is driving the statistical results, and is not representative of natural variability for quadrats within the reference area. When surveying Q20 in 2021, it was noted that the quadrat had moved across the sediment surface interface over a steep slope during deployment (in 2021), causing the sediment to be disturbed and exposing some underlying bedrock (Golder 2021b). The shift in substrate composition to conditions observed in 2022 are due to substrate settling out over time. A detrital layer composed of organic detritus and other debris was present in all quadrats; the extent and composition of the detrital layer was variable with no significant differences between area or years.

Similar macroflora and benthic epifaunal taxa were observed in 2022 as in previous years (2018 to 2021) and indicators (i.e., percent cover, density, and diversity) were variable among quadrats. Variability is expected for this component of the MEEMP, given the dynamic coastal environment of Milne Inlet: factors such as freshwater input, sediment transport processes, and ice scour influence the percent cover/density and distribution of species in any given year. Indicators were not significantly different between exposure and reference area in 2022. Interannual differences were observed in sessile epifauna taxa richness and motile density between years with lower values in 2022 compared to 2021, but the trend was documented in both areas, indicating it is not attributable to project activities. Overall, there is no evidence of project-related effects on this component, given decreases in 2022 indicators were observed in both exposure and reference areas and hence reflect external and/or regional factors.

The cause of the opportunistically observed bivalve mortalities could not be determined, but does not appear to be related to changes in water quality or sediment quality. Water and sediment quality parameters (major ions, nutrients, metals, hydrocarbons, and polycyclic aromatic hydrocarbons) were generally within the Canadian Council of Ministers of the Environment (CCME) marine water quality and sediment quality guidelines, or (as used for parameters for which CCME guidelines do not exist) within ranges observed during previous sampling (2015 to 2021) (Chapters 2.0 and 3.0). Total chromium concentration exceeded Canadian Council of Ministers of the Environment (CCME) marine water quality guidelines in one water sample, and total copper concentration (for which there is no CCME marine water quality guideline) was higher than previously observed in Milne Inlet in one water sample (Chapter 2.0). However, dissolved copper and dissolved chromium were low in both instances, and these are the more bioavailable forms of the metals. The apparent widespread nature of the bivalve mortalities, which occurred across multiple species and in the vicinity of quadrats located in both the Reference and Exposure areas, suggest some other factor or factors were affecting marine bivalves. It is possible that bivalve mortalities could be caused by naturally occurring sea ice interactions with the seabed, as has been observed in other high Arctic environments such as Resolute Bay, Nunavut (Kvitek et al. 1998). When sea water freezes to become sea ice, the salt is expelled, creating channels of dense, hypersaline brine within and under the ice. The supercooled high salinity brine, which is denser than the surrounding water, may release from the sea ice and flow to the seabed, resisting mixing. Under certain conditions, the supercooled brine may freeze sessile benthic organisms that cannot move away and/or create an ephemeral high saline, anoxic environment that is fatal to benthic organisms trapped within (Kvitek et al. 1998). The blackened siphon ends present on some deceased bivalves may indicate that anaerobic bacterial decay similar to what is observed during brine pool mortality events occurred within Milne Inlet during the winter of 2021-2022.

As was done in 2021, effect size was explored using a power analysis to estimate the sample size needed to detect Project-related change based on levels of observed variability among quadrats, and whether the increased sample size from 16 quadrats in 2021 to 25 quadrats in 2022 was adequate to fully describe the benthic community assemblage. The results of the power analysis indicate that an increase in effort to 25 quadrats per area (50 in total) would result in sufficient power to detect a ±40% effect size for most benthic assemblage variables (except percent cover/density), but few substrate variables (only silt and sand).This was not unexpected given epifaunal communities are commonly associated with high temporal and spatial variability; this is the reason standard EEM practice generally recommends monitoring benthic infauna rather than epifauna (Environment Canada 2012). In addition, the taxa accumulation curve completed for the 2022 data suggested that the benthic community assemblage has not been fully characterized by the current sampling effort of 25 quadrats, although the curve appears to be approaching its asymptote. The diving effort involved with surveying 50 quadrats within the limited open-water season in the region would not be achievable within the short timeframe available for the summer field program. Even if the logistical challenges of a single research vessel, limited transportation and operating schedules could be overcome, the use of multiple dive teams would introduce a new source of variation in the data. A more conservative increase in the number of quadrats (e.g., up to 15 quadrats per area) would result in sufficient power to detect a ±40% effect size for only one additional indicator (motile epifauna taxa richness), thus the benefit of adding a limited number of additional quadrats to increase statistical power is minimal. Instead, it is recommended to maintain the current sampling methodology (as this has produced the highest resolution in the data thus far) and current sampling effort (i.e., detection of large-scale trends only), accepting the associated statistical limitations.

5.6 Conclusions and Recommendations

Overall, macrofloral and benthic epifaunal community assemblages are comparable between exposure and reference areas though some indicators vary interannually, likely driven by natural environmental factors (e.g., temperature, salinity, ice scour). Monitoring efforts to date reveal no evidence of overarching spatial or temporal trends that might be associated with Project-induced effects from construction or operation activities and Milne Port. Monitoring of macroflora and benthic epifauna assemblages should continue using the same sampling and statistical design.

A bivalve mortality event appeared to have occurred in or adjacent to multiple quadrats throughout both the exposure and reference areas. The occurrence of mortalities in both the exposure and reference areas suggested this was a natural event.No general change in water quality or sediment quality that could account for bivalve mortalities was detected during Project monitoring, however a possible explanation is that freezing or anoxia may have occurred due to a sea ice interaction with the seabed during the winter of 2021-2022, resulting in overwintering mortality of benthic organisms that were unable to move away.

In 2023, Q16 should be relocated, and a new time series started for that quadrat under a new name (e.g., Q27). Additionally, it is recommended to continue to monitor for opportunistic observations of deceased bivalves and that a sample should be collected, when possible, for toxicological analyses.

Q20 is considered an outlier in the 2021 data for substrate composition and it may be necessary to relocate this quadrat to undisturbed substrate in 2023.

5.7 Closure

We trust this information is sufficient for your needs at this time. Should you have any questions or concerns, please do not hesitate to contact Andrea Locke, on behalf of the undersigned, at 250-881-7372.

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APPENDIX 5A

DFO's Marine Foreshore Environmental Assessment Procedure

MARINE FORESHORE ENVIRONMENTAL ASSESSMENT PROCEDURE

Marine development projects have the potential to effect fish[1] and fish habitat[2]. Fisheries and Oceans Canada (DFO) is responsible for the protection and management of fish habitats under the authority of the *Fisheries Act* and may request plans, specifications and environmental assessments specific to marine projects where more detailed information is required. Assessments may be necessary for all types of projects, including, but not limited to aquaculture, log handling, industrial port development, marinas, private moorage facilities, marine repair facilities, pipeline or outfall installations, vessel launches or barge ramps, dredging projects and shoreline protection projects (breakwaters and seawalls). Presented below are standardized, transect-based assessment procedures intended to provide DFO with the basic information required to determine the potential effects of a development project on fish habitat.

Assessment Area

For comparative purposes, the assessment area should include both the foreshore site proposed for development as well as the adjacent foreshore. This will provide a context for the project and may provide data about cumulative effects if similar developments already occur on-site. A large scale site plan, preferably an enlargement of the hydrographic chart, with a small scale insert of the general geographic location will serve as a base map of the study area.

Tidal Height and Water Depth Measurements

The lowest normal tide (0.0 m), or chart datum, will be used as the reference point for the measurement of tidal height and water depth. Tidal height is recorded as positive relative to chart datum, while water depth below chart datum will be recorded as a negative value. For example, if the assessment is made when the tide is at 2 m, and observations are taken at a water depth of 6 m, then the depth will be recorded as -4 m. Tidal height will be corrected using the closest secondary port to the reference port found in the Canadian Tide and Current Tables, with further correction made for daylight savings time as required.

Transect Layout

Transects should be established perpendicular to the shoreline at regular intervals both within and adjacent to the proposed or active development area so as to sample representative fish habitat conditions. A preliminary low water reconnaissance or dive survey may be advisable to establish

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[1] shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals;

[2] shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals;

appropriate boundaries for the assessment. Transects should begin at the highest high water mark (HHWM: distance referenced as Station 0.0 m) and, at a minimum, extend to a depth of -20 m (–30 m if the development has the potential to effect deeper benthic habitats). Though small-scale intertidal projects may only require intertidal transects, care must be taken to ensure that a representative sample is collected across the proposed development area. Procedural manuals are available from DFO if sampling of intertidal clam or benthic invertebrates is required. To ensure complete assessment of marine plants and animals in the photic zone, deeper transects may be necessary, especially to determine the effects of sunken debris or woodwaste accumulations resulting from existing developments. Transects should be spaced approximately 25 m apart, although this interval may vary depending on the width of the site. The number of transects required will depend on the nature of the foreshore development proposed, anticipated effects of the development, and local site conditions (tides and currents, geography, fetch, geology, etc.). Transects should be individually numbered and indicated on the site plan, and their commencement point referenced to benchmarks, where possible.

Recording Observations

Habitat inventories should be conducted during the more productive spring and summer months. At that time, algae and saltmarsh species are more readily identifiable, enabling a better assessment of the productive capacity of the site.

Observations should be recorded every 5 m along the transect or at significant changes in habitat type. Observations should include substrate type and composition, presence and relative abundance of marine animals and plants, and any other notable features (e.g., debris accumulations) using the following format:

Substrate

Substrate types are to be subdivided into the following size class categories:

- Bedrock
- Boulder (>256 mm diameter)
- Cobble (64-256 mm diameter)
- Gravel (2-64 mm diameter)
- Sand (0.0625-2 mm diameter)
- Silt/Mud/Clay (<0.0625 mm diameter)

Substrate types are recorded cumulatively as percentages out of a total of 100% (e.g., Boulder 5%; Cobble 15%; Gravel 60%, Sand 20%)

Marine Plants

Marine plants include rooted vascular vegetation (e.g., eelgrass, saltmarsh vegetation, etc.) and marine algae (e.g., rockweed, kelp, etc.). Marine plant observations are recorded as percent areal coverage estimated per 5 m × 1 m transect segment. Observations can be recorded as percentages (5%, 10%, 15%, etc.) or by utilizing the following areal coverage classes:

+	<5%
1	5-25%
2	>25-50%
3	>50-75%
4	>75-100%

Sessile Animals

Many marine animals permanently attached to substrates function as important fish habitat (e.g., barnacles, bay mussels, etc.). Sessile animals are recorded as percent areal coverage along the transect line using either estimated percentages or by areal coverage classes, as presented above.

Motile Animals

Motile animals include fish and marine invertebrates such as crabs and snails. These can be individually counted along the transect or, where too numerous, their estimated numbers can be recorded. Population estimates will most likely be applied to species such as herring or mysid shrimp that naturally occur in large numbers.

Other Features

Accumulations of wood bark and debris, sunken logs or other waste materials arising from onsite or nearby development activities should also be recorded. For wood bark and related small size debris, observations are recorded as percent areal coverage estimates per 5 m × 1 m transect segment and estimated deposition depth (e.g., 15% / 10 cm). For larger materials (sunken logs, wood chunks, etc.), observations can be recorded by individual piece count or by estimate of percent areal coverage.

Observations should be correlated to the transect distance from the HHWM and (corrected) tidal height or water depth (e.g., Sta. 0+80 m / +4.5 m), with information compiled in tabular form, by transect. Common names of observed animals and plants are acceptable for the data table; a species list with scientific names should, however, be appended to the report.

General marine plant categories (e.g., rockweed, eelgrass, bull kelp, saltmarsh, etc.) and any other notable features should be sketched to scale directly on a copy of the site plan, drawings or photographs of the site. A site profile should be prepared for each transect showing the slope of the foreshore and the location of indicator marine plants or invertebrates. A sketch of the proposed marine development should be superimposed over the site plan so that any potential effect of the project on fish habitat is clear. Compensatory habitat proposed for offsetting altered habitat should also be sketched on site maps and profiles to enable review of the positioning of replacement habitat relative to the project.

Photographic Documentation

It is essential to produce a photographic record along the intertidal and subtidal transects. A videographic record of subtidal transects is also recommended. Photos and videos provide a real-time record of characteristic fish habitat at the proposed site and can be invaluable to future post-development site monitoring. Photographic records also facilitate comparison of the productivity of natural habitats with any compensatory habitat constructed to offset habitat losses. As visibility may be a problem, careful attention should be given to appropriate tidal levels, and midday lighting conditions are recommended. Aerial photos, taken at low tide, are often useful to put the site into context with the surrounding area and to verify information provided from other sources.

Assessment reports should include photographs of representative fish habitat types. Depending upon the scope of the proposed foreshore development, an unedited, labelled copy of the assessment video may also be required for the report submission. The video footage should be referenced with pertinent information (e.g., time, date, depth, heading, etc.), and a written or recorded interpretation should accompany the video.

Summary of information to be submitted

1. Basemap showing tenure area boundaries, surrounding area, transect locations and sampling stations
2. Shoreline video/photographs of intertidal zone
3. Underwater video/photographs of transects
4. Tabular data for each transect describing substrate type and composition, marine plants, sessile and motile marine animals, and other notable features
5. Habitat map showing location of different substrate types, plants, animals and operational infrastructure
6. Profile diagrams of each transect showing slope, sediment types and the major marine plants or animals observed
7. Photographs of site and aerial photographs if available.

APPENDIX 5B

Photographs

Photo 1: Q24 prior to deployment in the reference area (7 August 2022).

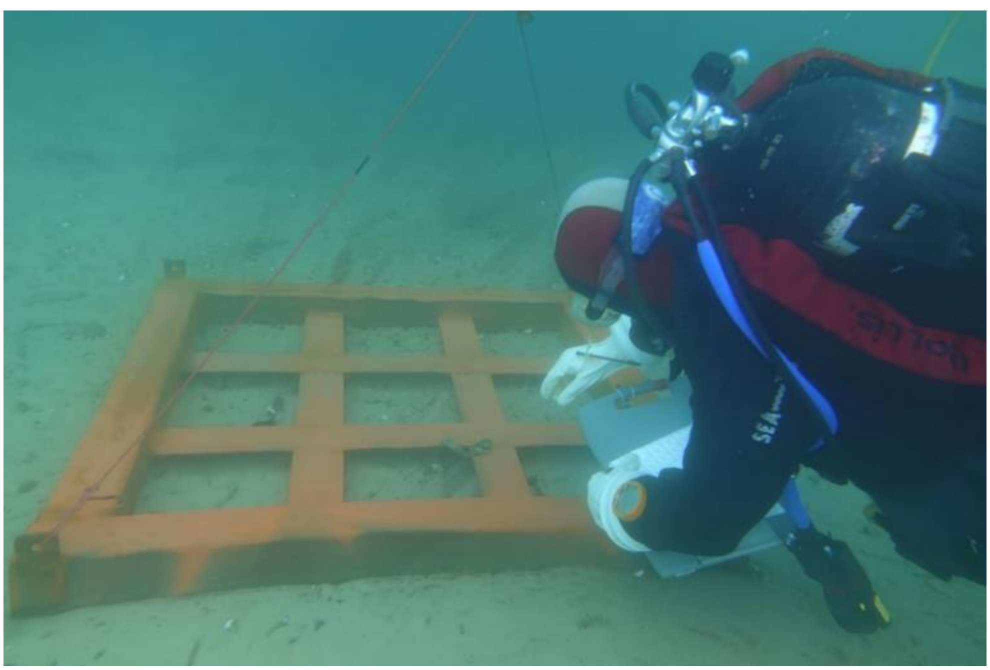


Photo 2: WSP diver surveying Q26 within the reference area (10 August 2022).

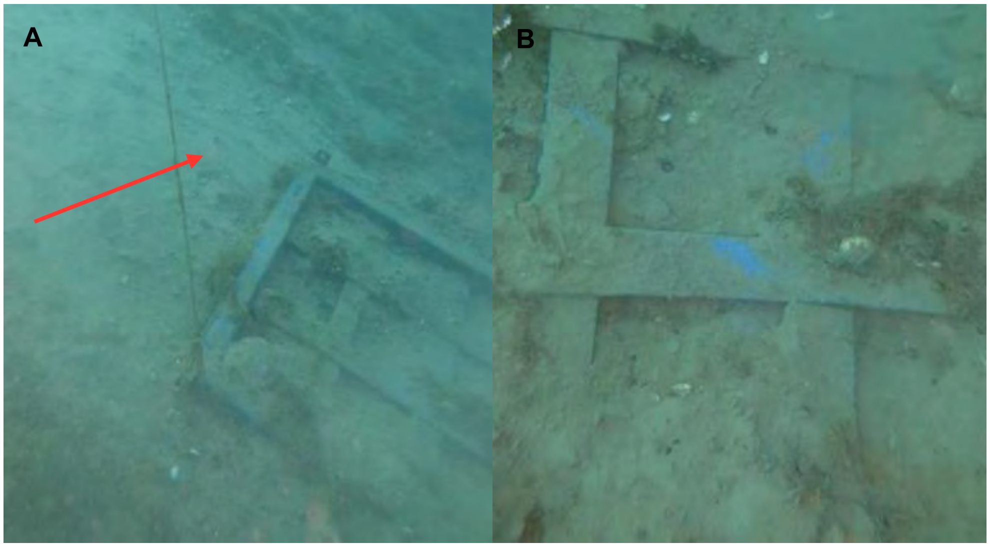


Photo 3. Q16 post-disturbance in 2022 showing A) drag marks (red arrow) and B) sediment upheaval.

Photo 4: Sugar kelp (*Saccharina latissima*) in Q25 within the reference area (10 August 2022).

Photo 5: Rockweed (*Fucus distichus*), *Pylaiella* sp. (red arrow), and sugar kelp (lower right corner) with detrital algae in Q10 within the reference area (4 August 2022).

Photo 6: Acidweed (*Desmarestia spp*; red arrow) with rockweed and *Pylaiella* sp. in Q7 within the reference area (4 August 2022).

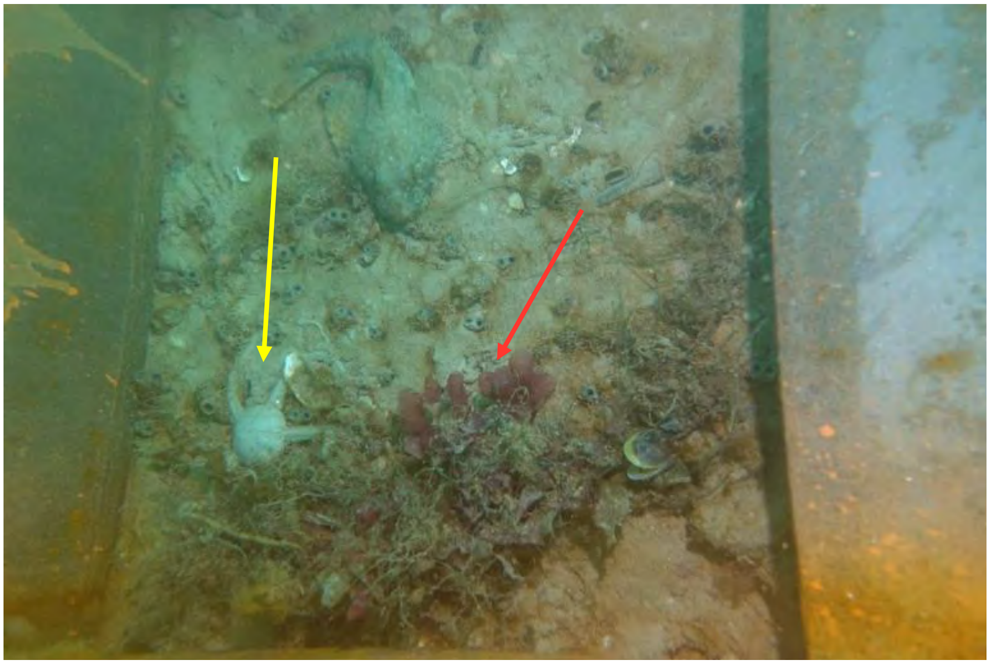


Photo 7: *Coccotylus truncatus* (red arrow) and brittle star (yellow arrow) in Q2 within the exposure area (9 August 2022).

Photo 8: *Savoiea arctica* identified by taxonomy lab in Q8 within the reference area (4 August 2022).

Photo 9: Unidentified red filamentous algae (Rhodophyta indet.) in Q4 within the exposure area (6 August 2022).

Photo 10: *Chaetomorpha melagonium* (red arrow), unidentified shrimp (Crangonidae indet.; yellow arrow), and a green urchin (*Strongylocentrotus droebachiensis*; black arrow) in Q4 within the exposure area (6 August 2022).

Photo 11: Unidentified aquatic bryophyte in Q21 within the exposure area (7 August 2022).

Photo 12: Scaled polychaete (*Harmothoe* sp.), identified by taxonomy laboratory in Q14 within the exposure area (6 August 2022).

Photo 13: Small sabellid worm sp. 1 (Sabellidae indet.) in Q14 within the exposure area (6 August 2022).

Photo 14: Unidentified polychaete (Polychaeta indet.) in Q7 within the reference area (4 August 2022).

Photo 15: Burrowing anemone (Ceriantharia indet.; red arrow) and cone worm (*Cistenides granulata*; yellow arrow) in Q7 within the reference area (4 August 2022).

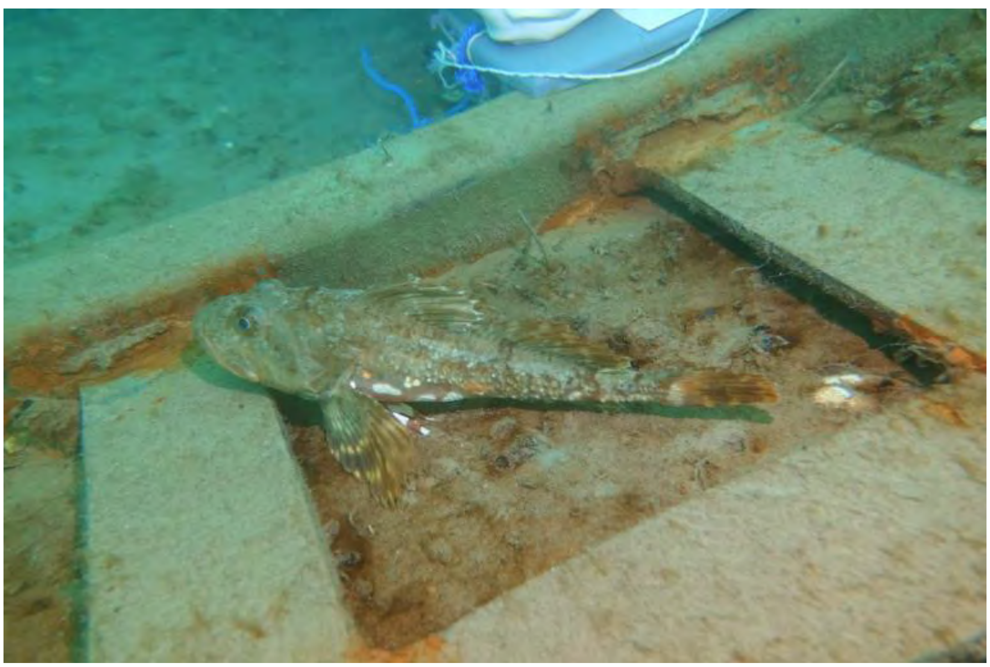


Photo 16. Shorthorn Sculpin (*Myoxocephalus Scorpius)* in Q19 within the reference area (8 August 2022).

Photo 17. Saddled Eelpout (*Lycodes mucosus*) in Q5 within the exposure area (2 August 2022).

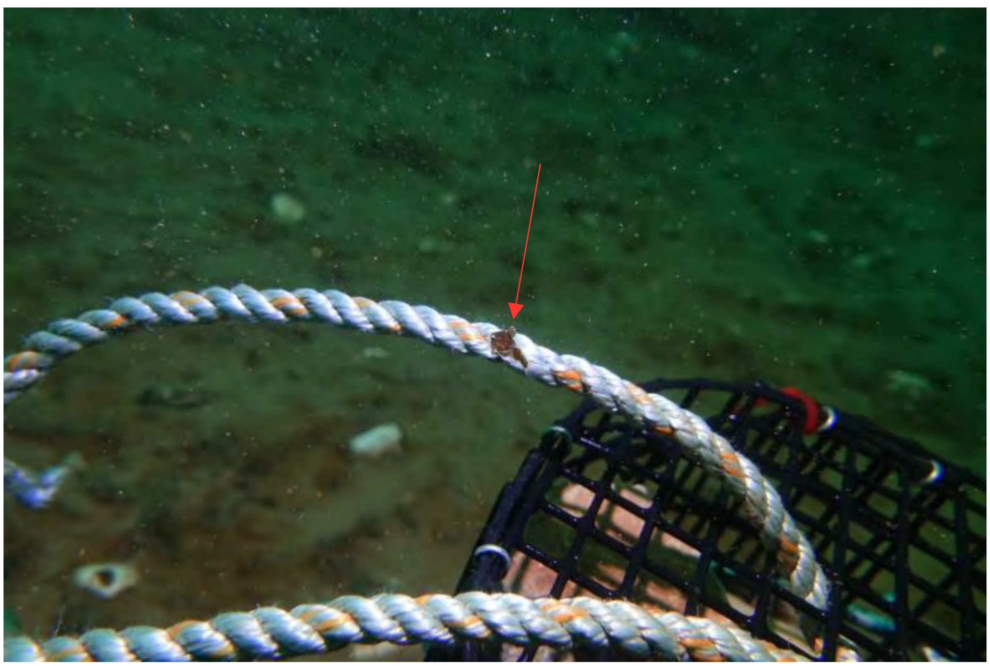


Photo 18. Juvenile common Lumpfish (*Cyclopterus lumpus*; red arrow) after leaving Q8 within the reference area (4 August 2022). Depicted in the photo is also a newly deployed settlement basket (Chapter 8).

Photo 19: Fish Doctor (*Gymnelus hemifasciatus*) in Q7 within the reference area (4 August 2022).

Photo 20: Ribbon worm (Nemertea indet.) in Q12 within the exposure area (7 August 2022).

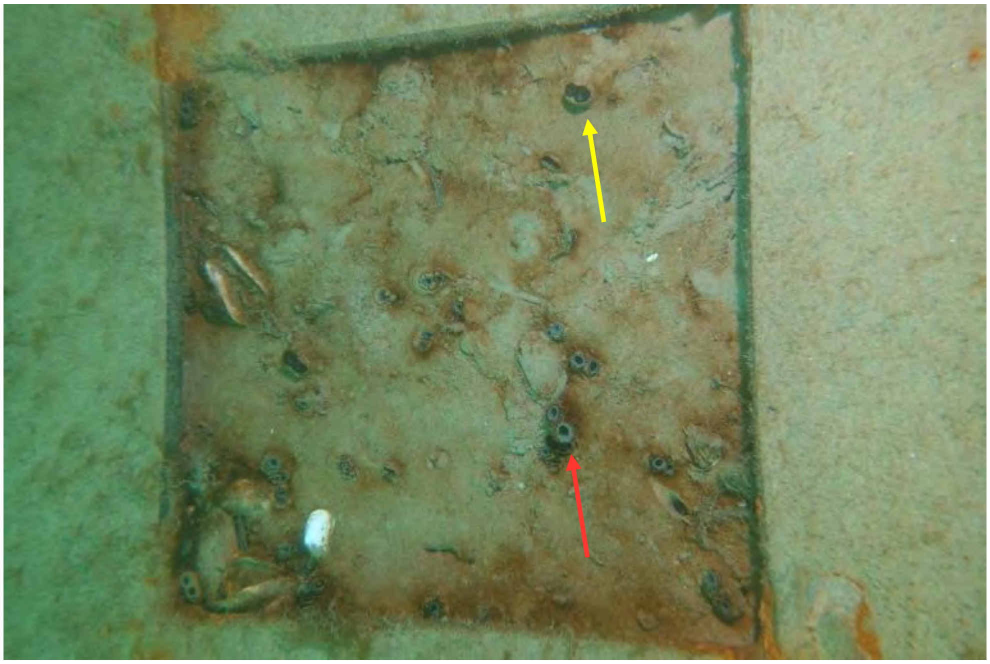


Photo 21. Wrinkled rock-borers (*Hiatella arctica;* red arrow) and blunt gaper (*Mya truncata*.; yellow arrow) in Q19 within the reference area (8 August 2022).

Photo 22: Discord mussel (*Musculus discors*; red arrows) in Q13 within the exposure area (3 August 2022).

Photo 23: Unidentified burrowing sea cucumber (Holothuroidea indet.) in Q3 within the exposure area (3 August 2022).

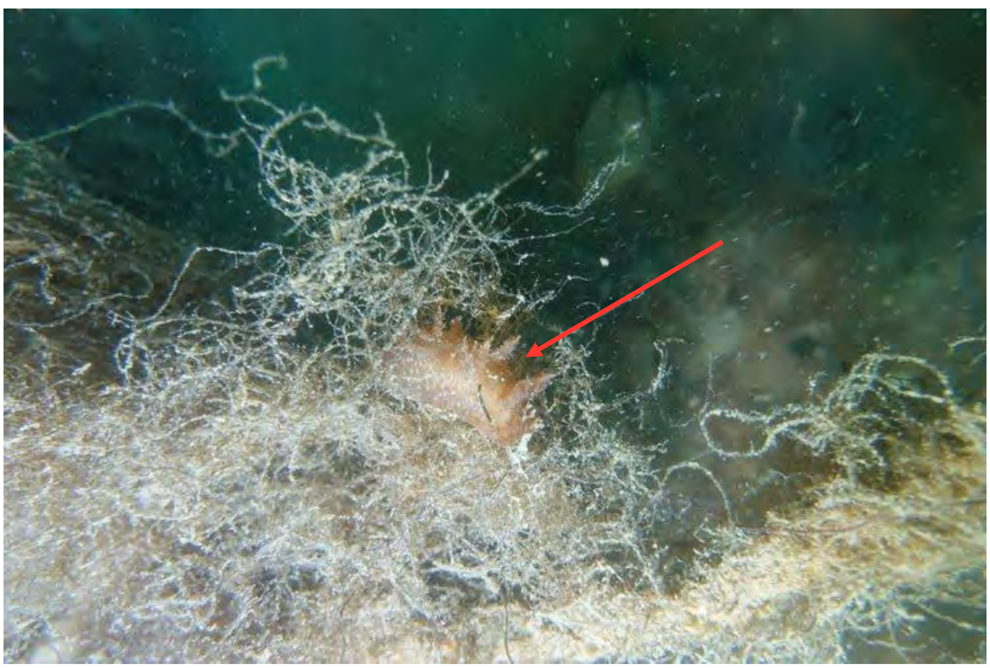


Photo 24: Unidentified nudibranch (Nudibranchia indet.; red arrow) in Q3 within the exposure area (3 August 2022).

Photo 25: Eelpout (Zoarcidae indet.) residing in the hollow frame of Q1 (left) and Q15 (right) in the exposure area.

Photo 26: Shorthorn Sculpin (*Myoxocephalus scorpius*) residing in the hollow frame of Q24 (left) and Q26 (right) in the exposure area.

Photo 27: Arctic Sculpin (*Myoxocephalus scorpioides*) opportunistically observed outside Q21 within the exposure area (7 August 2022).

Photo 28: Prickleback (Family Stichaeidae) opportunistically observed outside Q21 within the exposure area (7 August 2022).

Photo 29: Sandlance (*Ammodytes* sp.) opportunistically observed 3.0 m inshore of Q24/Q25/Q26 within the reference area (10 August 2022).

Photo 30: Unidentified sea star (Astroidea indet.) opportunistically observed outside Q5 within the exposure area (2 August 2022).

Photo 31: Deceased bivalves opportunistically observed in the exposure and reference areas, A) Discord mussel in Q11 within the exposure area; B) Greenland cockles (*Serripes groenlandicus*) in Q14 within the exposure area; C) Blunt gapers (*Mya truncata*) in Q25 within the reference area; D) Icelandic scallop (*Chlamys islandica*) in Q4 within the exposure area.

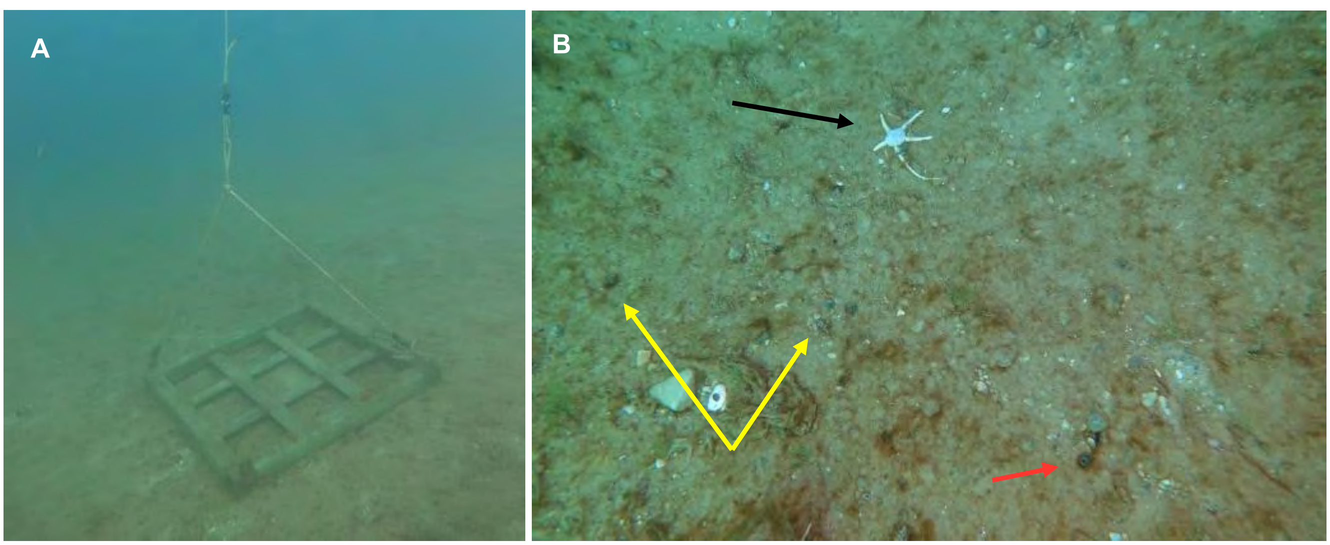


Photo 32: A) New location of Q12 within the exposure area; B) Photo taken of habitat and biota immediately adjacent to Q12 with brittle star (black arrow), wrinkled rock-borer clams (*Hiatella arctica*) (yellow arrows), and blunt gaper (*Mya truncata*) (red arrow).

APPENDIX 5C

Quadrat Survey Data (2021 – 2022)

Appendix 5C
Table 1. 2021 Quadrat Survey Data, Milne Inlet

Quadrat Number	Year of Deployment	Study Area	UTM (17W) Easting (m)	UTM (17W) Northing (m)	Survey Date (DD/MM/YYYY)	Quadrat Multiplier (to standardize to 1 m^2)	Depth (m) Chart Datum	Substrate (% cover) Bedrock	Cobble	Gravel	Sand	Silt	Shell -whole/crushed	Detrital veneer	Other debris (i.e., metal)
Q1	2020	Milne Port	502828	7976382	14/08/2021	2.291	8.9	-	-	-	60	40	3	12	4
Q3	2020	Milne Port	504208	7976659	15/08/2021	2.291	10.4	-	-	2	38	57	3	11	8
Q4	2020	Milne Port	504363	7976611	06/08/2021	2.291	12.1	-	2	1	27	68	2	10	4
Q5	2020	Milne Port	504802	7976731	06/08/2021	2.291	12.4	-	-	1	27	72	-	17	8
Q11	2021	Milne Port	502820	7976371	14/08/2021	2.291	7.5	-	-	-	60	40	1	14	-
*Q12	2021	Milne Port	503041	7976474	11/08/2021	2.291	6.0	-	1	2	87	9	1	13	-
Q13	2021	Milne Port	504210	7976643	15/08/2021	2.291	7.9	-	2	11	38	50	1	9	-
Q14	2021	Milne Port	504350	7976589	16/08/2021	2.291	7.6	-	1	12	55	32	1	6	-
Q15	2021	Milne Port	504800	7976721	06/08/2021	2.291	7.4	-	-	-	30	70	1	14	-
Q6	2020	Reference Area	506563	7979107	08/08/2021	2.291	15.4	-	-	-	25	70	5	6	2
Q7	2020	Reference Area	506774	7979170	16/08/2021	2.291	10.1	-	4	-	26	69	2	11	3
Q8	2020	Reference Area	506957	7979457	16/08/2021	2.291	10.5	-	1	-	38	60	3	12	3
Q10	2020	Reference Area	506584	7979115	08/08/2021	2.291	6.1	-	1	8	23	67	1	12	5
Q16	2021	Reference Area	506567	7979090	08/08/2021	2.291	5.6	-	3	12	23	56	6	7	-
Q17	2021	Reference Area	506774	7979163	16/08/2021	2.291	8.9	-	3	-	19	78	1	9	-
Q18	2021	Reference Area	506956	7979452	16/08/2021	2.291	9.8	-	-	-	20	80	2	11	-
Q20	2021	Reference Area	506588	7979125	08/08/2021	2.291	10.9	6	-	-	23	67	5	-	-

Quadrat Number	Macroalgae (% Cover) Detrital Algae	Kelp Sugar kelp *Saccharina latissima*	Kelp Sieve kelp *Agarum clathratum*	Brown Rockweed *Fucus distichus*	Brown Brown filamentous *Pylaiella* sp.	Brown Brown filamentous *Halosiphon tomentosus*	Brown Acid weed *Desmarestia* sp.	Brown Brown filamentous 1 cf. *Coelocladia arctica*	Brown Brown filamentous Ochrophyta indet.	Green Short green filamentous 1 Chlorophyta indet.	Green Green filamentous *Chaetomorpha melagonium*	Green Green filamentous Chlorophyta Indet.	Red Red filamentous Rhodophyta indet.	Red Red branching *Savoiea arctica*	Red Red bladed *Coccotylus truncatus*	Red Red bladed *Dilsea socialis*	Red Encrusting coralline Corallinales indet.
Q1	8	-	-	-	8	-	-	-	-	-	-	-	-	-	1	-	-
Q3	14	-	-	-	1	-	<1	2	-	-	-	-	-	-	-	-	-
Q4	4	-	-	-	-	-	6	-	<1	-	-	-	2	-	-	-	-
Q5	5	-	2	-	<1	-	1	-	<1	-	-	-	-	-	-	-	-
Q11	-	<1	-	-	7	2	1	-	-	<1	<1	-	-	-	2	-	-
*Q12	1	-	-	-	5	-	1	-	-	-	-	-	-	-	-	-	-
Q13	37	2	-	-	2	1	16	17	-	-	-	-	-	-	-	-	-
Q14	44	1	-	-	-	-	33	-	-	-	-	<1	-	-	<1	-	-
Q15	16	-	-	-	5	-	2	9	6	1	1	-	-	-	6	-	-
Q6	38	-	-	-	-	-	-	-	1	-	-	<1	-	-	<1	-	-
Q7	43	-	-	-	-	-	17	4	-	-	3	-	-	-	4	-	2
Q8	8	<1	-	-	-	7	1	-	-	-	-	1	-	-	<1	-	-
Q10	9	1	-	-	11	-	-	-	1	-	-	<1	-	-	-	-	-
Q16	2	2	-	<1	19	-	-	-	<1	-	<1	-	1	-	-	5	-
Q17	8	2	-	-	8	-	22	-	-	-	-	1	-	-	3	-	2
Q18	-	-	-	-	3	2	7	<1	-	-	-	-	-	1	-	-	-
Q20	1	2	-	-	2	-	6	-	-	-	-	-	-	-	-	-	1

Quadrat Number	Invertebrates (Sessile: % cover; Motile: # individuals) Tubes[1] Polychaeta indet.	Annelida Cone worm *Cistenides granulata*	Annelida Small sabellid worm sp. 1 Sabellidae indet.	Annelida Large sabellid worm sp. 2 Sabellidae indet.	Arthropoda Amphipod Amphipoda Indet.	Arthropoda Barnacle Balanomorpha indet.	Arthropoda Pandalus shrimp *Pandalus* sp.	Arthropoda Sculptured shrimp *Sclerocrangon boreas*	Cnidaria Burrowing anenome Ceriantharia indet.	Echinodermata Brittle star Opiuridae indet.	Echinodermata Green urchin *Strongylocentrotus droebachiensis*	Mollusca Northern astarte *Astarte borealis*	Mollusca Astarte clam *Astarte* sp.	Mollusca Macoma clam *Macoma* sp.	Mollusca Blunt gaper *Mya* sp.	Mollusca Wrinkled rock-borer *Hiatella arctica*	Mollusca Icelandic scallop *Chlamys islandica*	Mollusca Greenland glass scallop *Similipecten greenlandicus*	Mollusca Discord mussel *Musculus discors*	Mollusca Mussel Mytilida indet.	Mollusca Clam Bivalvia indet.	Mollusca Margarite snail *Margarites* sp.	Mollusca Limpet Lottiidae indet.	Mollusca Snail Vetigastropoda indet.	Platyhelminthes Flat worm Platyhelminthes	Tunicata Orange tunicate sp. 1 *Polycarpa* sp.	Tunicata Tunicate Tunicata indet.	Fish (# individuals) Eelpout Pout Gymnelus sp.	Sculpin Sculpin Cottidae indet.	Fish Unidentified Juvenile fish
Q1	-	3	<1	<1	-	-	1	-	-	1	6	-	-	-	-	28	-	-	-	-	-	-	-	-	-	<1	-	-	-	1
Q3	-	4	<1	-	-	-	-	-	-	6	8	-	-	-	4	24	-	1	-	-	-	1	-	-	-	-	<1	-	-	-
Q4	<1	1	<1	<1	-	-	-	1	-	1	10	-	-	<1	<1	13	<1	-	-	-	-	-	-	-	1	-	-	-	-	-
Q5	<1	<1	-	<1	-	-	-	-	-	2	15	-	-	-	<1	12	<1	2	-	-	5	-	-	-	-	-	-	1	-	-
Q11	-	6	<1	-	-	-	-	-	-	-	-	-	-	-	<1	28	-	1	<1	-	<1	-	-	-	-	<1	-	-	-	-
*Q12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Q13	-	9	5	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	<1	<1	-	-	-	-	-	-	-	-	-	-
Q14	-	3	8	-	-	-	-	-	-	-	1	-	-	-	-	2	-	-	-	-	<1	-	-	-	-	-	-	-	-	-
Q15	<1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	28	-	-	-	<1	1	-	-	-	-	-	-	-	-	-
Q6	<1	<1	-	<1	-	-	3	-	-	58	6	-	<1	-	2	7	<1	6	-	-	<1	1	-	-	-	-	-	-	-	-
Q7	-	<1	<1	1	1	-	-	-	1	2	1	-	-	-	<1	4	-	-	<1	-	-	-	1	-	-	-	-	-	-	-
Q8	-	1	<1	<1	-	-	-	-	-	2	-	<1	-	-	2	33	<1	-	-	<1	-	-	-	-	-	-	-	-	-	-
Q10	-	4	<1	-	-	-	-	-	-	1	-	-	-	-	-	3	-	-	<1	1	-	-	-	-	-	-	-	-	-	-
Q16	-	8	-	-	-	-	-	-	-	1	-	-	<1	-	2	2	-	-	-	<1	<1	1	-	1	-	<1	-	-	1	-
Q17	-	<1	2	<1	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	<1	-	1	1	-	-	-	-	-	-	-
Q18	-	<1	<1	-	-	-	-	-	-	1	-	-	-	-	1	30	<1	-	-	-	-	-	-	-	-	-	-	-	-	1
Q20	-	4	-	<1	-	<1	-	-	-	11	-	<1	2	-	<1	22	<1	-	-	<1	<1	1	1	-	-	<1	-	-	-	-

Notes: Individual organism counts have been corrected for quadrat area (quadrats deployed in 2020/2021 have a multiplier of 2.291). * indicates the quadrat was not included in data analysis in 2021. Grey highlighting indicates sessile invertebrates.

[1] Tubes are likley sabellid worms, though animal inside tube was not observed during survey and not included in data analysis.

Table 2. 2022 Quadrat Survey Data, Milne Inlet

Quadrat Number	Year of Deployment	Study Area	UTM (17W) Easting (m)	UTM (17W) Northing (m)	Survey Date (DD/MM/YYYY)	Quadrat Multiplier (to standardize to 1 m^2)	Depth (-m) Chart Datum	Substrate (% cover): Bedrock	Cobble	Gravel	Sand	Silt	Shell - whole/crushed	Detrital veneer	Other debris (i.e., metal)	Brown diatom mat
Q1	2020	Milne Port	502828	7976382	06/08/2022	2.291	10.0	-	-	15	30	45	10	7	-	2
Q2	2022	Milne Port	502843	7976385	09/08/2022	1.582	12.3	-	-	15	40	40	5	-	30	15
Q3	2020	Milne Port	504208	7976659	03/08/2022	2.291	11.7	-	-	16	26	51	7	10	20	5
Q4	2020	Milne Port	504363	7976611	06/08/2022	2.291	14.0	-	5	5	20	65	5	5	20	-
Q5	2020	Milne Port	504802	7976731	02/08/2022	2.291	12.9	-	-	-	20	80	-	25	-	-
Q11	2021	Milne Port	502820	7976371	06/08/2022	2.291	8.4	-	-	-	30	60	10	-	-	-
Q12	2022	Milne Port	503034	7976479	07/08/2022	2.291	11.5	-	7	5	65	23	-	-	10	-
Q13	2021	Milne Port	504210	7976643	03/08/2022	2.291	9.8	-	-	13	27	51	9	-	10	-
Q14	2021	Milne Port	504350	7976589	06/08/2022	2.291	9.4	-	-	15	25	55	5	-	-	-
Q15	2021	Milne Port	504800	7976721	02/08/2022	2.291	10.5	-	-	-	20	80	-	-	30	7
Q21	2022	Milne Port	502197	7976453	07/08/2022	1.582	6.0	-	-	5	54	40	1	-	-	-
Q22	2022	Milne Port	502198	7976473	07/08/2022	1.582	10.0	-	-	-	30	70	<1	-	30	15
Q23	2022	Milne Port	502823	7976365	09/08/2022	1.582	5.8	-	7	12	61	20	-	-	-	-
Q6	2020	Reference Area	506563	7979107	10/08/2022	2.291	18.3	-	-	-	20	70	10	<1	30	30
Q7	2020	Reference Area	506774	7979170	04/08/2022	2.291	11.1	-	10	-	30	60	-	3	15	20
Q8	2020	Reference Area	506957	7979457	04/08/2022	2.291	11.3	-	-	6	33	53	8	3	20	15
Q9	2020	Reference Area	506962	7979448	08/08/2022	2.291	9.7	-	5	5	20	68	2	-	30	10
Q10	2020	Reference Area	506584	7979115	04/08/2022	2.291	8.8	-	-	15	25	60	-	5	-	-
*Q16	2022	Reference Area	506558	7979093	10/08/2022	2.291	9.1	-	5	5	68	20	2	-	-	-
Q17	2021	Reference Area	506774	7979163	04/08/2022	2.291	10.2	-	-	-	35	65	-	-	-	5
Q18	2021	Reference Area	506956	7979452	04/08/2022	2.291	11.1	-	-	-	30	60	10	-	15	20
Q19	2021	Reference Area	506953	7979447	08/08/2022	2.291	11.5	-	-	5	25	60	10	-	20	15
Q20	2021	Reference Area	506588	7979125	04/08/2022	2.291	13.6	-	5	-	80	15	-	-	-	30
Q24	2022	Reference Area	506939	7979398	10/08/2022	1.582	8.1	-	5	-	75	20	-	-	10	-
Q25	2022	Reference Area	506937	7979405	10/08/2022	1.582	9.8	-	-	10	65	20	5	-	-	-
Q26	2022	Reference Area	506935	7979397	10/08/2022	1.582	9.1	-	-	15	75	10	-	-	-	-

Quadrat Number	Macroalgae (% cover): Detrital Algae	Kelp: Sugar kelp *Saccharina latissima*	Kelp: Sieve kelp *Agarum clathratum*	Brown: Rockweed *Fucus distichus*	Brown: Brown filamentous *Pylaiella* sp.	Brown: Acid weed *Desmarestia* sp.	Brown: Brown branching *Battersia* sp.	Green: Green filamentous *Chaetomorpha melagonium*	Green: Green filamentous Chlorophyta Indet.	Red: Red bladed *Coccotylus truncatus*	Red: Red branching *Savoiea arctica*	Red: Red filamentous Rhodophyta indet.	Aquatic bryophyte Bryophyta indet.
Q1	-	-	-	-	2	5	-	1	-	<1	-	<1	-
Q2	7	-	-	-	5	15	-	3	-	10	-	-	-
Q3	-	5	-	20	-	50	-	-	-	-	-	-	-
Q4	15	-	-	-	7	15	-	1	-	-	-	7	-
Q5	7	-	-	-	-	5	-	<1	-	1	1	-	-
Q11	-	-	2	-	1	10	-	1	-	2	-	-	-
Q12	-	-	-	-	15	-	-	-	-	-	-	-	-
Q13	-	-	-	10	10	30	-	1	-	-	-	-	-
Q14	40	-	-	-	-	20	-	-	-	5	-	-	-
Q15	30	-	-	-	5	-	-	2	-	7	-	-	-
Q21	-	-	-	-	4	-	-	-	-	-	-	-	15
Q22	-	<1	-	-	2	-	-	-	-	-	-	-	-
Q23	-	-	-	-	7	5	-	-	-	-	-	-	-
Q6	40	-	-	-	-	30	-	-	-	<1	-	-	-
Q7	40	-	-	-	-	30	-	7	1	3	-	1	-
Q8	10	-	-	-	7	5	-	-	-	2	2	-	-
Q9	20	-	-	-	10	-	2	1	-	5	-	-	-
Q10	-	5	-	60	-	15	-	-	-	-	-	-	-
*Q16	-	-	-	-	-	30	-	-	-	-	-	-	-
Q17	30	-	-	40	40	40	-	2	-	-	-	-	-
Q18	-	-	-	10	-	10	-	-	-	2	-	-	-
Q19	15	-	-	-	-	-	-	1	-	2	-	-	-
Q20	40	5	-	15	15	-	-	-	-	-	-	-	-
Q24	-	10	-	5	20	3	-	2	-	-	-	-	-
Q25	-	<1	-	-	-	-	-	-	-	-	-	-	-
Q26	20	5	-	-	-	-	-	-	-	-	-	-	-

Quadrat Number	Invertebrates (Sessile: % cover; Motile: # individuals): Annelida: Tubes[1] Polychaeta indet.	Annelida: Scaled polychaete *Harmonthoe sp.*	Annelida: Polychaete (motile) Polychaeta Indet.	Annelida: Cone worm *Cistenides granulata*	Annelida: Small sabellid worm sp. 1 Sabellidae indet.	Annelida: Large sabellid worm sp. 2 Sabellidae indet.	Arthropoda: Shrimp Crangonidae indet.	Arthropoda: Mysid shrimp Mysida indet.	Nemertea: Ribbon worm Nemertea indet.	Echinodermata: Sea cucumber Holothuroidea Indet.	Echinodermata: Brittle star Opiuridae indet.	Echinodermata: Green urchin *Strongylocentrotus droebachiensis*	Cnidaria: Burrowing anenome Ceriantharia indet.	Mollusca: Northern astarte *Astarte borealis*	Mollusca: Astarte clam *Astarte* sp.	Mollusca: Blunt gaper *Mya truncata*	Mollusca: Blunt gaper *Mya* sp.	Mollusca: Wrinkled rock-borer *Hiatella arctica*	Mollusca: Icelandic scallop *Chlamys islandica*	Mollusca: Greenland glass scallop *Similipecten greenlandicus*	Mollusca: Discord mussel *Musculus discors*	Mollusca: Mussel Mytilida indet.	Mollusca: Margarite snail *Margarites* sp.	Mollusca: Nudibranch Nudibranchia Indet.	Mollusca: Sea angel *Clione limacina*	Tunicata: Orange tunicate sp. 1 *Polycarpa* sp.	Fish (# individuals): Eelpout: Fish Doctor *Gymnelus viridis*	Eelpout: Saddled Eelpout *Lycodes mucosus*	Lumpfish: Lumpfish (juvenile) *Cyclopterus lumpus*	Sculpin: Fourhorn Sculpin *Myoxocephalus quadricornis*	Sculpin: Shorthorn Sculpin *Myoxocephalus scorpius*
Q1	-	-	-	25	-	-	-	-	-	-	1	1	-	-	-	5	-	20	-	-	-	-	-	-	-	-	-	-	-	-	1
Q2	-	-	-	10	-	-	-	-	-	-	1	-	-	-	-	-	5	30	-	-	1	-	-	-	-	-	-	-	-	-	1
Q3	-	-	-	5	1	-	-	-	-	1	6	7	-	-	-	10	-	15	1	-	-	-	-	-	-	-	-	-	-	-	-
Q4	-	-	-	5	2	5	1	-	-	-	5	5	-	-	-	2	-	10	-	-	-	-	-	-	-	1	-	1	-	-	-
Q5	2	-	1	5	-	-	-	-	-	-	2	19	-	-	-	5	-	3	-	-	-	-	-	-	-	-	-	-	-	1	-
Q11	10	-	-	7	-	-	-	100	-	-	-	1	-	-	<1	-	5	7	-	-	5	-	-	-	-	-	-	-	-	-	-
Q12	-	-	-	<1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Q13	-	-	-	30	10	-	-	-	-	-	-	2	-	-	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-
Q14	-	1	-	7	2	-	-	-	-	-	-	4	4	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	1
Q15	13	-	-	5	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Q21	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Q22	-	-	-	15	7	-	-	-	-	-	2	-	-	-	-	5	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-
Q23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Q6	2	-	-	-	-	-	-	-	-	1	44	4	-	-	-	-	4	30	4	-	-	-	-	1	-	-	-	-	-	-	-
Q7	5	-	1	7	<1	-	-	-	-	-	-	2	3	<1	-	1	-	10	-	-	-	4	1	-	-	-	1	-	-	-	-
Q8	5	-	-	3	2	-	-	-	-	-	-	-	-	1	-	1	3	10	-	-	-	2	-	-	-	-	-	-	1	-	-
Q9	5	-	-	20	-	-	-	-	-	-	-	-	-	1	-	-	5	30	-	-	-	7	-	-	-	-	-	-	-	-	1
Q10	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	1	-	-	-	-	-	-	-	-	-
*Q16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30		-	<1	-	-	-	-	-	-	-	-	-	-
Q17	2	-	-	10	5	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-
Q18	-	-	-	10	-	-	-	-	-	-	1	1	-	-	-	1	-	20	-	-	2	10	-	-	-	-	-	-	-	-	1
Q19	2	-	-	7	-	-	-	-	-	-	-	-	-	-	-	10	-	20	-	-	-	-	1	-	-	-	-	-	1	-	1
Q20	-	-	-	15	-	-	-	-	-	-	-	1	-	1	-	-	-	80	-	1	-	15	1	-	-	-	-	-	-	-	-
Q24	-	-	-	-	-	-	-	30	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Q25	-	-	-	5	-	-	-	30	-	-	-	-	-	-	-	-	5	20	-	-	-	-	-	-	-	-	-	-	-	-	1
Q26	-	-	-	5	-	-	-	-	-	-	-	-	-	<1	-	1	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes: Individual organism counts have been corrected for quadrat area (quadrats deployed in 2020/2021 have a multiplier of 2.291; quadrats deployed in 2022 have a multiplier of 1.5820). * indicates the quadrat was not included in data analysis in 2022. Grey highlighting indicates sessile invertebrates.

[1] Tubes are likley sabellid worms, though animal inside tube was not observed during survey and not included in data analysis.

APPENDIX 5D

ANOVA Analysis Results

Table 1. 1-factor ANOVA summary statistics and results from R analyses for cobble by area in 2022.

Response				Cobble			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	1.5	2.8	0.8	-0.2	3.2
Reference	2022	12	2.1	3.3	1.0	-0.0	4.2
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	2.413	1	0.254	0.619
			Residuals	218.147	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 2. 2-factor ANOVA summary statistics and results from R analyses for cobble by area and year for quadrats sampled in 2021 and 2022.

Response				Cobble			
Covariate				N/A			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	3.4	5.1	1.8	-0.9	7.6
Exposure	2022	8	8.0	7.5	2.6	1.8	14.2
Reference	2021	7	1.1	3.0	1.1	-1.7	3.9
Reference	2022	7	3.0	5.8	2.2	-2.3	8.3
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	1.200	1	0.229	0.636
			area	8.860	1	1.693	0.205
			year:area	0.156	1	0.262	0.613
			Residuals	136.036	26	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

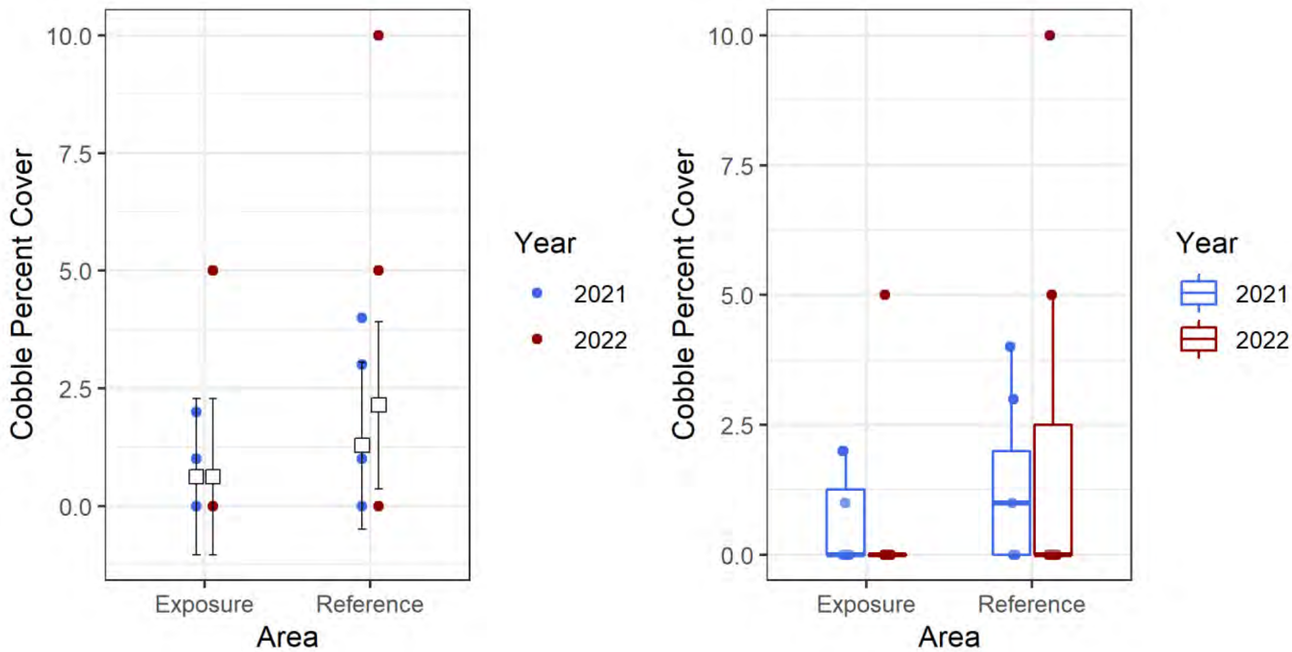


Figure 1. Percent cover of cobble by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 3. 1-factor ANOVA summary statistics and results from R analyses for gravel by area in 2022.

Response				Gravel			
Data Transformation Applied				Log10[x+1]			
Summary Statistics (Transformed Data)							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	0.7	0.5	0.1	0.4	1.1
Reference	2022	12	0.5	0.5	0.2	0.2	0.8
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	0.355	1	1.266	0.272
			Residuals	6.440	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 4. 2-factor ANOVA summary statistics and results from R analyses for gravel by area and year for quadrats sampled in 2021 and 2022.

Response				Gravel			
Covariate				Depth			
Data Transformation Applied				Log10[x+1]			
Summary Statistics (Transformed Data)							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	0.4	0.5	0.2	0.0	0.8
Exposure	2022	8	0.7	0.6	0.2	0.2	1.2
Reference	2021	7	0.1	0.4	0.1	-0.2	0.5
Reference	2022	7	0.3	0.5	0.2	-0.2	0.8
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	0.674	1	2.958	0.098
			area	0.505	1	2.215	0.149
			depth	0.588	1	2.581	0.121
			year:area	0.028	1	0.125	0.727
			Residuals	5.697	25	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

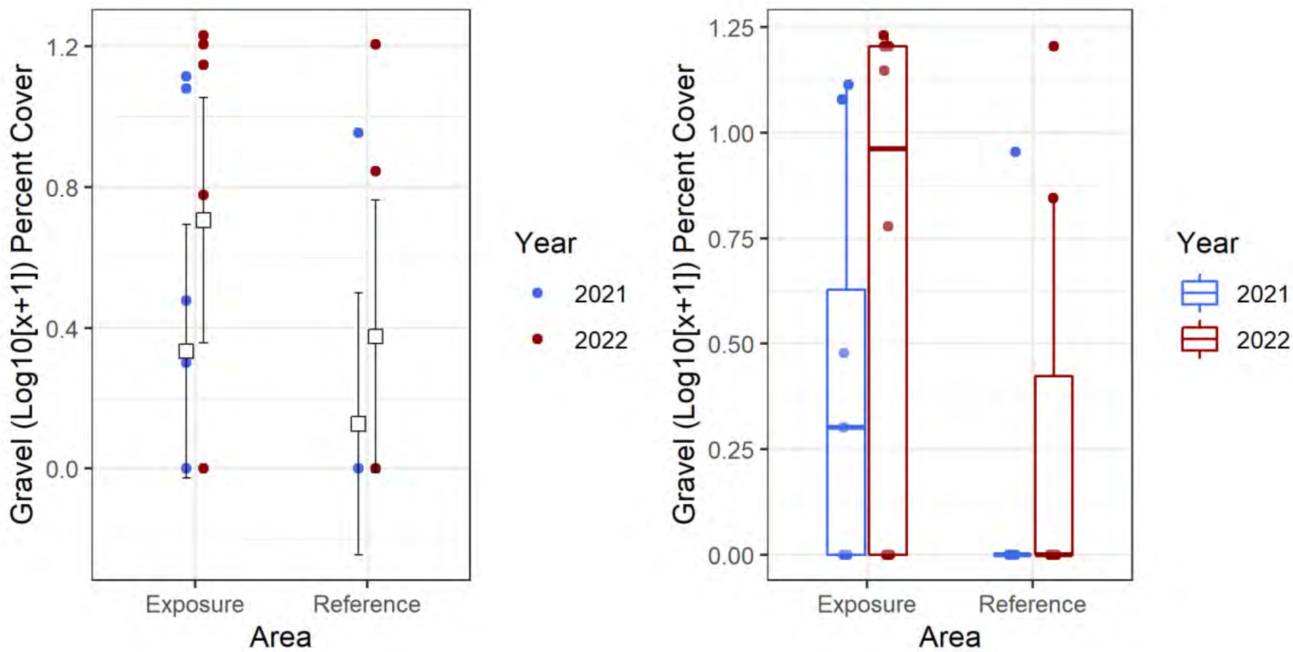


Figure 2. Percent cover of gravel (log10 transformed) by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 5. 1-factor ANOVA summary statistics and results from R analyses for sand by area in 2022.

Response				Sand			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	34.5	15.7	4.4	25.0	43.9
Reference	2022	12	42.8	23.6	6.8	27.8	57.7
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	428.7	1	1.088	0.308
			Residuals	9061.5	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 6. 2-factor ANOVA summary statistics and results from R analyses for sand by area and year for quadrats sampled in 2021 and 2022.

Response				Sand			
Covariate				N/A			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	41.9	14.4	5.1	29.9	53.9
Exposure	2022	8	24.8	4.3	1.5	21.2	28.4
Reference	2021	7	24.9	6.3	2.4	19.0	30.7
Reference	2022	7	36.1	20.0	7.6	17.7	54.6
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	112.1	1	0.693	0.413
			area	0.600	1	0.002	0.551
			year:area	**1506.7**	**1**	**9.314**	**0.005**
			Residuals	4206.1	26	-	-
Emmeans contrasts – year | area							
Area	**Contrast**		**Estimate**	**SE**	**Df**	**T ratio**	**P-value**
Exposure	**2021 - 2022**		**17.100**	**6.360**	**26**	**2.693**	**0.012**
Reference	2021 - 2022		-11.300	6.800	26	-1.66	0.109
Emmeans contrasts – area | year							
Year	**Contrast**		**Estimate**	**SE**	**Df**	**T ratio**	**P-value**
2021	**Exposure - Reference**		**17.000**	**6.580**	**26**	**2.585**	**0.016**
2022	Exposure - Reference		-11.400	6.580	26	-1.731	0.095

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equvalent to a P-value; T ratio = the estimate divided by the standard error.

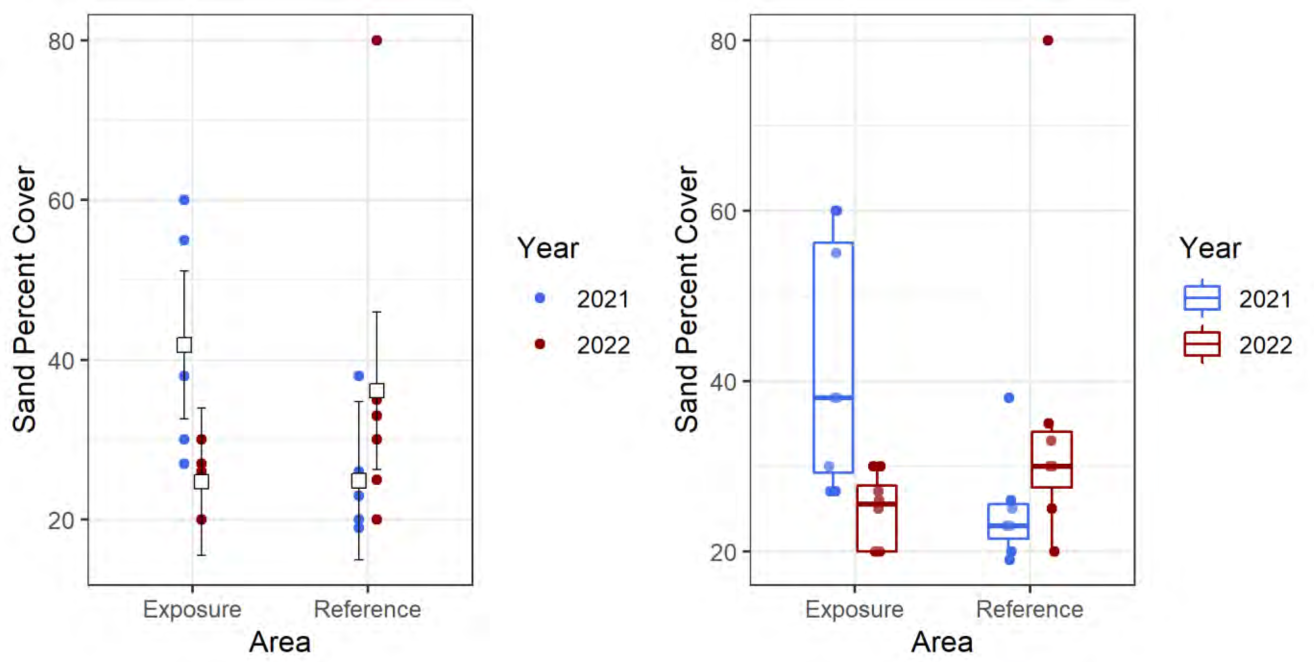


Figure 3. Percent cover of sand by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 7. 1-factor ANOVA summary statistics and results from R analyses for silt by area in 2022.

Response				Silt			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	52.2	18.9	5.3	40.8	63.7
Reference	2022	12	46.8	23.1	6.7	32.1	61.4
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	187.4	1	0.424	0.521
			Residuals	10158.6	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 8. 2-factor ANOVA summary statistics and results from R analyses for silt by area and year for quadrats sampled in 2021 and 2022.

Response				Silt			
Covariate				N/A			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	53.6	15.5	5.5	40.7	66.6
Exposure	2022	8	60.9	13.3	4.7	49.8	72.0
Reference	2021	7	70.1	6.9	2.6	63.8	76.5
Reference	2022	7	54.7	18.3	6.9	37.8	71.6
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	83.3	1	0.417	0.524
			area	200.2	1	0.014	0.326
			year:area	**960.1**	**1**	**3.681**	**0.038**
			Residuals	5193	26	-	-
Emmeans contrasts – year | area							
Area	**Contrast**		**Estimate**	**SE**	**Df**	**T ratio**	**P-value**
Exposure	2021 - 2022		-7.25	7.070	26	-1.026	0.314
Reference	2021 - 2022		15.43	7.550	26	2.042	0.051
Emmeans contrasts – area | year							
Year	**Contrast**		**Estimate**	**SE**	**Df**	**T ratio**	**P-value**
2021	**Exposure - Reference**		**-16.520**	**7.310**	**26**	**-2.258**	**0.033**
2022	Exposure - Reference		6.160	7.310	26	0.842	0.407

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value; T ratio = the estimate divided by the standard error.

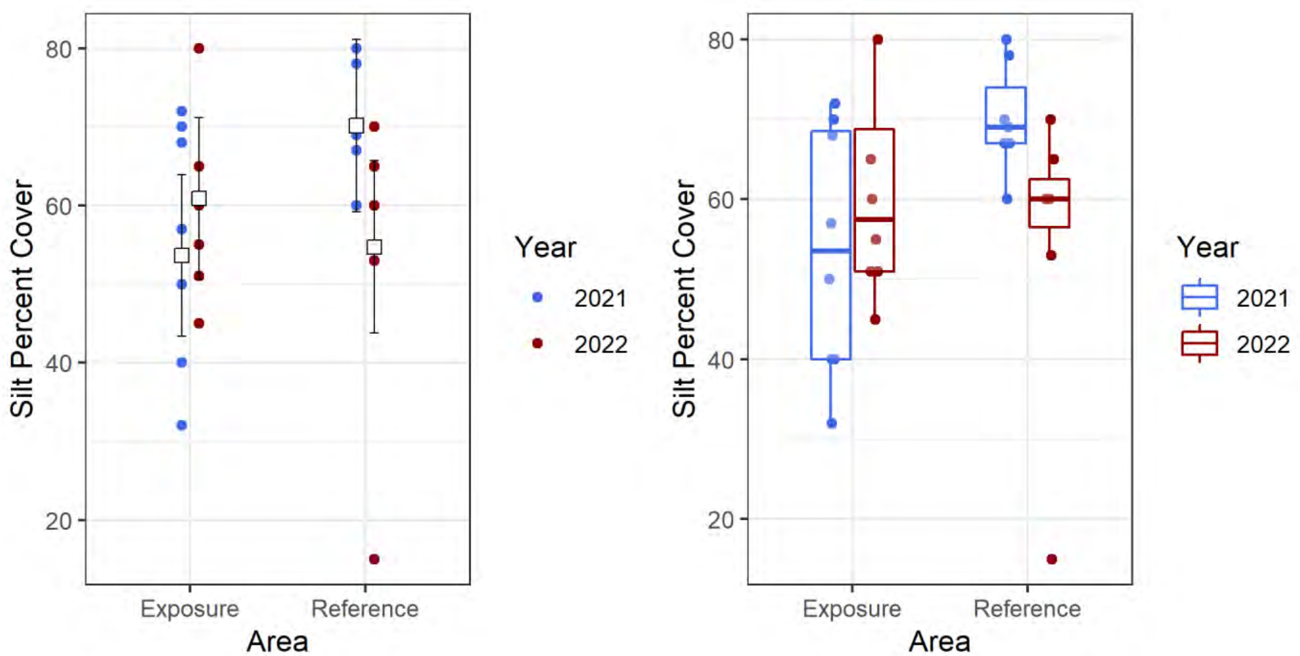


Figure 4. Percent cover of silt by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 9. 1-factor ANOVA summary statistics and results from R analyses for shell by area in 2022.

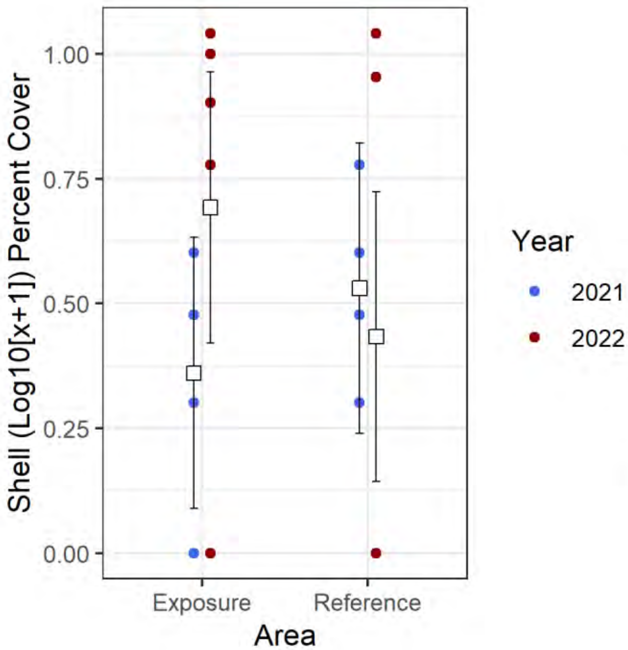
Response				Shell			
Data Transformation Applied				Log10[x+1]			
Summary Statistics (Transformed Data)							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	4.1	4.0	1.1	1.7	6.5
Reference	2022	12	3.8	4.5	1.3	0.9	6.6
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	0.0483	1	0.226	0.639
			Residuals	4.9228	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 10. 2-factor ANOVA summary statistics and results from R analyses for shell by area and year for quadrats sampled in 2021 and 2022.

Response				Shell			
Covariate				N/A			
Data Transformation Applied				Log10[x+1]			
Summary Statistics (Transformed Data)							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	0.4	0.2	0.1	0.2	0.5
Exposure	2022	8	0.7	0.4	0.2	0.3	1.1
Reference	2021	7	0.5	0.2	0.1	0.4	0.7
Reference	2022	7	0.4	0.5	0.2	-0.1	0.9
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	0.1306	1	0.935	0.343
			area	0.0148	1	0.106	0.748
			year:area	0.3434	1	2.459	0.129
			Residuals	3.6313	26	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.



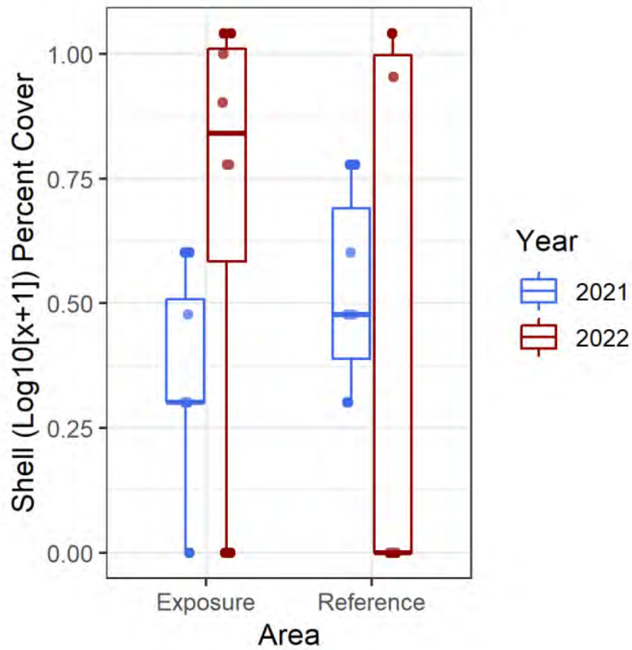


Figure 5. Percent cover of shell (log10 transformed) by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 11. 1-factor ANOVA summary statistics and results from R analyses for detrital veneer by area in 2022.

Response				Detrital Veneer			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	14.9	17.7	4.9	4.2	25.6
Reference	2022	12	23.8	19.9	5.8	11.1	36.4
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	486.200	1	1.379	0.252
			Residuals	8109.200	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 12. 2-factor ANOVA summary statistics and results from R analyses for detrital veneer by area and year for quadrats sampled in 2021 and 2022.

Response				Detrital Veneer			
Covariate				Depth			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	11.6	3.4	1.2	8.8	14.5
Exposure	2022	8	11.8	14.1	5.0	-0.1	23.6
Reference	2021	7	8.7	4.4	1.7	4.7	12.8
Reference	2022	7	28.6	20.4	7.7	9.8	47.4
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	250.5	1	1.904	0.180
			area	135	1	1.026	0.321
			depth	**787.6**	**1**	**5.987**	**0.022**
			year:area	**709**	**1**	**5.389**	**0.029**
			Residuals	3288.9	25	-	-
Emmeans contrasts – year | area							
Area	**Contrast**		**Estimate**	**SE**	**Df**	**T ratio**	**P-value**
Exposure	2021 - 2022		0.073	0.163	36	0.448	0.657
Reference	**2021 - 2022**		**0.695**	**0.166**	**36**	**4.181**	**<0.001**
Emmeans contrasts – area | year							
Year	**Contrast**		**Estimate**	**SE**	**Df**	**T ratio**	**P-value**
2021	Exposure - Reference		-0.182	0.18	36	-1.009	0.320
2022	**Exposure - Reference**		**0.44**	**0.145**	**36**	**3.028**	**0.005**

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value; T ratio = the estimate divided by the standard error.

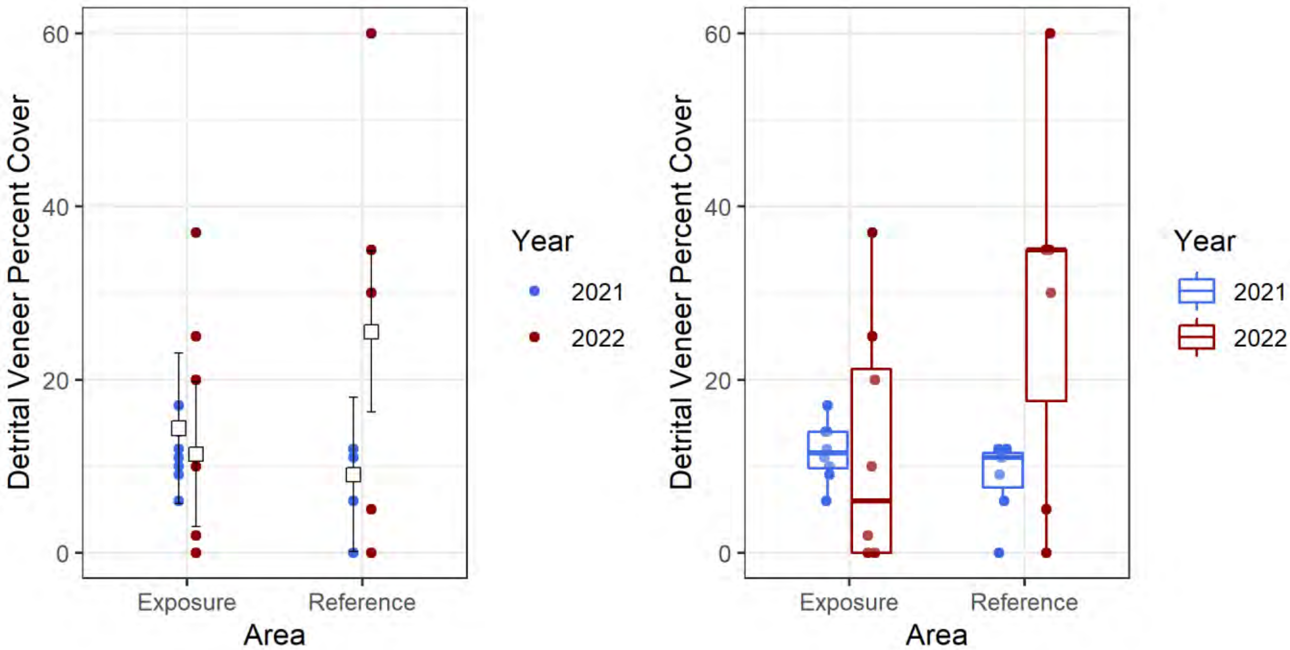


Figure 6. Percent cover of detrital veneer by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 13. 1-factor ANOVA summary statistics and results from R analyses for detrital algae by area in 2022.

Response				Detrital Algae			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	7.6	13.1	3.6	-0.3	15.6
Reference	2022	12	17.9	16.4	4.8	7.5	28.4
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	662.2	1	3.021	0.096
			Residuals	5042.0	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 14. 2-factor ANOVA summary statistics and results from R analyses for detrital algae by area and year for quadrats sampled in 2021 and 2022.

Response				Detrital Algae			
Covariate				N/A			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	16.2	16.0	5.7	2.8	29.6
Exposure	2022	8	11.5	15.7	5.5	-1.6	24.6
Reference	2021	7	15.2	17.6	6.7	-1.0	31.5
Reference	2022	7	22.9	18.9	7.1	5.4	40.3
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	8.3	1	0.029	0.867
			area	201.9	1	0.700	0.411
			year:area	283.0	1	0.981	0.331
			Residuals	7502.4	26	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

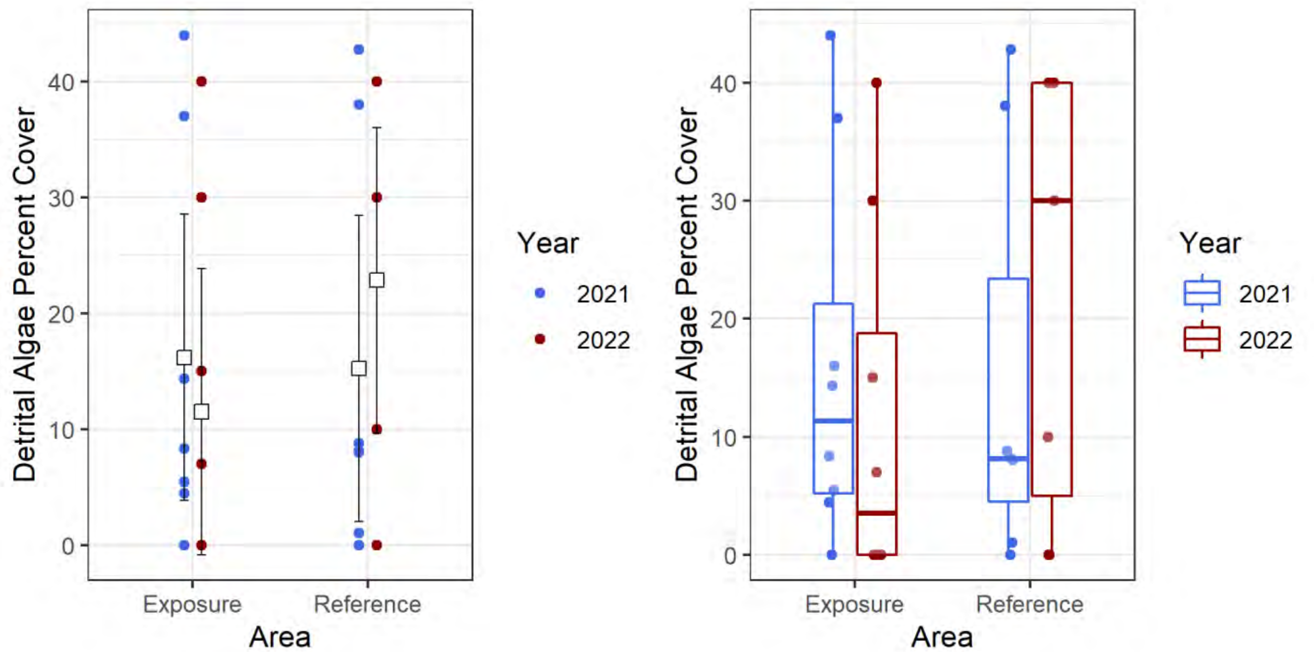


Figure 7. Percent cover of detrital algae by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 15. 1-factor ANOVA summary statistics and results from R analyses for other debris by area in 2022.

Response				Other Debris			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	3.6	7.2	2.0	-0.8	8.0
Reference	2022	12	1.0	1.7	0.5	-0.1	2.1
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	2.413	1	0.254	0.619
			Residuals	218.147	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 16. 2-factor ANOVA summary statistics and results from R analyses for other debris by area and year for quadrats sampled in 2021 and 2022.

Response				Other Debris			
Covariate				Depth			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	3.0	3.6	1.3	0.0	6.0
Exposure	2022	8	5.9	8.7	3.1	-1.4	13.1
Reference	2021	7	1.9	2.0	0.7	0.1	3.7
Reference	2022	7	1.7	2.0	0.8	-0.1	3.5
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	2.85	1	0.118	0.735
			area	76.47	1	3.155	0.088
			depth	51.29	1	2.1162	0.158
			year:area	17.7	1	0.730	0.401
			Residuals	605.87	26	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

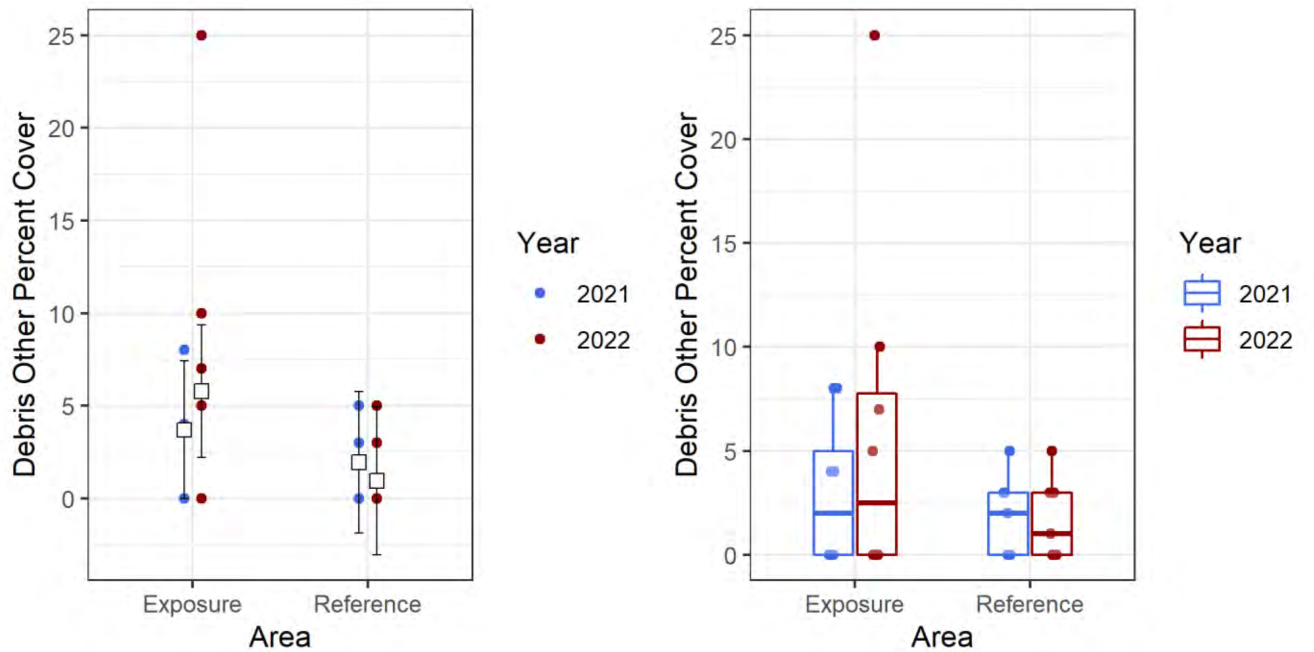


Figure 8. Percent cover of other debris by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 17. 1-factor ANOVA summary statistics and results from R analyses for percent cover of macroalgae by area in 2022.

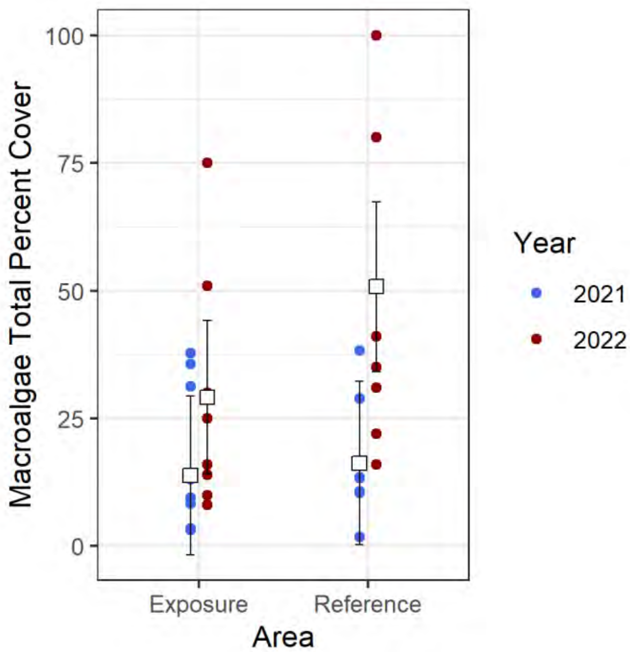
Response				Macroalgae Total Percent Cover			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	23.9	19.9	5.5	11.9	36.0
Reference	2022	12	32.7	30.4	8.8	13.4	52.0
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	477.1	1	0.736	0.400
			Residuals	14915.6	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 18. 2-factor ANOVA summary statistics and results from R analyses for percent cover of macroalgae by area and year for quadrats sampled in 2021 and 2022.

Response				Macroalgae Total Percent Cover			
Covariate				Depth			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	17.8	14.7	5.2	5.5	30.0
Exposure	2022	8	28.6	23.3	8.3	9.1	48.1
Reference	2021	7	16.7	12.5	4.7	5.1	28.6
Reference	2022	7	46.4	31.4	11.9	17.4	75.5
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			**year**	**4016.7**	**1**	**9.518**	**0.005**
			area	1011.3	1	2.396	0.134
			depth	**1617.2**	**1**	**3.832**	**0.062**
			year:area	689.1	1	1.633	0.213
			Residuals	10550.8	25	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.



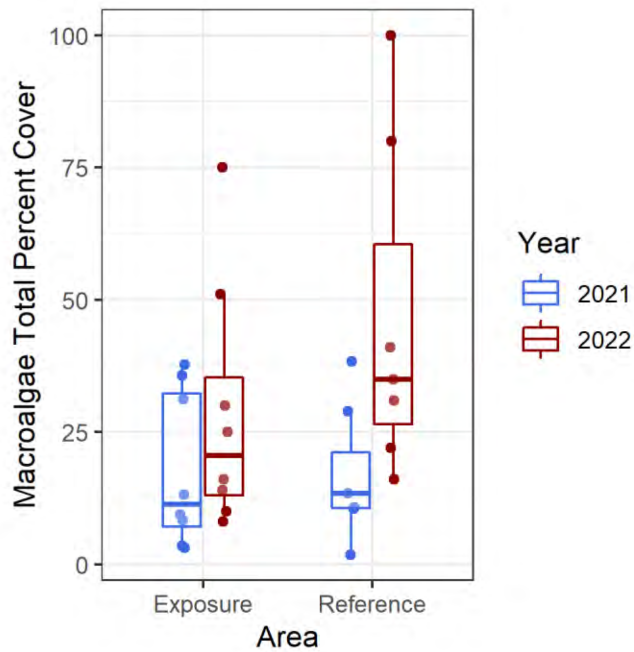


Figure 9. Percent cover of macroalgae by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 19. 1-factor ANOVA summary statistics and results from R analyses for macroalgae taxonomic richness by area in 2022.

Response				Macroalgae Taxonomic Richness			
Data Transformation Applied				Log10[x+1]			
Summary Statistics (Transformed Data)							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	0.6	0.2	0.0	0.5	0.7
Reference	2022	12	0.6	0.2	0.0	0.5	0.7
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	0.005	1	0.211	0.651
			Residuals	0.512	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 20. 2-factor ANOVA summary statistics and results from R analyses for macroalgae taxonomic richness by area and year for quadrats sampled in 2021 and 2022.

Response				Macroalgae Taxonomic Richness			
Covariate				Depth			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	4.0	1.9	0.7	2.5	5.6
Exposure	2022	8	3.8	1.0	0.4	2.9	4.6
Reference	2021	7	4.4	1.1	0.4	3.4	5.5
Reference	2022	7	3.1	0.7	0.3	2.5	3.8
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	1.167	1	0.846	0.366
			area	0.185	1	0.134	0.717
			depth	**7.593**	**1**	**5.506**	**0.027**
			year:area	1.911	1	1.386	0.250
			Residuals	34.478	25	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

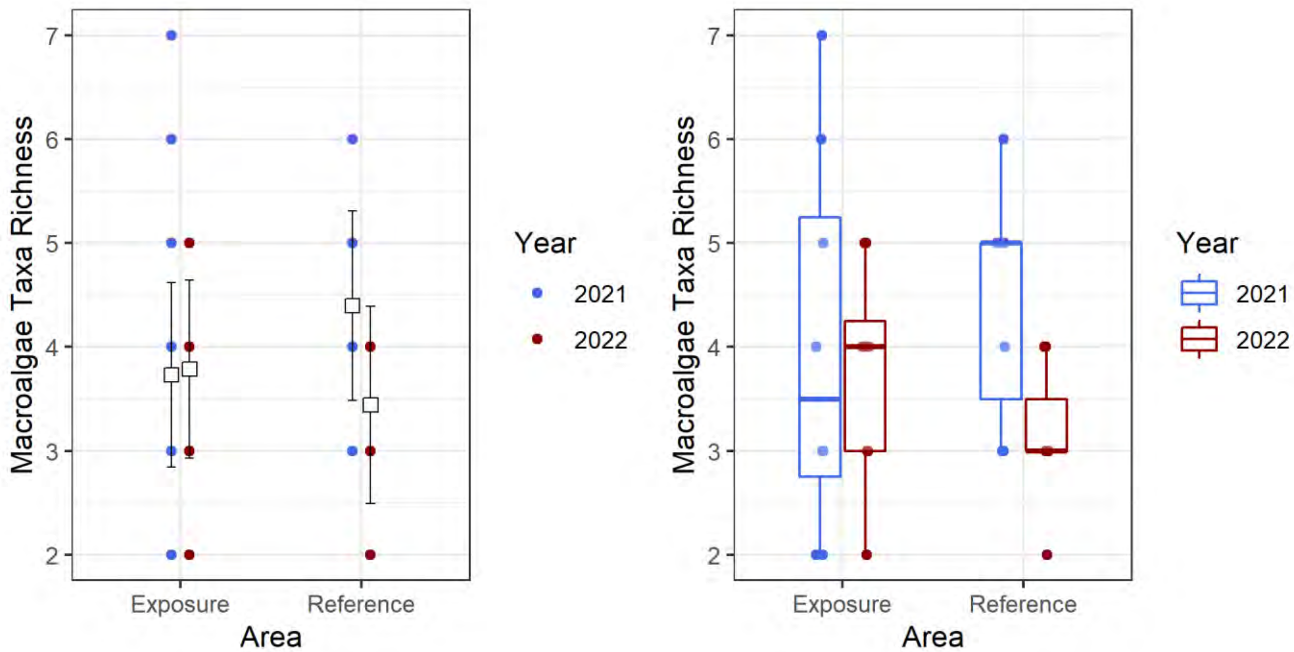


Figure 10. Taxonomic richness of macroalgae by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 21. 1-factor ANOVA summary statistics and results from R analyses for macroalgae Simpson's Diversity Index by area in 2022.

Response			Macroalgae Simpson's Diversity Index				
Data Transformation Applied			N/A				
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	0.490	0.187	0.052	0.377	0.603
Reference	2022	12	0.429	0.264	0.076	0.261	0.597
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	0.023	1	0.445	0.512
			Residuals	1.188	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 22. 2-factor ANOVA summary statistics and results from R analyses for macroalgae Simpson's Diversity Index by area and year for quadrats sampled in 2021 and 2022.

Response			Macroalgae Simpson's Diversity Index				
Covariate			N/A				
Data Transformation Applied			N/A				
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	0.513	0.239	0.084	0.313	0.713
Exposure	2022	8	0.554	0.111	0.039	0.461	0.647
Reference	2021	7	0.551	0.122	0.046	0.438	0.663
Reference	2022	7	0.491	0.220	0.083	0.288	0.695
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	0.000	1	0.007	0.932
			area	0.001	1	0.034	0.855
			year:area	0.019	1	0.564	0.459
			Residuals	0.865	26	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

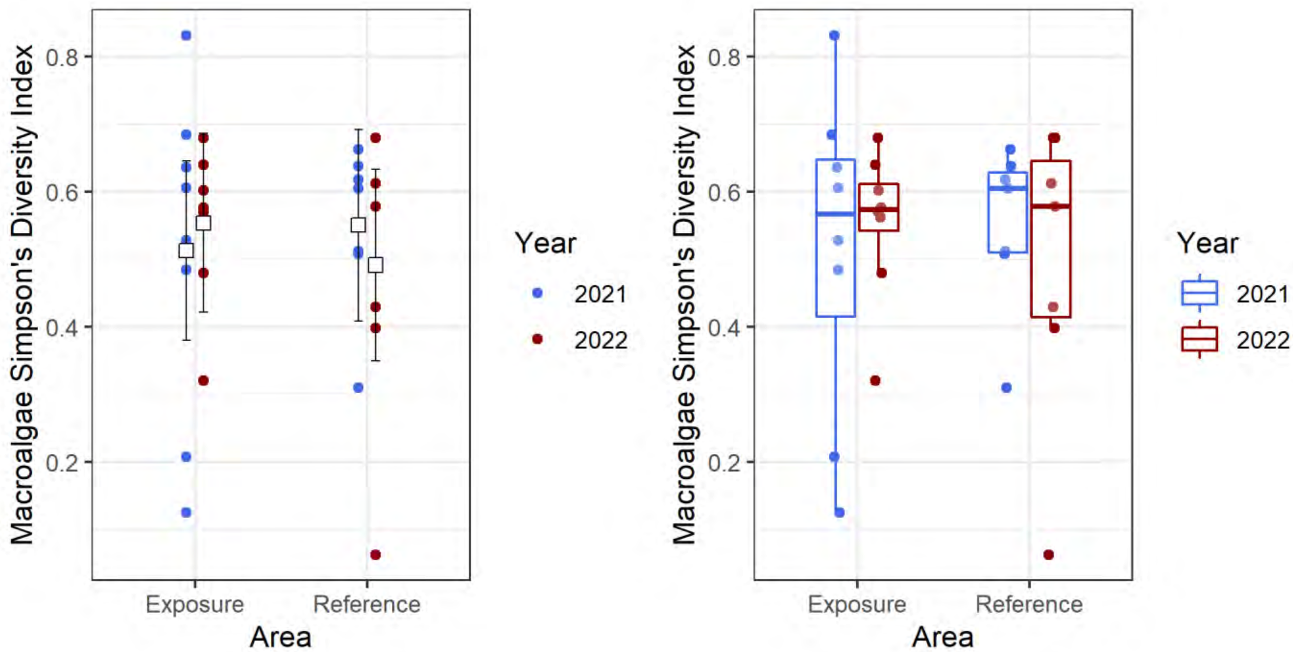


Figure 11. Diversity (SDI) of macroalgae by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 23. 1-factor ANOVA summary statistics and results from R analyses for percent cover of sessile epifauna by area in 2022.

Response			Sessile Epifauna Total Percent Cover				
Data Transformation Applied			Log10[x+1]				
Summary Statistics (Transformed Data)							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	1.2	0.6	0.2	0.8	1.5
Reference	2022	12	1.4	0.4	0.1	1.2	1.7
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	0.414	1	1.445	0.242
			Residuals	6.587	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 24. 2-factor ANOVA summary statistics and results from R analyses for percent cover of sessile epifauna by area and year for quadrats sampled in 2021 and 2022.

Response			Sessile Epifauna Total Percent Cover				
Covariate			Silt				
Data Transformation Applied			N/A				
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	26.1	9.0	3.2	18.5	33.7
Exposure	2022	8	29.8	21.1	7.5	12.1	47.4
Reference	2021	7	19.1	13.2	5.0	6.9	31.3
Reference	2022	7	38.4	28.9	10.9	11.8	65.1
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	501	1	2.086	0.161
			area	188.3	1	0.784	0.384
			silt	**3713.5**	**1**	**15.462**	**0.001**
			year:area	19.5	1	0.081	0.778
			Residuals	6004.4	25	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

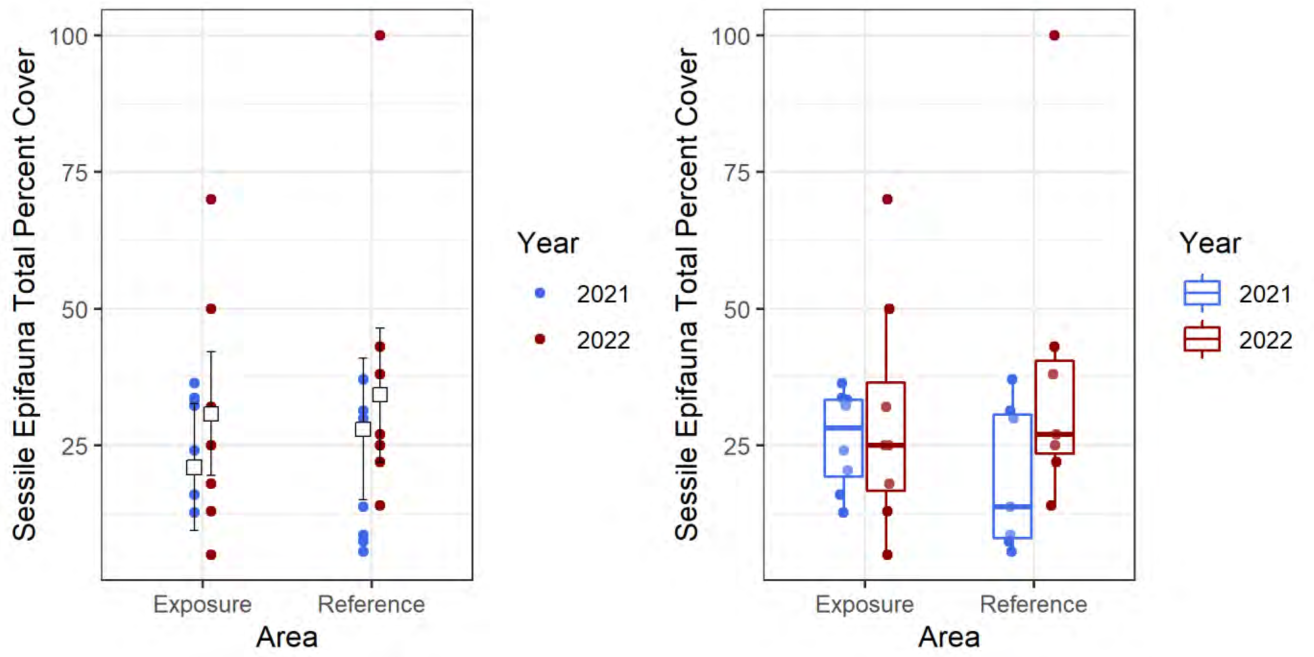


Figure 12. Percent cover of sessile epifauna by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 25. 1-factor ANOVA summary statistics and results from R analyses for sessile epifauna taxonomic richness by area in 2022.

Response			Sessile Epifauna Taxonomic Richness				
Data Transformation Applied			Log10[x+1]				
Summary Statistics (Transformed Data)							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	0.6	0.3	0.1	0.4	0.7
Reference	2022	12	0.7	0.2	0.1	0.6	0.8
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	0.080	1	1.803	0.192
			Residuals	1.023	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 26. 2-factor ANOVA summary statistics and results from R analyses for sessile epifauna taxonomic richness by area and year for quadrats sampled in 2021 and 2022.

Response			Sessile Epifauna Taxonomic Richness				
Covariate			N/A				
Data Transformation Applied			N/A				
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	5.0	1.6	0.6	3.7	6.3
Exposure	2022	8	3.8	1.6	0.6	2.4	5.1
Reference	2021	7	6.4	1.8	0.7	4.8	8.1
Reference	2022	7	4.4	1.6	0.6	2.9	5.9
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			**year**	**19.200**	**1**	**7.038**	**<0.001**
			area	8.288	1	3.038	0.093
			year:area	1.050	1	0.385	0.540
			Residuals	70.929	26	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

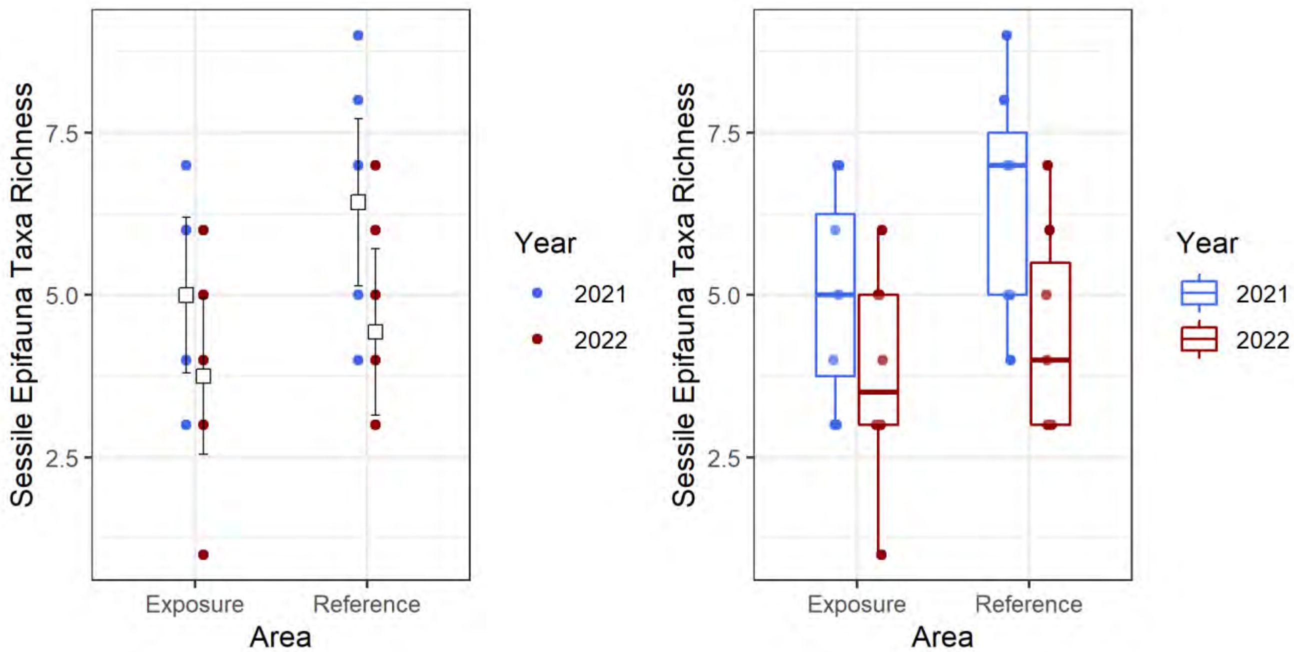


Figure 13. Taxonomic richness of sessile epifauna by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 27. 1-factor ANOVA summary statistics and results from R analyses for sessile epifauna Simpson's Diversity Index by area in 2022.

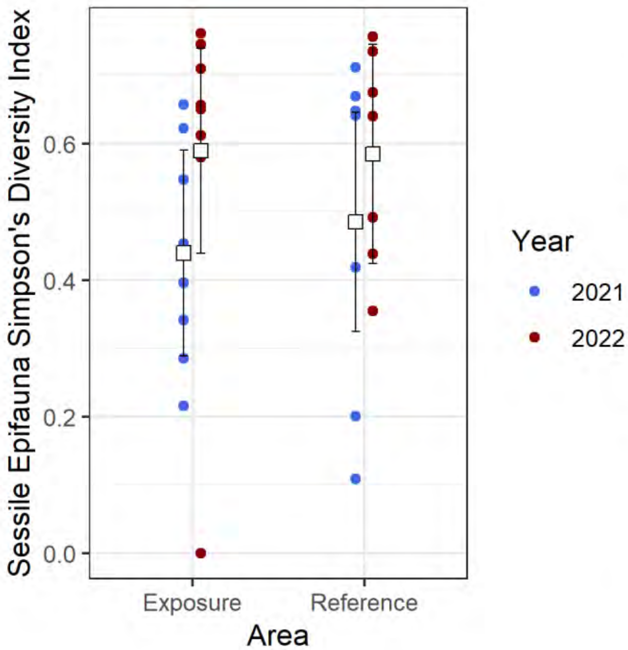
Response			Sessile Epifauna Simpson's Diversity Index				
Data Transformation Applied			N/A				
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	0.451	0.320	0.089	0.258	0.644
Reference	2022	12	0.534	0.207	0.060	0.403	0.666
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	0.043	1	0.589	0.451
			Residuals	1.697	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 28. 2-factor ANOVA summary statistics and results from R analyses for sessile epifauna Simpson's Diversity Index by area and year for quadrats sampled in 2021 and 2022.

Response			Sessile Epifauna Simpson's Diversity Index				
Covariate			N/A				
Data Transformation Applied			N/A				
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	0.440	0.160	0.056	0.306	0.573
Exposure	2022	8	0.590	0.246	0.087	0.384	0.796
Reference	2021	7	0.486	0.246	0.093	0.258	0.713
Reference	2022	7	0.585	0.156	0.059	0.440	0.729
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	0.119	1	2.786	0.107
			area	0.003	1	0.073	0.789
			year:area	0.005	1	0.111	0.742
			Residuals	1.113	26	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.



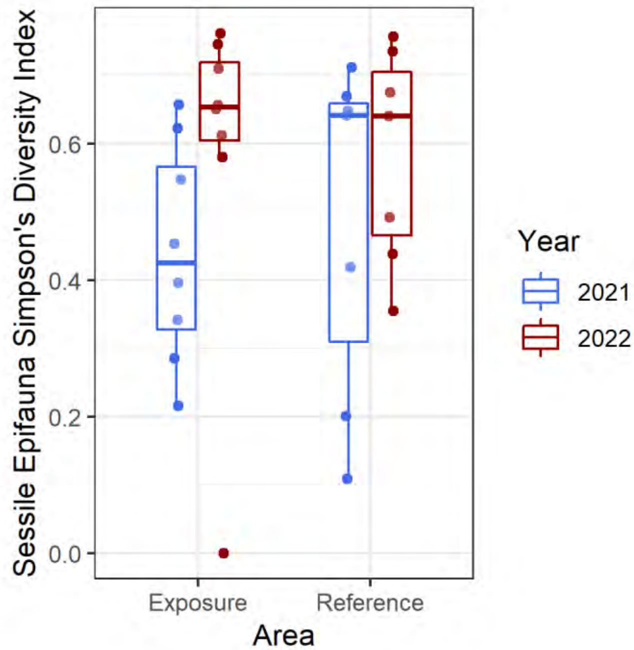


Figure 14. Diversity (SDI) of sessile epifauna by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 29. 1-factor ANOVA summary statistics and results from R analyses for motile epifauna density by area in 2022

Response			Motile Epifauna Density				
Data Transformation Applied			N/A				
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	12.4	15.7	4.4	2.9	21.9
Reference	2022	12	12.5	32.3	9.3	-8.0	33.1
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	0.200	1	0.000	0.986
			Residuals	14449.70	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 30. 2-factor ANOVA summary statistics and results from R analyses for motile epifauna density by area and year for quadrats sampled in 2021 and 2022.

Response				Motile Epifauna Density			
Covariate				Depth			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	16.1	17.5	6.2	1.4	30.7
Exposure	2022	8	18.6	17.5	6.2	4.0	33.2
Reference	2021	7	30.8	55.9	21.1	-21.0	82.5
Reference	2022	7	20.0	41.9	15.9	-18.8	58.7
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			**year**	**3172.4**	**1**	**8.438**	**0.008**
			area	257.3	1	0.684	0.416
			depth	**24169.5**	**1**	**64.283**	**<0.001**
			year:area	404.2	1	1.075	0.310
			Residuals	9399.7	25	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

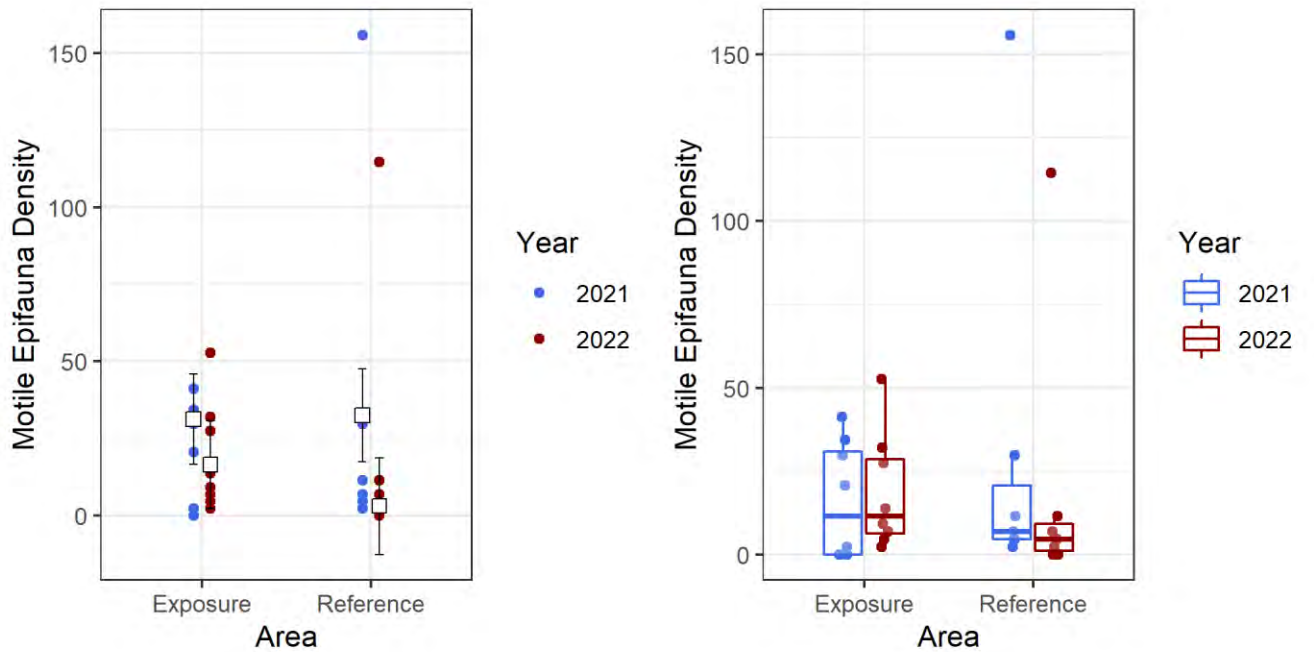


Figure 15. Density of motile epifauna by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 31. 1-factor ANOVA summary statistics and results from R analyses for motile epifauna taxonomic richness by area in 2022.

Response				Motile Epifauna Taxonomic Richness			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	1.9	1.3	0.4	1.1	2.7
Reference	2022	12	1.6	1.6	0.5	0.6	2.6
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	0.72	1	0.346	0.562
			Residuals	47.84	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 32. 2-factor ANOVA summary statistics and results from R analyses for motile epifauna taxonomic richness by area and year for quadrats sampled in 2021 and 2022.

Response				Motile Epifauna Taxonomic Richness			
Covariate				Depth			
Data Transformation Applied				N/A			
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	1.9	1.8	0.6	0.4	3.4
Exposure	2022	8	2.5	1.3	0.5	1.4	3.6
Reference	2021	7	2.6	1.3	0.5	1.4	3.8
Reference	2022	7	2.0	1.7	0.7	0.4	3.6
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	2.041	1	1.498	0.232
			area	1.041	1	0.764	0.390
			depth	**28.529**	**1**	**20.940**	**<0.001**
			year:area	2.881	1	2.115	0.158
			Residuals	34.06	25	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value

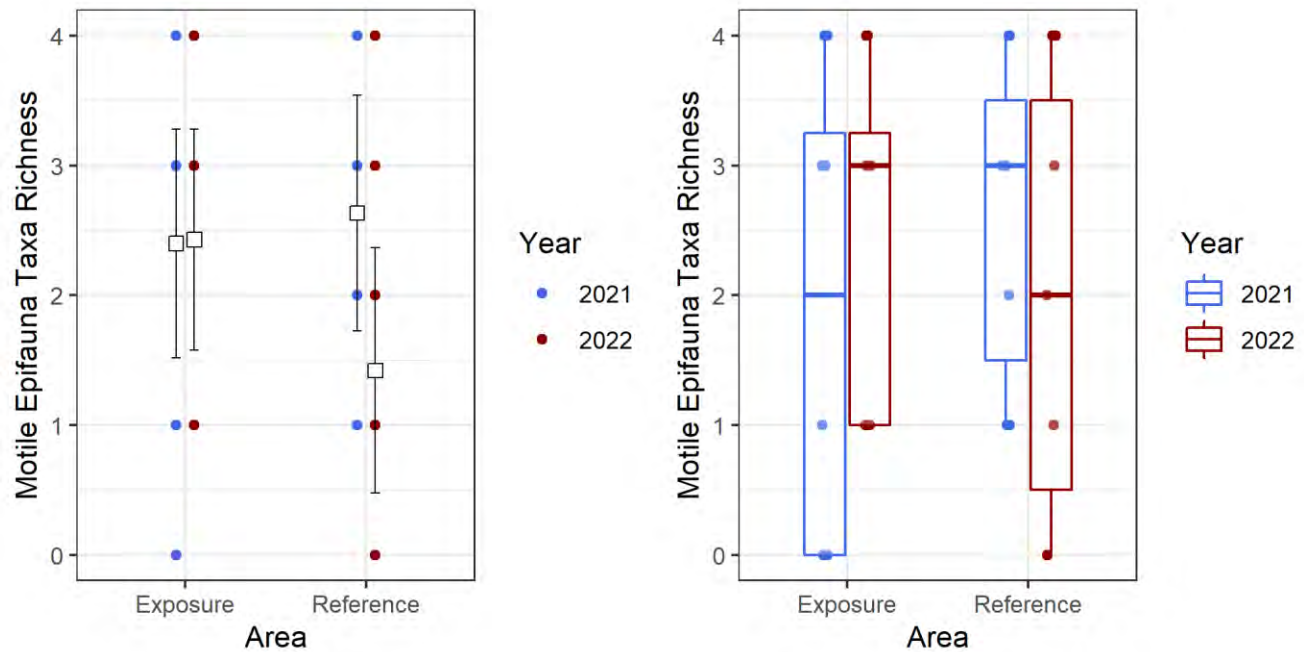


Figure 16. Taxonomic richness of motile epifauna by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

Table 33. 1-factor ANOVA summary statistics and results from R analyses for motile epifauna Simpson's Diversity Index by area in 2022.

Response			Motile Epifauna Simpson's Diversity Index				
Data Transformation Applied			N/A				
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2022	13	0.243	0.285	0.079	0.071	0.415
Reference	2022	12	0.223	0.299	0.086	0.033	0.413
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
1-Factor ANOVA			area	0.002	1	0.028	0.868
			Residuals	1.952	23	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

Table 34. 2-factor ANOVA summary statistics and results from R analyses for motile epifauna Simpson's Diversity Index by area and year for quadrats sampled in 2021 and 2022.

Response			Motile Epifauna Simpson's Diversity Index				
Covariate			N/A				
Data Transformation Applied			N/A				
Summary Statistics							
Area	**Year**	**Number of Quadrats**	**Mean**	**Standard Deviation**	**Standard Error (SE)**	**Lower 95% Confidence Limit**	**Upper 95% Confidence Limit**
Exposure	2021	8	0.219	0.247	0.087	0.012	0.425
Exposure	2022	8	0.332	0.294	0.104	0.086	0.578
Reference	2021	7	0.346	0.294	0.111	0.074	0.618
Reference	2022	7	0.287	0.304	0.115	0.006	0.569
Analysis							
Test			**Variable**	**Sum Sq**	**Df**	**F value**	**Pr(>F)**
2-Factor ANOVA, Type II			year	0.008	1	0.100	0.754
			area	0.013	1	0.157	0.696
			year:area	0.055	1	0.680	0.417
			Residuals	2.107	26	-	-

Note: **Bold red** highlights indicate statistically significant results. Sum Sq = sum-of-squares [differences between each value and its group mean]; Df = degrees of freedom [i.e., number of quadrats]; F value = ratio of two mean square values [computed by dividing the sum-of-squares by the appropriate number of degrees of freedom]; Pr(>F) = equivalent to a P-value.

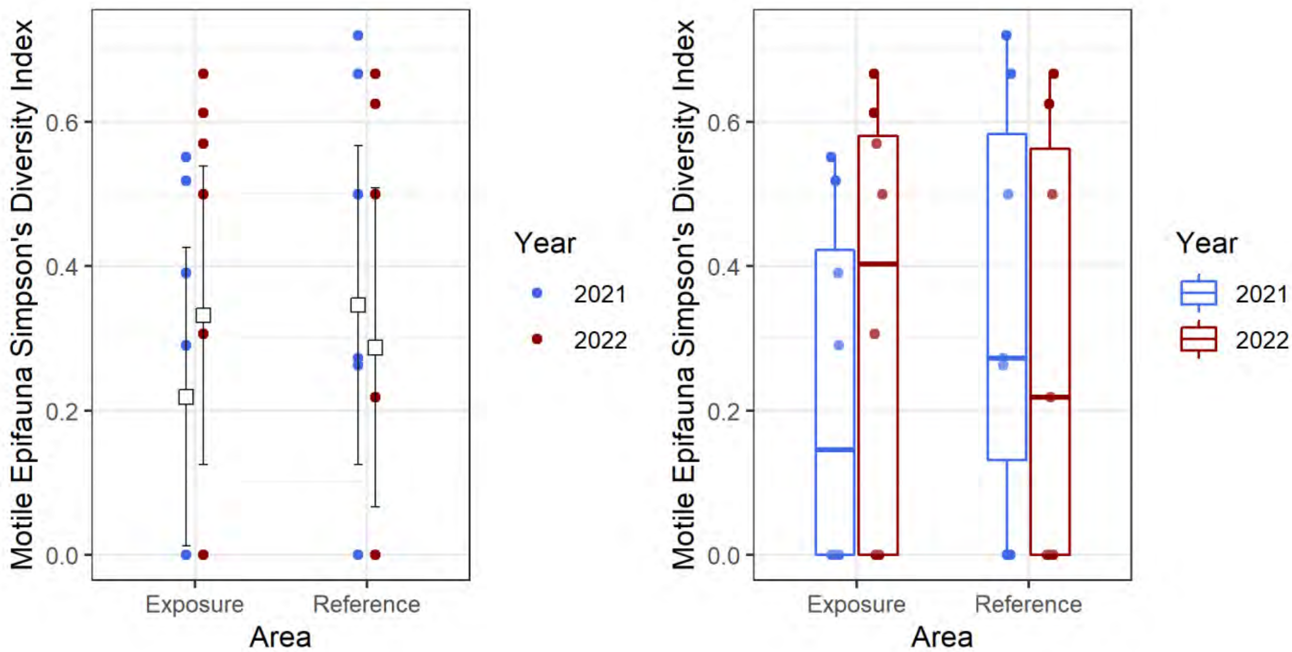


Figure 17. Diversity (SDI) of motile epifauna by area and year – represented as a scatter plot (left) with predicted means shown as black squares, and as boxplots (right).

APPENDIX 5E

Power Analysis Results

POWER ANALYSIS – BENTHIC EPIFAUNA AND MACROFLORA

This section presents the results of a power analysis undertaken for the 2021 and 2022 benthic epifauna and macroflora monitoring data at Milne Port.

METHODS

A Type I error is concluding there is a significant effect when none exists (i.e., a false positive). Alpha (α) is the probability of committing a Type I error. A Type II error is the probability of concluding there is no significant effect when there is a real effect of some specified magnitude (i.e., a false negative). Beta (β) is the probability of committing a Type II error. The power of a statistical test ($1 - \beta$) is the probability of detecting a real effect. In this analysis, the Type I error-rate (α), also referred to as the significance level, was set to 0.05. The desired minimum statistical power was 80%, which corresponds to a type II error-rate of 0.2. Power analyses were conducted to assess the power of statistical tests under multiple effect sizes. For each model, a set of effect sizes was created, based on preliminary power analyses, so that power >80% was achieved at the largest absolute values of effect sizes, but also so that power is assessed at a range of effect sizes. Since the analysis focused on assessment of changes to statistical power at different effect sizes, the power analysis used the observed samples sizes from the collected data.

Data Simulation following Effect Size Application

The power to detect statistically significant effects was estimated using residual bootstrapping in R v. 4.2.1 (R 2022), following the approach of Fox and Weisberg (2018). The general approach was to simulate data based on the model selected for interpretation, the observed sample size (or the sample size of choice), and the residuals, and re-run the models that were used for the original analysis using the simulated data. The data simulation and analysis were repeated at least 1,000 times, and the proportion of repetitions where the *P*-values of interest were significant ($P<0.05$) was interpreted as the statistical power of the test.

To produce simulated data, the original model was used to predict values of the response variable, and the raw residuals (i.e. the difference between the predicted and observed value for each observation) from the original model were calculated and retained. The predicted values were then adjusted according to the effect size, depending on analysis (see below for details). For each iteration of the simulation, the residuals from the original analysis were sampled with replacement, and then summed with effect size-adjusted model predictions, to produce a set of simulated data. Adding the residuals to the effect size-adjusted predictions was done to create a level of variability in the simulated data that was similar to the observed data. The simulated data were then analyzed using the same model structure as the original analysis.

In the analysis of 2021-2022 data, where the question of interest was the detection of change in response variables between exposure and the reference area, the effect was applied as percentage relative to the values predicted for the reference area. That is, an increasing effect size resulted in a larger difference between exposure and reference area samples (Figure 1). The simulated data were analyzed using the same model as the original analysis described in the main report, and the *P*-values for the site on the response variable were retained, which included both the main effect of site and an interaction with site (for ANCOVAs where a significant interaction between site and the covariate was found). If any of these *P*-values were less than 0.05, it was considered a significant overall effect of site. The proportion of repetitions with *P*-values less than 0.05 was interpreted as the statistical power of the overall regression for that effect size. The power analysis was performed on a range of effect sizes - 20%, 30%, and 40%, and a range of sample sizes – from the collected number of samples up to 60 samples total (30 quadrats at each site), in increments of 1 quadrat per site. Since the modeling used a normal distribution of the errors, the power to detect an effect size applies to either negative or positive effect size. That is, the 20%, 30%, and 40% effect sizes represent either a decrease or an increase of the relevant magnitude.

Power Analysis – Reporting of Results

Power curves were produced, showing statistical power as a function of sample size and effect size in percentages. Horizontal lines were added to visualize statistical power values of 0.8 (hereafter sufficient power) and 0.9 (hereafter high power), and the observed effect size was provided in the results.

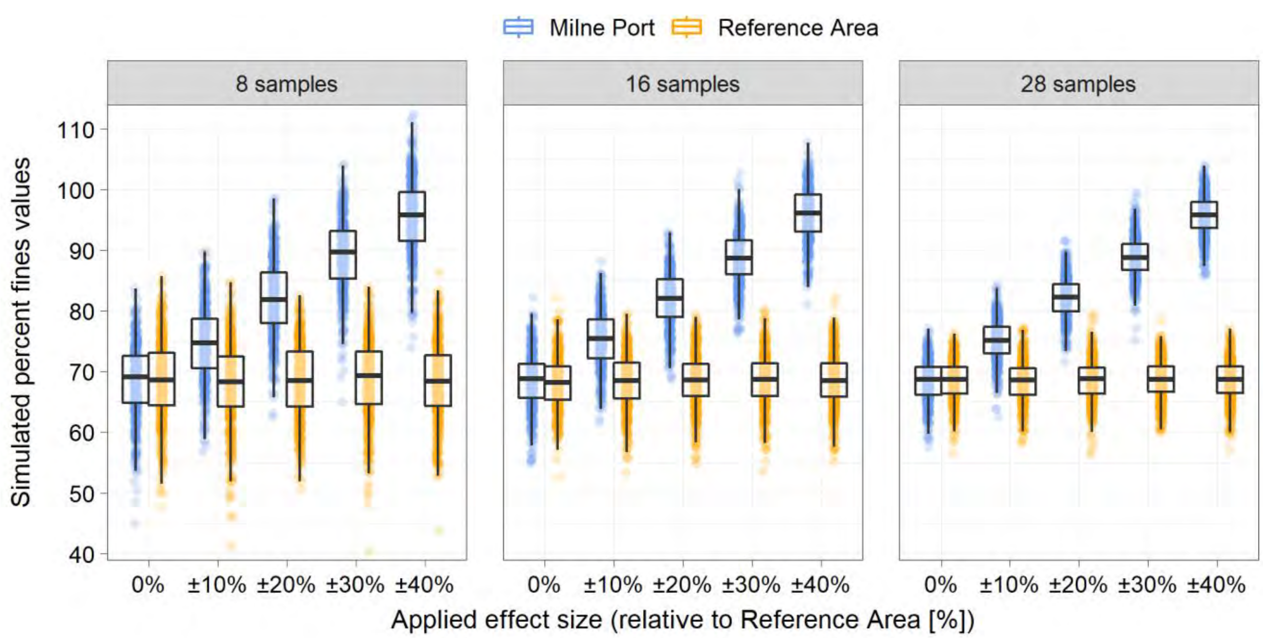


Figure 5E-1 Application of effect sizes and simulation of increasing sample sizes to assess statistical power of detecting a difference between the reference and exposure area (2022 percent fines model).

RESULTS

The power analysis indicated that the data collected as part of the substrate, macroflora, and benthic epifauna sampling had low power to detect a ±20% effect size at the collected sample size for all examined variables except for silt (Figure 5E-2; Figure 5E-3). An increase in sample size from the current 13 samples per area would only result in sufficient power to detect a ±20% effect size for macroflora taxa richness (at 26 samples per area), macroflora SDI (at 30 samples per area), and sessile epifauna taxa richness (at 17 samples per area). This level of effort is prohibitive, especially given that it would still not achieve sufficient power for the remaining variables.

For an effect size of ±40%, sufficient power would be achieved for the following combinations of variables and effect sizes:

- Substrate:
  - Sand – at 10 samples per area
  - Silt – at 10 samples per area
- Macroflora:
  - taxa richness – at 10 samples per area
  - SDI – at 10 samples per area
- Sessile epifauna:
  - Taxa richness – at 10 samples per area
  - SDI – at 11 samples per area
- Motile epifauna:
  - Taxa richness – at 17 samples per area
- Sufficient power was not achieved even at ±40% effect size and 30 samples per area for cobble, gravel, shell, detrital veneer, detrital algae, debris (other), macroflora total percent cover, sessile epifauna total percent cover, motile epifauna density and SDI.

The observed effect sizes for the analyzed summary variables ranged from -68% (for detrital algae in 2022) to +550 (for debris [other] in 2022; Table 5E-1). The absolute magnitude of the observed effect sizes was <20% for 14 out of the 34 tests performed. This is consistent with few significant area effects found in the original analyses (given the observed effect size and sample size): a significant interaction between year and area for sand, and a significant interaction between year and area for motile epifauna density. For all other variables, either a large effect size or a large sample size would be required to detect a significant difference between the reference and exposure area.

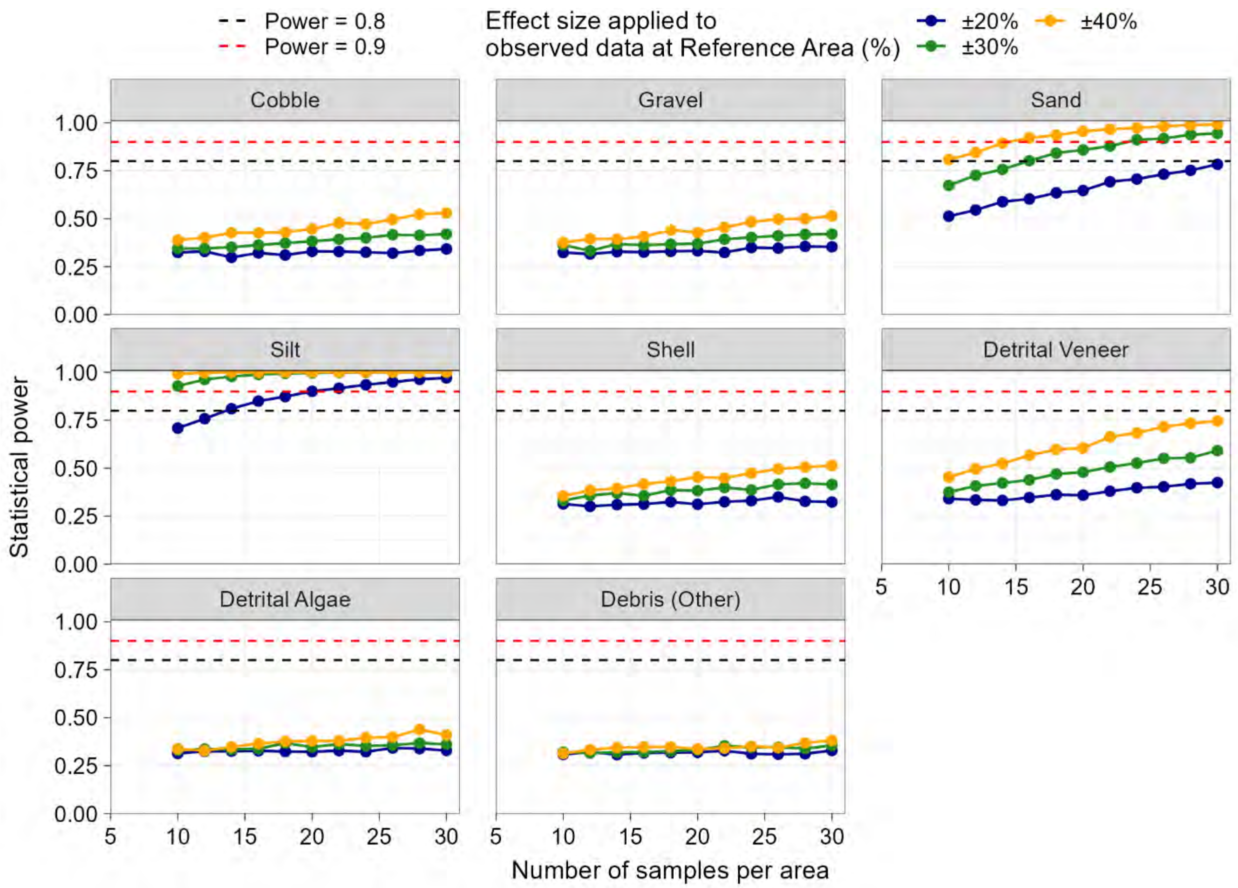


Figure 5E-2 Statistical power of the models of sediment data to detect a significant effect between the reference and exposure area based on quadrat data collected in 2021-2022.

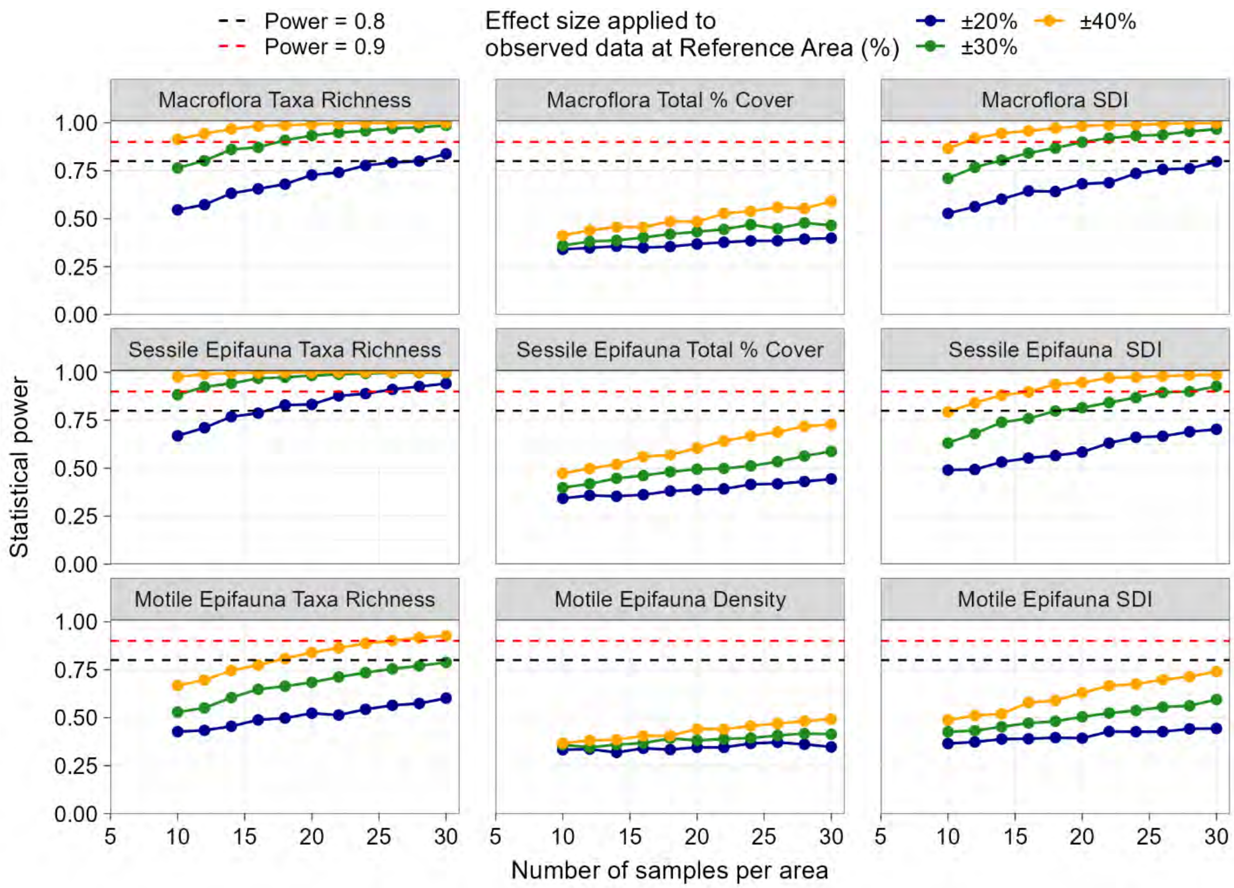


Figure 5E-3 Statistical power of the models of benthic macroflora and epifauna data to detect a significant effect between the reference and exposure area based on quadrat data collected in 2021-2022.

Table 5E-1: Observed effect sizes for analyses of sediment and benthic and macroflora and epifauna indicators from 2021-2022.

Component	Variable	Observed effect sizes (%)	
		2021	2022
Substrate	Cobble	-58.3	-29.8
	Gravel	21.7	45.9
	Sand	60.6	-19.4
	Silt	-19.5	17.2
	Shell	-52.3	35.1
	Detrital veneer	47.6	-30.3
	Detrital algae	65.6	-68.4
	Debris (other)	106.7	550.3
Macroflora	Macroflora taxa richness	-13.5	8.1
	Macro total percent cover	-10.8	-7.5
	Macroflora SDI	7.5	7.6
Sessile Epifauna	Sessile epifauna taxa richness	-19.1	-16.2
	Sessile epifauna total cover	58.7	-29.2
	Sessile epifauna SDI	0.5	-19
Motile Epifauna	Motile epifauna taxa richness	-20.6	51.7
	Motile epifauna density	-36.9	272.8
	Motile epifauna SDI	-45.9	8.8

SUMMARY

Overall, statistical power was low to detect a ±20% effect size relative to the reference area even if sample sizes increased. For some variables, such as cobble, gravel, macroflora total percent cover, sessile epifauna total percent cover, and motile epifauna density, none of the assessed sample sizes and effect sizes resulted in sufficient power.

An increase in sample size to 25 quadrats per site (i.e., total of 50 quadrats) would result in sufficient power (>0.8) to detect a ±40% effect size for most macroflora and epifauna variables, except for macroflora total percent cover, sessile epifauna total percent cover, motile epifauna density and SDI. For sediment, an increase in sample size to 25 quadrats per site would result in sufficient power (>0.8) to detect a ±40% effect size only for sand and silt, but not for any of the other variables.

Implications of Power Analysis Results

The results indicated that seven of the summary variables had sufficient power to detect a ±40% effect size given the 2021-2022 sample size (sand, silt, macroflora taxa richness, macroflora SDI, sessile epifauna richness, and sessile epifauna SDI). Due to the variability in the data, either a large effect size or a large sample size (or both) would be required to consistently be able to detect a difference between the two areas for the remaining variables. An increase to 25 quadrats per site (from the current 13 quadrats) would still not achieve sufficient power to detect a ±20% for most of the remaining variables, except for macroflora taxa richness and sessile epifauna taxa richness. The increase in sample size to 25 quadrats, combined with setting ±40% effect sizes as the desired difference to detect would achieve sufficient power for many, but not all summary variables. This sample size would require a substantial increase in field effort.

REFERENCES

Fox, J. and Weisberg, S. 2018. Bootstrapping Regression Models in R. An Appendix to An R Companion to Applied Regression, third edition, https://socialsciences.mcmaster.ca/jfox/Books/Companion/appendices/Appendix-Bootstrapping.pdf.

R Core Team. 2022. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

APPENDIX 5F

Taxa List

APPENDIX 5F
Taxa Identified During 2022 Quadrat Surveys in Milne Port, NU

Macroflora	
Common Name	**Scientific Name**
Sieve kelp	*Agarum clathratum*
Sugar kelp	*Saccharina latissima*
Rockweed	*Fucus distichus*
	Pylaiella sp.
Acid weed	*Desmarestia sp.*
	Battersia spp.
	Chaetomorpha melagonium
Green filamentous	Chlorophyta indet.
	Coccotylus truncatus
	Savoiea arctica
Red filamentous	Rhodophyta indet.
Aquatic bryophyte	Bryophyta indet.

Fishes	
Common Name	**Taxa Name**
Fish Doctor	*Gymnelus hemifasciatus*
Saddled Eelpout	*Lycodes mucosus*
Eelpout	**Zoarcidae indet.**
Lumpfish	*Cyclopterus lumpus*
Fourhorn Sculpin	*Myoxocephalus quadricornis*
Shorthorn Sculpin	*Myoxocephalus scorpius*
Arctic Sculpin	***Myoxocephalus scorpioides***
Prickleback	**Stichaeidae indet.**
Sandlance	***Ammodytes sp.***

Sessile Epifauna	
Common Name	**Scientific Name**
Cone worm	*Cistenides granulata*
Small sabellid worm sp. 1	Sabellidae indet.
Large sabellid worm sp. 2	Sabellidae indet.
Burrowing anenome	Ceriantharia indet.
Northern astarte	*Astarte borealis*
Astarte clam	*Astarte sp.*
Icelandic scallop	*Chlamys islandica*
Greenland glass scallop	*Similipecten greenlandicus*
Greendland cockle	***Serripes groenlandicus***
Wrinkled rock-borer	*Hiatella arctica*
Discord mussel	*Musculus discors*
Mussel	Mytilida indet.
Blunt gaper	*Mya truncata*
Blunt gaper	*Mya sp.*
Tunicate	*Polycarpa sp.*

Motile Epifauna	
Common Name	**Scientific Name**
Scaled polychaete	*Harmonthoe sp.*
Polychaete	Polychaeta Indet.
Shrimp	Crangonidae indet.
Mysid shrimp	Mysida indet.
Ribbon worm	Nemertea indet.
Sea cucumber	Holothuroidea Indet.
Brittle star	Opiuridae indet.
Green urchin	*Strongylocentrotus droebachiensis*
Margarite snail	*Margarites spp.*
Nudibranch	Nudibranchia Indet.
Sea angel	*Clione limacina*
Sea star	**Asteroidea indet.**

Note: taxa in **Bold** indicate opportunistic sighting taxa only, not taxa that was observed within the permanent quadrats.

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REPORT

Chapter 6.0 Marine Fish Community Program

2022 Milne Port Marine Environmental Effects Monitoring Program (MEEMP) and Non-Indigenous Species and Aquatic Invasive Species (NIS/AIS) Monitoring Program

Submitted to:

Baffinland Iron Mines Corporation

2275 Upper Middle Road East, Suite 300
Oakville, ON L6H 0C3

Submitted by:

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Victoria British Columbia V8Z 0B9, Canada

1663724-430f-R-Rev0-64000

28 April 2023

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TABLES

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Definitions
ANOVA	Analysis of Variance
cm	centimeter
CPUE	Catch-Per-Unit-Effort
DFO	Fisheries and Oceans Canada
DPF	Direct Project Footprint
ERP	Early Revenue Phase
FA	Fishing Area
FEIS	Final Environmental Impact Statement
GPS	Global Positioning System
hr	Hour
IPF	Indirect Project Footprint
km	Kilometer
m	Meter
m^2	Square-meter
mm	millimeter
MEEMP	Marine Environmental Effects Monitoring Program
MEWG	Marine Environment Working Group
n	Number of individuals
N	Number of stations
NIS/AIS	Non-Indigenous Species/Aquatic Invasive Species
No.	Number
PC	Project Certificate
QA/QC	Quality Assurance and Quality Control
SD	Standard Deviation
SE	Standard Error
%	Percent
$<$	Less than
≤	Less than or equal to

6.0 MARINE FISH COMMUNITY PROGRAM

6.1 Introduction

This chapter presents the results of the marine fish community program, a component of the larger Marine Environmental Effects Monitoring Program (MEEMP) conducted in Milne Inlet during the 2022 open-water season. This chapter was developed in consideration of the potential Project-related effects on marine fish and fish habitat as identified in the 2012 Final Environmental Impact Statement (FEIS) and subsequent addenda, as well as monitoring requirements outlined in the Project Certificate (PC) Conditions described in Chapter 1.0, Table 1-2. PC Conditions related to the monitoring of marine fish habitat include PC Conditions No. 99 (b)(ii), 99 (c), 113, and 114. This chapter supplements Chapter 7 (Marine Fish Health), which focuses on the health of the local marine fish community in Milne Port, including length frequency distributions, length-weight relationships, visual assessment of internal and external abnormalities, and tissue chemistry.

6.2 Objectives

The objectives of the MEEMP are outlined in Section 1.3 of Chapter 1.0 (Program Overview). The objectives specific to the marine fish community program component are as follows:

- Characterize the marine fish community at Milne Port in terms of species presence, number of fish caught, and relative abundance.
- Provide species-specific and overall Catch-Per–Unit-Effort (CPUE) for each fishing method for 2022 catch data to better understand the efficacy of fishing methods at Milne Port.
- Compare 2022 catch statistics (total abundance and species composition) to previous years using annual data plots from 2020 to 2022.
- Test for differences in overall CPUE between 2020, 2021, and 2022 while accounting for differences in the location and number of sampling locations to better understand trends at Milne Port.

6.3 Study Design

The current study design for fishing reflects feedback from the Marine Environment Working Group (MEWG), while maintaining consistency with the design used during previous monitoring years to facilitate comparisons of results over time. For the period of 2014 to 2017, the study design remained largely unaltered except for the addition of angling (jigging and trolling) and a trial for minnow traps as a method in 2017; from 2014 to 2017, sampling was conducted over a two-week period in August. In 2018, sampling duration was extended to four weeks of the open-water season instead of two weeks to provide a more accurate representation of the fish community. The extended sampling period was also accompanied by the addition of beach seining (“seine net”) as a supplemental fishing method (Table 6-1).

In 2019, the sampling duration was extended to five weeks of the open water season to continue to provide accurate representation of the fish community. Hoop net traps (also known as fyke nets) were trialed during the 2019 MEEMP fish sampling program and fully added to the program in 2020 as a minimum three-year trial study to determine whether this method was more effective in capturing fish than Fukui traps (Table 6-1). This addition was made following input from the MEWG regarding low capture efficiency in Fukui traps (DFO, QIA; 2018

MEEMP/AIS report comments, M-23042019, M-21062019. The use of both hoop nets and Fukui traps continued through 2022, reflecting the commitment made to the MEWG to collect three years of data to facilitate comparison of results from both trapping techniques.

In 2020, the MEEMP fish sampling program was reduced to three weeks during the open water season (continued in 2021); however, unlike in previous years where fishing was conducted alongside other MEEMP program components over the four- to five-week program, a dedicated fish sampling team was created to increase efficiency and catch opportunities in the limited available open water season. Additionally in 2020, trawling was trialed as a fishing method in Milne Port to improve detection of rarely sampled fish species (i.e., bottom-associated taxa); trawling was continued in 2021 and 2022. Changes were also made to angling efforts in 2020 to increase effort in targeted areas for species of interest (e.g., Arctic Char [*Salvelinus alpinus*] and Fourhorn Sculpin [*Myoxocephalus quadricornis*]) and to better support the objectives of the MEEMP Fish Health program (see Chapter 7.0 Fish Health and Tissue Chemistry). In 2021, longlining was trialed as a fishing method in Milne Port to improve capture efficiency and community detection of deeper benthic species; however, as no fish were caught, the method was discontinued for 2022.

Table 6-1: MEEMP Fish Capture Methods per Year (2010 - 2022)

	2010	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Angling - Jigging						√	√	√	√	√	√
Angling - Trolling						√	√	√	√	√	√
Fukui Trap		√	√	√	√	√	√	√	√	√	√
Gill Net	√	√	√	√	√	√	√	√	√	√	√
Hoop Net								√*	√	√	√
Longlining										√*	
Minnow Trap						√*					
Seine Net							√	√	√		
Trawling									√*	√	√

*Limited sampling events to test the method.

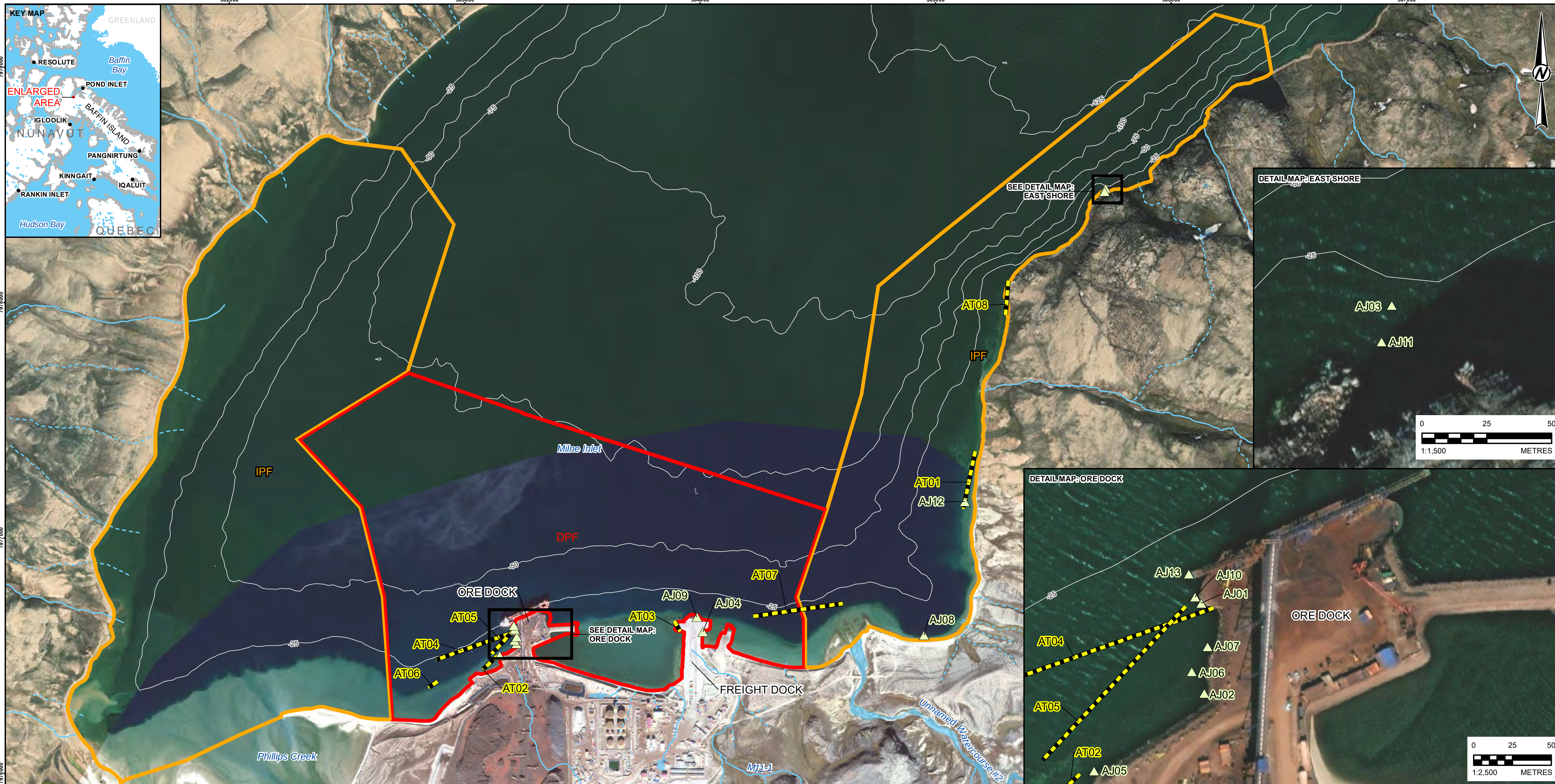
6.3.1 Modifications to the Program (2022)

Changes to fishing methods for the 2022 MEEMP program included the discontinuation of longline fishing which was trialled unsuccessfully in 2021 (Table 6-1). The rationale was described in Golder (2022).

Continued exploratory fishing to identify a suitable reference area for the MEEMP fish health sampling program was conducted in 2022 in two locations: southwest of the Tugaat River outflow, approximately 15 km northeast of Milne Port, and on the northern shore of the mouth of Koluktoo Bay, approximately 23 km northeast of Milne Port. Exploratory fishing results, including locations for the 2022 fish sampling undertaken as part of the effort to identify a favourable reference site, are presented in Appendix 7A of Chapter 7 (Fish Health and Tissue Chemistry).

Figure 6-1 through Figure 6-5 illustrate the 2020 to 2022 deployment locations for each fishing method and identify the boundaries of the two fishing areas in Milne Port.

CPUE calculations were revised for two fishing methods (hoop nets and Fukui traps) to better account for field variability. Previously, CPUE was assessed for these methods as number of fish per 24 hour of effort per trap. For the 2022 report, CPUE metrics were modified to the number of fish per hour for hoop nets and to the number of fish per hour of effort per trap for Fukui traps. Data from 2020 and 2021 were re-calculated with the modified CPUE calculations and compared against 2022 results. CPUE data from sampling prior to 2020 have not been standardized and are therefore not included as part of this report.



LEGEND

- 2022 ANGLING (JIGGING) SAMPLING LOCATION
- 2022 ANGLING (TROLLING) SAMPLING LOCATION
- BATHYMETRIC CONTOUR (25 m INTERVAL)
- INTERMITTENT WATERCOURSE
- WATERCOURSE
- INDIRECT PROJECT FOOT PRINT (IPF)
- DIRECT PROJECT FOOT PRINT (DPF)
- WATERBODY

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PROJECTION: UTM ZONE 17 DATUM: NAD 83

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PROJECT
MARY RIVER PROJECT

CONSULTANT
wsp

YYYY-MM-DD	2023-04-27
DESIGNED	BG
PREPARED	AA
REVIEWED	AL
APPROVED	AL

TITLE
ANGLING SAMPLE LOCATIONS IN MILNE PORT; MEEMP 2022

PROJECT NO.	CONTROL	REV.	FIGURE
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LEGEND

- 2022 FUKUI TRAP SAMPLING LOCATION
- BATHYMETRIC CONTOUR (25 m INTERVAL)
- INTERMITTENT WATERCOURSE
- WATERCOURSE
- INDIRECT PROJECT FOOT PRINT (IPF)
- DIRECT PROJECT FOOT PRINT (DPF)
- WATERBODY

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PREPARED	AA
REVIEWED	AL
APPROVED	AL

TITLE
FUKUI TRAP DEPLOYMENT LOCATIONS IN MILNE PORT; MEEMP 2022

PROJECT NO.	CONTROL	REV.	FIGURE
166372401	64000-04	0	6-2

LEGEND

- 2022 GILLNET SAMPLING LOCATION
- BATHYMETRIC CONTOUR (25 m INTERVAL)
- INDIRECT PROJECT FOOT PRINT (IPF)
- DIRECT PROJECT FOOT PRINT (DPF)

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REFERENCE(S)

BATHYMETRY CREATED BY GOLDER FROM MULTIPLE DATA SOURCES. FREIGHT DOCK DATA PROVIDED BY HATCH, MARCH 4, 2020. ADDITIONAL MILNE PORT INFRASTRUCTURE DATA OBTAINED FROM CLIENT, MAY 2, 2020 AND MAY 28, 2018. HYDROGRAPHY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. MILNE PORT IMAGERY CAPTURED AUGUST 2020 © 2020 DIGITAL GLOBE, INC. ADDITIONAL IMAGERY COPYRIGHT © 20190802 ESRI AND ITS LICENSORS. SOURCE: MAXAR VIVID. USED UNDER LICENSE, ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 17 DATUM: NAD 83

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DESIGNED	BG
PREPARED	AA
REVIEWED	AL
APPROVED	AL

TITLE
GILL NET DEPLOYMENT LOCATIONS IN MILNE PORT; MEEMP 2022

PROJECT NO.	CONTROL	REV.	FIGURE
166372401	64000-04	0	6-3

LEGEND

- △ 2022 HOOP NET SAMPLING LOCATION
- BATHYMETRIC CONTOUR (25 m INTERVAL)
- INTERMITTENT WATERCOURSE
- WATERCOURSE
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- DIRECT PROJECT FOOT PRINT (DPF)
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PREPARED	AA
REVIEWED	AL
APPROVED	AL

TITLE
HOOP NET DEPLOYMENT LOCATIONS IN MILNE PORT; MEEMP 2022

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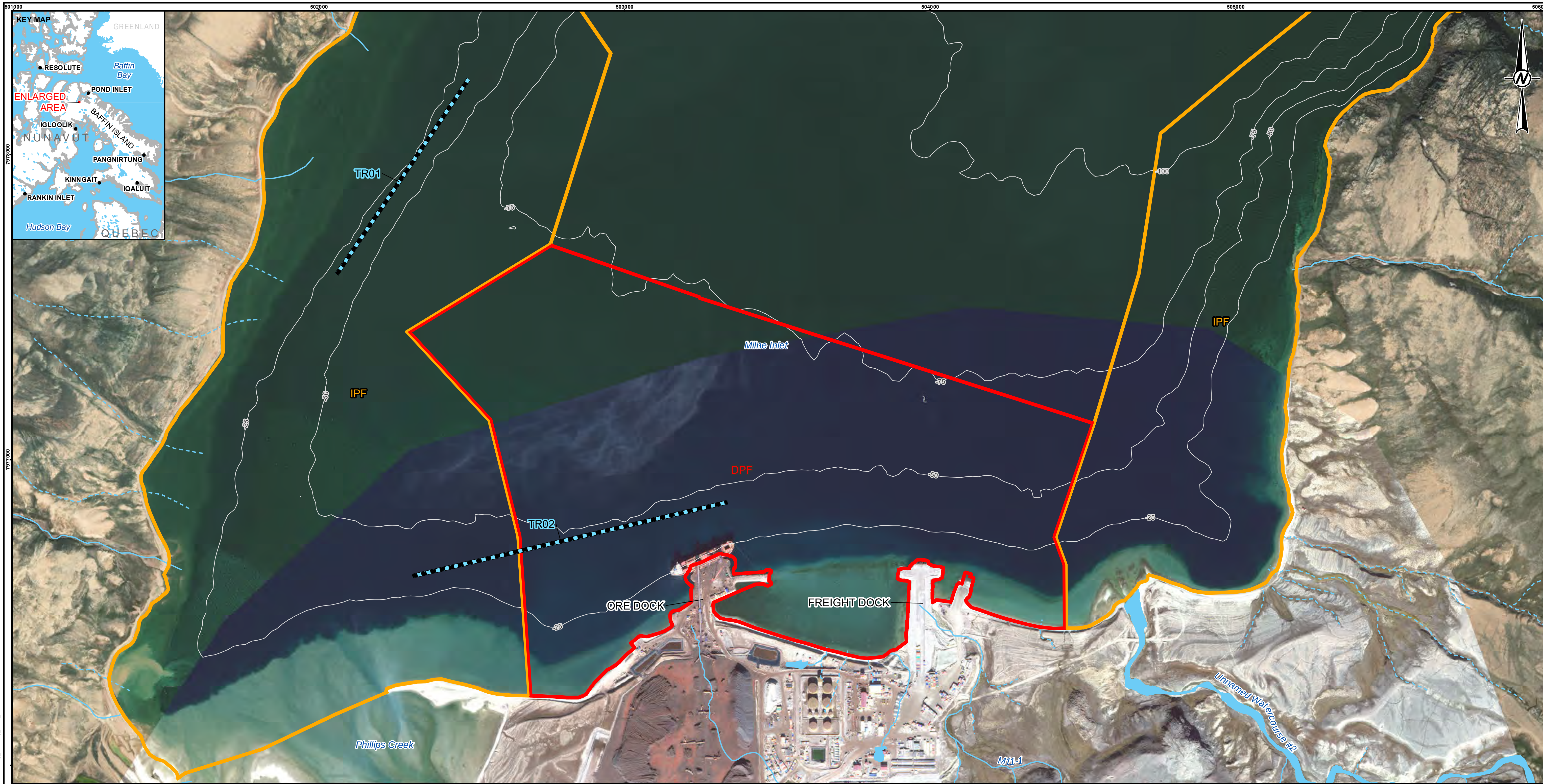

LEGEND

- 2022 TRAWLING SAMPLING LOCATION
- BATHYMETRIC CONTOUR (25 m INTERVAL)
- INTERMITTENT WATERCOURSE
- WATERCOURSE
- INDIRECT PROJECT FOOT PRINT (IPF)
- DIRECT PROJECT FOOT PRINT (DPF)
- WATERBODY

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REFERENCE(S)

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PROJECTION: UTM ZONE 17 DATUM: NAD 83

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PROJECT
MARY RIVER PROJECT

CONSULTANT
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YYYY-MM-DD	2023-04-27
DESIGNED	BG
PREPARED	AA
REVIEWED	AL
APPROVED	AL

TITLE
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PROJECT NO.	CONTROL	REV.	FIGURE
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6.3.2 Endpoints

CPUE is the primary metric used for characterization of the fish catch data, in addition to total number of fish caught, taxa richness, and relative abundance of taxa. Comparison using these metrics is only feasible within a fishing method and this report does not compare CPUE between methods. A statistical analysis of these endpoints over the course of the entire MEEMP program (2015 to 2022) was not feasible due to the limited sample sizes and inconsistent fishing effort data for sampling events conducted prior to 2020. However, statistical comparisons of CPUE data, by method, in years 2020, 2021, and 2022 and contrasting the two fishing areas were completed for this report.

6.4 Materials and Methods

6.4.1 Field Methodology

Fish sampling was conducted in the Milne Port area from 1 to 15 August 2022 using both active (angling [jigging and trolling], gill net, and trawling) and passive (Fukui trap and hoop net) capture methods (Figure 6-1 to Figure 6-5). Fish sampling locations were consistent with those used in previous years, including exploratory reference site sampling near the mouth of the Tugaat River and in Koluktoo Bay for the fish health program. Fishing effort in 2022 occurred over a two-week period during the open-water season. All mortalities were retained and processed as described in Chapter 7.0 (Fish Health and Tissue Chemistry).

6.4.1.1 Permitting

The following scientific data collection permits were obtained prior to the start of the 2022 fish sampling program:

- Fisheries and Oceans Canada (DFO) Licence to Fish for Scientific Purposes Permit # S-22/23-1034-NU-A1
- DFO Animal Use Protocol Permit # OPA-ACC-2022-64
- Nunavut Research Institute (NRI) Scientific Research Licence # 02 030 22R-M

Copies of permits are provided in Appendix 6A.

6.4.1.2 Fishing Areas

Recognizing that the marine fish community may differ across the Milne Port area and differences may or may not stem from potential Project-related effects, two distinct Fisheries Areas (FAs) were identified for Milne Port; one encompassing waters directly in or adjacent to the terminal infrastructure footprint (Direct Project Footprint area; DPF) and one encompassing waters outside (west and east) of the terminal infrastructure footprint (Indirect Project Footprint; IPF). The FAs reflect different exposure levels relative to terminal operations and marine berthing activities. The integration of FAs in the study design provides an opportunity to better characterize any variability in Milne Port area fish communities and standardize sampling locations among years. Coverage and effort across the FAs are determined, in part, by the effectiveness of a particular method at characterizing the fish community within an FA, consequently each FA may include a range of sampling efforts and methods. A description of the FAs is provided in Table 6-2 and their spatial arrangement is shown in Figure 6-1 to Figure 6-5.

Table 6-2: Fishing Areas (FAs) of Milne Port

Fishing Area	Area (ha)	Description
Direct Project Footprint (DPF)	192.14	The Direct Project Footprint FA (DPF) includes the immediate Area of Influence[1] adjacent to Project infrastructure, and includes shoreline in the vicinity of the Ore Dock, Ore Pile, Freight dock, and Fuel Farm. The DPF is also an area of relatively high marine traffic compared to the Indirect Project Footprint (see below). Habitat in the DPF is characterized by mixed (sand/gravel to cobble/boulder)[1] shoreline including coarse rock offsetting habitat along the Ore Dock and Freight Dock. The DPF FA extends 1.38 km from shore at its western boundary, and 0.98 km from shore at its eastern boundary.
Indirect Project Footprint (IPF)	405.64	The Indirect Project Footprint[2] FA (IPF) includes areas along the shorelines to the east and west of the DPF, outside of the immediate Area of Influence. The IPF includes the mouth of Philips Creek, which is characterized by soft substrate (sand and gravel) and brackish water, as well as the shoreline to the east of the DPF, which is also characterized by brackish water due to input from Unnamed Watercourse #2, as well as substrate ranging from soft sand to mixed gravel and cobble. The IPF FA extends 2.63 km from shore at the mouth of Philips Creek at its western boundary, and 2.77 km from the southern shore of Milne Inlet at its western boundary.

[1] See chapters 3.0 and 5.0 for definitions of substrate size categories.[2] Note: IPF does not include fishing areas around Tugaat River or Koluktoo Bay.

6.4.1.3 Fishing Methods

A total of 84 fishing efforts (i.e., sampling events) comprising six methodologies were completed in Milne Port in 2022. A summary of the fishing efforts is presented in

Table 6-3 with summaries of each method found in Sections 6.4.1.3.1 to 6.4.1.3.5. Full details for each fishing sampling effort can be found in Appendix 6B.

Table 6-3: Summary of 2022 Fish Sampling Efforts in Milne Port

Fishing Method	Area	Number of Stations (N)	Total Effort (hours)
Angling – Jigging	DPF	8	12.77
	IPF	5	5.3
Angling – Trolling	DPF	6	6.37
	IPF	2	2.3
Fukui Trap	DPF	15	924.12 (for set of 3 traps)
	IPF	15	927.93 (for set of 3 traps)
Gill Net	DPF	10	25.73
	IPF	12	28.42
Hoop Net	DPF	6	484.43
	IPF	3	184.95
Trawling	DPF	1	0.68

Fishing Method	Area	Number of Stations (N)	Total Effort (hours)
	IPF	1	0.47

6.4.1.3.1 Angling (Jigging and Trolling)

Angling (jigging and trolling) was conducted between 2 and 14 August 2022 to characterize the demersal and pelagic fish community in Milne Port (Appendix 6B). A total of 21 angling events were undertaken across the two FAs as follows: 13 events in the DPF and 8 events in the IPF (Table 6-3; Figure 6-1). The total effort for both angling methods for Milne Port was 11.53 hours, or a total effort in rod-hours of 26.73 hours. The duration of sampling was activity-dependent, with jigging ranging between 0.32 and 1.32 hours (N = 13) and trolling ranging between 0.10 and 0.80 minutes (N = 8). Start and end coordinates of angling efforts were recorded using a Garmin GPS and logged in a field notebook. Jigging occurred from a stationary position or during vessel movement with two to three rods and lines deployed from the field vessel (Appendix 6C – Photo 1). Hooks or spoon lures were allowed to hit the bottom, then flicked upward to attract bottom fish. For trolling, lines with lures were cast over the side of the field vessel and spooled in towards the vessel to attract pelagic fish.

6.4.1.3.2 Fukui Traps

Fukui traps were used to sample demersal fish in nearshore habitat at Milne Port from 1 August to 13 August 2022 (Appendix 6B). Each Fukui trap set consisted of three traps connected with a line, with each trap measuring 61 cm x 46 cm x 20 cm, with 1.25 cm stretch mesh, and equipped with a bait container (Appendix 6C – Photo 2). Since 2019, Fukui traps have been deployed using the ‘sinker’ method described in Bergshoeff et al. (2019) as per a recommendation made by the MEWG (QIA;

2018 MEEMP/AIS report comments; M-23042019; M-21062019). Traps were baited with Arctic Char (accidental mortalities, see Chapter 7.0 for details) prior to being deployed for several days at each station. A total of 30 Fukui trap sampling events were undertaken with 15 sets in each of the FAs (Table 6-3; Figure 6-2). Deployment time was calculated by trap-hours (i.e., number of traps deployed multiplied by time deployed) and ranged from 94.35 to 288.50 hours, with a mean deployment time of 185.20 hours. Traps were checked every 1 to 3 days and bait containers were refilled, if necessary, prior to redeployment. Fishing locations and depths were recorded using a Garmin GPS and Hummingbird depth sounder and logged in a field notebook.Due to historically low CPUE in Fukui traps observed in the Milne Port area, hoop nets (Section 6.4.1.3.4) were used starting in 2020 to assess their potential as a replacement for Fukui traps. Use of Fukui traps has continued through 2022 to meet existing commitments to the MEWG to continue both methodologies for a minimum of 3 years to allow for a comparison between fish sampling methods and results.

6.4.1.3.3 Gill Nets

Standardized monofilament gill nets were used to sample shallow (i.e., up to -15 m CD) subtidal areas for characterization of pelagic fish communities present in the Milne Port area. A total of 22 gill net sets were performed from 1 to 14 August 2022 (Appendix 6B). The 22 gill net sampling events were divided across the two FAs as follows: 10 sets in the DPF and 12 sets in the IPF (Table 6-3; Figure 6-3). Each gill net consisted of six panels with each panel measuring 15.2 m in length and 2.4 m in width, with panel mesh sizes (stretch) of 2.5 cm, 3.8 cm, 5.1 cm, 6.4 cm, 7.6 cm, and 10.2 cm. The gill nets were deployed in a shore-perpendicular orientation (smallest mesh size closest to shore) and were either suspended just below the water surface or were weighted to run along the seabed (Appendix 6C – Photo 3). Nets were examined for fish presence at least once every two hours for the duration of deployment (soak duration was at most four hours). Sampling locations were recorded using a Garmin GPS and logged in a field notebook. Total soak times ranged from 1.08 hour to 3.83 hours, with an average soak time of 2.47 hours. Total soak time for gill net sampling was 54.25 hours.

6.4.1.3.4 Hoop Nets

Hoop nets were used to sample demersal fish in nearshore habitat at Milne Port from 1 August to 15 August 2022. A total of 9 hoop net sampling events (referred to as 'sets' consisting of a single net) were undertaken: 6 sets in the DPF and 3 sets in the IPF (Table 6-3, Figure 6-4). Fishing locations were recorded using a Garmin GPS and logged in a field notebook. Total sampling effort was 669.38 hours with an average sampling effort per net of 74.38 hours (Appendix 6B). Sampling was conducted using a single 5 m dual-chamber hoop net with 25 mm mesh (Appendix 6C – Photo 4). Orientation of the hoop nets varied by deployment type. Shore-based nets were set in the subtidal zone during low tide with the wing panels running from a water depth of +2 m CD to -1 m CD. Nets were checked every 1 to 3 days after deployment. Shore-based west and east-oriented nets were placed so the 1.0 m diameter mouth was perpendicular to the shore and the 10 m length wing panels were oriented in a wide V-shape extending outwards from the net opening, targeting fish moving through the subtidal. Shore-based north and south-oriented nets were placed so the mouth was parallel to shore either facing shore (south orientation) or open water (north orientation), targeting fish moving in and out of sources of freshwater input. Hoop nets were held in an open and weighted on both ends to lay flat on the seabed, targeting demersal species.

6.4.1.3.5 Trawling

On 15 August 2021, two trawl sampling events were conducted in the Milne Port area, one in each fishing area (Table 6-3; Figure 6-5). Trawling effort built upon the 2020 efficacy trial and 2021 efforts to target fish taxa not typically caught using other methods. Trawl sampling consisted of towing an otter trawl from a vessel for a set time (between 0.47 and 0.68 hours) and trawl distance (between 700 and 1,100 m). The otter trawl comprised a cone shaped net composed of a 4.9 m wide diameter mouth held open by two wooden doors on either side of the opening (Appendix 6C – Photo 5). The front section of the net was composed of 38 mm stretched nylon mesh. The rear of the net (cod end) was composed of 32 mm stretched mesh. The otter trawl was deployed from the vessel's hydraulic A-frame system, with the net towed slowly off the bow while the vessel slowly reversed at a speed of one knot. Once the net reached the seafloor, it was raised slightly (to ~2 to 3 m above bottom) to minimize drag impacts on the sea floor and to target benthic/demersal fish species. Sampling locations were selected based on water depth and bottom morphology using bathymetric charts. Sample contours ranged from 30 to 50 m in depth. Start and end waypoints for otter trawl sampling were recorded using the onboard navigation system (Raymarine Axiom Hybrid Touch Pro with Navionics+ Bundle) and logged in a field notebook (Appendix 6B).

6.4.1.4 Fish Health Reference Site – Exploratory Fishing

On 10 August 2022, one day of exploration was conducted at nine sites between northern Milne Port and the Tugaat River mouth to assess area suitability as a potential fish health program reference site, expanding upon exploratory efforts completed in 2021 in which no favourable site was determined. Fishing efforts were conducted at three of the nine exploratory sites, along the shoreline south of the Tugaat River estuary and on the northern edge of Koluktoo Bay and included gill netting and angling (jigging). Full details of each exploratory site and fishing effort are presented in Appendix 7A of Chapter 7.0 (Fish Health and Tissue Chemistry).

6.4.2 Data Analysis

Consistent with previous years, figures were prepared for visualization of the fish catch data by sampling method. Descriptive summary statistics (e.g., mean, standard deviation [SD], CPUE) were also used to compare total catch and catch data among common taxa, sampling method and survey year. To remain consistent with the 2020 and 2021 reports, descriptive summary statistics were also provided for length and weight data in Appendix 6D – Tables 1 and 2.

Catch data, specifically CPUE, for each fishing method were reported according to the units in Table 6-4.

Table 6-4: Catch-Per-Unit-Effort Units for each Fishing Method

Fishing Method	Unit	Description
Angling (Jigging/Trolling)	Fish/hr/rod	Relative to 1 hour of effort and the number of rods
Fukui Trap	Fish/hr/trap	Relative to 1 hour of deployment and the number of traps
Gill Net	Fish/hr/100 m	Relative to 1 hour of effort and for the length of the net adjusted to 100 m
Hoop Net	Fish/hr	Relative to 1 hour of deployment
Longlining	Fish/hr/hook	Relative to 1 hour of deployment and the number of hooks per line
Seine Net	Fish/100 m^2	Relative to total area covered (m^2)
Trawling	Fish/hr	Relative to 1 hour of deployment

Data from 2020 and 2021 were re-analyzed with the 2022 updated CPUE equations and compared against 2022 results. Longlining, seine net, and trawling were excluded from this comparative analysis as longlines were not used in 2020 or 2022, seine netting was not conducted in 2021 or 2022, and trawling in 2020 was limited to a single test of methods effort.

For angling (jigging and trolling), Fukui trap, gill net, and hoop net datasets, trends in CPUE as a function of sampling year and sampling location (i.e., FA) were assessed using a generalized linear model with a negative binomial distribution. The response variable in the model was the number of fish caught, and to account for differences in effort, each model used an offset that depended on the type of sampling effort: for angling (both jigging and trolling), the offset was calculated by multiplying the number of rods by the length of fishing period. For Fukui traps, the offset was calculated by multiplying the number of traps in each cluster by the length of trap set. For gill nets, the offset was calculated by multiplying the length of set period by the gill net correction factor, which standardized fishing to 100 ft of net. For hoop nets, the offset was simply the length of set period. The models included the main effects of year (as a categorical variable) and sampling location (i.e., FA), as well as the interaction between the two. Trolling was only used once in 2021, in the IPF; therefore, this single data point was removed from data analysis, resulting in only 2020 and 2022 data being analysed for the trolling catch dataset.

A significance level (α) of 0.05 was used in interpretation of results. If the interaction between year and sampling area was significant, or if the interaction was not significant but the main effect of year was significant, multiple comparisons with familywise error corrections were used to assess specific differences between individual sampling years (except for trolling where only two years were available) or between locations within year (for a significant interaction term). If the interaction was not significant but the main effect of location was statistically significant, a multiple comparison was not performed, since there were only two sampling locations, and hence a significant main effect of location indicated a significant difference between the locations. P-values <0.05 are considered to indicate significance between groups. Analyses were conducted using R software version 4.2.1 (R Core Team 2022).

Power Analysis

A power analysis was conducted using the 2020 to 2022 data to estimate the sample size needed to detect Project-related change based on levels of observed variability between FAs. The power analysis was conducted to evaluate the number of efforts required to detect reduction in CPUE in the DPF of 20%, 30% and 40% compared to the IPF with 80% statistical power. A full description of the power analysis methodology is provided in Appendix 6E.

6.4.3 Field Quality Assurance and Quality Control

Quality assurance and quality control (QA/QC) measures for quantitative and qualitative data collected during fishing surveys, included:

- Prior to fishing activities, all field members were briefed on sampling protocols and made aware of their role in data collection. Fishing methodologies were standardized to minimize the introduction of sampling error during sample collection.
- Nets and traps were cleaned between efforts and checked for breakages or failures to maintain consistency in efforts. Broken nets and traps were repaired or replaced.
- Field notes were taken during all surveys using prepared field sheets to provide a complete and accurate data collection process and a consistent record of sampling effort. A second team member reviewed data from field sheets and entered them into a spreadsheet while checking for inconsistencies or missing information. A third team member reviewed the entered data for inconsistencies and comprehensiveness.
- Scans of the field datasheets and GPS waypoints were saved to a laptop computer and external hard drive at the end of each day. Fish were identified to lowest practicable level (species, where possible). Any identification that was questionable in the field was verified using fish field guides. Fish that could not be identified to species-level in the field were retained for subsequent identification by Biologica Environmental Services Ltd., an accredited taxonomic laboratory.

6.5 Results

Details of fish catch data from 2020 to 2022 are presented in Appendix 6B and shown in figures in Appendix 6D. Field photographs are presented in Appendix 6C. Supplemental results figures and tables are provided in Appendix 6D, and power analysis to evaluate the number of efforts required to detect reduction in CPUE in the DPF of 20%, 30% and 40% compared to the IPF with 80% statistical power is detailed in Appendix 6E.

6.5.1 2022 Summary

A total of 484 fish belonging to 11 known taxa were recorded in the DPF and IPF from 84 fishing efforts using a combination of methods during the 2022 open water survey season in Milne Port (Table 6-5; Table 6-6). Similar to previous sampling years (SEM 2016, 2017; Golder 2018, 2019, 2020, 2021, 2022), Fourhorn Sculpin (63%; Appendix 6C – Photo 6) and Arctic Char (20% of catch; Appendix 6C – Photo 7) were the two most common fish species captured (all gears combined), comprising 83% of the total catch (all methods combined) in 2022 (Table 6-5). The remaining 17% of the total catch was composed of: Shorthorn Sculpin (*Myoxocephalus scorpius*, 6%; Appendix 6C – Photo 8), Ribbed Sculpin (*Triglops pingelii*, 3%; Appendix 6C – Photo 9), Greenland Cod (*Gadus ogac*, 2%; Appendix 6C – Photo 10), Arctic Staghorn Sculpin (*Gymnocanthus tricuspis*, 2%; Appendix 6C – Photo 11), Arctic Sculpin (*Myoxocephalus scorpioides*, 1%; Appendix 6C – Photo 12), juvenile Polar Cod (*Boreogadus saida*; 1%; Appendix 6C – Photo 13), and a single Saddled Eelpout (*Lycodes mucosus*; <1%; Appendix 6C – Photo 14; Table 6-5). Two taxa were recorded for the first time in Milne Port: Spatulate Sculpin (*Icelus spatulata*; 1%; Appendix 6C – Photo 15) and a single Halfbarred Pout (*Gymnelus hemifasciatus*; <1%; Appendix 6C – Photo 16).

Table 6-5: Total Catch Summary Statistics by Taxon and Fishing Method (2022)

Taxa	Angling - Jigging		Angling - Trolling		Fukui Trap		Gill Net		Hoop Net		Trawling		Total (n)
	DFP	IPF	DPF	IPF	DPF	IPF	DFP	IPF	DFP	IPF	DFP	IPF	
Arctic Char	0	0	1	0	0	0	35	62	0	0	0	0	**98**
Arctic Sculpin	0	0	0	1	0	2	0	1	1	0	0	0	**5**
Arctic Staghorn Sculpin	0	0	0	0	0	0	0	0	0	0	7	1	**8**
Fourhorn Sculpin	109	0	29	1	3	1	68	42	53	0	0	0	**306**
Greenland Cod	1	4	1	1	1	0	0	0	0	0	0	0	**8**
Halfbarred Pout	0	0	0	0	0	1	0	0	0	0	0	0	**1**
Polar Cod	0	0	0	0	0	0	0	0	0	0	6	1	**7**
Ribbed Sculpin	0	0	0	0	0	0	0	0	0	0	6	8	**14**
Saddled Eelpout	0	0	0	0	1	0	0	0	0	0	0	0	**1**
Shorthorn Sculpin	4	16	4	1	0	2	0	3	1	0	0	0	**31**
Spatulate Sculpin	0	0	0	0	0	0	0	0	0	0	3	2	**5**
Total (n)	**114**	**20**	**35**	**4**	**5**	**6**	**103**	**108**	**55**	**0**	**22**	**12**	**484**

Note: ‘n’ in the table and hereafter refers to the number of individuals.

Fukui traps had the highest taxa diversity of captured fish (6 taxa) but overall few numbers of each taxon (Table 6-5). However, two of the species captured by the Fukui traps were not represented in any other sampling method. Trolling captured five taxa but 74% of the fish recorded were Fourhorn Sculpin. Trawling and gill nets both had recorded taxa richness of 4 taxa (although the fourth taxon captured by trawling was an unidentified sculpin and it cannot be ruled out that the juvenile specimens may belong to one of the three sculpin species identified in trawling catches) while jigging and hoop nets had taxa richness of 3 taxa. There was no overlap between the species captured by trawling and any other sampling method (Table 6-5).

Gill nets were the most successful overall method of fish capture in 2022 with 103 fish in the DPF and 108 fish in the IPF; however, jigging captured more fish within the DPF (n = 114) than gill nets (Table 6-6). Hoop nets, trolling, and trawling methods captured less than 60 fish each, with all methods having higher total within the DPF than IPF. Fukui traps were the least successful fishing method utilized in 2022, capturing only 11 fish in total (Table 6-6).

Table 6-6: Total Catch Summary Statistics by Fishing Method and Fishing Area (Direct Project Footprint (DPF) and Indirect Project Footprint (IDF))(2022)

Fishing Method	Number of Efforts		Total Catch (n)	
	DPF	IPF	DPF	IPF
Angling - Jigging	8	5	114	20
Angling - Trolling	6	2	35	4
Fukui Trap	15	15	5	6
Gill Net	10	12	103	108
Hoop Net	6	3	55	0
Trawling	1	1	22	12
Total	**46**	**38**	**334**	**150**

Mean CPUE rates for the three dominant taxa captured (Arctic Char, Fourhorn Sculpin, and Shorthorn Sculpin) were low for all fishing methods with large variability in CPUE rates for all methods (Table 6-7). Of these three species, Arctic Char and Fourhorn Sculpin are assessed as indicators of fish health in Milne Inlet (chapter 7.0); examining catch rates by gear type demonstrates that they are most effectively captured using different methods. Arctic Char were most effectively caught by gill nets with a mean CPUE of 2.01 ± 1.75 fish/hr/100m (Table 6-7). Trolling also captured Arctic Char with a mean CPUE value of 0.14 ± 0.38 fish/hr/rod (Table 6-7). Fourhorn Sculpin were most efficiently caught via jigging with a mean CPUE of 5.02 ± 7.91 fish/hr/rod but were also caught via trolling (mean CPUE = 2.95 ± 4.75 fish/hr/rod) and gill nets (mean CPUE = 2.45 ± 2.94 fish/hr/100m; Table 6-7). Mean CPUE values for Fukui traps and hoop nets were low (<0.1) for all taxa. Trawling only captured non-dominant fish, with CPUE rates of 4.70 ± 1.66 fish/hr for other sculpin and 1.37 ± 0.83 fish/hr for other fish (Table 6-7).

Table 6-7: Catch-Per-Unit-Effort Summary Statistics (Mean ± SD) by Taxon and Fishing Method (2022)

Taxa[1]	Angling – Jigging (Fish/hr/rod)	Angling – Trolling (Fish/hr/rod)	Fukui Trap (Fish/hr/trap)	Gill Net (Fish/hr/100m)	Hoop Net (Fish/hr)	Trawling (Fish/hr)
Arctic Char	0.00 ± 0.00	0.14 ± 0.38	0.00 ± 0.00	2.01 ± 1.75	0.00 ± 0.00	0.00 ± 0.00
Fourhorn Sculpin	5.02 ± 7.91	2.95 ± 4.74	<0.01 ± <0.01	2.45 ± 2.94	0.09 ± 0.16	0.00 ± 0.00
Shorthorn Sculpin	1.43 ± 2.96	0.45 ± 0.89	<0.01 ± <0.01	0.13 ± 0.44	<0.01 ± 0.01	0.00 ± 0.00
Other Sculpin	0.00 ± 0.00	0.03 ± 0.15	<0.01 ± <0.01	0.01 ± 0.08	<0.01 ± <0.01	4.70 ± 1.66
Other Fish	0.10 ± 0.45	0.06 ± 0.25	<0.01 ± <0.01	0.00 ± 0.00	0.00 ± 0.00	1.37 ± 0.83
All Fish	**6.84 ± 7.37**	**3.90 ± 4.31**	**<0.01 ± <0.01**	**4.62 ± 2.95**	**0.11 ± 0.17**	**28.95 ± 3.24**

[1] Fish taxa were grouped based on relative abundance percentages from 2022 catch data. Taxa with abundances <5% were grouped as follows: other sculpin (arctic sculpin, arctic staghorn sculpin, ribbed sculpin, unidentified sculpin) and other fish (Greenland cod, halfbarred pout, saddled eelpout, unidentified cod).

6.5.2 Interannual Comparisons

6.5.2.1 Fish Community

From 2020 to 2022, a total of 1,939 fish have been caught within Milne Inlet during open-water surveys (Appendix 6B, Appendix 6D – Tables 3 and 4). The dominant fish taxon caught over the three-year period was Fourhorn Sculpin (51%) followed by Arctic Char across all methods combined (18%; Appendix 6D). Due to differences in effort and in gear-specific catch rates, quantitative comparison of catch between the two areas and over time is only possible by examining CPUE within gear type.

Fish catch relative abundances among efforts and across years (2020 to 2022) remained fairly consistent (Table 6-8; Figure 6-6). Angling-jigging predominantly caught Fourhorn Sculpin, Shorthorn Sculpin and Greenland Cod (average relative abundance 2020 – 2022 = 66%, 15%, and 14%, respectively) while angling-trolling predominantly caught Shorthorn Sculpin and Fourhorn Sculpin (average relative abundance 2020 – 2022 = 38% and 26%, respectively; Table 6-8; Figure 6-6). Relative abundances of fishes captured by angling-trolling fluctuated among years with the number of efforts and associated catch; between 2020 and 2021 seven efforts were completed with only a single fish caught while in 2022 eight efforts captured 39 fish (Appendix 6B).

Fukui traps caught mainly non-dominant sculpin taxa (e.g., Arctic Sculpin and unidentified sculpins) followed by Fourhorn Sculpin (average relative abundance 2020 – 2022 = 40% each; Table 6-8; Figure 6-6). Fukui trap catches in 2022 differed slightly from 2020 and 2021 with reduced relative abundance of Fourhorn Sculpin and non-dominant sculpins but increased relative abundance of Shorthorn Sculpin, non-dominant fish (e.g., eelpouts), and a single Greenland Cod (Table 6-8). Hoop nets almost exclusively caught Fourhorn Sculpin (average relative abundance 2020 – 2022 = 94%; Table 6-8; Figure 6-6).

Gill nets almost exclusively caught Fourhorn Sculpin and Arctic Char (average relative abundance 2020 – 2022 = 49% and 45%, respectively; Table 6-8; Figure 6-6). Longlines, only utilized in 2021, did not catch any fish. Seine nets, only utilized in 2020, mainly captured juvenile unidentified sculpins (61%) and Fourhorn Sculpin (30%; Table 6-8; Figure 6-6). Trawling consistently caught only non-dominant sculpin species (e.g., Arctic Staghorn Sculpin, Ribbed Sculpin, Spatulate Sculpin, and unidentified sculpins) and several rarely caught fish taxa (e.g., Atlantic Poacher, Polar Cod, unidentified snailfish; average relative abundance 2020 – 2022 = 60% and 40%, respectively; Table 6-8; Figure 6-6).

Table 6-8: Relative Abundances of Grouped Taxa by Fishing Method and Year (2020-2022)

Method[1]	Year	Arctic Char	Fourhorn Sculpin	Greenland Cod	Shorthorn Sculpin	Other sculpins	Other fishes
Angling - Jigging	2020	1%	58%	22%	18%	2%	0%
	2021	2%	58%	18%	11%	12%	0%
	2022	0%	81%	4%	15%	0%	0%
Angling - Trolling	2020	0%	0%	0%	100%	0%	0%
	2021	0%	0%	0%	0%	0%	0%
	2022	3%	77%	5%	13%	3%	0%
Fukui Trap	2020	0%	42%	0%	7%	44%	7%
	2021	0%	41%	0%	0%	59%	0%
	2022	0%	36%	9%	18%	18%	18%

Method[1]	Year	Arctic Char	Fourhorn Sculpin	Greenland Cod	Shorthorn Sculpin	Other sculpins	Other fishes
Gill Net	**2020**	47%	42%	0%	7%	4%	0%
	2021	41%	52%	0%	4%	2%	0%
	2022	46%	52%	0%	1%	0%	0%
Hoop Net	**2020**	1%	87%	4%	4%	5%	0%
	2021	0%	100%	0%	0%	0%	0%
	2022	0%	96%	0%	2%	2%	0%
Seine Net	**2020**	1%	30%	0%	0%	65%	4%
Trawling	**2020**	0%	0%	0%	0%	21%	79%
	2021	0%	0%	0%	0%	78%	22%
	2022	0%	0%	0%	0%	79%	21%

Note: Grey highlighting indicated relative abundances > 40%. Fish taxa were grouped based on relative abundance percentages from 2020 to 2022 catch data. Taxa with abundances <5% were grouped as follows: other sculpins (Arctic Sculpin, Arctic Staghorn Sculpin, Ribbed Sculpin, Spatulate Sculpin, and unidentified sculpins) and other fishes (Arctic Alligatorfish, Atlantic Poacher, Fourline Snakeblenny, Halfbarred Pout, Northern Sand Lance, Polar Cod, Saddled Eelpout, unidentified cods, and unidentified snailfish).

[1] Longlining was discontinued in 2022 as no fish were caught during any effort in 2021.

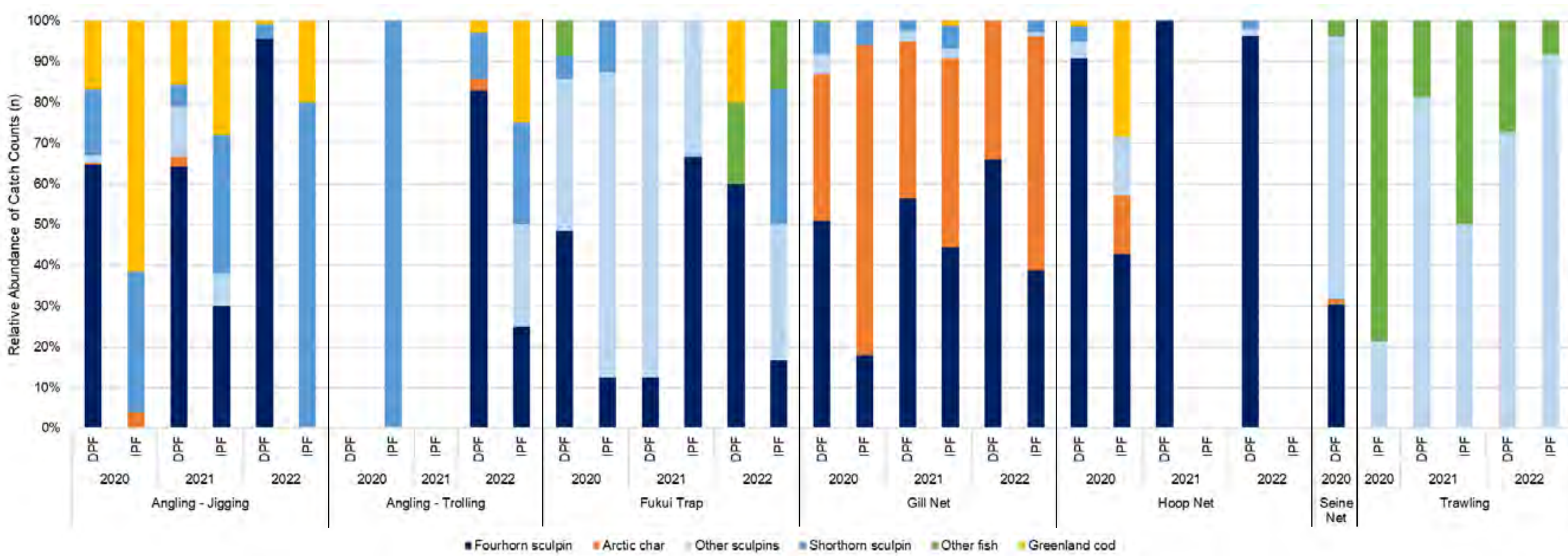

Figure 6-6: Relative Abundances of Grouped Taxa per Fishing Method and by Year (2020-2022)and Fishing Area (Direct Project Footprint (DPF) and Indirect Project Footprint (IPF))

Note: Fish taxa were grouped based on relative abundance percentages from 2020 to 2022 catch data. Taxa with abundances <5% were grouped as follows: other sculpins (Arctic Sculpin, Arctic Staghorn Sculpin, Ribbed Sculpin, Spatulate Sculpin, and unidentified sculpins) and other fishes (Arctic Alligatorfish, Atlantic Poacher, Fourline Snakeblenny, Halfbarred Pout, Northern Sand Lance, Polar Cod, Saddled Eelpout, unidentified cods, and unidentified snailfish).

6.5.2.2 Catch by Fishing Method

Trawling was a major driver in differences in taxa richness between 2020 and 2022; trawling taxa richness increased from 3 taxa in 2020 to 9 taxa in 2021 with an increased number of trawling efforts resulting in catches of previously unrecorded fish in Milne Port (e.g., Atlantic Alligatorfish, Atlantic Poacher, Ribbed Sculpin, Spatulate Sculpin, and unidentified snailfish; Table 6-9; Appendix 6B). Trawling taxa richness decreased to 4 taxa in 2022, possibly due to fewer trawling efforts and increased efforts not to let the trawl touch the seabed during deployment in 2022 (Table 6-9). While this shallower operation of the net probably allowed some demersal fishes to evade capture, the change was made to avoid any possible impacts of contact between the trawl and the seabed.

Fukui Traps also captured lower taxa richness in 2020 and 2022, with 6 taxa recorded in both years compared to 2 taxa in 2021, likely due to the capture of rarely observed fish in Milne Port (i.e., Fourlined Snakeblenny and Northern Sand Lance in 2020 and Halfbarred Pout and Saddled Eelpout in 2022; Table 6-9; Appendix 6B).

Table 6-9: Taxa Richness by Fishing Method (2020-2022)

Fishing Method	Number of Taxa		
	2020	2021	2022
Angling - Jigging	5	5	4
Angling - Trolling	1	0	5
Fukui Trap	6	2	6
Gill Net	7	5	4
Hoop Net	6	1	3
Seine Net	4	-	-
Trawling	3	9	4
Total	10	13	11

Note: Longlining was excluded in 2022 as no fish were caught in 2021. Trolling did not catch fish in 2021. Seine nets were not deployed after 2020.

Mean CPUE of most fishing methods was highly variable, regardless of fishing area or year (Figure 6-7; Table 6-10). Mean CPUEs of fishing methods tended to be higher in the DPF compared to the IPF for all years, with the exception of trolling in 2020 (DPF = 0.00 ± 0.00 versus IPF = 0.24 ± 0.42), gill nets in 2020 (DPF = 3.98 ± 3.20 versus IPF = 8.50 ± 18.56), and Fukui traps in 2021 (DPF = <0.01 ± <0.01 versus IPF = 0.01 ± 0.01; Figure 6-7; Table 6-10).

Average CPUE for Angling – jigging in the DPF increased over the three-year period (2020 = 5.52 ± 5.81 fish/hr/rod, 2021 = 6.58 ± 4.00 fish/hr/rod, 2022 = 8.84 ± 8.74 fish/hr/rod; Figure 6-7; Table 6-10). Angling-jigging CPUE within the IPF was highest in 2021 with an average of 6.58 ± 7.54 fish/hr/rod, while CPUE values in 2020 and 2022 were both <4 fish/hr/rod.

Average CPUE for angling – trolling was greatest in 2022 in both the DPF and IPF (4.62 ± 5.22 fish/hr/rod and 1.74 ± 0.11 fish/hr/rod, respectively), a large increase from 2020 and 2021 where catch efficiencies were <0.5 fish/hr/rod in both areas (Figure 6-7; Table 6-10). In the analysis[1] of CPUE, angling (trolling) was found to have a significant year effect (P = 0.015; Table 6-11). Since the single trolling effort from 2021 (Table 6-10) was

[1] In the models for trolling and for hoop net sampling, the interaction between area and year could not be included due to lack of model convergence. Therefore, for these two sampling methods, only the main effects of year and area could be assessed.

removed from analysis, this result indicated a significant difference between 2020 and 2022 CPUE. Specifically, the 2022 CPUE was significantly higher than the 2020 CPUE values.

CPUEs for gill nets in 2020 and 2022 were different between the DPF and IPF, with the IPF having a higher catch rate than the DPF in 2020 (DPF = 3.98 ± 3.20 fish/hr/100m versus IPF = 8.50 ± 18.56 fish/hr/100m) but the opposite trend in 2021 (DPF = 6.19 ± 5.41 fish/hr/100m versus IPF = 3.11 ± 1.78 fish/hr/100m; Figure 6-7; Table 6-10). Average CPUEs for gill net efforts in 2022 was comparable between the DPF and the IPF (DPF = 4.69 ± 3.88 fish/hr/100m versus IPF = 4.55 ± 2.25 fish/hr/100m; Figure 6-7; Table 6-10). Fukui traps, longlining and seine nets all had average CPUEs <0.2 for all years and areas (Figure 6-7; Table 6-10).

For hoop net sampling, which had CPUE values <0.2 fish/hr for all years and areas, the DPF was found to have significantly higher CPUE than the IPF (P <0.001; Table 6-11). Catch rate at DPF was 637% higher than at IPF for hoop nets (when considering all years combined). Only hoop nets had an observed effect size large enough to be detected as a significant effect of area; for other gear types, statistical power was not sufficient to detect effect given the sample size. An increase in sampling efforts (per area) to 8 to 10 sampling events for angling-jigging, 11 sampling events for angling-trolling, 10 to 12 sampling events for gill nets, and 24 hoop nets would allow for detection of a 40% effect size (Appendix 6E).

Trawling had the greatest range in average CPUE among efforts and across all years ranging from 4.76 ± 5.02 fish/hr in 2021 within the IPF to 333.75 ± 333.75 fish/hr in 2020 within the IPF area. Maximum CPUE decreased from 2020 to 2022 for trawling (2020 = 333.75 ± 333.75 fish/hr, 2021 = 116.36 ± 116.36 fish/hr, 2022 = 32.20 ± 32.20 fish/hr), likely due to shallower depth trawled in 2020 and/or increased trawling efforts and increased efforts not to let the trawl touch the seabed during deployment in 2021 and 2022 (Table 6-10).

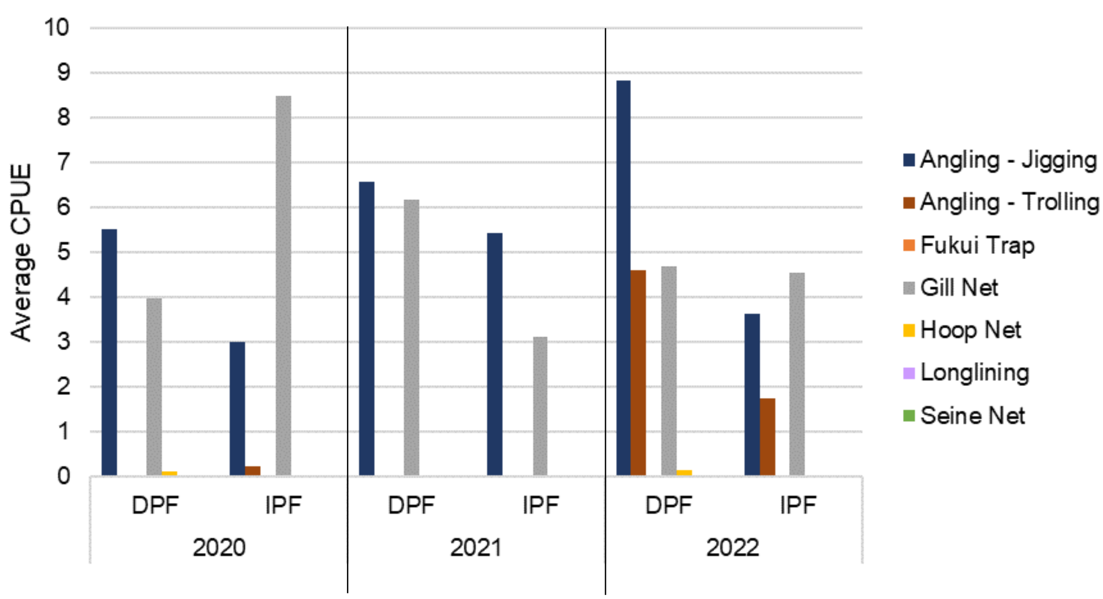

Figure 6-7: Average Catch-Per-Unit-Effort (CPUE) of Grouped Taxa per Fishing Method by Year (2020-2022) and Fishing Area (Direct Project Footprint (DPF) and Indirect Project Footprint (IPF))

Note: Trawling was excluded from the figure due to high CPUE values that skewed the figure. Trawling CPUE values can be found in Table 6-10.

Table 6-10: Catch-Per-Unit-Effort Summary Statistics by Fishing Area (Direct Project Footprint (DPF), Indirect Project Footprint (IPF)) Fishing Method and Year (2020-2022)

Method (CPUE Unit)	Year	Area	Sampling Events	CPUE Summary Statistic				
				Mean	Median	SD	Min	Max
Angling – Jigging (Fish/hr/rod)	2020	DPF	18	5.52	2.60	5.81	0.00	17.07
		IPF	7	3.02	2.94	1.28	1.07	5.14
	2021	DPF	19	6.58	4.00	7.54	0.38	31.58
		IPF	7	5.45	4.00	5.71	0.00	16.80
	2022	DPF	8	8.84	7.17	8.74	0.00	22.00
		IPF	5	3.63	2.00	4.67	0.00	11.14
Angling – Trolling (Fish/hr/rod)	2020	DPF	3	0.00	0.00	0.00	0.00	0.00
		IPF	3	0.24	0.00	0.42	0.00	0.73
	2021	IPF	1	0.00	0.00	-	0.00	0.00
	2022	DPF	6	4.62	2.82	5.22	0.00	12.50
		IPF	2	1.74	1.74	0.11	1.67	1.82
Fukui Trap (Fish/hr/trap)	2020	DPF	24	0.01	<0.01	0.01	0.00	0.03
		IPF	3	0.01	<0.01	0.01	0.00	0.02
	2021	DPF	9	<0.01	<0.01	<0.01	0.00	0.01
		IPF	5	0.01	0.01	0.01	0.00	0.01
	2022	DPF	15	<0.01	0.00	<0.01	0.00	0.01
		IPF	15	<0.01	0.00	<0.01	0.00	0.01
Gill Net (Fish/hr/100m)	2020	DPF	16	3.98	3.55	3.20	0.50	13.77
		IPF	9	8.50	2.03	18.56	0.00	57.71
	2021	DPF	11	6.19	4.22	5.41	0.52	17.92
		IPF	10	3.11	2.75	1.78	0.28	5.99
	2022	DPF	10	4.69	4.76	3.88	0.00	12.49
		IPF	12	4.55	4.95	2.25	0.00	7.02
Hoop Net (Fish/hr)	2020	DPF	7	0.12	0.04	0.17	0.00	0.44
		IPF	4	0.01	0.01	<0.01	0.01	0.01
	2021	DPF	6	0.03	0.02	0.03	0.00	0.07
		IPF	1	0.00	0.00	-	0.00	0.00
	2022	DPF	6	0.16	0.08	0.20	0.01	0.55
		IPF	3	0.00	0.00	0.00	0.00	0.00
Longlining (Fish/hr/hook)	2021	IPF	3	0.00	0.00	0.00	0.00	0.00
Seine Net (Fish/100m^2)	2020	DPF	18	0.01	<0.01	0.01	0.00	0.03
Trawling (Fish/hr)	2020	IPF	1	333.75	333.75	-	333.75	333.75
	2021	DPF	1	116.36	116.36	-	116.36	116.36
		IPF	3	4.76	4.29	5.02	0.00	10.00
	2022	DPF	1	32.20	32.20	-	32.20	32.20
		IPF	1	25.71	25.71	-	25.71	25.71

Table 6-11: Statistical Significance (P-Values) from Analysis of Catch-Per-Unit-Effort relative to Year and Fishing Area, for each Fishing Method (2020-2022)

Statistical Test	Angling - Jigging	Angling - Trolling	Fukui Trap	Gill Net	Hoop Net
Area	0.422	0.649	0.079	0.099	**<0.001**
Year	0.938	**0.015**	0.134	0.155	0.122
Interaction	0.649	No interaction included in model	0.701	0.237	No interaction included in model

Note: Cells highlighted in blue and bolded indicate significance levels < 0.05. Longlining, seine net, and trawling were excluded from this comparative analysis as longlines were not used in 2020, seine netting was not conducted in 2021 or 2022, and trawling in 2020 was limited to a single test of methods effort. Full analysis results are presented in Appendix 6D.

A similar trend was seen in the mean CPUEs of grouped taxa (i.e., taxa that are <5% relative abundance by catch from 2020 to 2022 were grouped) as was seen in relative abundance of catch counts by fishing method and fishing area (Table 6-12; Figure 6-8).

The mean CPUE for angling-jigging was highest for Fourhorn Sculpin in all years, followed by Shorthorn Sculpin and Greenland Cod (with the exception of 2021, wherein Greenland Cod average CPUE was higher than Shorthorn Sculpin; Table 6-12; Figure 6-8). Mean CPUE for Fourhorn Sculpin from jigging increased non-significantly from 2020 to 2022 within the DPF (2020 = 2.54 fish/hr/rod, 2021 = 3.89 fish/hr/rod, 2022 = 8.15 fish/hr/rod); however, within the IPF the maximum CPUE for Fourhorn Sculpin was observed in 2021 (0.95 fish/hr/rod) while in 2020 and 2022 there were no Fourhorn Sculpin caught. Fourhorn Sculpin CPUE by angling-jigging[2] in the DPF was significantly higher than in the IPF (P = 0.048; Table 6-13) across years. The Mean CPUE of Shorthorn Sculpin by angling-jigging increased within the IPF from 2020 to 2022 (2020 = 1.70 fish/hr/rod, 2021 = 1.79 fish/hr/rod, 2022 = 3.20 fish/hr/rod) while DPF CPUE decreased from 1.76 fish/hr/rod in 2020 to 0.37 fish/hr/rod in 2021 and remained low in 2022. Mean CPUE of Greenland Cod in both areas were greater in 2021 than in 2020 and 2022 (both years <1 fish/hr/rod in both areas), with a maximum value of 2.46 fish/hr/rod in the IPF compared to 1.06 fish/hr/rod in the DPF in 2021. Mean CPUEs for other taxa and groupings for jigging were <0.2 fish/hr/rod for all years and areas (Table 6-12; Figure 6-8).

Mean CPUE values for angling-trolling were <0.5 for all taxa and groupings across years and areas with the exception of 2022 DPF efforts which had an average CPUE of 3.79 fish/hr/rod for Fourhorn Sculpin (Table 6-12; Figure 6-8). Analyses for Fourhorn Sculpin CPUE by angling-trolling were not analyzed due to a high number of zeroes in the data. Fukui traps and seine nets did not exceed an average CPUE of 0.01 for any taxa or grouping in either area within the three-year period (Table 6-12; Figure 6-8). For Fukui traps, the interaction between year and area was significant for Fourhorn Sculpin (P = 0.048; Table 6-13), suggesting interannual differences in the trend between the two areas. Specifically, CPUE at DPF was significantly lower than at IPF in 2021 (P = 0.025) but not in 2020 or 2022 (P >0.3 for both).

[2] In the analysis of Fourhorn Sculpin CPUE, the models for angling-jigging and for hoop net sampling did not include the interaction between area and year due to lack of model convergence.

Gill net mean CPUE was greatest for Arctic Char (range = 1.31 – 6.38 fish/hr/100m) and Fourhorn Sculpin (range = 1.34 – 3.27 fish/hr/100m; Table 6-12; Figure 6-8). Arctic Char data were only analyzed for gill net sampling, since data from angling (both jigging and trolling), Fukui traps, and hoop nets could not be analyzed due to a high number of zeroes in the data. For gill net sampling, no significant effects of area, year, or interaction between the two were found (Table 6-13). The trend in Arctic Char catch rate in the DPF was 10% higher than in the IPF for gill nets and this effect size was small and could not be statistically detected. The results of power analysis indicated that 12 gill net sets per area would be sufficient to detect a 20% effect size between the two areas for Arctic Char (Appendix 6E). Mean CPUEs for other taxa and groupings for gill nets were ≤0.5 fish/hr/100m for all years and areas. Mean CPUE values were generally greater in the DPF than in the IPF for all taxa and groupings in 2020 and 2022 (Table 6-12; Figure 6-8); for Fourhorn Sculpin, only the main effect of area was significant (P = 0.011), with CPUE at DPF being significantly higher than at IPF.

Fourhorn Sculpin mean CPUEs by hoop net were greatest in 2020 and 2022 within the DPF with efficiencies of 0.11 fish/hr and 0.15 fish/hr, respectively, followed by 0.3 fish/hr in 2021 DPF. Maximum mean CPUEs for Shorthorn Sculpin by hoop net reached 0.01 in the DPF in 2020 and 2022 and all other taxa and groupings were <0.01 for all years and areas (Table 6-12; Figure 6-8). For Fourhorn Sculpin caught via hoop nets, only the main effect of area was significant (P = 0.001), with CPUE at DPF being significantly higher than at IPF.

All four analyzed gear types (i.e., angling-jigging, angling-trolling, gill nets, and hoop nets) had observed effect sizes large enough to be detected for Fourhorn Sculpin. The results of power analysis indicated that to detect a 40% effect size between the areas, 10 to 12 gill net sampling events per area would be required. For angling-jigging and hoop nets, sufficient power to detect a 40% effect size was not achieved even at maximum assessed sample sizes (Appendix 6E).

Trawling efforts over a three-year period captured only rarely observed (i.e., grouped) taxa but no common taxa in Milne Inlet, with the highest CPUEs over the three-year period being in 2020 within the IPF with 262.50 fish/hr for ‘other fishes’ (i.e., Arctic Alligatorfish, Atlantic Poacher, Fourline Snakeblenny, Halfbarred Pout, Northern Sand Lance, Polar Cod, Saddled Eelpout, unidentified cods, and unidentified snailfish) and 23.75 fish/hr for ‘other sculpins’ (Arctic, Arctic Staghorn, Ribbed, Spatulate, and unidentified sculpins; Table 6-12). Mean CPUEs by trawling decreased for both groups in 2021 and 2022 in both areas. Mean CPUE differed largely between areas in 2021, with IPF trawling efficiency <1 fish/hr for both groupings of taxa, but with DPF efficiencies at 23.64 fish/hr for ‘other sculpins’ and 7.27 fish/hr for ‘other fishes’ (Table 6-12). Trawling CPUEs were similar in both the DPF and the IPF in 2022 for ‘other sculpins’ (DPF = 4.68 fish/hr versus IPF = 4.71 fish/hr), while CPUE was higher in the DPF compared to the IPF for ‘other fishes’ in 2022 (DPF = 2.93 fish/hr versus IPF = 0.71 fish/hr; Table 6-12).

Table 6-12: Grouped Taxa Mean Catch-Per-Unit-Effort by Fishing Method and Fishing Area (2020-2022)

Method	Year	Area	Arctic Char	Fourhorn Sculpin	Greenland Cod	Shorthorn Sculpin	Other sculpins	Other fishes
Angling - Jigging (Fish/hr/rod)	2020	DPF	0.03	2.54	0.97	1.76	0.04	0.00
		IPF	0.15	0.00	0.57	1.70	0.00	0.00
	2021	DPF	0.17	3.89	1.06	0.37	0.19	0.00
		IPF	0.00	0.95	2.46	1.79	0.13	0.00
	2022	DPF	0.00	8.15	0.13	0.56	0.00	0.00
		IPF	0.00	0.00	0.80	3.20	0.00	0.00
Angling - Trolling (Fish/hr/rod)	2020	DPF	0.00	0.13	0.00	0.00	0.00	0.00
		IPF	0.00	0.00	0.00	0.49	0.00	0.00
	2021	IPF	0.00	0.00	0.00	0.00	0.00	0.00
	2022	DPF	0.19	3.79	0.19	0.44	0.00	0.00
		IPF	0.00	0.42	0.45	0.45	0.10	0.00
Fukui Trap (Fish/hr/trap)	2020	DPF	0.00	<0.01	0.00	<0.01	<0.01	<0.01
		IPF	0.00	<0.01	0.00	<0.01	<0.01	0.00
	2021	DPF	0.00	<0.01	0.00	0.00	<0.01	0.00
		IPF	0.00	<0.01	0.00	0.00	<0.01	0.00
	2022	DPF	0.00	<0.01	<0.01	0.00	0.00	<0.01
		IPF	0.00	<0.01	0.00	<0.01	<0.01	<0.01
Gillnet (Fish/hr/100m)	2020	DPF	1.31	2.17	0.00	0.29	0.07	<0.01
		IPF	6.38	1.63	0.00	0.50	0.00	0.00
	2021	DPF	2.53	3.27	0.00	0.23	0.04	0.00
		IPF	1.53	1.34	0.03	0.15	0.03	0.00
	2022	DPF	1.45	3.24	0.00	0.00	0.00	0.00
		IPF	2.47	1.78	0.00	0.23	0.02	0.00
Hoop Net (Fish/hr)	2020	DPF	0.00	0.11	<0.01	0.01	<0.01	0.00
		IPF	<0.01	<0.01	<0.01	0.00	<0.01	0.00
	2021	DPF	0.00	0.03	0.00	0.00	0.00	0.00
		IPF	0.00	0.00	0.00	0.00	0.00	0.00
	2022	DPF	0.00	0.15	0.00	<0.01	<0.01	0.00
		IPF	0.00	0.00	0.00	0.00	0.00	0.00
Longlining (Fish/hr/hook)	2021	IPF	0.00	0.00	0.00	0.00	0.00	0.00
Seine Net (Fish/100m^2)	2020	DPF	<0.01	<0.01	0.00	0.00	<0.01	<0.01
Trawling (Fish/hr)	2020	IPF	0.00	0.00	0.00	0.00	23.75	262.50
	2021	DPF	0.00	0.00	0.00	0.00	23.64	7.27
		IPF	0.00	0.00	0.00	0.00	0.76	0.83
	2022	DPF	0.00	0.00	0.00	0.00	4.68	2.93
		IPF	0.00	0.00	0.00	0.00	4.71	0.71

Note: Fish taxa were grouped based on relative abundance percentages from 2020 to 2022 catch data. Taxa with abundances <5% were grouped as follows: other sculpins (Arctic, Arctic Staghorn, Ribbed, Spatulate, and unidentified sculpins) and other fishes (Arctic Alligatorfish, Atlantic Poacher, Fourline Snakeblenny, Halfbarred Pout, Northern Sand Lance, Polar Cod, Saddled Eelpout, unidentified cods, and unidentified snailfish).

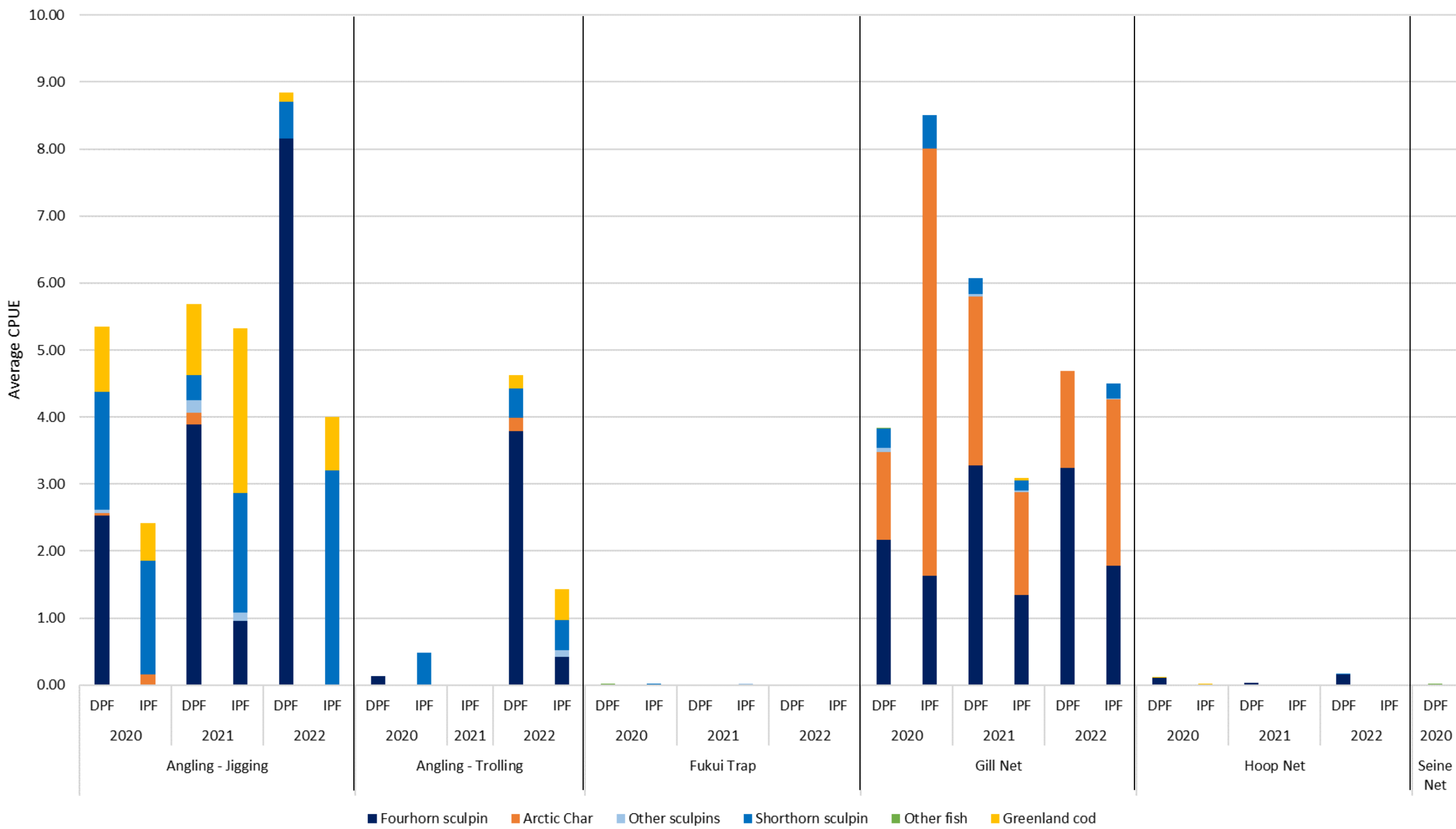

Figure 6-8: Grouped Taxa Mean Catch-Per-Unit-Effort by Fishing Method and Fishing Area (2020-2022)

Note: Fish taxa were grouped based on relative abundance percentages from 2020 to 2022 catch data. Taxa with abundances <5% were grouped as follows: other sculpin (Arctic Sculpin, Arctic Staghorn Sculpin, Ribbed Sculpin, Spatulate Sculpin, and unidentified sculpin) and other fish (Arctic Alligatorfish, Atlantic Poacher, Fourline Snakeblenny, Halfbarred Pout, Northern Sand Lance. Polar Cod, Saddled Eelpout, unidentified cod, and unidentified snailfish). Trawling was excluded from the figure due to high CPUE values that skewed the figure. Trawling CPUE values can be found in Table 6-12. Longlining was also excluded from the figure due to no fish caught in 2021, which thereby led to discontinuation of the program in 2022.

Table 6-13: Statistical P-Value Results from ANOVA of Catch-Per-Unit-Effort for Arctic Char and Fourhorn Sculpin by Fishing Method, Year, and Fishing Area (2020-2022)

Statistical Test	Angling - Jigging	Angling - Trolling	Fukui Trap	Gill netsn	Hoop Net
Arctic Char					
ANOVA					
Area	Not analyzed	Not analyzed	Not analyzed	0.627	Not analyzed
Year				0.270	
Interaction				0.522	
Fourhorn Sculpin					
ANOVA					
Area	**0.048**	Not analyzed	0.589	**0.011**	**0.001**
Year	0.131		0.268	0.272	0.260
Interaction	No interaction included in model		**0.048**	0.340	No interaction included in model

Note: Cells highlighted in blue and bolded indicate significance levels <0.05. Longlining, seine net, and trawling were excluded from this comparative analysis as longlines were not used in 2020 or 2022, seine netting was not conducted in 2021 or 2022, and trawling in 2020 was limited to a single proof of concept effort. Full analytical results are presented in Appendix 6D.

6.6 Discussion

In total, 484 individual fish, representing 10 known taxa, were caught from 84 fishing efforts with several gear types during the 2022 open water survey season in Milne Port In comparison, 852 individual fish representing 10 taxa were captured in 2020 and 603 individual fish belonging to 13 taxa were captured in 2021. As different levels of effort occurred among years and catch rates (CPUE) varied by method, CPUE evaluated separately for each fishing method is more valid approach for year to year statistical comparisons.

Species composition in 2022 was consistent with 2020 and 2021 catches. Two new taxa, both of which were Arctic species posing no risk as AIS, were recorded for the first time in Milne Port: Halfbarred Pout (*Gymnelus hemifasciatus*; single individual) and Spatulate Sculpin (*Icelus spatulate*; five individuals). The Halfbarred Pout has largely been recorded in the Bering and Beaufort Seas with few sightings in the northern Arctic Archipelago (Anderson 1994); however, distribution data collection within Canada is limited (FishBase 2022). The Spatulate Sculpin is a small native sculpin species with a known distribution around northern Baffin Island, although not previously recorded in Milne Inlet or Eclipse Sound (FishBase 2022).

Examination of the success of various fishing methods to collect the species used as indicators for monitoring fish health indicated that the methods currently in use were appropriate for this purpose. Following the pattern of previous years, gillnets remained an effective method for capturing Arctic Char, accounting for 99% of all Arctic Char caught in 2022 (although CPUE is not directly comparable among methods). Unlike in previous years where the majority of Fourhorn Sculpin were caught via angling-jigging, gill nets were successful at capturing Fourhorn sculpin in 2022, representing 36% of all Fourhorn Sculpin caught by these two fishing methods. Fewer angling efforts were conducted in 2022 compared to 2020 and 2021, but were more successful (i.e., higher CPUE) than previous years with comparable taxa richness. Following the study design modification in 2020 to have additional angling efforts undertaken to increase capture rates for Fourhorn Sculpin in support of the Fish Health Program (Chapter 7.0), the CPUE of surveys from 2020 to 2022 have increased relative to pre-2020 surveys.

In the last three years (2020 to 2022) both Fukui traps and hoop nets were deployed to determine if Fukui traps should continue to be fished based on comparisons of capture effectiveness. Fukui trap efforts in 2022 achieved the highest taxa richness of any fishing method in 2022 and captured two species not detected by any other method. However, total Fukui trap catches in 2022 yielded the least number of fish of any effort in 2022 (n = 11) and yielded fewer captured fish than the two previous years (2020 = 47 fish, 2021 = 17 fish) despite an increased number of efforts in 2022. Hoop net fishing effort numbers remained low compared to other methods but increased in fish catch and taxa richness from 2021. Over the three-year trial study period, hoop net efforts have yielded twice as many captured fish (n = 151) compared to Fukui traps (n = 71), despite less than half the number of total efforts and half the number of total set hours. However, the fish caught by hoop net in 2022 were almost exclusively Fourhorn Sculpin (comprising 53 of the 55 fish caught by this method) and all of these fish were caught in the DPF. Over the three years of hoop net operation, the CPUE in the DPF was significantly higher than in the IPF; for Fourhorn Sculpin, CPUE was 1,144% higher in the DPF.

Trawling in 2022 yielded high mean CPUEs (range = 32.20 - 25.71 fish/hr), but maximum CPUE was lower than in 2020 and 2021. The historical high in 2020 was due to the capture of schooling juvenile Polar Cod during the only trawling effort in 2020, which accounted for 80% of the yield. Schooling behaviour is common in juvenile Arctic Cod and may also occur in Polar Cod (Laidre and Heide-Jørgensen 2005; Mueter et al. 2016); however, no schools of cod were captured in 2021 or 2022 trawls, resulting in decreased CPUEs. In addition, decreased CPUE in 2022 may be attributed to increased emphasis on not letting the trawl contact the seabed, per the recommendation made in 2020 to change the method to reduce impacts to non-target species (e.g., by-catch benthic organisms; Golder 2021).

Overall, statistical analyses of CPUE for all species combined indicated higher hoop net CPUE in the DPF compared to the IPF, and higher angling-trolling CPUE in 2022 compared to 2020, with no other statistically significant results identified. For Fourhorn Sculpin, analyses generally suggested higher CPUE values in the DPF compared to the IPF. For Arctic Char sampled using gill nets, no differences between years or areas were found. Overall, the results generally support that existing mitigation measures are functioning as intended and that current Project activities are not resulting in adverse effects on the local marine fish communities in Milne Port. However, increasing sampling effort for angling-jigging, angling-trolling, and hoop nets would result in an increased statistical power to detect smaller effect sizes, and therefore improve detection of changes.

Overall, fishing methods were deemed effective in characterizing the marine fish community in terms of species presence and relative abundance. Fish sampling in 2020, 2021, and 2022 yielded similar numbers and proportional representation of the dominant fish species in Milne Port (Arctic Char, Fourhorn Sculpin and Shorthorn Sculpin) relative to previous years. The delineation of FAs and the standardization of fishing methods established in 2021 are planned to continue as they appear to be effective means of assessing interannual change in relative fish abundance and distribution at Milne Port.

6.7 Conclusions and Recommendations

This chapter addresses 2022 program objectives, including the characterization of species composition and relative abundance of fish at Milne Port. Total catch and diversity of fish species were higher compared to pre-2020 surveys and comparable to 2020 and 2021 results. The contrast between 2014-2019 and 2020-2022 reflects increased fishing effort and introduction of new fish sampling methods rather than changes in the fish community. Fishing gear efficiencies were also evaluated, with gillnets, angling-jigging, and trawls remaining the most effective gear types for capturing fish. Importantly, higher fish catches have been recorded closer to Project infrastructure than further away, indicating that the Project has not adversely affected the local marine fish community. Monitoring data from 2022 align with FEIS predictions, and subsequent ERP addendums, which predicted the potential for minor and localized effects on fish and fish habitat.

Recommendations for the 2023 MEEMP sampling program include maintaining standardized fishing efforts as was done from 2020 to 2022 and dividing efforts consistently between the FAs so any changes in the Milne Port area fish community at Milne Port can be identified. Additionally, following the results of the three-year trial, it is time to consider whether the use of Fukui traps should be discontinued due to low total catch rates. Hoop nets are recommended as a replacement fishing method if Fukui trap removal is deemed appropriate upon further discussion with the MEWG. While it would be possible to continue fishing both Fukui and hoop nets, perhaps more evenly distributing effort between the two methods, the cost of doing so would be lower statistical power as neither could reach the required number of efforts to achieve 40% effect size detection in the limited fishing season available. With the recommended removal of Fukui traps from the program, the number of efforts per area of each fishing method (i.e., angling [jigging and trolling], gill nets, hoop nets, and trawling) should be increased in 2023 to achieve 40% effect size detection for fishing methods. Statistical analyses indicate power to detect a 40% effect size could be achieved by increasing the number of efforts to at least 8 to 10 sampling events for angling-jigging, 11 sampling events for angling-trolling, 12 sampling events for gill nets, and 24 sampling events for hoop nets.

6.8 Closure

We trust this information is sufficient for your needs at this time. Should you have any questions or concerns, please do not hesitate to contact Phil Rouget, on behalf of the undersigned, at +1 250 419 4945

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APPENDIX 6A

Permits

Nunavut Research Institute / ᓄᓇᕗᒻᒥ ᖃᐅᔨᓴᖅᑐᓕᕆᔨᒃᑯᑦ
Box 1720, Iqaluit, NU X0A 0H0 phone:(867) 979-7279 fax: (867) 979-7109 e-mail: mosha.cote@arcticcollege.ca

SCIENTIFIC RESEARCH LICENSE

LICENSE NUMBER 02 030 22R-M

ISSUED TO: Megan-Lord Hoyle
Baffinland Iron Mines Corporation
2275 Upper Middle Road East, Suite 300
Oakville, Ontario
L6H 0C3 Canada

TEAM MEMBERS: Please see attached

TITLE: Mary River Project

OBJECTIVES OF RESEARCH:

Environmental data collection and analysis for monitoring and management of the Mary River project as prescribed by Project Certificate No. 005 – Amendment 3 and Type "A" Water Licence No. 2AM-MRY1325 – Amendment 1.

TERMS & CONDITIONS:

The holder of the licence will be bound by the terms and conditions of the Nunavut Impact Review Board Screening Decision Report and the Department of Culture & Heritage archaeological sites terms and conditions. These terms and conditions will form part of this licence.

DATA COLLECTION IN NU:
DATES: April 25, 2022 to December 31, 2022
LOCATION: Steensby Port, Mary River, Milne Inlet Port/Road

Scientific Research License 02 030 22R-M expires on December 31, 2022
Issued at Iqaluit, NU on Apriil 25, 2022

Jamal Shirley
Science Advisor

SCIENTIFIC RESEARCH LICENCE

Authorized Team members for Scientific Research License 02 030 22 R-M

NRI Permit 2022 – Baffinland Environmental Monitoring Programs

Principal Scientists* and Dates

Site Environment Team

- Jonas Arreak
- Tom Williamson
- Connor Devereaux
- Allison Parker
- Kendra Button
- Bradley Rasmussen
- Mathew Raymond
- Lezley McAlister
- Matt Weaver
- Justin Dee
- Josh Pennell
- Heidi Mettler
- Katie Babin
- Blair Greene
- Tyson Angnetsiak
- Mick Appaqaq
- Peter Woolfrey

Golder Aerial Survey Team (June to October)

- Patrick Abgrall*
- Phil Rouget*
- Tannis Thomas*
- Kyla Graham*
- Mitch Firman*

Golder MEEMP/AIS/Marine Fish Habitat Offset Team (July to Sept)

- Phil Rouget*
- Elaine Irving*
- Rainie Sharpe*
- Marina Winterbottom*
- Erika Grebeldinger*
- Dan Vicente*
- Patricia Tomliens*
- Phil Osborne*

Golder Bruce Head Team (July to September)

- Phil Rouget*
- Ainsley Allen*
- Sima Usvyatsov*
- Mitch Ferman*

Passive Acoustic Monitoring Program (July to September)

- Melanie Austin*
- Emily Maxner*

EDI (May to October)

- Patrick Audet*
- Mike Setterington*

AEMP/ Milne Inlet Freshwater – Minnow (August)

- *Paul Lepage
- Samantha Burke
- Jessica Tester

Hydrology- North Water Environmental (June)

- *Andrew Rees

Freshwater Fish Habitat Monitoring - North/South Consultants (NSC) Inc. (June – September)

- Catherine Brandt
- Jordan Mazur
- *Mike Johnson
- *Megan Cooley

Air Quality – Stantec (January to December)

- Douglas Rimmer
- *Dan Jarrett
- *Greg Johnson

Fisheries and Oceans Canada   Pêches et Océans Canada

Date: July 12th 2022

To: Phil Rouget, WSP Golder

Subject: OPA-ACC-2022-64 Interim Approval

Dear Phil,

Your 2022 Animal Use Protocol (AUP), number OPA-ACC-2022-64, entitled "Baffinland Iron Mines Corp, Mary River Project, 2022 Marine Environmental Effects Monitoring Program (MEEMP) and Marine Habitat Offset Monitoring Program" has been reviewed and interim approved by the Ontario, Prairie and Arctic Animal Care Committee (OPA-ACC). When the OPA-ACC meets in person, a full approval will be sent as per CCAC policies.

Please be advised that should there be a need to revise the protocol you are requested to contact the OPA-ACC and obtain approval prior to proceeding.

In addition, you are required to submit a brief report within 30 days of completion of the project outlining the unexpected changes to the protocol, the number of animals used and any unanticipated results. If injuries or mortalities occur, an incident report must be provided. A blank copy of these forms will be sent out with your final approval.

Feel free to contact me if you have any questions or concerns.

Sincerely,

Michelle Wetton-Salo

Michelle Wetton-Salo
Chair Person of OPA-ACC

Ontario, Prairie and Arctic Animal Care Committee
Arctic & Aquatic Research
Ontario and Prairie Region / région de l'Ontario et des Prairies
Fisheries and Oceans Canada / Pêches et Océans Canada
501 University Crescent
Winnipeg, Manitoba R3T 2N6
Phone:204-983-5238
DFO.OPAAnimalCareCommittee-ComitedeprotectiondesanimauxOPA.MPO@dfo-mpo.gc.ca

Canada

Fisheries and Oceans Canada | Pêches et Océans Canada

Licence #: S-22/23-1034-NU-A1

Philippe Rouget
3795 Carey Road 2nd floor
Victoria, BC, CA V8Z 6T8

Dear Philippe Rouget,

Enclosed is your amended Licence to Fish for Scientific Purposes issued pursuant to Section 52 of the Fishery (General) Regulations.

Failure to comply with any of the conditions specified on the attached licence may result in a contravention of the Fishery (General) Regulations.

Please be advised that this licence only permits those activities stated on your licence. Any other activity may require approval under the Fisheries Act or other legislation. It is the Project Authority's responsibility to obtain any other approvals.

Please ensure that you include the licence number and project title in any future correspondence and that you complete the Summary Harvest Report upon completion of activities under this licence.

Yours truly,

Colin Charles
Fisheries Management
Arctic Region
Fisheries and Oceans Canada

Date

Enclosure

LICENCE TO FISH FOR SCIENTIFIC PURPOSES

AMENDMENT

S-22/23-1034-NU-A1

Pursuant to Section 52 of the Fishery (General) Regulations, the Minister of Fisheries and Oceans hereby authorizes the individual(s) listed below to fish for scientific purposes, subject to the conditions specified.

Project Authority: Philippe Rouget — Golder Associates Ltd.
3795 Carey Road 2nd floor
Victoria, BC, CA V8Z 6T8

Other Personnel: Phil Rouget, Patricia Tomliens, Dave Hasek, Ronnie Komangapik, Dan Vicente, Niallan O'Brien Andrew Rippington, Kristin Westman, Monica Redmond, Jeff Reynolds, Bryce Gunning, Alison Loeppky

Objectives: Baffinland Iron Mines Corp. - Mary River Project - 2022 Marine Environmental Effects Monitoring Program (MEEMP) and Marine Habitat Offset Monitoring Program, Baffin Island, Nunavut

The Project objectives are to conduct sampling to adhere to the terms and conditions of Baffinland to operate the existing Mary River Mine and Port Facility in Milne Inlet (North Baffin Island) and future port facility in Steensby Inlet (South Baffin Island), including:
1. To assess the effectiveness of fish offsetting measures in relation to the construction of the Milne freight dock.
2. To measure effects of the Project on the marine environment and evaluate the effectiveness of mitigation measures in place to manage adverse effects on the marine environment.

CONDITIONS

Specified Conditions:

Other Species Encountered may include: Snakeblenny, Slender (Lumpenus fabricii); Cod, Polar (Arctogadus glacialis); Lumpsucker, Spiny (Eumicrotremus orbis); Lumpsucker, Atlantic Spiny (Eumicrotremus spinosus);

Sample Size for species listed above: 500 LIVE, 100 DEAD

All weights are listed in kilograms (kg)

Waters:

Water Body: **Steensby Inlet Area**
Point A: 70° 15' N, 78° 35' W

Species: Benthos — Gear: Ponar dredge, Van Veen Grab

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
	200.00	100.00						

Water Body: **Steensby Inlet Area**
Point A: 70° 15' N, 78° 35' W

Species: Gastropods/Shellfish — Gear: Ponar dredge

Species:

Gear: Van Veen Grab

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			500	200				

Water Body: **Steensby Inlet Area**
Point A: 70° 15' N, 78° 35' W

Species:
Arctic Alligatorfish
Atlantic Poacher
Capelin
Cod
Cod, Arctic
Cod, Greenland
Eelpout
Eelpout, Saddled
Fish Doctor
Fourline Snakeblenny
Lumpfish (Lumpsucker)
Sand Lance
Sand Lance, Pacific
Sculpin, Arctic
Sculpin, Arctic Staghorn
Sculpin, Atlantic Hookear
Sculpin, Longhorn
Sculpin, Ribbed
Sculpin, Shorthorn
Sculpins Spp.
Snailfish
Stickleback, Ninespine

Gear:
10 MM Mesh Gillnets and Larger
Angling
Fish Trap
Fyke Nets
Jigging
Longline
Seine
Trolling

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			500	100				

Water Body: **Steensby Inlet Area**
Point A: 70° 15' N, 78° 35' W

Species:
Arctic Char (Searun)
Sculpin, Fourhorn

Gear:
10 MM Mesh Gillnets and Larger
Angling
Fish Trap
Fyke Nets
Longline
Seine
Trolling

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			500	200				

Water Body: **Milne Inlet**
Point A: 72° 20' N, 80° 30' W

Species:
Arctic Alligatorfish

Gear:
10 MM Mesh Gillnets and Larger

Species: Atlantic Poacher
Capelin
Cod
Cod, Arctic
Cod, Greenland
Eelpout
Eelpout, Saddled
Fish Doctor
Fourline Snakeblenny
Lumpfish (Lumpsucker)
Sand Lance
Sand Lance, Pacific
Sculpin, Arctic
Sculpin, Arctic Staghorn
Sculpin, Atlantic Hookear
Sculpin, Longhorn
Sculpin, Ribbed
Sculpin, Shorthorn
Sculpins Spp.
Snailfish
Stickleback, Ninespine

Gear: Angling
Fish Trap
Fyke Nets
Jigging
Longline
Seine
Trolling

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			500	100				

Water Body: Milne Inlet
Point A: 72° 20' N, 80° 30' W

Species: Arctic Char (Searun)
Sculpin, Fourhorn

Gear: 10 MM Mesh Gillnets and Larger
Angling
Fish Trap
Fyke Nets
Longline
Seine
Trolling

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			500	200				

Water Body: Milne Inlet
Point A: 72° 20' N, 80° 30' W

Species: Benthos

Gear: Ponar dredge
Van Veen Grab

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
	200.00	100.00						

Water Body: Milne Inlet
Point A: 72° 20' N, 80° 30' W

Species: Gastropods/Shellfish

Gear: Ponar dredge

Species: Gear: Van Veen Grab

Total Weight	Weight Live	Weight Dead	Number Alive	Number Dead	Number Tows	Number Sets	Hours	Minutes
			500	200				

Fishing Period: July 16, 2022 to October 31, 2022

A copy of this licence must be available at the study site and produced at the request of a fishery officer.

Live fish may not be retained unless specified in the conditions of this licence.

The licence holder shall immediately cease fishing when the total fish killed or live sampled reaches any of the maximums set for any of the species listed.

Transportation:

Other approvals/permits may be necessary to collect or transport certain species, such as Marine Mammal Transportation Permits. For marine mammal parts, products and derivatives a Marine Mammal Transportation Licence is required for domestic transport and, for international transport a Canadian CITES Export Permit is also required.

Report on Activities:

The Project Authority will submit to the License Delivery Officer, Department of Fisheries and Oceans, within one month of the expiry date, a report stating:

i) whether or not the field work was conducted; and if conducted

ii) waterbody location, fishing coordinates, gear types used at each coordinate, numbers or amount of fish (by species) collected and/or marked and the date or period of collection.

A Summary Harvest Report template is provided by the License Delivery Officer at time of issuance of this licence .

The Project Authority also will provide a copy of any published or public access documents which result from the project . Information supplied will be used for population management purposes by the Department of Fisheries and Oceans and becomes part of the public record.

All documents should be sent to:

Fisheries and Oceans Canada
Fisheries Management
Arctic Region
P.O. Box 358
Iqaluit, NU X0A 0H0

Attention: Licence Delivery Officer

Telephone: (867) 979-8005
Fax: (867) 979-8039
E-mail: XCNA-NT-NUpermit@dfo-mpo.gc.ca

Allison McPhee
A/ Regional Director, Fisheries Management
Arctic Region
Fisheries and Oceans Canada

Date

For the Minister of Fisheries and Oceans.

Pursuant to Section 52 of the Fishery (General) Regulations.

APPENDIX 6B

2020 to 2022 Effort Data

Table 1. 2022 Fishing Effort Summary, Milne Inlet

Fshing Method	Site	Fishing Area[1]	Set Date (2022)	Pull Date (2022)	UTM Coordinates (17W) Start Easting	Start Northing	End Easting	End Northing	Total Effort (hr)
Angling - Jigging	AJ01	IPF	02-Aug	02-Aug	503217	7976609	-	-	0.50
Angling - Jigging	AJ02	DPF	03-Aug	03-Aug	503219	7976551	-	-	0.50
Angling - Jigging	AJ03	IPF	04-Aug	04-Aug	505722	7978486	-	-	0.50
Angling - Jigging	AJ04	DPF	04-Aug	04-Aug	504012	7976601	-	-	0.33
Angling - Jigging	AJ05	DPF	05-Aug	05-Aug	503148	7976501	-	-	1.32
Angling - Jigging	AJ06	DPF	05-Aug	05-Aug	503211	7976565	-	-	0.50
Angling - Jigging	AJ07	DPF	06-Aug	06-Aug	503221	7976581	-	-	0.72
Angling - Jigging	AJ08	IPF	08-Aug	08-Aug	504950	7976588	-	-	0.57
Angling - Jigging	AJ09	DPF	08-Aug	08-Aug	503986	7976664	-	-	0.38
Angling - Jigging	AJ10	DPF	11-Aug	11-Aug	503213	7976613	-	-	0.32
Angling - Jigging	AJ11	IPF	13-Aug	13-Aug	505718	7978472	-	-	0.33
Angling - Jigging	AJ12	IPF	14-Aug	14-Aug	505124	7977155	-	-	0.58
Angling - Jigging	AJ13	DPF	14-Aug	14-Aug	503209	7976628	-	-	1.25
Angling - Trolling	AT01	IPF	04-Aug	04-Aug	505168	7977369	505117	7977124	0.60
Angling - Trolling	AT02	DPF	04-Aug	04-Aug	503139	7976499	503077	7976441	0.20
Angling - Trolling	AT03	DPF	05-Aug	05-Aug	503890	7976647	503915	7976603	0.10
Angling - Trolling	AT04	DPF	06-Aug	06-Aug	503225	7976606	502879	7976483	0.43
Angling - Trolling	AT05	DPF	11-Aug	11-Aug	503207	7976607	503115	7976508	0.80
Angling - Trolling	AT06	DPF	13-Aug	13-Aug	502884	7976390	502845	7976364	0.30
Angling - Trolling	AT07	DPF	14-Aug	14-Aug	504225	7976667	504606	7976722	0.75
Angling - Trolling	AT08	IPF	14-Aug	14-Aug	505308	7978093	505297	7977948	0.55
Fukui Trap	FT01	DPF	01-Aug	03-Aug	503215	7976561	-	-	41.98
Fukui Trap	FT02	DPF	01-Aug	03-Aug	503204	7976540	-	-	42.05
Fukui Trap	FT03	DPF	01-Aug	03-Aug	503115	7976522	-	-	42.05
Fukui Trap	FT04	IPF	01-Aug	03-Aug	502740	7976275	-	-	41.05
Fukui Trap	FT05	IPF	01-Aug	03-Aug	502664	7976287	-	-	41.08
Fukui Trap	FT06	IPF	01-Aug	03-Aug	502661	7976441	-	-	41.08
Fukui Trap	FT07	IPF	03-Aug	05-Aug	502508	7976537	-	-	47.17
Fukui Trap	FT08	IPF	03-Aug	05-Aug	502392	7976461	-	-	47.28
Fukui Trap	FT09	IPF	03-Aug	05-Aug	502287	7976432	-	-	47.37
Fukui Trap	FT10	DPF	03-Aug	05-Aug	502980	7976395	-	-	46.80
Fukui Trap	FT11	DPF	03-Aug	05-Aug	502883	7976346	-	-	46.83
Fukui Trap	FT12	DPF	03-Aug	05-Aug	502897	7976391	-	-	46.85
Fukui Trap	FT13	DPF	05-Aug	09-Aug	503869	7976636	-	-	95.42
Fukui Trap	FT14	DPF	05-Aug	09-Aug	503911	7976549	-	-	95.33
Fukui Trap	FT15	DPF	05-Aug	09-Aug	503925	7976707	-	-	95.17
Fukui Trap	FT16	IPF	05-Aug	09-Aug	504683	7976765	-	-	95.08
Fukui Trap	FT17	IPF	05-Aug	09-Aug	504713	7976713	-	-	95.08
Fukui Trap	FT18	IPF	05-Aug	09-Aug	504844	7976638	-	-	95.08
Fukui Trap	FT19	DPF	09-Aug	13-Aug	504032	7976602	-	-	96.17
Fukui Trap	FT20	DPF	09-Aug	13-Aug	504072	7976570	-	-	96.00
Fukui Trap	FT21	IPF	09-Aug	13-Aug	505098	7976838	-	-	94.92
Fukui Trap	FT22	IPF	09-Aug	13-Aug	505135	7977043	-	-	93.92
Fukui Trap	FT23	IPF	09-Aug	13-Aug	505180	7977407	-	-	94.95
Fukui Trap	FT24	DPF	09-Aug	13-Aug	504064	7976674	-	-	87.67
Fukui Trap	FT25	IPF	13-Aug	14-Aug	505076	7977076	-	-	31.45
Fukui Trap	FT26	IPF	13-Aug	14-Aug	505149	7977299	-	-	31.20
Fukui Trap	FT27	IPF	13-Aug	14-Aug	505161	7977602	-	-	31.22
Fukui Trap	FT28	DPF	13-Aug	14-Aug	504217	7976641	-	-	30.50
Fukui Trap	FT29	DPF	13-Aug	14-Aug	504331	7976564	-	-	30.38
Fukui Trap	FT30	DPF	13-Aug	14-Aug	504411	7976544	-	-	30.92
Gill Net	GN01	DPF	01-Aug	01-Aug	503107	7976434	503092	7976539	3.83
Gill Net	GN02	IPF	01-Aug	01-Aug	502604	7976229	502624	7976318	3.53
Gill Net	GN03	IPF	04-Aug	04-Aug	505195	7977496	505141	7977420	2.48
Gill Net	GN04	IPF	04-Aug	04-Aug	505142	7977064	505077	7977023	1.93
Gill Net	GN05	DPF	04-Aug	04-Aug	504357	7976466	504347	7976559	2.12
Gill Net	GN06	DPF	04-Aug	04-Aug	503917	7976503	503853	7976561	2.00
Gill Net	GN07	IPF	07-Aug	07-Aug	505163	7976895	505137	7976814	1.40
Gill Net	GN08	DPF	07-Aug	07-Aug	504104	7976627	504184	7976646	1.25
Gill Net	GN09	DPF	08-Aug	08-Aug	503551	7976418	503540	7976508	3.40
Gill Net	GN10	IPF	08-Aug	08-Aug	504512	7976467	504431	7976503	2.72
Gill Net	GN11	DPF	08-Aug	08-Aug	503147	7976465	503083	7976538	1.32
Gill Net	GN12	DPF	11-Aug	11-Aug	503016	7976389	502941	7976420	3.47
Gill Net	GN13	IPF	11-Aug	11-Aug	502691	7976239	502721	7976325	3.75
Gill Net	GN14	IPF	13-Aug	13-Aug	505265	7977776	505183	7977801	2.00
Gill Net	GN15	IPF	13-Aug	13-Aug	505296	7978014	505243	7977967	2.00
Gill Net	GN16	IPF	13-Aug	13-Aug	505198	7977544	505108	7977590	1.08
Gill Net	GN17	DPF	13-Aug	13-Aug	502962	7976310	502915	7976399	1.42
Gill Net	GN18	IPF	13-Aug	13-Aug	502390	7976283	502435	7976360	1.38
Gill Net	GN19	DPF	14-Aug	14-Aug	504141	7976580	504225	7976637	3.22
Gill Net	GN20	IPF	14-Aug	14-Aug	504761	7976633	504808	7976702	2.70
Gill Net	GN21	IPF	14-Aug	14-Aug	502537	7976250	502579	7976330	3.43
Gill Net	GN22	DPF	14-Aug	14-Aug	503106	7976431	503082	7976516	3.72
Hoop Net	HN01	DPF	01-Aug	03-Aug	503008	7976390	-	-	50.93
Hoop Net	HN02	DPF	01-Aug	03-Aug	503131	7976472	-	-	50.58
Hoop Net	HN03	DPF	03-Aug	08-Aug	503444	7976596	-	-	124.63
Hoop Net	HN04	DPF	03-Aug	08-Aug	503929	7976592	-	-	124.40
Hoop Net	HN05	IPF	08-Aug	13-Aug	504564	7976631	-	-	111.30
Hoop Net	HN06	DPF	08-Aug	13-Aug	504131	7976549	-	-	110.72
Hoop Net	HN07	IPF	13-Aug	15-Aug	504558	7976647	-	-	49.23
Hoop Net	HN08	DPF	13-Aug	14-Aug	503050	7976442	-	-	23.17
Hoop Net	HN09	IPF	14-Aug	15-Aug	504366	7976489	-	-	24.42
Trawling	TR01	IPF	15-Aug	15-Aug	502058	7977608	502490	7978248	0.47
Trawling	TR02	DPF	15-Aug	15-Aug	502305	7976619	503338	7976862	0.68

[1] DPF = Direct Project Footprint; IPF = Indirect Project Footprint

Appendix 6B
Table 2. 2020 Fishing Catch Data, Milne Inlet

Fish Number[1]	Species Code[2]	Length (mm)	Weight (g)	Sex	Stage	Date	Capture Method	Site	Area[3]	Start UTM (NAD 83)	End UTM (NAD 83)	Zone	Start Waypoint	End Waypoint	Start/Set Date	Start Time	End/Pull Date	End Time	Total Hours	Average Water Depth (m)	Substrate Type[4]	Released / Mortality / Euthanized
NFC	-	-	-	-	-	2020-07-29	Angling - Trolling	AN01	DPF	504151 7976631	504559 7976658	17W	AN01S	AN01E	2020-07-29	12:54	2020-07-29	13:07	0.22	5	Sa	-
320	FHSC	170.0	45.0	U	-	2020-07-31	Angling - Jigging	AN02	DPF	503192 7976573	-	17W	AN02	-	2020-07-31	9:41	2020-07-31	10:50	1.15	10	-	Released
321	FHSC	172.0	45.5	U	-	2020-07-31	Angling - Jigging	AN02	DPF	503192 7976573	-	17W	AN02	-	2020-07-31	9:41	2020-07-31	10:50	1.15	10	-	Released
313	GRCD	456.0	1130.0	U	A	2020-07-31	Angling - Jigging	AN02	DPF	503192 7976573	-	17W	AN02	-	2020-07-31	9:41	2020-07-31	10:50	1.15	10	-	Released
314	GRCD	468.0	1220.0	U	A	2020-07-31	Angling - Jigging	AN02	DPF	503192 7976573	-	17W	AN02	-	2020-07-31	9:41	2020-07-31	10:50	1.15	10	-	Released
315	GRCD	455.0	1180.0	U	A	2020-07-31	Angling - Jigging	AN02	DPF	503192 7976573	-	17W	AN02	-	2020-07-31	9:41	2020-07-31	10:50	1.15	10	-	Released
316	GRCD	440.0	1000.0	U	A	2020-07-31	Angling - Jigging	AN02	DPF	503192 7976573	-	17W	AN02	-	2020-07-31	9:41	2020-07-31	10:50	1.15	10	-	Released
317	GRCD	478.0	1390.0	U	A	2020-07-31	Angling - Jigging	AN02	DPF	503192 7976573	-	17W	AN02	-	2020-07-31	9:41	2020-07-31	10:50	1.15	10	-	Released
318	GRCD	398.0	670.0	U	A	2020-07-31	Angling - Jigging	AN02	DPF	503192 7976573	-	17W	AN02	-	2020-07-31	9:41	2020-07-31	10:50	1.15	10	-	Released
319	GRCD	454.0	1180.0	U	A	2020-07-31	Angling - Jigging	AN02	DPF	503192 7976573	-	17W	AN02	-	2020-07-31	9:41	2020-07-31	10:50	1.15	10	-	Released
322	GRCD	450.0	980.0	U	A	2020-07-31	Angling - Jigging	AN02	DPF	503192 7976573	-	17W	AN02	-	2020-07-31	9:41	2020-07-31	10:50	1.15	10	-	Euthanized
329	ARCH	400.0	260.0	U	U	2020-07-31	Angling - Jigging	AN03	DPF	503207 7976619	-	17W	AN03	-	2020-07-31	11:19	2020-07-31	12:10	0.85	15	Bo	Released
323	GRCD	621.0	2570.0	U	A	2020-07-31	Angling - Jigging	AN03	DPF	503207 7976619	-	17W	AN03	-	2020-07-31	11:19	2020-07-31	12:10	0.85	15	Bo	Released
324	GRCD	434.0	940.0	M	A	2020-07-31	Angling - Jigging	AN03	DPF	503207 7976619	-	17W	AN03	-	2020-07-31	11:19	2020-07-31	12:10	0.85	15	Bo	Released
327	GRCD	434.0	970.0	U	U	2020-07-31	Angling - Jigging	AN03	DPF	503207 7976619	-	17W	AN03	-	2020-07-31	11:19	2020-07-31	12:10	0.85	15	Bo	Released
325	SHSC	412.0	930.0	U	A	2020-07-31	Angling - Jigging	AN03	DPF	503207 7976619	-	17W	AN03	-	2020-07-31	11:19	2020-07-31	12:10	0.85	15	Bo	Released
326	SHSC	169.0	80.0	M	U	2020-07-31	Angling - Jigging	AN03	DPF	503207 7976619	-	17W	AN03	-	2020-07-31	11:19	2020-07-31	12:10	0.85	15	Bo	Released
328	SHSC	241.0	150.0	U	U	2020-07-31	Angling - Jigging	AN03	DPF	503207 7976619	-	17W	AN03	-	2020-07-31	11:19	2020-07-31	12:10	0.85	15	Bo	Released
330	GRCD	498.0	1320.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Released
331	GRCD	518.0	1790.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Released
332	GRCD	480.0	1230.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Released
333	GRCD	440.0	990.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Released
334	GRCD	534.0	1540.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Released
335	GRCD	518.0	1490.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Released
336	GRCD	408.0	690.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Released
337	GRCD	636.0	3060.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Released
338	GRCD	482.0	1410.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Euthanized
339	GRCD	564.0	1930.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Released
340	GRCD	442.0	1020.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Released
341	GRCD	504.0	1580.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Released
342	GRCD	569.0	2900.0	-	-	2020-07-31	Angling - Jigging	AN04	DPF	503214 7976583	-	17W	AN04	-	2020-07-31	12:30	2020-07-31	14:10	1.67	12	-	Released
343	GRCD	670.0	3700.0	M	A	2020-07-31	Angling - Jigging	AN05	DPF	503209 7976585	-	17W	AN05	-	2020-07-31	16:15	2020-07-31	17:10	0.92	15	-	Released
344	GRCD	446.0	1100.0	U	A	2020-07-31	Angling - Jigging	AN05	DPF	503209 7976585	-	17W	AN05	-	2020-07-31	16:15	2020-07-31	17:10	0.92	15	-	Released
345	SHSC	366.0	680.0	U	A	2020-07-31	Angling - Jigging	AN05	DPF	503209 7976585	-	17W	AN05	-	2020-07-31	16:15	2020-07-31	17:10	0.92	15	-	Released
346	SHSC	374.0	730.0	U	A	2020-07-31	Angling - Jigging	AN05	DPF	503209 7976585	-	17W	AN05	-	2020-07-31	16:15	2020-07-31	17:10	0.92	15	-	Released
347	GRCD	484.0	1170.0	U	U	2020-08-01	Angling - Jigging	AN06	DPF	503220 7976562	-	17W	AN06	-	2020-08-01	13:15	2020-08-01	13:45	0.50	-	-	Released
348	GRCD	520.0	1700.0	U	U	2020-08-01	Angling - Jigging	AN06	DPF	503220 7976562	-	17W	AN06	-	2020-08-01	13:15	2020-08-01	13:45	0.50	-	-	Released
349	SHSC	185.0	93.2	U	U	2020-08-01	Angling - Jigging	AN07	DPF	503342 7976668	-	17W	AN07	-	2020-08-01	13:53	2020-08-01	14:20	0.45	15	Sa, Bo	Released
350	SHSC	189.0	110.0	U	U	2020-08-02	Angling - Jigging	AN08	IPF	504872 7976647	-	17W	AN08	-	2020-08-02	13:03	2020-08-02	13:14	0.20	5	Co, Sa	Released
351	SHSC	377.0	700.0	U	A	2020-08-02	Angling - Jigging	AN08	IPF	504872 7976647	-	17W	AN08	-	2020-08-02	13:03	2020-08-02	13:14	0.20	5	Co, Sa	Released
352	SHSC	396.0	1020.0	U	A	2020-08-02	Angling - Jigging	AN09	DPF	503978 7976676	-	17W	AN09	-	2020-08-02	14:14	2020-08-02	14:35	0.35	5	Bo	Released
353	SHSC	327.0	440.0	U	A	2020-08-02	Angling - Jigging	AN09	DPF	503978 7976676	-	17W	AN09	-	2020-08-02	14:14	2020-08-02	14:35	0.35	5	Bo	Released
354	SHSC	232.0	180.0	U	U	2020-08-02	Angling - Jigging	AN09	DPF	503978 7976676	-	17W	AN09	-	2020-08-02	14:14	2020-08-02	14:35	0.35	5	Bo	Released
355	SHSC	261.0	280.0	U	A	2020-08-02	Angling - Jigging	AN09	DPF	503978 7976676	-	17W	AN09	-	2020-08-02	14:14	2020-08-02	14:35	0.35	5	Bo	Released
356	SHSC	186.0	80.0	U	U	2020-08-02	Angling - Jigging	AN09	DPF	503978 7976676	-	17W	AN09	-	2020-08-02	14:14	2020-08-02	14:35	0.35	5	Bo	Released
357	SHSC	218.0	160.0	U	U	2020-08-02	Angling - Jigging	AN09	DPF	503978 7976676	-	17W	AN09	-	2020-08-02	14:14	2020-08-02	14:35	0.35	5	Bo	Released
NFC	-	-	-	-	-	2020-08-02	Angling - Trolling	AN10	IPF	504606 7976681	505320 7977499	17W	AN10	-	2020-08-02	14:47	2020-08-02	15:20	0.55	5	Co	-
358	FHSC	144.0	24.0	U	U	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
359	FHSC	189.0	60.0	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
360	FHSC	194.0	64.2	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
361	FHSC	201.0	64.8	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
362	FHSC	195.0	70.4	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
364	FHSC	172.0	40.4	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
365	FHSC	167.0	38.1	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
366	FHSC	183.0	59.6	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
367	FHSC	175.0	56.6	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
368	FHSC	180.0	55.6	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
370	FHSC	184.0	54.4	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
371	FHSC	156.0	32.3	U	U	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
374	FHSC	170.0	39.3	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
376	FHSC	177.0	46.6	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
377	FHSC	148.0	29.8	U	U	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
378	FHSC	179.0	49.4	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
379	FHSC	215.0	109.3	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released

380	FHSC	203.0	66.8	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
381	FHSC	203.0	82.6	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
382	FHSC	230.0	115.5	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
383	FHSC	209.0	98.6	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
384	FHSC	210.0	74.0	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
385	FHSC	242.0	110.0	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
386	FHSC	210.0	99.2	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
387	FHSC	221.0	114.3	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
388	FHSC	194.0	64.1	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
389	FHSC	220.0	116.7	F	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Euthanized
390	FHSC	215.0	81.8	M	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Euthanized
391	FHSC	205.0	75.4	M	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Euthanized
392	FHSC	197.0	85.0	M	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Euthanized
363	SHSC	159.0	38.3	U	U	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
369	SHSC	142.0	25.1	U	U	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
372	SHSC	164.0	44.7	U	A	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
373	SHSC	122.0	13.5	U	U	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
375	SHSC	140.0	21.3	U	U	2020-08-02	Angling - Jigging	AN11	DPF	503185 7976522	-	17W	AN11	-	2020-08-02	15:49	2020-08-02	16:30	0.68	2	Co/Sa	Released
469	ARSC	145.0	36.3	U	U	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
434	FHSC	173.0	48.3	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
435	FHSC	174.0	51.4	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
436	FHSC	176.0	54.9	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
437	FHSC	191.0	78.6	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
438	FHSC	172.0	44.3	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
439	FHSC	179.0	52.7	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
440	FHSC	163.0	43.0	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
441	FHSC	204.0	75.0	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
442	FHSC	130.0	19.0	U	J	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
443	FHSC	156.0	31.0	U	J	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
444	FHSC	160.0	38.7	U	U	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
445	FHSC	185.0	53.1	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
446	FHSC	157.0	30.0	U	U	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
447	FHSC	213.0	97.2	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
448	FHSC	228.0	113.9	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
449	FHSC	207.0	95.4	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
450	FHSC	170.0	38.7	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
451	FHSC	234.0	120.0	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
452	FHSC	160.0	34.4	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
453	FHSC	182.0	62.4	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
454	FHSC	167.0	45.3	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
455	FHSC	194.0	70.0	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
456	FHSC	169.0	40.3	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
457	FHSC	150.0	29.5	U	U	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
458	FHSC	175.0	48.8	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
459	FHSC	165.0	38.9	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
460	FHSC	163.0	43.1	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
461	FHSC	169.0	37.4	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
462	FHSC	163.0	38.6	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
463	FHSC	173.0	46.7	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
464	FHSC	164.0	37.2	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
465	FHSC	140.0	21.1	U	U	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
466	FHSC	175.0	47.6	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
467	FHSC	150.0	26.6	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
468	FHSC	157.0	37.7	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
470	FHSC	140.0	21.7	U	U	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
471	FHSC	159.0	35.2	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
472	FHSC	163.0	36.1	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
473	FHSC	136.0	17.7	U	U	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
474	FHSC	148.0	30.2	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
475	FHSC	127.0	19.0	U	U	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
476	FHSC	129.0	15.7	U	U	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
477	FHSC	134.0	18.9	U	U	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
478	FHSC	310.0	380.0	F	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Euthanized
479	FHSC	236.0	147.7	M	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Euthanized
480	FHSC	212.0	78.1	M	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Euthanized
481	FHSC	226.0	103.8	M	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Euthanized
482	FHSC	190.0	65.5	M	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Euthanized
483	FHSC	220.0	104.0	M	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Euthanized
484	FHSC	250.0	150.0	M	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Euthanized
485	FHSC	198.0	70.6	M	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Euthanized

Table 2. 2020 Fishing Catch Data, Milne Inlet

486	FHSC	197.0	70.4	M	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Euthanized
487	FHSC	235.0	118.8	F	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Euthanized
488	FHSC	214.0	86.3	F	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Euthanized
489	FHSC	276.0	230.0	M	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Euthanized
490	FHSC	244.0	140.0	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
491	FHSC	263.0	200.0	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
492	FHSC	263.0	160.0	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
493	FHSC	200.0	68.4	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
494	FHSC	229.0	120.0	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
495	FHSC	191.0	60.0	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
496	FHSC	209.0	90.9	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
497	FHSC	204.0	74.8	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
498	FHSC	200.0	74.7	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
499	FHSC	196.0	72.1	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
500	FHSC	196.0	71.5	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
501	FHSC	184.0	54.3	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
502	FHSC	210.0	81.6	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
430	SHSC	190.0	71.1	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
431	SHSC	174.0	53.3	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
432	SHSC	219.0	102.5	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
433	SHSC	200.0	73.1	U	A	2020-08-03	Angling - Jigging	AN12	DPF	503213 7976562	-	17W	AN12	-	2020-08-03	11:21	2020-08-03	12:35	1.23	-	Bo	Released
584	ARSC	178.0	60.0	-	-	2020-08-05	Angling - Jigging	AN13	DPF	503213 7976610	-	17W	AN13	-	2020-08-05	11:13	2020-08-05	12:45	1.53	10	Co, Bo	Released
585	GRCD	378.0	710.0	-	-	2020-08-05	Angling - Jigging	AN13	DPF	503213 7976610	-	17W	AN13	-	2020-08-05	11:13	2020-08-05	12:45	1.53	10	Co, Bo	Released
587	GRCD	436.0	830.0	U	A	2020-08-05	Angling - Jigging	AN13	DPF	503213 7976610	-	17W	AN13	-	2020-08-05	11:13	2020-08-05	12:45	1.53	10	Co, Bo	Released
588	GRCD	636.0	2980.0	U	A	2020-08-05	Angling - Jigging	AN13	DPF	503213 7976610	-	17W	AN13	-	2020-08-05	11:13	2020-08-05	12:45	1.53	10	Co, Bo	Released
589	GRCD	441.0	1100.0	U	A	2020-08-05	Angling - Jigging	AN13	DPF	503213 7976610	-	17W	AN13	-	2020-08-05	11:13	2020-08-05	12:45	1.53	10	Co, Bo	Released
590	GRCD	610.0	2470.0	U	A	2020-08-05	Angling - Jigging	AN13	DPF	503213 7976610	-	17W	AN13	-	2020-08-05	11:13	2020-08-05	12:45	1.53	10	Co, Bo	Released
586	SHSC	408.0	740.0	U	A	2020-08-05	Angling - Jigging	AN13	DPF	503213 7976610	-	17W	AN13	-	2020-08-05	11:13	2020-08-05	12:45	1.53	10	Co, Bo	Released
NFC	-	-	-	-	-	2020-08-05	Angling - Jigging	AN14	DPF	503214 7976572	502775 7976251	17W	AN14A	AN14B	2020-08-05	10:44	2020-08-05	10:54	0.17	-	-	-
506	FHSC	201.0	73.4	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
507	FHSC	236.0	190.0	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
508	FHSC	243.0	130.0	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
509	FHSC	243.0	150.0	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
510	FHSC	272.0	180.0	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
511	FHSC	220.0	95.6	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
512	FHSC	213.0	97.2	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
513	FHSC	251.0	130.0	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
514	FHSC	203.0	72.0	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
515	FHSC	254.0	190.0	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
516	FHSC	232.0	95.8	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
517	FHSC	235.0	130.0	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
518	FHSC	241.0	130.0	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
519	FHSC	233.0	118.4	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
520	FHSC	208.0	83.3	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
521	FHSC	217.0	83.4	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
522	FHSC	231.0	130.0	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
523	FHSC	253.0	150.0	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
524	FHSC	205.0	82.7	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
525	FHSC	228.0	100.0	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
526	FHSC	200.0	71.9	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
527	FHSC	199.0	79.4	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
528	FHSC	197.0	68.5	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
529	FHSC	195.0	69.1	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
530	FHSC	208.0	78.0	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
531	FHSC	204.0	77.2	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
532	FHSC	192.0	64.4	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
533	FHSC	211.0	86.0	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
534	FHSC	207.0	80.4	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
535	FHSC	181.0	56.3	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
536	FHSC	209.0	86.7	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
537	FHSC	191.0	70.4	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
538	FHSC	179.0	48.7	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
539	FHSC	210.0	88.8	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
540	FHSC	219.0	96.3	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
541	FHSC	194.0	52.4	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
542	FHSC	175.0	51.8	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
543	FHSC	193.0	71.3	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
544	FHSC	242.0	120.0	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
545	FHSC	148.0	29.5	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
546	FHSC	189.0	65.0	M	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released

547	FHSC	162.0	37.1	F	A	2020-08-05	Angling - Jigging	AN15	DPF	503391 7976593	-	17W	AN15	-	2020-08-05	16:10	2020-08-05	17:05	0.92	2	Bo/Sa	Released
591	GRCD	598.0	2400.0	U	A	2020-08-06	Angling - Jigging	AN16	IPF	505726 7978486	-	17W	AN16	-	2020-08-06	16:25	2020-08-06	17:00	0.58	15	Bo	Released
592	GRCD	414.0	830.0	U	U	2020-08-06	Angling - Jigging	AN16	IPF	505726 7978486	-	17W	AN16	-	2020-08-06	16:25	2020-08-06	17:00	0.58	15	Bo	Released
593	GRCD	548.0	1880.0	U	A	2020-08-06	Angling - Jigging	AN16	IPF	505726 7978486	-	17W	AN16	-	2020-08-06	16:25	2020-08-06	17:00	0.58	15	Bo	Released
594	GRCD	454.0	1000.0	U	U	2020-08-06	Angling - Jigging	AN16	IPF	505726 7978486	-	17W	AN16	-	2020-08-06	16:25	2020-08-06	17:00	0.58	15	Bo	Released
595	GRCD	506.0	1610.0	U	A	2020-08-06	Angling - Jigging	AN16	IPF	505726 7978486	-	17W	AN16	-	2020-08-06	16:25	2020-08-06	17:00	0.58	15	Bo	Released
596	GRCD	497.0	1310.0	U	U	2020-08-06	Angling - Jigging	AN16	IPF	505726 7978486	-	17W	AN16	-	2020-08-06	16:25	2020-08-06	17:00	0.58	15	Bo	Released
597	GRCD	444.0	480.0	U	U	2020-08-06	Angling - Jigging	AN16	IPF	505726 7978486	-	17W	AN16	-	2020-08-06	16:25	2020-08-06	17:00	0.58	15	Bo	Released
598	GRCD	446.0	1010.0	U	U	2020-08-06	Angling - Jigging	AN16	IPF	505726 7978486	-	17W	AN16	-	2020-08-06	16:25	2020-08-06	17:00	0.58	15	Bo	Released
599	GRCD	520.0	1490.0	U	A	2020-08-06	Angling - Jigging	AN16	IPF	505726 7978486	-	17W	AN16	-	2020-08-06	16:25	2020-08-06	17:00	0.58	15	Bo	Released
600	GRCD	474.0	1210.0	U	U	2020-08-07	Angling - Jigging	AN17	IPF	505710 7978466	-	17W	AN17	-	2020-08-07	10:00	2020-08-07	10:34	0.57	15	Bo	Released
601	GRCD	490.0	1370.0	U	U	2020-08-07	Angling - Jigging	AN17	IPF	505710 7978466	-	17W	AN17	-	2020-08-07	10:00	2020-08-07	10:34	0.57	15	Bo	Released
602	GRCD	494.0	1470.0	U	U	2020-08-07	Angling - Jigging	AN17	IPF	505710 7978466	-	17W	AN17	-	2020-08-07	10:00	2020-08-07	10:34	0.57	15	Bo	Euthanized
603	GRCD	628.0	2980.0	U	A	2020-08-07	Angling - Jigging	AN17	IPF	505710 7978466	-	17W	AN17	-	2020-08-07	10:00	2020-08-07	10:34	0.57	15	Bo	Released
604	GRCD	510.0	1420.0	U	A	2020-08-07	Angling - Jigging	AN17	IPF	505710 7978466	-	17W	AN17	-	2020-08-07	10:00	2020-08-07	10:34	0.57	15	Bo	Released
605	GRCD	440.0	1120.0	U	A	2020-08-08	Angling - Jigging	AN18	DPF	503210 7976609	-	17W	AN18	-	2020-08-08	10:50	2020-08-08	11:20	0.50	15	Bo/Sa	Released
606	GRCD	470.0	1140.0	U	U	2020-08-08	Angling - Jigging	AN18	DPF	503210 7976609	-	17W	AN18	-	2020-08-08	10:50	2020-08-08	11:20	0.50	15	Bo/Sa	Released
607	GRCD	451.0	1040.0	U	U	2020-08-08	Angling - Jigging	AN18	DPF	503210 7976609	-	17W	AN18	-	2020-08-08	10:50	2020-08-08	11:20	0.50	15	Bo/Sa	Released
608	GRCD	485.0	1330.0	U	U	2020-08-08	Angling - Jigging	AN18	DPF	503210 7976609	-	17W	AN18	-	2020-08-08	10:50	2020-08-08	11:20	0.50	15	Bo/Sa	Released
609	SHSC	375.0	610.0	U	A	2020-08-08	Angling - Jigging	AN18	DPF	503210 7976609	-	17W	AN18	-	2020-08-08	10:50	2020-08-08	11:20	0.50	15	Bo/Sa	Released
610	SHSC	421.0	1060.0	U	A	2020-08-08	Angling - Jigging	AN18	DPF	503210 7976609	-	17W	AN18	-	2020-08-08	10:50	2020-08-08	11:20	0.50	15	Bo/Sa	Released
611	SHSC	286.0	260.0	U	A	2020-08-08	Angling - Jigging	AN18	DPF	503210 7976609	-	17W	AN18	-	2020-08-08	10:50	2020-08-08	11:20	0.50	15	Bo/Sa	Released
612	SHSC	351.0	480.0	U	A	2020-08-08	Angling - Jigging	AN18	DPF	503210 7976609	-	17W	AN18	-	2020-08-08	10:50	2020-08-08	11:20	0.50	15	Bo/Sa	Released
NFC	-	-	-	-	-	2020-08-08	Angling - Trolling	AN19	DPF	504197 7976632	504054 7976893	17W	AN19S	AN19E	2020-08-08	14:23	2020-08-08	15:40	1.28	2	Sa, Bo	-
613	GRCD	513.0	1040.0	U	A	2020-08-09	Angling - Jigging	AN20	IPF	506244 7978922	-	17W	AN20	-	2020-08-09	10:41	2020-08-09	12:05	1.40	20	Bo/Sa	Released
614	GRCD	517.0	1710.0	U	A	2020-08-09	Angling - Jigging	AN20	IPF	506244 7978922	-	17W	AN20	-	2020-08-09	10:41	2020-08-09	12:05	1.40	20	Bo/Sa	Released
615	SHSC	270.0	330.0	U	A	2020-08-09	Angling - Jigging	AN20	IPF	506244 7978922	-	17W	AN20	-	2020-08-09	10:41	2020-08-09	12:05	1.40	20	Bo/Sa	Released
616	SHSC	362.0	640.0	U	A	2020-08-09	Angling - Jigging	AN21	IPF	505263 797877	-	17W	AN21	-	2020-08-09	12:44	2020-08-09	13:00	0.27	3	Sa, Bo	Released
617	SHSC	211.0	110.0	U	A	2020-08-09	Angling - Jigging	AN21	IPF	505263 797877	-	17W	AN21	-	2020-08-09	12:44	2020-08-09	13:00	0.27	3	Sa, Bo	Released
618	SHSC	155.0	60.0	U	A	2020-08-09	Angling - Trolling	AN22	IPF	505316 7978102	505140 7977163	17W	AN22S	AN22	2020-08-09	15:39	2020-08-09	16:20	0.68	3	Sa	Released
619	FHSC	192.0	68.9	F	A	2020-08-09	Angling - Jigging	AN23	DPF	504040 7976628	-	17W	AN23	-	2020-08-09	16:50	2020-08-09	17:10	0.33	2	Bo/Sa	Released
NFC	-	-	-	-	-	2020-08-09	Angling - Trolling	AN24	IPF	504123 7976633	505138 7977193	17W	AN24S	AN24E	2020-08-09	15:23	2020-08-09	15:44	0.35	2	Sa	-
NFC	-	-	-	-	-	2020-08-11	Angling - Jigging	AN25	DPF	503072 7976373	-	17W	AN25	-	2020-08-11	10:27	2020-08-11	10:37	0.17	25	-	-
652	GRCD	475.0	1240.0	U	U	2020-08-11	Angling - Jigging	AN26	DPF	503207 7976594	-	17W	AN26	-	2020-08-11	15:23	2020-08-11	15:45	0.37	15	Sa, Bo	Released
NFC	-	-	-	-	-	2020-08-11	Angling - Trolling	AN27(a)	DPF	504059 7976674	504545 7976652	17W	AN27	-	2020-08-11	16:31	2020-08-11	16:45	0.23	3	Sa, Co	-
710	ARCH	325.0	420.0	U	J	2020-08-14	Angling - Jigging	AN27(b)	IPF	505301 7978060	-	17W	AN27	-	2020-08-14	9:32	2020-08-14	10:00	0.47	-	-	Released
711	SHSC	290.0	340.0	-	-	2020-08-14	Angling - Jigging	AN27(b)	IPF	505301 7978060	-	17W	AN27	-	2020-08-14	9:32	2020-08-14	10:00	0.47	-	-	Released
720	FHSC	260.0	250.0	U	A	2020-08-14	Angling - Jigging	AN28	DPF	503955 7976671	-	17W	AN28	-	2020-08-14	10:40	2020-08-14	11:00	0.33	4	Bo	Released
712	SHSC	344.0	650.0	U	A	2020-08-14	Angling - Jigging	AN28	DPF	503955 7976671	-	17W	AN28	-	2020-08-14	10:40	2020-08-14	11:00	0.33	4	Bo	Released
713	SHSC	373.0	760.0	U	A	2020-08-14	Angling - Jigging	AN28	DPF	503955 7976671	-	17W	AN28	-	2020-08-14	10:40	2020-08-14	11:00	0.33	4	Bo	Released
714	SHSC	342.0	480.0	U	A	2020-08-14	Angling - Jigging	AN28	DPF	503955 7976671	-	17W	AN28	-	2020-08-14	10:40	2020-08-14	11:00	0.33	4	Bo	Released
715	SHSC	289.0	290.0	U	A	2020-08-14	Angling - Jigging	AN28	DPF	503955 7976671	-	17W	AN28	-	2020-08-14	10:40	2020-08-14	11:00	0.33	4	Bo	Released
716	SHSC	292.0	360.0	U	A	2020-08-14	Angling - Jigging	AN28	DPF	503955 7976671	-	17W	AN28	-	2020-08-14	10:40	2020-08-14	11:00	0.33	4	Bo	Released
717	SHSC	250.0	180.0	U	A	2020-08-14	Angling - Jigging	AN28	DPF	503955 7976671	-	17W	AN28	-	2020-08-14	10:40	2020-08-14	11:00	0.33	4	Bo	Released
718	SHSC	278.0	270.0	U	A	2020-08-14	Angling - Jigging	AN28	DPF	503955 7976671	-	17W	AN28	-	2020-08-14	10:40	2020-08-14	11:00	0.33	4	Bo	Released
719	SHSC	217.0	100.0	U	A	2020-08-14	Angling - Jigging	AN28	DPF	503955 7976671	-	17W	AN28	-	2020-08-14	10:40	2020-08-14	11:00	0.33	4	Bo	Released
721	SHSC	277.0	290.0	U	A	2020-08-14	Angling - Jigging	AN28	DPF	503955 7976671	-	17W	AN28	-	2020-08-14	10:40	2020-08-14	11:00	0.33	4	Bo	Released
722	SHSC	232.0	170.0	U	A	2020-08-14	Angling - Jigging	AN28	DPF	503955 7976671	-	17W	AN28	-	2020-08-14	10:40	2020-08-14	11:00	0.33	4	Bo	Released
723	SHSC	368.0	630.0	U	A	2020-08-14	Angling - Jigging	AN29	IPF	505036 7976854	-	17W	AN29	-	2020-08-14	14:05	2020-08-14	14:38	0.55	30	Sa	Released
724	SHSC	234.0	210.0	U	A	2020-08-14	Angling - Jigging	AN29	IPF	505036 7976854	-	17W	AN29	-	2020-08-14	14:05	2020-08-14	14:38	0.55	30	Sa	Released
725	SHSC	200.0	90.0	U	A	2020-08-14	Angling - Jigging	AN29	IPF	505036 7976854	-	17W	AN29	-	2020-08-14	14:05	2020-08-14	14:38	0.55	30	Sa	Released
726	ARSC	130.0	32.8	-	-	2020-08-15	Angling - Jigging	AN30	DPF	503364 7976586	-	17W	AN30	-	2020-08-15	9:45	2020-08-15	10:20	0.58	2	-	Released
727	ARSC	131.0	28.5	-	-	2020-08-15	Angling - Jigging	AN30	DPF	503364 7976586	-	17W	AN30	-	2020-08-15	9:45	2020-08-15	10:20	0.58	2	-	Released
728	FHSC	151.0	31.1	F	-	2020-08-15	Angling - Jigging	AN30	DPF	503364 7976586	-	17W	AN30	-	2020-08-15	9:45	2020-08-15	10:20	0.58	2	-	Released
301	SHSC	200.0	11.7	M	A	2020-07-27	Fukui Trap	FT01	DPF	502887 7976396	-	17W	FT01	-	2020-07-27	15:31	2020-08-01	10:22	114.85	10	Sa	Released
NFC	-	-	-	-	-	2020-07-28	Fukui Trap	FT02	DPF	502706 7976270	-	17W	176/177	-	2020-07-28	10:45	2020-08-01	9:55	95.17	8	Sa	-
308	FHSC	217.0	88.9	F	A	2020-07-28	Fukui Trap	FT03	IPF	502260 7976451	-	17W	178/179	-	2020-07-28	11:44	2020-08-01	9:40	93.93	5	Sa	Euthanized
302	SHSC	124.0	22.3	U	J	2020-07-28	Fukui Trap	FT03	IPF	502260 7976451	-	17W	178/179	-	2020-07-28	11:44	2020-08-01	9:40	93.93	5	Sa	Released
303	UNSC	75.0	4.4	U	J	2020-07-28	Fukui Trap	FT03	IPF	502260 7976451	-	17W	178/179	-	2020-07-28	11:44	2020-08-01	9:40	93.93	5	Sa	Released
304	UNSC	61.0	2.7	U	J	2020-07-28	Fukui Trap	FT03	IPF	502260 7976451	-	17W	178/179	-	2020-07-28	11:44	2020-08-01	9:40	93.93	5	Sa	Released
305	UNSC	72.0	4.3	U	J	2020-07-28	Fukui Trap	FT03	IPF	502260 7976451	-	17W	178/179	-	2020-07-28	11:44	2020-08-01	9:40	93.93	5	Sa	Released
306	UNSC	68.0	4.2	U	J	2020-07-28	Fukui Trap	FT03	IPF	502260 7976451	-	17W	178/179	-	2020-07-28	11:44	2020-08-01	9:40	93.93	5	Sa	Released
307	UNSC	60.0	2.8	U	J	2020-07-28	Fukui Trap	FT03	IPF	502260 7976451	-	17W	178/179	-	2020-07-28	11:44	2020-08-01	9:40	93.93	5	Sa	Released
309	UNSC	65.0	4.1	U	J	2020-07-28	Fukui Trap	FT04	IPF	501484 7976207	-	17W	180/181	-	2020-07-28	12:01	2020-08-01	10:15	94.23	10	Sa, Co, Bo	Released
NFC	-	-	-	-	-	2020-07-28	Fukui Trap	FT05	DPF	502734 7976422	-	17W	FT05	-	2020-07-28	12:07	2020-08-01	9:50	93.72	20	Sa, Bo	-
NFC	-	-	-	-	-	2020-07-28	Fukui Trap	FT06	DPF	502995 7976409	-	17W	FT06	-	2020-07-28	12:10	2020-08-01	10:00	93.83	20	-	-
565	FHSC	166.0	47.2	U	U	2020-08-01	Fukui Trap	FT07	DPF	503177 7976521	-	17W	FT07	-	2020-08-01	10:08	2020-08-05	9:05	94.95	2	Sa,Bo	Released
566	FHSC	168.0	39.9	U	U	2020-08-01	Fukui Trap	FT07	DPF	503177 7976521	-	17W	FT07	-	2020-08-01	10:08	2020-08-05	9:05	94.95	2	Sa,Bo	Released
567	UNSC	141.0	21.2	U	J	2020-08-01	Fukui Trap	FT07	DPF	503177 7976521	-	17W	FT07	-	2020-08-01	10:08	2020-08-05	9:05	94.95	2	Sa,Bo	Released
568	UNSC	123.0	12.7	U	J	2020-08-01	Fukui Trap	FT07	DPF	503177 7976521	-	17W	FT07	-	2020-08-01	10:08	2020-08-05	9:05	94.95	2	Sa,Bo	Released

Table 2. 2020 Fishing Catch Data, Milne Inlet

564	ARSC	127.0	26.6	U	U	2020-08-01	Fukui Trap	FT08	DPF	503195 7976534	-	17W	FT08	-	2020-08-01	9:11	2020-08-05	9:10	95.98	2	Sa,Bo	Released
563	FHSC	220.0	92.2	M	A	2020-08-01	Fukui Trap	FT08	DPF	503195 7976534	-	17W	FT08	-	2020-08-01	9:11	2020-08-05	9:10	95.98	2	Sa,Bo	Euthanized
559	FHSC	224.0	118.8	F	A	2020-08-01	Fukui Trap	FT09	DPF	503212 7976554	-	17W	FT09	-	2020-08-01	10:14	2020-08-05	9:15	95.02	2	Sa, Bo	Released
560	FHSC	223.0	108.1	F	A	2020-08-01	Fukui Trap	FT09	DPF	503212 7976554	-	17W	FT09	-	2020-08-01	10:14	2020-08-05	9:15	95.02	2	Sa, Bo	Released
561	FHSC	196.0	66.4	F	A	2020-08-01	Fukui Trap	FT09	DPF	503212 7976554	-	17W	FT09	-	2020-08-01	10:14	2020-08-05	9:15	95.02	2	Sa, Bo	Released
562	UNSC	149.0	29.2	U	J	2020-08-01	Fukui Trap	FT09	DPF	503212 7976554	-	17W	FT09	-	2020-08-01	10:14	2020-08-05	9:15	95.02	2	Sa, Bo	Released
762	ARSC	112.0	20.6	U	U	2020-08-01	Fukui Trap	FT10	DPF	503394 7976642	-	17W	FT10	-	2020-08-01	10:31	2020-08-02	8:42	22.18	3	Sa,Bo	Released
763	FHSC	202.0	66.4	F	A	2020-08-01	Fukui Trap	FT10	DPF	503394 7976642	-	17W	FT10	-	2020-08-01	10:31	2020-08-02	8:42	22.18	3	Sa,Bo	Euthanized
551	ARSC	119.0	20.7	U	U	2020-08-01	Fukui Trap	FT11	DPF	503494 7976629	-	17W	FT11	-	2020-08-01	10:30	2020-08-05	9:30	95.00	3	Sa,Bo	Released
552	FHSC	214.0	84.5	F	A	2020-08-01	Fukui Trap	FT11	DPF	503494 7976629	-	17W	FT11	-	2020-08-01	10:30	2020-08-05	9:30	95.00	3	Sa,Bo	Released
554	FHSC	196.0	67.6	F	A	2020-08-01	Fukui Trap	FT11	DPF	503494 7976629	-	17W	FT11	-	2020-08-01	10:30	2020-08-05	9:30	95.00	3	Sa,Bo	Released
555	FHSC	195.0	68.2	F	A	2020-08-01	Fukui Trap	FT11	DPF	503494 7976629	-	17W	FT11	-	2020-08-01	10:30	2020-08-05	9:30	95.00	3	Sa,Bo	Released
557	FHSC	186.0	54.2	F	A	2020-08-01	Fukui Trap	FT11	DPF	503494 7976629	-	17W	FT11	-	2020-08-01	10:30	2020-08-05	9:30	95.00	3	Sa,Bo	Released
550	NRSL	170.0	16.2	U	U	2020-08-01	Fukui Trap	FT11	DPF	503494 7976629	-	17W	FT11	-	2020-08-01	10:30	2020-08-05	9:30	95.00	3	Sa,Bo	Released
553	UNSC	130.0	18.7	U	J	2020-08-01	Fukui Trap	FT11	DPF	503494 7976629	-	17W	FT11	-	2020-08-01	10:30	2020-08-05	9:30	95.00	3	Sa,Bo	Released
556	UNSC	140.0	21.8	U	J	2020-08-01	Fukui Trap	FT11	DPF	503494 7976629	-	17W	FT11	-	2020-08-01	10:30	2020-08-05	9:30	95.00	3	Sa,Bo	Released
558	UNSC	134.0	19.3	U	J	2020-08-01	Fukui Trap	FT11	DPF	503494 7976629	-	17W	FT11	-	2020-08-01	10:30	2020-08-05	9:30	95.00	3	Sa,Bo	Released
549	ARSC	200.0	117.8	U	A	2020-08-01	Fukui Trap	FT12	DPF	503464 7976592	-	17W	FT12	-	2020-08-01	10:34	2020-08-05	9:35	95.02	3	Sa,Bo	Released
548	FHSC	177.0	47.5	M	A	2020-08-01	Fukui Trap	FT12	DPF	503464 7976592	-	17W	FT12	-	2020-08-01	10:34	2020-08-05	9:35	95.02	3	Sa,Bo	Released
657	FHSC	235.0	111.9	F	A	2020-08-05	Fukui Trap	FT13	DPF	503922 7976599	-	17W	FT13	-	2020-08-05	9:23	2020-08-11	10:55	121.53	5	Sa, Bo	Released
656	NRSL	168.0	16.8	U	A	2020-08-05	Fukui Trap	FT13	DPF	503922 7976599	-	17W	FT13	-	2020-08-05	9:23	2020-08-11	10:55	121.53	5	Sa, Bo	Released
654	ARSC	132.0	30.9	U	U	2020-08-05	Fukui Trap	FT14	DPF	503889 7976626	-	17W	FT14	-	2020-08-05	9:25	2020-08-11	11:05	145.67	5	Sa, Bo	Released
655	ARSC	90.0	8.8	U	U	2020-08-05	Fukui Trap	FT14	DPF	503889 7976626	-	17W	FT14	-	2020-08-05	9:25	2020-08-11	11:05	145.67	5	Sa, Bo	Released
653	SHSC	181.0	40.0	U	U	2020-08-05	Fukui Trap	FT14	DPF	503889 7976626	-	17W	FT14	-	2020-08-05	9:25	2020-08-11	11:05	145.67	5	Sa, Bo	Released
658	FHSC	194.0	20.0	U	U	2020-08-05	Fukui Trap	FT15	DPF	503900 7976672	-	17W	FT15	-	2020-08-05	9:26	2020-08-11	11:15	145.82	5	Sa, Bo	Released
NFC	-	-	-	-	-	2020-08-05	Fukui Trap	FT16	DPF	504049 7976642	-	17W	FT16	-	2020-08-05	9:56	2020-08-11	11:25	145.48	5	Sa, Bo	-
NFC	-	-	-	-	-	2020-08-05	Fukui Trap	FT17	DPF	504005 7976663	-	17W	FT17	-	2020-08-05	9:58	2020-08-11	11:30	145.53	5	Sa, Bo	-
751	FLSB	280.0	-	U	U	2020-08-11	Fukui Trap	FT18	DPF	503903 7976750	-	17W	FT18	-	2020-08-11	11:00	2020-08-15	15:55	100.92	20	Sa, Co	Released
NFC	-	-	-	-	-	2020-08-11	Fukui Trap	FT19	DPF	503960 7976771	-	17W	FT19	-	2020-08-11	11:07	2020-08-15	16:05	100.97	20	Sa, Co	-
753	ARSC	138.0	37.2	U	U	2020-08-11	Fukui Trap	FT20	DPF	504140 7976580	-	17W	FT20	-	2020-08-11	11:14	2020-08-15	16:15	101.02	5	Sa, Co	Released
752	FHSC	189.0	55.6	M	A	2020-08-11	Fukui Trap	FT20	DPF	504140 7976580	-	17W	FT20	-	2020-08-11	11:14	2020-08-15	16:15	101.02	5	Sa, Co	Released
754	FHSC	150.0	29.6	-	-	2020-08-11	Fukui Trap	FT20	DPF	504140 7976580	-	17W	FT20	-	2020-08-11	11:14	2020-08-15	16:15	101.02	5	Sa, Co	Released
NFC	-	-	-	-	-	2020-08-11	Fukui Trap	FT21	DPF	504304 7976730	-	17W	FT21	-	2020-08-11	11:21	2020-08-15	16:25	101.07	20	Sa, Co	-
NFC	-	-	-	-	-	2020-08-11	Fukui Trap	FT22	IPF	504609 7976678	-	17W	FT22	-	2020-08-11	11:44	2020-08-15	16:30	100.77	2	Sa, Co	-
NFC	-	-	-	-	-	2020-08-15	Fukui Trap	FT23	DPF	503980 7976881	-	17W	FT23	-	2020-08-15	16:00	2020-08-20	8:00	112.00	50	-	-
NFC	-	-	-	-	-	2020-08-15	Fukui Trap	FT24	DPF	504179 7976704	-	17W	FT24	-	2020-08-15	16:07	2020-08-20	8:10	112.05	20	-	-
NFC	-	-	-	-	-	2020-08-15	Fukui Trap	FT25	DPF	503824 7976635	-	17W	FT25	-	2020-08-15	16:13	2020-08-20	13:35	117.37	2	Sa	-
761	FHSC	159.0	37.8	U	U	2020-08-15	Fukui Trap	FT26	DPF	503706 7976518	-	17W	FT26	-	2020-08-15	16:30	2020-08-20	13:30	117.00	2	Sa	Released
NFC	-	-	-	-	-	2020-08-15	Fukui Trap	FT27	DPF	503535 7976530	-	17W	FT27	-	2020-08-15	16:35	2020-08-20	13:25	116.83	2	Sa	-
128	ARCH	505.0	1020.0	U	A	2020-07-27	Gill Net	GN01	DPF	502979 7976335	502938 7976419	17W	GN01A	GN01B	2020-07-27	15:45	2020-07-27	17:45	2.00	5	-	Mortality
129	ARCH	599.0	1960.0	M	A	2020-07-27	Gill Net	GN01	DPF	502979 7976335	502938 7976419	17W	GN01A	GN01B	2020-07-27	15:45	2020-07-27	17:45	2.00	5	-	Mortality
130	ARCH	441.0	910.0	U	A	2020-07-27	Gill Net	GN01	DPF	502979 7976335	502938 7976419	17W	GN01A	GN01B	2020-07-27	15:45	2020-07-27	17:45	2.00	5	-	Mortality
131	ARCH	272.0	120.0	U	U	2020-07-27	Gill Net	GN01	DPF	502979 7976335	502938 7976419	17W	GN01A	GN01B	2020-07-27	15:45	2020-07-27	17:45	2.00	5	-	Mortality
132	FHSC	216.0	91.2	U	A	2020-07-27	Gill Net	GN01	DPF	502979 7976335	502938 7976419	17W	GN01A	GN01B	2020-07-27	15:45	2020-07-27	17:45	2.00	5	-	Mortality
133	FHSC	198.0	61.2	U	A	2020-07-27	Gill Net	GN01	DPF	502979 7976335	502938 7976419	17W	GN01A	GN01B	2020-07-27	15:45	2020-07-27	17:45	2.00	5	-	Mortality
134	FHSC	209.0	71.8	U	A	2020-07-27	Gill Net	GN01	DPF	502979 7976335	502938 7976419	17W	GN01A	GN01B	2020-07-27	15:45	2020-07-27	17:45	2.00	5	-	Mortality
135	FHSC	164.0	36.2	U	U	2020-07-27	Gill Net	GN01	DPF	502979 7976335	502938 7976419	17W	GN01A	GN01B	2020-07-27	15:45	2020-07-27	17:45	2.00	5	-	Mortality
136	ARCH	602.0	2320.0	F	A	2020-07-27	Gill Net	GN02	DPF	502717 7976229	502740 7976321	17W	GN02A	GN02B	2020-07-27	15:59	2020-07-27	17:59	2.00	-	-	Mortality
137	ARCH	512.0	1320.0	F	A	2020-07-27	Gill Net	GN02	DPF	502717 7976229	502740 7976321	17W	GN02A	GN02B	2020-07-27	15:59	2020-07-27	17:59	2.00	-	-	Mortality
139	FHSC	173.0	41.0	U	U	2020-07-27	Gill Net	GN02	DPF	502717 7976229	502740 7976321	17W	GN02A	GN02B	2020-07-27	15:59	2020-07-27	17:59	2.00	-	-	Released
140	FHSC	174.0	45.7	U	A	2020-07-27	Gill Net	GN02	DPF	502717 7976229	502740 7976321	17W	GN02A	GN02B	2020-07-27	15:59	2020-07-27	17:59	2.00	-	-	Released
141	FHSC	227.0	114.0	U	A	2020-07-27	Gill Net	GN02	DPF	502717 7976229	502740 7976321	17W	GN02A	GN02B	2020-07-27	15:59	2020-07-27	17:59	2.00	-	-	Released
138	UNSC	120.0	16.4	U	U	2020-07-27	Gill Net	GN02	DPF	502717 7976229	502740 7976321	17W	GN02A	GN02B	2020-07-27	15:59	2020-07-27	17:59	2.00	-	-	Released
NFC	-	-	-	-	-	2020-07-28	Gill Net	GN03	IPF	501830 7976071	501894 7976184	17W	GN03A	GN03B	2020-07-28	10:23	2020-07-28	13:30	3.12	-	-	-
142	SHSC	188.0	52.1	U	U	2020-07-28	Gill Net	GN04	DPF	502787 7976222	502809 7976340	17W	GN04A	GN04B	2020-07-28	11:06	2020-07-28	17:40	6.57	-	-	Released
143	UNSC	135.0	19.5	U	J	2020-07-28	Gill Net	GN04	DPF	502787 7976222	502809 7976340	17W	GN04A	GN04B	2020-07-28	11:06	2020-07-28	17:40	6.57	-	-	Released
144	UNSC	131.0	18.6	U	J	2020-07-28	Gill Net	GN04	DPF	502787 7976222	502809 7976340	17W	GN04A	GN04B	2020-07-28	11:06	2020-07-28	17:40	6.57	-	-	Released
145	FHSC	247.0	150.0	U	U	2020-07-28	Gill Net	GN05	IPF	502495 7976268	502565 7976342	17W	GN05A	GN05B	2020-07-28	11:17	2020-07-28	17:55	6.63	-	Sa	Released
146	ARCH	640.0	2980.0	U	A	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
147	ARCH	395.0	610.0	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
148	ARCH	348.0	480.0	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Euthanized
154	ARCH	558.0	1980.0	F	A	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Euthanized
155	ARCH	491.0	1300.0	U	A	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
156	ARCH	139.0	24.9	U	J	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Mortality
157	ARCH	134.0	21.9	U	J	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
158	ARCH	142.0	30.1	U	J	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Mortality
149	FHSC	261.0	240.0	U	A	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
150	FHSC	192.0	66.6	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
151	FHSC	201.0	67.7	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
160	FHSC	294.0	310.0	U	A	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released

161	FHSC	243.0	110.0	U	A	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
162	FHSC	211.0	79.2	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
163	FHSC	230.0	110.0	U	A	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
164	FHSC	215.0	86.9	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
165	FHSC	214.0	93.7	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
166	FHSC	238.0	112.7	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	Sa, Bo	Released
167	FHSC	193.0	71.8	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
168	FHSC	194.0	67.0	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
169	FHSC	199.0	82.6	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
171	FHSC	185.0	65.2	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
172	FHSC	191.0	73.7	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
173	FHSC	180.0	53.2	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
175	FHSC	189.0	65.8	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
176	FHSC	184.0	59.6	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
177	FHSC	166.0	43.5	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
178	FHSC	196.0	57.1	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
180	FHSC	175.0	46.4	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
181	FHSC	149.0	25.7	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
182	FHSC	157.0	35.6	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
183	FHSC	166.0	39.9	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
186	FHSC	187.0	56.5	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
153	SHSC	152.0	27.7	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
174	SHSC	188.0	62.9	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
179	SHSC	153.0	29.5	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
185	SHSC	130.0	19.2	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
159	STSC	168.0	90.7	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
152	UNSC	150.0	28.7	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
170	UNSC	153.0	28.1	U	J	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
184	UNSC	128.0	18.2	U	U	2020-07-28	Gill Net	GN06	DPF	502999 7976400	502971 7976482	17W	GN06A	GN06B	2020-07-28	14:01	2020-07-28	17:15	3.23	-	-	Released
187	ARCH	652.0	3400.0	M	A	2020-07-29	Gill Net	GN07	DPF	503889 7976639	503833 7976711	17W	GN07A	GN07B	2020-07-29	9:46	2020-07-29	14:30	4.73	-	-	Released
188	ARCH	542.0	1650.0	U	A	2020-07-29	Gill Net	GN07	DPF	503889 7976639	503833 7976711	17W	GN07A	GN07B	2020-07-29	9:46	2020-07-29	14:30	4.73	-	-	Released
189	ARCH	528.0	1420.0	U	A	2020-07-29	Gill Net	GN07	DPF	503889 7976639	503833 7976711	17W	GN07A	GN07B	2020-07-29	9:46	2020-07-29	14:30	4.73	-	-	Mortality
190	ARCH	516.0	1400.0	U	A	2020-07-29	Gill Net	GN07	DPF	503889 7976639	503833 7976711	17W	GN07A	GN07B	2020-07-29	9:46	2020-07-29	14:30	4.73	-	-	Mortality
191	FHSC	226.0	96.0	U	A	2020-07-29	Gill Net	GN07	DPF	503889 7976639	503833 7976711	17W	GN07A	GN07B	2020-07-29	9:46	2020-07-29	14:30	4.73	-	-	Released
192	FHSC	252.0	130.0	U	A	2020-07-29	Gill Net	GN07	DPF	503889 7976639	503833 7976711	17W	GN07A	GN07B	2020-07-29	9:46	2020-07-29	14:30	4.73	-	-	Released
193	FHSC	232.0	925.0	U	A	2020-07-29	Gill Net	GN07	DPF	503889 7976639	503833 7976711	17W	GN07A	GN07B	2020-07-29	9:46	2020-07-29	14:30	4.73	-	-	Released
194	FHSC	182.0	48.3	-	-	2020-07-29	Gill Net	GN07	DPF	503889 7976639	503833 7976711	17W	GN07A	GN07B	2020-07-29	9:46	2020-07-29	14:30	4.73	-	-	Released
195	ARCH	440.0	900.0	U	A	2020-07-29	Gill Net	GN08	DPF	503722 7976368	503761 7976464	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	14:45	4.73	-	-	Mortality
202	ARCH	142.0	22.2	-	-	2020-07-29	Gill Net	GN08	DPF	503722 7976368	503761 7976464	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	14:45	4.73	-	-	Released
204	ARCH	368.0	600.0	-	-	2020-07-29	Gill Net	GN08	DPF	503722 7976368	503761 7976464	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	14:45	4.73	-	-	Released
196	FHSC	172.0	44.5	U	U	2020-07-29	Gill Net	GN08	DPF	503722 7976368	503761 7976464	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	14:45	4.73	-	-	Released
197	FHSC	202.0	77.0	U	A	2020-07-29	Gill Net	GN08	DPF	503722 7976368	503761 7976464	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	14:45	4.73	-	-	Released
198	FHSC	170.0	42.4	U	U	2020-07-29	Gill Net	GN08	DPF	503722 7976368	503761 7976464	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	14:45	4.73	-	-	Released
199	FHSC	160.0	35.3	U	U	2020-07-29	Gill Net	GN08	DPF	503722 7976368	503761 7976464	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	14:45	4.73	-	-	Released
200	FHSC	160.0	36.6	U	U	2020-07-29	Gill Net	GN08	DPF	503722 7976368	503761 7976464	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	14:45	4.73	-	-	Released
201	FHSC	162.0	35.9	U	U	2020-07-29	Gill Net	GN08	DPF	503722 7976368	503761 7976464	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	14:45	4.73	-	-	Released
203	FHSC	118.0	13.2	-	-	2020-07-29	Gill Net	GN08	DPF	503722 7976368	503761 7976464	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	14:45	4.73	-	-	Released
205	FHSC	218.0	101.3	U	A	2020-07-29	Gill Net	GN09	DPF	503722 7976368	-	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	12:00	1.98	-	-	Released
206	FHSC	166.0	41.1	U	U	2020-07-29	Gill Net	GN09	DPF	503722 7976368	-	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	12:00	1.98	-	-	Released
207	FHSC	184.0	59.1	U	U	2020-07-29	Gill Net	GN09	DPF	503722 7976368	-	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	12:00	1.98	-	-	Released
208	FHSC	156.0	35.7	U	U	2020-07-29	Gill Net	GN09	DPF	503722 7976368	-	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	12:00	1.98	-	-	Released
209	FHSC	160.0	37.2	U	U	2020-07-29	Gill Net	GN09	DPF	503722 7976368	-	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	12:00	1.98	-	-	Released
210	FHSC	192.0	57.9	U	A	2020-07-29	Gill Net	GN09	DPF	503722 7976368	-	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	12:00	1.98	-	-	Released
211	FHSC	170.0	47.2	-	-	2020-07-29	Gill Net	GN09	DPF	503722 7976368	-	17W	GN08A	GN08B	2020-07-29	10:01	2020-07-29	12:00	1.98	-	-	Released
212	ARCH	638.0	3260.0	U	A	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Euthanized
213	ARCH	422.0	720.0	U	A	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Released
214	ARCH	338.0	340.0	U	A	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Released
215	ARCH	378.0	460.0	U	A	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Mortality
216	ARCH	420.0	830.0	U	A	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Mortality
217	ARCH	352.0	490.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Mortality
218	ARCH	411.0	860.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Mortality
219	ARCH	480.0	1380.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Euthanized
220	ARCH	355.0	450.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Euthanized
221	ARCH	412.0	880.0	F	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Euthanized
222	ARCH	528.0	1660.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Euthanized
223	ARCH	427.0	870.0	F	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Mortality
224	ARCH	313.0	360.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Euthanized
225	ARCH	314.0	400.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Mortality
231	ARCH	414.0	890.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Released
232	ARCH	326.0	450.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Released

233	ARCH	326.0	350.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Released
226	FHSC	244.0	130.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Released
227	FHSC	260.0	180.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Released
228	FHSC	268.0	210.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Released
229	FHSC	200.0	74.4	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Released
230	FHSC	198.0	61.3	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Released
234	FHSC	314.0	400.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Released
235	FHSC	304.0	310.0	-	-	2020-07-29	Gill Net	GN10	DPF	504084 7976589	504114 7976676	17W	GN10A	GN10B	2020-07-29	7:43	2020-07-29	14:15	6.53	-	-	Released
236	ARCH	623.0	2760.0	U	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Released
237	ARCH	447.0	1100.0	U	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Released
238	ARCH	400.0	740.0	U	U	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Released
239	ARCH	282.0	260.0	U	U	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
246	ARCH	512.0	1700.0	M	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
247	ARCH	430.0	870.0	-	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
251	ARCH	668.0	4040.0	U	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Released
252	ARCH	459.0	1310.0	U	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Released
253	ARCH	478.0	1260.0	U	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Released
254	ARCH	460.0	1320.0	U	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Mortality
255	ARCH	462.0	1240.0	U	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
256	ARCH	432.0	1070.0	U	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
257	ARCH	439.0	940.0	U	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
258	ARCH	409.0	780.0	U	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
259	ARCH	456.0	1370.0	U	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
260	ARCH	366.0	690.0	U	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
261	ARCH	268.0	230.0	U	J	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
240	FHSC	216.0	89.3	F	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
241	FHSC	168.0	37.5	U	U	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Released
242	FHSC	180.0	52.1	U	U	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Released
243	FHSC	201.0	86.6	M	A	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
245	FHSC	199.0	76.1	-	-	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
250	FHSC	252.0	170.0	-	-	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Euthanized
248	NRSL	168.0	16.7	-	-	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Released
244	SHSC	150.0	25.8	U	U	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Released
249	SHSC	144.0	22.4	U	J	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Released
262	SHSC	129.0	15.3	U	J	2020-07-30	Gill Net	GN11	DPF	503026 7976388	502918 7976365	17W	GN11A	GN11B	2020-07-30	8:41	2020-07-30	16:08	7.45	-	-	Released
263	ARCH	636.0	2910.0	U	A	2020-07-30	Gill Net	GN12	DPF	503055 7976426	502979 7976504	17W	GN12A	GN12B	2020-07-20	12:27	2020-07-30	16:20	3.88	-	-	Released
266	FHSC	295.0	260.0	A	F	2020-07-30	Gill Net	GN12	DPF	503055 7976426	502979 7976504	17W	GN12A	GN12B	2020-07-20	12:27	2020-07-30	16:20	3.88	-	-	Euthanized
264	SHSC	164.0	40.2	U	J	2020-07-30	Gill Net	GN12	DPF	503055 7976426	502979 7976504	17W	GN12A	GN12B	2020-07-20	12:27	2020-07-30	16:20	3.88	-	-	Released
267	SHSC	290.0	370.0	U	A	2020-07-30	Gill Net	GN12	DPF	503055 7976426	502979 7976504	17W	GN12A	GN12B	2020-07-20	12:27	2020-07-30	16:20	3.88	-	-	Released
265	UNSC	134.0	18.1	U	J	2020-07-30	Gill Net	GN12	DPF	503055 7976426	502979 7976504	17W	GN12A	GN12B	2020-07-20	12:27	2020-07-30	16:20	3.88	-	-	Released
272	ARCH	302.0	270.0	U	J	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Euthanized
281	ARCH	509.0	1920.0	U	A	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
282	ARCH	366.0	610.0	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
283	ARCH	414.0	760.0	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
284	ARCH	374.0	720.0	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Euthanized
268	FHSC	175.0	47.6	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
269	FHSC	125.0	13.6	U	J	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
270	FHSC	161.0	33.2	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
273	FHSC	219.0	102.0	-	-	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Euthanized
274	FHSC	199.0	70.9	-	-	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Euthanized
275	FHSC	185.0	55.9	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
277	FHSC	185.0	55.1	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
279	FHSC	170.0	51.2	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
280	FHSC	160.0	35.4	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
286	FHSC	184.0	64.6	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
287	FHSC	188.0	58.3	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
288	FHSC	175.0	52.9	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
290	FHSC	182.0	57.0	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
291	FHSC	168.0	36.7	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
292	FHSC	161.0	34.8	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
293	FHSC	183.0	67.0	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
295	FHSC	137.0	23.2	U	J	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
296	FHSC	198.0	65.8	F	A	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Euthanized
297	FHSC	210.0	69.6	F	A	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Euthanized
298	FHSC	194.0	79.7	F	A	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Euthanized
299	FHSC	223.0	110.8	M	A	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Euthanized
300	FHSC	211.0	90.0	F	A	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Euthanized
271	SHSC	191.0	67.3	U	A	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
276	SHSC	186.0	51.9	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
285	SHSC	366.0	720.0	U	A	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released

294	SHSC	194.0	63.4	U	U	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
278	UNSC	122.0	17.6	U	J	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
289	UNSC	129.0	17.3	U	J	2020-08-01	Gill Net	GN13	DPF	503147 7976494	503061 7976545	17W	087	088	2020-08-01	11:00	2020-08-01	16:30	5.50	-	-	Released
393	ARCH	526.0	1620.0	U	A	2020-08-02	Gill Net	GN14	IPF	504832 7976584	504815 7976671	17W	GN014S	GN014E	2020-08-02	12:13	2020-08-02	13:30	1.28	-	-	Released
394	ARCH	380.0	510.0	U	J	2020-08-02	Gill Net	GN14	IPF	504832 7976584	504815 7976671	17W	GN014S	GN014E	2020-08-02	12:13	2020-08-02	13:30	1.28	-	-	Released
395	ARCH	850.0	6110.0	U	A	2020-08-02	Gill Net	GN14	IPF	504832 7976584	504815 7976671	17W	GN014S	GN014E	2020-08-02	12:13	2020-08-02	13:30	1.28	-	-	Released
396	ARCH	425.0	520.0	U	U	2020-08-02	Gill Net	GN14	IPF	504832 7976584	504815 7976671	17W	GN014S	GN014E	2020-08-02	12:13	2020-08-02	13:30	1.28	-	-	Euthanized
397	FHSC	257.0	170.0	F	A	2020-08-02	Gill Net	GN14	IPF	504832 7976584	504815 7976671	17W	GN014S	GN014E	2020-08-02	12:13	2020-08-02	13:30	1.28	-	-	Euthanized
398	FHSC	221.0	104.8	F	A	2020-08-02	Gill Net	GN14	IPF	504832 7976584	504815 7976671	17W	GN014S	GN014E	2020-08-02	12:13	2020-08-02	13:30	1.28	-	-	Euthanized
399	ARCH	350.0	300.0	U	U	2020-08-02	Gill Net	GN15	IPF	504675 7976589	504589 7976625	17W	GN015A	GN015B	2020-08-02	12:32	2020-08-02	15:30	2.97	-	-	Released
400	ARCH	381.0	600.0	U	U	2020-08-02	Gill Net	GN15	IPF	504675 7976589	504589 7976625	17W	GN015A	GN015B	2020-08-02	12:32	2020-08-02	15:30	2.97	-	-	Released
401	ARCH	342.0	410.0	U	U	2020-08-02	Gill Net	GN15	IPF	504675 7976589	504589 7976625	17W	GN015A	GN015B	2020-08-02	12:32	2020-08-02	15:30	2.97	-	-	Released
402	ARCH	361.0	520.0	U	U	2020-08-02	Gill Net	GN15	IPF	504675 7976589	504589 7976625	17W	GN015A	GN015B	2020-08-02	12:32	2020-08-02	15:30	2.97	-	-	Released
403	ARCH	354.0	490.0	U	U	2020-08-02	Gill Net	GN15	IPF	504675 7976589	504589 7976625	17W	GN015A	GN015B	2020-08-02	12:32	2020-08-02	15:30	2.97	-	-	Euthanized
503	ARCH	424.0	940.0	U	U	2020-08-06	Gill Net	GN16	IPF	505229 7977692	505108 7977629	17W	GN16A	GN16B	2020-08-06	15:52	2020-08-06	17:28	1.60	-	-	Released
504	ARCH	496.0	1570.0	U	U	2020-08-06	Gill Net	GN16	IPF	505229 7977692	505108 7977629	17W	GN16A	GN16B	2020-08-06	15:52	2020-08-06	17:28	1.60	-	-	Released
505	ARCH	350.0	460.0	U	U	2020-08-06	Gill Net	GN16	IPF	505229 7977692	505108 7977629	17W	GN16A	GN16B	2020-08-06	15:52	2020-08-06	17:28	1.60	-	-	Euthanized
569	ARCH	859.0	6710.0	M	A	2020-08-08	Gill Net	GN17	DPF	504355 7976465	504369 7976566	17W	GN17S	GN17E	2020-08-08	12:30	2020-08-08	16:35	4.08	-	-	Released
570	ARCH	568.0	2430.0	U	A	2020-08-08	Gill Net	GN17	DPF	504355 7976465	504369 7976566	17W	GN17S	GN17E	2020-08-08	12:30	2020-08-08	16:35	4.08	-	-	Released
571	ARCH	638.0	3990.0	U	A	2020-08-08	Gill Net	GN17	DPF	504355 7976465	504369 7976566	17W	GN17S	GN17E	2020-08-08	12:30	2020-08-08	16:35	4.08	-	-	Released
572	ARCH	321.0	380.0	U	U	2020-08-08	Gill Net	GN17	DPF	504355 7976465	504369 7976566	17W	GN17S	GN17E	2020-08-08	12:30	2020-08-08	16:35	4.08	-	-	Released
573	ARCH	594.0	2550.0	U	U	2020-08-08	Gill Net	GN17	DPF	504355 7976465	504369 7976566	17W	GN17S	GN17E	2020-08-08	12:30	2020-08-08	16:35	4.08	-	-	Released
576	ARCH	452.0	1240.0	-	-	2020-08-08	Gill Net	GN17	DPF	504355 7976465	504369 7976566	17W	GN17S	GN17E	2020-08-08	12:30	2020-08-08	16:35	4.08	-	-	Euthanized
577	ARCH	398.0	750.0	-	-	2020-08-08	Gill Net	GN17	DPF	504355 7976465	504369 7976566	17W	GN17S	GN17E	2020-08-08	12:30	2020-08-08	16:35	4.08	-	-	Euthanized
574	FHSC	184.0	70.6	M	A	2020-08-08	Gill Net	GN17	DPF	504355 7976465	504369 7976566	17W	GN17S	GN17E	2020-08-08	12:30	2020-08-08	16:35	4.08	-	-	Released
575	FHSC	169.0	44.5	M	A	2020-08-08	Gill Net	GN17	DPF	504355 7976465	504369 7976566	17W	GN17S	GN17E	2020-08-08	12:30	2020-08-08	16:35	4.08	-	-	Released
580	ARCH	674.0	3910.0	U	A	2020-08-08	Gill Net	GN18	IPF	504520 7976478	504468 7976557	17W	GN19S	GN19E	2020-08-08	12:44	2020-08-08	16:40	3.93	-	-	Euthanized
581	ARCH	453.0	1140.0	U	A	2020-08-08	Gill Net	GN18	IPF	504520 7976478	504468 7976557	17W	GN19S	GN19E	2020-08-08	12:44	2020-08-08	16:40	3.93	-	-	Euthanized
578	FHSC	226.0	80.0	F	A	2020-08-08	Gill Net	GN18	IPF	504520 7976478	504468 7976557	17W	GN19S	GN19E	2020-08-08	12:44	2020-08-08	16:40	3.93	-	-	Released
579	FHSC	219.0	70.0	F	A	2020-08-08	Gill Net	GN18	IPF	504520 7976478	504468 7976557	17W	GN19S	GN19E	2020-08-08	12:44	2020-08-08	16:40	3.93	-	-	Released
582	FHSC	211.0	90.0	M	A	2020-08-08	Gill Net	GN18	IPF	504520 7976478	504468 7976557	17W	GN19S	GN19E	2020-08-08	12:44	2020-08-08	16:40	3.93	-	-	Released
583	FHSC	212.0	107.9	M	A	2020-08-08	Gill Net	GN18	IPF	504520 7976478	504468 7976557	17W	GN19S	GN19E	2020-08-08	12:44	2020-08-08	16:40	3.93	-	-	Released
620	ARCH	832.0	3830.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
621	ARCH	443.0	1190.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
622	ARCH	380.0	590.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
623	ARCH	403.0	770.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
624	ARCH	414.0	840.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
631	ARCH	435.0	950.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Euthanized
632	ARCH	372.0	570.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Mortality
633	ARCH	581.0	2500.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
634	ARCH	348.0	510.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
635	ARCH	326.0	320.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
636	ARCH	410.0	810.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
637	ARCH	312.0	340.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
638	ARCH	318.0	380.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
639	ARCH	287.0	250.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
640	ARCH	425.0	740.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
641	ARCH	291.0	270.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
642	ARCH	319.0	360.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
643	ARCH	274.0	260.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
644	ARCH	312.0	340.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
645	ARCH	320.0	210.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
648	ARCH	415.0	900.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Euthanized
649	ARCH	383.0	630.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Euthanized
650	ARCH	342.0	460.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Euthanized
625	FHSC	228.0	120.0	F	A	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
627	FHSC	263.0	210.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
628	FHSC	201.0	40.0	F	A	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
630	FHSC	209.0	60.0	F	A	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
646	FHSC	189.0	30.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
647	FHSC	212.0	70.0	F	A	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
626	SHSC	234.0	180.0	-	-	2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
629	SHSC	209.0	120.0			2020-08-09	Gill Net	GN19	IPF	505308 7977985	505247 7977912	17W	GN19S	-	2020-08-09	14:40	2020-08-09	15:15	0.58	-	-	Released
659	ARCH	542.0	1780.0	U	A	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Released
660	ARCH	556.0	2060.0	U	A	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Released
662	ARCH	445.0	790.0	U	U	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Euthanized
663	ARCH	310.0	320.0	U	U	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Euthanized
664	ARCH	472.0	1230.0	U	U	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Euthanized
673	ARCH	409.0	740.0	U	U	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Euthanized
674	ARCH	373.0	500.0	U	U	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Euthanized

675	ARCH	387.0	690.0	U	U	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Euthanized
661	FHSC	216.0	110.0	F	A	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Released
668	FHSC	232.0	120.0	F	A	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Released
669	FHSC	291.0	310.0	F	A	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Released
670	FHSC	264.0	210.0	F	A	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Released
671	FHSC	197.0	50.0	F	A	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Released
672	FHSC	220.0	110.0	F	A	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Released
665	SHSC	234.0	170.0	U	A	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Released
666	SHSC	310.0	400.0	U	A	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Released
667	SHSC	249.0	200.0	U	A	2020-08-11	Gill Net	GN20	DPF	504052 7976620	504077 7976705	17W	GN20S	GN20E	2020-08-11	14:42	2020-08-11	17:10	2.47	-	Sa, Bo	Released
677	ARCH	314.0	290.0	U	U	2020-08-13	Gill Net	GN21	DPF	503931 7976573	503844 7976573	17W	GN21S	GN21E	2020-08-13	11:20	2020-08-13	13:45	2.42	-	Sa	Released
676	FHSC	149.0	25.0	U	A	2020-08-13	Gill Net	GN21	DPF	503931 7976573	503844 7976573	17W	GN21S	GN21E	2020-08-13	11:20	2020-08-13	13:45	2.42	-	Sa	Released
678	ARCH	636.0	3920.0	-	A	2020-08-14	Gill Net	GN22	IPF	504764 7976620	504777 7976709	17W	GN22S	GN22E	2020-08-14	11:35	2020-08-14	15:52	4.28	-	-	Released
679	ARCH	463.0	1240.0	-	A	2020-08-14	Gill Net	GN22	IPF	504764 7976620	504777 7976709	17W	GN22S	GN22E	2020-08-14	11:35	2020-08-14	15:52	4.28	-	-	Released
680	ARCH	468.0	1230.0	-	-	2020-08-14	Gill Net	GN22	IPF	504764 7976620	504777 7976709	17W	GN22S	GN22E	2020-08-14	11:35	2020-08-14	15:52	4.28	-	-	Released
681	ARCH	281.0	280.0	-	-	2020-08-14	Gill Net	GN22	IPF	504764 7976620	504777 7976709	17W	GN22S	GN22E	2020-08-14	11:35	2020-08-14	15:52	4.28	-	-	Released
682	ARCH	346.0	470.0	-	-	2020-08-14	Gill Net	GN22	IPF	504764 7976620	504777 7976709	17W	GN22S	GN22E	2020-08-14	11:35	2020-08-14	15:52	4.28	-	-	Released
683	ARCH	309.0	340.0	-	-	2020-08-14	Gill Net	GN22	IPF	504764 7976620	504777 7976709	17W	GN22S	GN22E	2020-08-14	11:35	2020-08-14	15:52	4.28	-	-	Released
684	ARCH	382.0	530.0	-	-	2020-08-14	Gill Net	GN22	IPF	504764 7976620	504777 7976709	17W	GN22S	GN22E	2020-08-14	11:35	2020-08-14	15:52	4.28	-	-	Released
685	ARCH	515.0	1680.0	-	-	2020-08-14	Gill Net	GN22	IPF	504764 7976620	504777 7976709	17W	GN22S	GN22E	2020-08-14	11:35	2020-08-14	15:52	4.28	-	-	Released
686	ARCH	395.0	760.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
687	ARCH	424.0	1100.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
688	ARCH	352.0	520.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
693	ARCH	436.0	1120.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Euthanized
694	ARCH	587.0	2430.0	-	A	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
695	ARCH	359.0	540.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
696	ARCH	420.0	1020.0		-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
697	ARCH	409.0	820.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
699	ARCH	160.0	10.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
700	ARCH	449.0	1200.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Euthanized
701	ARCH	266.0	130.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Euthanized
702	ARCH	275.0	110.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Euthanized
703	ARCH	318.0	140.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
704	ARCH	340.0	230.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
705	ARCH	475.0	1240.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
706	ARCH	330.0	420.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
707	ARCH	360.0	510.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
708	ARCH	308.0	310.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
709	ARCH	298.0	250.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Euthanized
689	FHSC	241.0	200.0	F	A	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
691	FHSC	245.0	170.0	F	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
690	SHSC	264.0	280.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
692	SHSC	262.0	280.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
698	SHSC	126.0	40.0	-	-	2020-08-14	Gill Net	GN23A	IPF	505158 7976925	505078 7976930	17W	GN23S	GN23E	2020-08-14	11:40	2020-08-14	16:00	4.33	-	-	Released
729	FHSC	177.0	40.0	F	-	2020-08-15	Gill Net	GN23B	DPF	503501 7976433	503500 7976516	17W	GN23S	GN23E	2020-08-15	9:10	2020-08-15	12:30	3.33	-	Sa, Bo	Released
730	FHSC	181.0	40.0	F	-	2020-08-15	Gill Net	GN23B	DPF	503501 7976433	503500 7976516	17W	GN23S	GN23E	2020-08-15	9:10	2020-08-15	12:30	3.33	-	Sa, Bo	Released
731	FHSC	257.0	170.0	F	-	2020-08-15	Gill Net	GN23B	DPF	503501 7976433	503500 7976516	17W	GN23S	GN23E	2020-08-15	9:10	2020-08-15	12:30	3.33	-	Sa, Bo	Released
732	FHSC	179.0	40.0	M	-	2020-08-15	Gill Net	GN23B	DPF	503501 7976433	503500 7976516	17W	GN23S	GN23E	2020-08-15	9:10	2020-08-15	12:30	3.33	-	Sa, Bo	Released
733	FHSC	214.0	90.0	M	-	2020-08-15	Gill Net	GN23B	DPF	503501 7976433	503500 7976516	17W	GN23S	GN23E	2020-08-15	9:10	2020-08-15	12:30	3.33	-	Sa, Bo	Released
734	FHSC	178.0	40.0	M	-	2020-08-15	Gill Net	GN23B	DPF	503501 7976433	503500 7976516	17W	GN23S	GN23E	2020-08-15	9:10	2020-08-15	12:30	3.33	-	Sa, Bo	Released
735	FHSC	145.0	20.0	M	-	2020-08-15	Gill Net	GN23B	DPF	503501 7976433	503500 7976516	17W	GN23S	GN23E	2020-08-15	9:10	2020-08-15	12:30	3.33	-	Sa, Bo	Released
736	FHSC	224.0	130.0	F	-	2020-08-15	Gill Net	GN23B	DPF	503501 7976433	503500 7976516	17W	GN23S	GN23E	2020-08-15	9:10	2020-08-15	12:30	3.33	-	Sa, Bo	Released
737	FHSC	178.0	40.0	M	-	2020-08-15	Gill Net	GN23B	DPF	503501 7976433	503500 7976516	17W	GN23S	GN23E	2020-08-15	9:10	2020-08-15	12:30	3.33	-	Sa, Bo	Released
738	FHSC	158.0	30.0	F	-	2020-08-15	Gill Net	GN23B	DPF	503501 7976433	503500 7976516	17W	GN23S	GN23E	2020-08-15	9:10	2020-08-15	12:30	3.33	-	Sa, Bo	Released
739	FHSC	202.0	89.7	F	-	2020-08-15	Gill Net	GN23B	DPF	503501 7976433	503500 7976516	17W	GN23S	GN23E	2020-08-15	9:10	2020-08-15	12:30	3.33	-	Sa, Bo	Released
740	FHSC	163.0	40.9	M	-	2020-08-15	Gill Net	GN23B	DPF	503501 7976433	503500 7976516	17W	GN23S	GN23E	2020-08-15	9:10	2020-08-15	12:30	3.33	-	Sa, Bo	Released
741	ARCH	542.0	2120.0	-	A	2020-08-15	Gill Net	GN24	DPF	503291 7976526	503373 7976516	17W	GN24S	GN24E	2020-08-15	9:15	2020-08-15	12:35	3.33	-	Sa, Bo	Released
742	ARCH	548.0	2160.0	-	A	2020-08-15	Gill Net	GN24	DPF	503291 7976526	503373 7976516	17W	GN24S	GN24E	2020-08-15	9:15	2020-08-15	12:35	3.33	-	Sa, Bo	Euthanized
745	ARCH	175.0	65.2	-	-	2020-08-15	Gill Net	GN24	DPF	503291 7976526	503373 7976516	17W	GN24S	GN24E	2020-08-15	9:15	2020-08-15	12:35	3.33	-	Sa, Bo	Released
749	ARSC	143.0	39.4	-	-	2020-08-15	Gill Net	GN24	DPF	503291 7976526	503373 7976516	17W	GN24S	GN24E	2020-08-15	9:15	2020-08-15	12:35	3.33	-	Sa, Bo	Released
743	FHSC	210.0	90.0	F	-	2020-08-15	Gill Net	GN24	DPF	503291 7976526	503373 7976516	17W	GN24S	GN24E	2020-08-15	9:15	2020-08-15	12:35	3.33	-	Sa, Bo	Released
744	FHSC	208.0	90.0	M	-	2020-08-15	Gill Net	GN24	DPF	503291 7976526	503373 7976516	17W	GN24S	GN24E	2020-08-15	9:15	2020-08-15	12:35	3.33	-	Sa, Bo	Released
746	FHSC	162.0	37.1	M	-	2020-08-15	Gill Net	GN24	DPF	503291 7976526	503373 7976516	17W	GN24S	GN24E	2020-08-15	9:15	2020-08-15	12:35	3.33	-	Sa, Bo	Released
747	FHSC	207.0	80.5	F	-	2020-08-15	Gill Net	GN24	DPF	503291 7976526	503373 7976516	17W	GN24S	GN24E	2020-08-15	9:15	2020-08-15	12:35	3.33	-	Sa, Bo	Released
748	FHSC	201.0	73.5	M	-	2020-08-15	Gill Net	GN24	DPF	503291 7976526	503373 7976516	17W	GN24S	GN24E	2020-08-15	9:15	2020-08-15	12:35	3.33	-	Sa, Bo	Released
750	FHSC	146.0	32.7	M	-	2020-08-15	Gill Net	GN24	DPF	503291 7976526	503373 7976516	17W	GN24S	GN24E	2020-08-15	9:15	2020-08-15	12:35	3.33	-	Sa, Bo	Released
81	FHSC	186.0	52.6	U	U	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
82	FHSC	190.0	72.5	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
83	FHSC	178.0	49.5	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
84	FHSC	172.0	43.8	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released

85	FHSC	205.0	91.5	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
86	FHSC	230.0	100.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
87	FHSC	160.0	33.4	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
88	FHSC	204.0	92.5	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
89	FHSC	235.0	106.7	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
90	FHSC	-	340.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Mortality
91	FHSC	307.0	290.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
92	FHSC	268.0	200.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
93	FHSC	261.0	130.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
94	FHSC	214.0	84.9	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
95	FHSC	231.0	110.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
96	FHSC	190.0	65.3	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
97	FHSC	231.0	130.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
98	FHSC	174.0	62.5	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
99	FHSC	146.0	26.6	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
100	FHSC	180.0	54.4	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
101	FHSC	139.0	24.4	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
102	FHSC	214.0	99.1	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
104	FHSC	182.0	58.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Mortality
105	FHSC	248.0	120.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
106	FHSC	178.0	51.7	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
107	FHSC	290.0	270.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
108	FHSC	230.0	120.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
110	FHSC	232.0	112.5	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
111	FHSC	192.0	67.9	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
112	FHSC	270.0	250.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
113	FHSC	238.0	130.0	-	-	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
114	FHSC	230.0	150.0	-	-	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
115	FHSC	198.0	79.7	-	-	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
116	FHSC	242.0	140.0	-	-	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
117	FHSC	246.0	160.0	-	-	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
118	FHSC	284.0	220.0	-	-	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
119	FHSC	276.0	250.0	-	-	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
120	FHSC	244.0	140.0	-	-	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
121	FHSC	198.0	66.2	-	-	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
109	SHSC	184.0	64.1	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
80	UNSC	97.0	6.2	U	U	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
103	UNSC	153.0	31.0	U	A	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
122	UNSC	150.0	30.9	-	-	2020-07-24	Hoop Net	HN01	DPF	503013 7976410	-	17W	HN01	-	2020-07-24	12:56	2020-07-28	14:10	97.23	-	Sa,Co	Released
123	FHSC	151.0	28.3	-	-	2020-07-24	Hoop Net	HN02	DPF	503050 7976438	-	17W	HN02	-	2020-07-24	13:05	2020-07-28	14:05	97.00	-	-	Released
124	FHSC	170.0	42.6	-	-	2020-07-24	Hoop Net	HN02	DPF	503050 7976438	-	17W	HN02	-	2020-07-24	13:05	2020-07-28	14:05	97.00	-	-	Released
125	FHSC	160.0	34.4	-	-	2020-07-24	Hoop Net	HN02	DPF	503050 7976438	-	17W	HN02	-	2020-07-24	13:05	2020-07-28	14:05	97.00	-	-	Mortality
126	FHSC	165.0	43.1	-	-	2020-07-24	Hoop Net	HN02	DPF	503050 7976438	-	17W	HN02	-	2020-07-24	13:05	2020-07-28	14:05	97.00	-	-	Mortality
127	FHSC	174.0	67.1	-	-	2020-07-24	Hoop Net	HN02	DPF	503050 7976438	-	17W	HN02	-	2020-07-24	13:05	2020-07-28	14:05	97.00	-	-	Mortality
311	FHSC	190.0	56.4	U	A	2020-07-28	Hoop Net	HN03	DPF	504015 7976580	-	17W	HN03	-	2020-07-28	16:08	2020-07-31	15:12	71.07	-	-	Released
310	SHSC	159.0	32.9	U	J	2020-07-28	Hoop Net	HN03	DPF	504015 7976580	-	17W	HN03	-	2020-07-28	16:08	2020-07-31	15:12	71.07	-	Sa,Gr,Co	Released
312	SHSC	177.0	36.1	-	-	2020-07-28	Hoop Net	HN04	DPF	504128 7976549	-	17W	HN04	-	2020-07-28	16:19	2020-07-31	15:02	70.72	1	Sa,Gr	Released
408	FHSC	180.0	46.9	U	U	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
409	FHSC	147.0	23.6	U	J	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
410	FHSC	210.0	81.2	F	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Euthanized
412	FHSC	175.0	48.7	U	U	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
413	FHSC	211.0	89.1	M	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Euthanized
414	FHSC	194.0	65.4	F	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Euthanized
415	FHSC	209.0	79.0	F	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Euthanized
416	FHSC	174.0	42.1	U	U	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
417	FHSC	182.0	59.0	U	U	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
418	FHSC	189.0	80.2	M	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Euthanized
419	FHSC	276.0	230.0	F	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Euthanized
420	FHSC	190.0	70.7	M	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Euthanized
421	FHSC	230.0	125.9	F	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Euthanized
422	FHSC	216.0	91.2	M	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Euthanized
423	FHSC	229.0	120.0	F	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
424	FHSC	217.0	101.1	M	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
425	FHSC	274.0	190.0	M	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
426	FHSC	219.0	102.2	M	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
427	FHSC	231.0	130.0	M	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
428	FHSC	166.0	36.5	U	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
429	FHSC	225.0	107.6	M	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
411	GRCD	472.0	1260.0	U	A	2020-07-31	Hoop Net	HN05	DPF	503012 7976410	-	17W	HN05	0	2020-07-31	15:36	2020-08-04	8:50	89.23	-	Sa,Co,Bo	Released
404	FHSC	172.0	46.5	U	U	2020-07-31	Hoop Net	HN06	DPF	503138 7976474	-	17W	HN06	-	2020-07-31	15:50	2020-08-04	8:50	89.00	1	Sa, Bo	Released

405	FHSC	161.0	41.2	U	U	2020-07-31	Hoop Net	HN06	DPF	503138 7976474	-	17W	HN06	-	2020-07-31	15:50	2020-08-04	8:50	89.00	1	Sa, Bo	Euthanized
406	FHSC	223.0	113.9	F	A	2020-07-31	Hoop Net	HN06	DPF	503138 7976474	-	17W	HN06	-	2020-07-31	15:50	2020-08-04	8:50	89.00	1	Sa, Bo	Euthanized
407	FHSC	179.0	50.2	U	A	2020-07-31	Hoop Net	HN06	DPF	503138 7976474	-	17W	HN06	-	2020-07-31	15:50	2020-08-04	8:50	89.00	1	Sa, Bo	Released
NFC	-	-	-	-	-	2020-08-01	Hoop Net	HN07	DPF	503004 7976372	-	17W	HN07	-	2020-08-01	10:19	2020-08-04	8:50	70.52	1	Co	-
651	GRCD	459.0	2300.0	U	A	2020-08-02	Hoop Net	HN08	IPF	504939 7976888	-	17W	HN08	-	2020-08-02	12:09	2020-08-11	11:20	215.18	30	-	Released
755	FHSC	180.0	45.3	U	U	2020-08-06	Hoop Net	HN09	IPF	504566 7976653	-	17W	HN09	-	2020-08-06	9:12	2020-08-20	13:05	339.88	1	Bo,Sa	Released
756	FHSC	161.0	38.5	-	-	2020-08-06	Hoop Net	HN09	IPF	504566 7976653	-	17W	HN09	-	2020-08-06	9:12	2020-08-20	13:05	339.88	1	Bo,Sa	Released
757	ARCH	191.0	79.6	U	J	2020-08-06	Hoop Net	HN10	IPF	504588 7976654	-	17W	HN10	-	2020-08-06	9:25	2020-08-20	13:00	339.58	1	Bo,Sa	Euthanized
758	FHSC	163.0	33.2	U	U	2020-08-06	Hoop Net	HN10	IPF	504588 7976654	-	17W	HN10	-	2020-08-06	9:25	2020-08-20	13:00	339.58	1	Bo,Sa	Released
760	ARSC	274.0	200.0	U	A	2020-08-11	Hoop Net	HN11	IPF	505362 7978186	-	17W	HN11	-	2020-08-11	12:10	2020-08-20	8:50	212.67	30	-	Released
759	GRCD	488.0	1180.0	U	A	2020-08-11	Hoop Net	HN11	IPF	505362 7978186	-	17W	HN11	-	2020-08-11	12:10	2020-08-20	8:50	212.67	30	-	Released
1	FHSC	134.0	20.3	U	U	2020-07-24	Seine Net	SN01	DPF	503009 7976382	502986 7976340	17W	SN01A	SN01B	2020-07-24	13:34	2020-07-24	13:43	0.15	-	-	Released
2	FHSC	134.0	16.6	U	U	2020-07-24	Seine Net	SN01	DPF	503009 7976382	502986 7976340	17W	SN01A	SN01B	2020-07-24	13:34	2020-07-24	13:43	0.15	-	-	Released
4	FHSC	130.0	18.9	U	U	2020-07-24	Seine Net	SN01	DPF	503009 7976382	502986 7976340	17W	SN01A	SN01B	2020-07-24	13:34	2020-07-24	13:43	0.15	-	-	Released
3	UNSC	90.0	5.2	U	J	2020-07-24	Seine Net	SN01	DPF	503009 7976382	502986 7976340	17W	SN01A	SN01B	2020-07-24	13:34	2020-07-24	13:43	0.15	-	-	Released
5	UNSC	87.0	5.1	U	J	2020-07-24	Seine Net	SN01	DPF	503009 7976382	502986 7976340	17W	SN01A	SN01B	2020-07-24	13:34	2020-07-24	13:43	0.15	-	-	Released
6	UNSC	91.0	6.0	U	J	2020-07-24	Seine Net	SN01	DPF	503009 7976382	502986 7976340	17W	SN01A	SN01B	2020-07-24	13:34	2020-07-24	13:43	0.15	-	-	Released
7	UNSC	95.0	7.0	U	J	2020-07-24	Seine Net	SN01	DPF	503009 7976382	502986 7976340	17W	SN01A	SN01B	2020-07-24	13:34	2020-07-24	13:43	0.15	-	-	Released
8	UNSC	113.0	9.0	U	J	2020-07-24	Seine Net	SN01	DPF	503009 7976382	502986 7976340	17W	SN01A	SN01B	2020-07-24	13:34	2020-07-24	13:43	0.15	-	-	Released
9	UNSC	95.0	6.2	U	J	2020-07-24	Seine Net	SN01	DPF	503009 7976382	502986 7976340	17W	SN01A	SN01B	2020-07-24	13:34	2020-07-24	13:43	0.15	-	-	Released
10	UNSC	89.0	5.2	U	J	2020-07-24	Seine Net	SN01	DPF	503009 7976382	502986 7976340	17W	SN01A	SN01B	2020-07-24	13:34	2020-07-24	13:43	0.15	-	-	Released
11	UNSC	80.0	3.3	U	J	2020-07-24	Seine Net	SN01	DPF	503009 7976382	502986 7976340	17W	SN01A	SN01B	2020-07-24	13:34	2020-07-24	13:43	0.15	-	-	Released
12	UNSC	80.0	3.4	U	J	2020-07-24	Seine Net	SN01	DPF	503009 7976382	502986 7976340	17W	SN01A	SN01B	2020-07-24	13:34	2020-07-24	13:43	0.15	-	-	Released
13	FHSC	187.0	65.0	U	A	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
14	FHSC	193.0	54.0	U	A	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
15	UNSC	135.0	19.6	U	J	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
16	UNSC	125.0	15.3	U	J	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
17	UNSC	127.0	17.2	U	J	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
18	UNSC	81.0	3.9	U	J	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
19	UNSC	80.0	4.0	U	J	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
20	UNSC	71.0	2.9	U	J	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
21	UNSC	78.0	3.1	U	J	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
22	UNSC	80.0	3.6	U	J	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
23	UNSC	80.0	3.8	U	J	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
24	UNSC	81.0	4.0	U	J	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
25	UNSC	72.0	2.6	U	J	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
26	UNSC	65.0	2.4	U	J	2020-07-24	Seine Net	SN02	DPF	502973 7976348	502937 7976296	17W	SN02A	SN02B	2020-07-24	14:31	2020-07-24	14:40	0.15	-	-	Released
27	FHSC	177.0	37.9	U	U	2020-07-24	Seine Net	SN03	DPF	502924 7976300	502896 7976256	17W	SN03A	SN03B	2020-07-24	14:43	2020-07-24	14:49	0.10	-	-	Released
30	FHSC	142.0	22.3	U	U	2020-07-24	Seine Net	SN03	DPF	502924 7976300	502896 7976256	17W	SN03A	SN03B	2020-07-24	14:43	2020-07-24	14:49	0.10	-	-	Released
28	UNSC	131.0	17.7	U	J	2020-07-24	Seine Net	SN03	DPF	502924 7976300	502896 7976256	17W	SN03A	SN03B	2020-07-24	14:43	2020-07-24	14:49	0.10	-	-	Released
29	UNSC	94.0	5.9	U	J	2020-07-24	Seine Net	SN03	DPF	502924 7976300	502896 7976256	17W	SN03A	SN03B	2020-07-24	14:43	2020-07-24	14:49	0.10	-	-	Released
31	UNSC	91.0	5.6	U	J	2020-07-24	Seine Net	SN03	DPF	502924 7976300	502896 7976256	17W	SN03A	SN03B	2020-07-24	14:43	2020-07-24	14:49	0.10	-	-	Released
32	UNSC	88.0	4.9	U	J	2020-07-24	Seine Net	SN03	DPF	502924 7976300	502896 7976256	17W	SN03A	SN03B	2020-07-24	14:43	2020-07-24	14:49	0.10	-	-	Released
33	UNSC	106.0	9.3	U	J	2020-07-24	Seine Net	SN03	DPF	502924 7976300	502896 7976256	17W	SN03A	SN03B	2020-07-24	14:43	2020-07-24	14:49	0.10	-	-	Released
34	UNSC	133.0	17.8	U	J	2020-07-24	Seine Net	SN03	DPF	502924 7976300	502896 7976256	17W	SN03A	SN03B	2020-07-24	14:43	2020-07-24	14:49	0.10	-	-	Released
NFC	-	-	-	-	-	2020-07-24	Seine Net	SN04	DPF	502885 7976257	502841 7976218	17W	SN04A	SN04B	2020-07-24	15:13	2020-07-24	15:18	0.08	-	-	-
35	UNSC	80.0	3.3	U	J	2020-07-24	Seine Net	SN05	DPF	502830 7976228	502775 7976222	17W	SN05A	SN05B	2020-07-24	15:20	2020-07-24	15:25	0.08	-	-	Released
36	UNSC	79.0	2.9	U	J	2020-07-24	Seine Net	SN05	DPF	502830 7976228	502775 7976222	17W	SN05A	SN05B	2020-07-24	15:20	2020-07-24	15:25	0.08	-	-	Released
37	UNSC	71.0	2.6	U	J	2020-07-24	Seine Net	SN05	DPF	502830 7976228	502775 7976222	17W	SN05A	SN05B	2020-07-24	15:20	2020-07-24	15:25	0.08	-	-	Released
38	UNSC	128.0	16.6	U	J	2020-07-24	Seine Net	SN05	DPF	502830 7976228	502775 7976222	17W	SN05A	SN05B	2020-07-24	15:20	2020-07-24	15:25	0.08	-	-	Released
39	FHSC	163.0	46.5	U	U	2020-07-24	Seine Net	SN06	DPF	502769 7976233	502716 7976225	17W	SN06A	SN06B	2020-07-24	15:32	2020-07-24	15:37	0.08	-	-	Released
40	UNSC	115.0	11.4	U	U	2020-07-24	Seine Net	SN06	DPF	502769 7976233	502716 7976225	17W	SN06A	SN06B	2020-07-24	15:32	2020-07-24	15:37	0.08	-	-	Released
41	UNSC	84.0	5.4	U	U	2020-07-24	Seine Net	SN06	DPF	502769 7976234	502716 7976226	17W	SN06A	SN06B	2020-07-24	15:32	2020-07-24	15:37	0.08	-	-	Released
44	FHSC	144.0	23.4	U	U	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
45	FHSC	126.0	15.9	U	U	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
46	FHSC	92.0	6.0	U	U	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
47	FHSC	93.0	5.8	U	U	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
48	FHSC	87.0	5.1	U	U	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
50	FHSC	85.0	3.9	U	U	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
51	FHSC	84.0	3.9	U	U	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
52	FHSC	78.0	3.3	U	U	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
53	FHSC	84.0	3.7	U	U	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
54	FHSC	86.0	4.6	U	U	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
55	FHSC	72.0	2.6	U	J	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
56	FHSC	73.0	2.8	U	-	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
42	NRSL	132.0	6.3	U	A	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
43	NRSL	140.0	6.6	U	A	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
49	UNSC	80.0	3.8	U	U	2020-07-24	Seine Net	SN07	DPF	503058 7976461	503137 7976466	17W	SN07A	SN07B	2020-07-24	10:01	2020-07-24	10:10	0.15	-	-	Released
57	FHSC	123.0	14.1	U	A	2020-07-25	Seine Net	SN08	DPF	503007 7976428	503041 7976434	17W	SN08A	SN08B	2020-07-25	11:18	2020-07-25	11:29	0.18	-	-	Released
58	FHSC	115.0	11.1	U	A	2020-07-25	Seine Net	SN08	DPF	503007 7976428	503041 7976434	17W	SN08A	SN08B	2020-07-25	11:18	2020-07-25	11:29	0.18	-	-	Released

59	FHSC	83.0	4.1	U	A	2020-07-25	Seine Net	SN08	DPF	503007 7976428	503041 7976434	17W	SN08A	SN08B	2020-07-25	11:18	2020-07-25	11:29	0.18	-	-	Released
60	FHSC	87.0	4.8	U	A	2020-07-25	Seine Net	SN08	DPF	503007 7976428	503041 7976434	17W	SN08A	SN08B	2020-07-25	11:18	2020-07-25	11:29	0.18	-	-	Released
61	NRSL	-	-	-	J	2020-07-25	Seine Net	SN08	DPF	503007 7976428	503041 7976434	17W	SN08A	SN08B	2020-07-25	11:18	2020-07-25	11:29	0.18	-	-	Mortality
NFC	-	-	-	-	-	2020-07-26	Seine Net	SN09	DPF	504126 7976538	504166 7976515	17W	SN09S	SN09E	2020-07-26	13:22	2020-07-26	13:26	0.07	-	-	-
62	UNSC	11.0	<0.5	U	J	2020-07-26	Seine Net	SN10	DPF	504173 7976520	504223 7976496	17W	SN10S	SN10E	2020-07-26	13:28	2020-07-26	13:31	0.05	-	-	Released
63	ARCH	132.0	18.7	U	J	2020-07-26	Seine Net	SN11	DPF	504224 7976499	504277 7976480	17W	SN11S	SN11E	2020-07-26	13:42	2020-07-26	13:46	0.07	-	-	Released
64	UNSC	118.0	13.0	U	J	2020-07-26	Seine Net	SN12	DPF	504064 7976542	504006 7976560	17W	SN12S	SN12E	2020-07-26	14:06	2020-07-26	14:10	0.07	-	-	Released
65	UNSC	113.0	11.3	U	J	2020-07-26	Seine Net	SN12	DPF	504064 7976542	504006 7976560	17W	SN12S	SN12E	2020-07-26	14:06	2020-07-26	14:10	0.07	-	-	Released
66	UNSC	31.0	0.5	U	J	2020-07-29	Seine Net	SN13	DPF	503930 7976441	503889 7976374	17W	SN13S	SN13E	2020-07-29	9:55	2020-07-29	10:10	0.08	-	-	Released
67	UNSC	22.0	<0.5	U	J	2020-07-29	Seine Net	SN13	DPF	503930 7976441	503889 7976374	17W	SN13S	SN13E	2020-07-29	9:55	2020-07-29	10:10	0.08	-	-	Released
68	UNSC	27.0	<0.5	U	J	2020-07-29	Seine Net	SN13	DPF	503930 7976441	503889 7976374	17W	SN13S	SN13E	2020-07-29	9:55	2020-07-29	10:10	0.08	-	-	Released
69	UNSC	30.0	<0.5	U	J	2020-07-29	Seine Net	SN13	DPF	503930 7976441	503889 7976374	17W	SN13S	SN13E	2020-07-29	9:55	2020-07-29	10:10	0.08	-	-	Released
70	UNSC	25.0	<0.5	U	J	2020-07-29	Seine Net	SN13	DPF	503930 7976441	503889 7976374	17W	SN13S	SN13E	2020-07-29	9:55	2020-07-29	10:10	0.08	-	-	Released
71	UNSC	30.0	<0.5	U	J	2020-07-29	Seine Net	SN13	DPF	503930 7976441	503889 7976374	17W	SN13S	SN13E	2020-07-29	9:55	2020-07-29	10:10	0.08	-	-	Released
72	UNSC	23.0	<0.5	U	J	2020-07-29	Seine Net	SN13	DPF	503930 7976441	503889 7976374	17W	SN13S	SN13E	2020-07-29	9:55	2020-07-29	10:10	0.08	-	-	Released
73	UNSC	-	<0.5	U	J	2020-07-29	Seine Net	SN13	DPF	503930 7976441	503889 7976374	17W	SN13S	SN13E	2020-07-29	9:55	2020-07-29	10:10	0.08	-	-	Mortality
74	UNSC	-	<0.5	U	J	2020-07-29	Seine Net	SN13	DPF	503930 7976441	503889 7976374	17W	SN13S	SN13E	2020-07-29	9:55	2020-07-29	10:10	0.08	-	-	Mortality
75	UNSC	27.0	<0.5	U	J	2020-07-29	Seine Net	SN13	DPF	503930 7976441	503889 7976374	17W	SN13S	SN13E	2020-07-29	9:55	2020-07-29	10:10	0.08	-	-	Mortality
76	UNSC	28.0	<0.5	U	J	2020-07-29	Seine Net	SN13	DPF	503930 7976441	503889 7976374	17W	SN13S	SN13E	2020-07-29	9:55	2020-07-29	10:10	0.08	-	-	Mortality
77	UNSC	24.0	<0.5	U	J	2020-07-29	Seine Net	SN13	DPF	503930 7976441	503889 7976374	17W	SN13S	SN13E	2020-07-29	9:55	2020-07-29	10:10	0.08	-	-	Mortality
NFC	-	-	-	-	-	2020-07-29	Seine Net	SN14	DPF	503883 7976374	503815 7976343	17W	SN14S	SN14E	2020-07-29	10:08	2020-07-29	10:12	0.07	-	-	-
78	UNSC	80.0	3.4	U	J	2020-07-29	Seine Net	SN15	DPF	503807 7976346	503729 7976350	17W	SN15S	SN15E	2020-07-29	10:14	2020-07-29	10:20	0.10	-	-	Released
79	UNSC	91.0	6.5	U	J	2020-07-29	Seine Net	SN16	DPF	503716 7976364	503647 7976378	17W	SN16S	SN16E	2020-07-29	10:43	2020-07-29	10:47	0.07	-	-	Released
NFC	-	-	-	-	-	2020-07-29	Seine Net	SN17	DPF	503640 7976387	503569 7976405	17W	SN17S	SN17E	2020-07-29	11:16	2020-07-29	11:21	0.08	-	-	-
NFC	-	-	-	-	-	2020-07-29	Seine Net	SN18	DPF	503568 7976404	503470 7976434	17W	SN18S	SN18E	2020-07-29	11:38	2020-07-29	11:47	0.15	-	-	-
843	STSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Mortality
844	STSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
845	STSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
846	STSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
847	STSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
848	STSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
849	STSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
850	STSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
851	STSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
852	STSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
764	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Mortality
765	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Mortality
766	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
767	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
768	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
769	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
770	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
771	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
772	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
773	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
774	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
775	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
776	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
777	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
778	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
779	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
780	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
781	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
782	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
783	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
784	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
785	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
786	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
787	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
788	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
789	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
790	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
791	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
792	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
793	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
794	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
795	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
796	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
797	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
798	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released

799	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
800	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
801	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
802	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
803	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
804	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
805	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
806	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
807	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
808	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
809	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
810	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
811	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
812	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
813	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
814	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
815	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
816	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
817	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
818	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
819	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
820	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
821	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
822	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
823	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
824	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
825	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
826	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
827	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
828	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
829	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
830	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
831	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Mortality
832	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Mortality
833	POCD	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
834	UNSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Mortality
835	UNSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Mortality
836	UNSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
837	UNSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
838	UNSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
839	UNSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
840	UNSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
841	UNSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released
842	UNSC	-	-	U	J	2020-08-13	Trawling	TRL01	IPF	501962 7976503	502402 7976580	17W	TR01S	TR01E	2020-08-13	16:11	2020-08-13	16:27	0.27	23-27 m	Sa	Released

[1] NFC = no fish caught

[2] ARCH = Arctic char; ARSC = Arctic sculpin; FHSC = Fourhorn sculpin; FLSB = Fourline snakeblenny; GRCD = Greenland cod; NRSL = Northern sandlance; POCD = Polar cod; SHSC = Shorthorn sculpin; STSC = Arctic staghorn sculpin; UNSC = Unknown sculpin

[3] DPF = direct project footprint; IPF = indirect project footprint

[4] Bo = Boulder; Co = Cobble; Gr = Gravel; Sa = Sand

Appendix 6B
Table 3. 2021 Fishing Catch Data, Milne Inlet

Fish Number[1]	Species Code[2]	Length (mm)	Weight (g)	Sex	Stage	Date	Capture Method	Site	Area[3]	Start UTM (NAD 83)	End UTM (NAD 83)	Zone	Start Waypoint	End Waypoint	Start/Set Date	Start Time	End/Pull Date	End Time	Total Hours	Average Water Depth (m)	Substrate Type[4]	Released / Mortality / Euthanized
1	GRCD	532.0	1690.0	U	A	06-Aug-21	Angling - Jigging	AN01	DPF	503217 7976600	-	17W	AN01	-	2021-08-06	12:28	2021-08-06	12:50	0.37	15	Bo	Released
2	GRCD	475.0	1352.0	U	A	06-Aug-21	Angling - Jigging	AN01	DPF	503217 7976600	-	17W	AN01	-	2021-08-06	12:28	2021-08-06	12:50	0.37	15	Bo	Released
3	GRCD	554.0	1876.0	U	A	06-Aug-21	Angling - Jigging	AN01	DPF	503217 7976600	-	17W	AN01	-	2021-08-06	12:28	2021-08-06	12:50	0.37	15	Bo	Released
4	GRCD	476.0	1173.0	U	A	06-Aug-21	Angling - Jigging	AN01	DPF	503217 7976600	-	17W	AN01	-	2021-08-06	12:28	2021-08-06	12:50	0.37	15	Bo	Released
5	GRCD	590.0	2890.0	U	A	06-Aug-21	Angling - Jigging	AN01	DPF	503217 7976600	-	17W	AN01	-	2021-08-06	12:28	2021-08-06	12:50	0.37	15	Bo	Released
6	GRCD	691.0	4075.0	U	A	06-Aug-21	Angling - Jigging	AN01	DPF	503217 7976600	-	17W	AN01	-	2021-08-06	12:28	2021-08-06	12:50	0.37	15	Bo	Released
7	SHSC	400.0	825.0	U	A	06-Aug-21	Angling - Jigging	AN01	DPF	503217 7976600	-	17W	AN01	-	2021-08-06	12:28	2021-08-06	12:50	0.37	15	Bo	Released
NFC	-	-	-	-	-	07-Aug-21	Angling - Jigging	AN02	IPF	505732 7978481	-	17W	AN02	-	2021-08-07	13:39	2021-08-07	14:10	0.52	30	Bo	-
NFC	-	-	-	-	-	07-Aug-21	Angling - Jigging	AN03	IPF	504883 7976683	504934 7976601	17W	AN03	AN03B	2021-08-07	14:22	2021-08-07	14:54	0.53	10	Bo	-
1	FHSC	210.0	70.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
2	FHSC	149.0	30.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
3	FHSC	204.0	110.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
4	FHSC	219.0	100.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
5	FHSC	186.0	60.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
6	FHSC	233.0	120.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
7	FHSC	203.0	70.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
8	FHSC	195.0	55.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
9	FHSC	169.0	40.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
10	FHSC	154.0	40.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
11	ARSC	134.0	15.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
12	ARSC	237.0	120.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
13	ARSC	246.0	180.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
14	ARSC	222.0	100.0	U	U	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Released
15	FHSC	265.0	185.0	F	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
16	FHSC	256.0	155.0	F	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
17	FHSC	281.0	190.0	M	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
18	FHSC	273.0	187.0	M	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
19	FHSC	228.0	103.0	M	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
20	FHSC	266.0	199.0	F	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
21	FHSC	205.0	79.0	F	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
22	FHSC	267.0	183.0	F	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
23	FHSC	211.0	83.0	M	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
24	FHSC	259.0	161.0	F	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
25	FHSC	214.0	87.0	F	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
26	FHSC	245.0	127.0	F	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
27	FHSC	216.0	100.0	M	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
28	FHSC	256.0	120.0	M	A	08-Aug-21	Angling - Jigging	AN04	DPF	503220 7976558	503167 7976507	17W	AN04	AN04B	2021-08-08	10:41	2021-08-08	11:45	1.07	3	Sa, blast rock	Euthanized
1	SHSC	229.0	160.0	U	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
2	FHSC	172.0	60.0	U	U	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
3	FHSC	187.0	70.0	U	U	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
4	FHSC	167.0	45.0	U	U	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
5	FHSC	197.0	80.0	U	U	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
6	FHSC	178.0	50.0	U	U	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
7	FHSC	197.0	80.0	U	U	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
8	FHSC	180.0	75.0	U	U	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
9	ARSC	105.0	40.0	U	U	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
10	ARSC	114.0	20.0	U	U	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
11	FHSC	175.0	60.0	U	U	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
12	FHSC	188.0	65.0	U	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
13	FHSC	198.0	90.0	U	U	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
14	FHSC	169.0	50.0	U	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
15	FHSC	184.0	65.0	U	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
16	FHSC	178.0	50.0	U	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
17	FHSC	172.0	60.0	U	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Released
18	FHSC	250.0	158.0	M	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized
19	FHSC	228.0	106.0	F	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized
20	FHSC	309.0	336.0	F	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized
21	FHSC	206.0	84.0	F	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized
22	FHSC	253.0	150.0	F	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized
23	FHSC	211.0	91.0	F	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized
24	FHSC	257.0	145.0	M	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized
25	FHSC	211.0	91.0	M	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized
26	FHSC	209.0	82.0	M	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized
27	FHSC	228.0	115.0	F	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized
28	FHSC	214.0	74.0	M	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized
29	FHSC	251.0	129.0	M	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized

30	FHSC	233.0	115.0	F	A	09-Aug-21	Angling - Jigging	AN05	DPF	503161 7976510	-	17W	AN05	-	2021-08-09	8:36	2021-08-09	8:55	0.32	2	Sa, blast rock	Euthanized
1	ARCH	630.0	2750.0	U	A	10-Aug-21	Angling - Jigging	AN06	DPF	503209 7976608	-	17W	AN06	-	10-Aug-21	9:35	2021-08-10	10:00	0.42	15	Bo	Released
2	GRCD	510.0	1730.0	U	A	10-Aug-21	Angling - Jigging	AN06	DPF	503209 7976608	-	17W	AN06	-	10-Aug-21	9:35	2021-08-10	10:00	0.42	15	Bo	Released
3	GRCD	531.0	1890.0	U	A	10-Aug-21	Angling - Jigging	AN06	DPF	503209 7976608	-	17W	AN06	-	10-Aug-21	9:35	2021-08-10	10:00	0.42	15	Bo	Released
1	FHSC	211.0	110.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
2	FHSC	249.0	150.0	F	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
3	FHSC	221.0	130.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
4	FHSC	168.0	40.0	U	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
5	FHSC	237.0	120.0	F	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
6	FHSC	194.0	80.0	M	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
7	FHSC	178.0	40.0	F	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
8	FHSC	224.0	100.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
9	FHSC	255.0	190.0	F	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
10	FHSC	213.0	100.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
11	FHSC	170.0	40.0	M	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
12	FHSC	198.0	70.0	F	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
13	FHSC	179.0	60.0	F	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
14	FHSC	162.0	50.0	M	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
15	FHSC	177.0	60.0	F	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
16	FHSC	156.0	40.0	M	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
17	FHSC	190.0	100.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
18	FHSC	179.0	80.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
19	FHSC	176.0	60.0	F	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
20	FHSC	159.0	40.0	M	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
21	ARSC	129.0	30.0	U	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
22	FHSC	196.0	80.0	M	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
23	FHSC	179.0	50.0	M	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
24	FHSC	148.0	50.0	F	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
25	ARSC	130.0	20.0	U	U	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Released
26	FHSC	230.0	114.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Euthanized
27	FHSC	312.0	250.0	F	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Euthanized
28	FHSC	280.0	197.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Euthanized
29	FHSC	215.0	82.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Euthanized
30	FHSC	325.0	321.0	F	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Euthanized
31	FHSC	216.0	95.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Euthanized
32	FHSC	249.0	143.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Euthanized
33	FHSC	248.0	148.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Euthanized
34	FHSC	225.0	109.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Euthanized
35	FHSC	239.0	116.0	F	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Euthanized
36	FHSC	214.0	86.0	M	A	10-Aug-21	Angling - Jigging	AN07	DPF	503168 7976510	503078 7976456	17W	AN07	AN07B	10-Aug-21	10:20	2021-08-10	11:16	0.93	7	Sa/Bo	Euthanized
1	GRCD	570.0	2350.0	U	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
2	ARCH	522.0	1620.0	U	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
3	GRCD	504.0	1750.0	U	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
4	GRCD	512.0	1650.0	U	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
5	GRCD	455.0	1210.0	U	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
6	GRCD	540.0	1760.0	U	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
7	GRCD	474.0	1070.0	U	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
8	GRCD	572.0	1390.0	U	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
9	ARCH	700.0	4600.0	U	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
10	FHSC	250.0	168.0	U	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
11	FHSC	276.0	240.0	U	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
12	FHSC	263.0	160.0	U	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
13	FHSC	276.0	240.0	F	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
14	FHSC	215.0	80.0	M	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
15	FHSC	212.0	80.0	M	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
16	ARSC	120.0	20.0	U	U	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
17	FHSC	174.0	50.0	U	U	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
18	FHSC	193.0	50.0	F	A	10-Aug-21	Angling - Jigging	AN08	DPF	503197 7976533	503227 7976602	17W	AN08	AN08B	2021-08-10	15:50	2021-08-10	16:53	1.05	15	Bo	Released
1	SHSC	341.0	400.0	U	A	11-Aug-21	Angling - Jigging	AN09	DPF	503975 7976671	-	17W	AN09	-	2021-08-11	15:04	2021-08-11	15:29	0.42	10	blast rock	Released
2	SHSC	365.0	530.0	U	A	11-Aug-21	Angling - Jigging	AN09	DPF	503975 7976671	-	17W	AN09	-	2021-08-11	15:04	2021-08-11	15:29	0.42	10	blast rock	Released
3	ARCH	559.0	1890.0	U	A	11-Aug-21	Angling - Jigging	AN09	DPF	503975 7976671	-	17W	AN09	-	2021-08-11	15:04	2021-08-11	15:29	0.42	10	blast rock	Released
1	GRCD	570.0	2510.0	U	A	11-Aug-21	Angling - Jigging	AN10	DPF	503219 7976597	-	177W	AN10	-	2021-08-11	16:18	2021-08-11	17:00	0.70	15	Bo	Released
2	GRCD	619.0	3200.0	U	A	11-Aug-21	Angling - Jigging	AN10	DPF	503219 7976597	-	177W	AN10	-	2021-08-11	16:18	2021-08-11	17:00	0.70	15	Bo	Released
3	GRCD	515.0	1510.0	U	A	11-Aug-21	Angling - Jigging	AN10	DPF	503219 7976597	-	177W	AN10	-	2021-08-11	16:18	2021-08-11	17:00	0.70	15	Bo	Released
4	SHSC	272.0	300.0	U	A	11-Aug-21	Angling - Jigging	AN10	DPF	503219 7976597	-	177W	AN10	-	2021-08-11	16:18	2021-08-11	17:00	0.70	15	Bo	Released
1	GRCD	568.0	2520.0	U	A	12-Aug-21	Angling - Jigging	AN11	DPF	503196 7976607	-	17W	AN11	-	2021-08-12	11:10	2021-08-12	12:30	1.33	12	Sa/Bo	Released
2	GRCD	481.0	1120.0	U	A	12-Aug-21	Angling - Jigging	AN11	DPF	503196 7976607	-	17W	AN11	-	2021-08-12	11:10	2021-08-12	12:30	1.33	12	Sa/Bo	Released
3	GRCD	467.0	1100.0	U	A	12-Aug-21	Angling - Jigging	AN11	DPF	503196 7976607	-	17W	AN11	-	2021-08-12	11:10	2021-08-12	12:30	1.33	12	Sa/Bo	Released
NFC	-	-	-	-	-	12-Aug-21	Angling - Trolling	AN12	IPF	503103 7976563	502074 7976769	17W	AN12A	AN12B	2021-08-12	16:03	2021-08-12	16:18	0.25	8	Co/Sa	-
1	GRCD	580	2690.0	U	A	12-Aug-21	Angling - Jigging	AN13	DPF	503205 7976617	-	17W	AN13	-	2021-08-12	16:36	2021-08-12	16:59	0.38	15	Bo	Released

Table 3. 2021 Fishing Catch Data, Milne Inlet

1	FHSC	221.0	80.0	M	A	14-Aug-21	Angling - Jigging	AN14	DPF	503367 7976582	503439 7976600	17W	AN14A	AN14B	2021-08-14	14:12	2021-08-14	15:32	1.33	1.5	Co/Bo	Released
2	FHSC	181.0	50.0	F	A	14-Aug-21	Angling - Jigging	AN15	DPF	503367 7976582	503439 7976600	17W	AN14A	AN14B	2021-08-14	14:12	2021-08-14	15:32	1.33	1.5	Co/Bo	Released
1	ARCH	268.0	230.0	U	U	15-Aug-21	Angling - Jigging	AN15	REF	522102 7996232	522088 7995960	17W	AN15A	AN15B	2021-08-15	11:10	2021-08-15	11:32	0.37	3	Sa/Bo	Released
2	ARSC	183.0	70.0	U	U	15-Aug-21	Angling - Jigging	AN15	REF	522102 7996232	522088 7995960	17W	AN15A	AN15B	2021-08-15	11:10	2021-08-15	11:32	0.37	3	Sa/Bo	Released
3	ARSC	115.0	30.0	U	U	15-Aug-21	Angling - Jigging	AN15	REF	522102 7996232	522088 7995960	17W	AN15A	AN15B	2021-08-15	11:10	2021-08-15	11:32	0.37	3	Sa/Bo	Released
4	ARSC	104.0	15.0	U	U	15-Aug-21	Angling - Jigging	AN15	REF	522102 7996232	522088 7995960	17X	AN15A	AN15B	2021-08-15	11:10	2021-08-15	11:32	0.37	3	Sa/Bo	Released
NFC	-	-	-	-	-	15-Aug-21	Angling - Jigging	AN16	REF	521736 7996932	-	17X	AN16A	-	2021-08-15	11:37	2021-08-15	11:40	0.05	30	Bo	-
NFC	-	-	-	-	-	15-Aug-21	Angling - Jigging	AN17	REF	522287 7996483	-	17X	AN17	-	2021-08-15	11:57	2021-08-15	12:30	0.55	5	Sa/Bo	-
NFC	-	-	-	-	-	15-Aug-21	Angling - Jigging	AN18	REF	520689 7996776	-	17X	AN18	-	2021-08-15	13:50	2021-08-15	14:03	0.22	4	Bo	-
NFC	-	-	-	-	-	15-Aug-21	Angling - Trolling	AN19	REF	523032 7996890	523181 7996769	17X	AN19A	AN19B	2021-08-15	14:39	2021-08-15	15:00	0.35	2	Bo/Co	-
1	GRCD	491.0	1490.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
2	GRCD	405.0	780.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
3	GRCD	518.0	1760.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
4	GRCD	447.0	970.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
5	GRCD	495.0	1370.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
6	GRCD	696.0	4930.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
7	GRCD	642.0	3420.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
8	GRCD	440.0	1040.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
9	GRCD	512.0	1320.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
10	GRCD	470.0	1210.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
11	GRCD	444.0	1170.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
12	SHSC	329.0	500.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
13	SHSC	300.0	340.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
14	SHSC	410.0	1020.0	U	U	16-Aug-21	Angling - Jigging	AN20	IPF	505749 7978496	-	17W	AN20	-	2021-08-16	11:05	2021-08-16	11:30	0.42	20	Bo	Released
1	GRCD	568.0	2180.0	U	A	16-Aug-21	Angling - Jigging	AN21	IPF	505728 7978489	-	17W	AN21	-	2021-08-16	16:10	2021-08-16	16:25	0.25	20	Bo	Released
2	SHSC	232.0	140.0	U	U	16-Aug-21	Angling - Jigging	AN21	IPF	505728 7978489	-	17W	AN21	-	2021-08-16	16:10	2021-08-16	16:25	0.25	20	Bo	Released
1	FHSC	239.0	150.0	F	A	16-Aug-21	Angling - Jigging	AN22	DPF	504054 7976663	504011 7976606	17W	AN22A	AN22B	2021-08-16	16:35	2021-08-16	17:05	0.50	3	Sa/Bo	Released
2	FHSC	234.0	130.0	M	A	16-Aug-21	Angling - Jigging	AN22	DPF	504054 7976663	504011 7976606	17W	AN22A	AN22B	2021-08-16	16:35	2021-08-16	17:05	0.50	3	Sa/Bo	Released
3	FHSC	241.0	140.0	F	A	16-Aug-21	Angling - Jigging	AN22	DPF	504054 7976663	504011 7976606	17W	AN22A	AN22B	2021-08-16	16:35	2021-08-16	17:05	0.50	3	Sa/Bo	Released
4	FHSC	210.0	90.0	M	A	16-Aug-21	Angling - Jigging	AN22	DPF	504054 7976663	504011 7976606	17W	AN22A	AN22B	2021-08-16	16:35	2021-08-16	17:05	0.50	3	Sa/Bo	Released
5	FHSC	184.0	45.0	M	A	16-Aug-21	Angling - Jigging	AN22	DPF	504054 7976663	504011 7976606	17W	AN22A	AN22B	2021-08-16	16:35	2021-08-16	17:05	0.50	3	Sa/Bo	Released
6	ARSC	129.0	40.0	U	U	16-Aug-21	Angling - Jigging	AN22	DPF	504054 7976663	504011 7976606	17W	AN22A	AN22B	2021-08-16	16:35	2021-08-16	17:05	0.50	3	Sa/Bo	Released
7	ARSC	105.0	20.0	U	U	16-Aug-21	Angling - Jigging	AN22	DPF	504054 7976663	504011 7976606	17W	AN22A	AN22B	2021-08-16	16:35	2021-08-16	17:05	0.50	3	Sa/Bo	Released
8	ARSC	113.0	30.0	U	U	16-Aug-21	Angling - Jigging	AN22	DPF	504054 7976663	504011 7976606	17W	AN22A	AN22B	2021-08-16	16:35	2021-08-16	17:05	0.50	3	Sa/Bo	Released
9	ARSC	134.0	30.0	U	U	16-Aug-21	Angling - Jigging	AN22	DPF	504054 7976663	504011 7976606	17W	AN22A	AN22B	2021-08-16	16:35	2021-08-16	17:05	0.50	3	Sa/Bo	Released
10	ARSC	121.0	30.0	U	U	16-Aug-21	Angling - Jigging	AN22	DPF	504054 7976663	504011 7976606	17W	AN22A	AN22B	2021-08-16	16:35	2021-08-16	17:05	0.50	3	Sa/Bo	Released
11	ARSC	122.0	35.0	U	U	16-Aug-21	Angling - Jigging	AN22	DPF	504054 7976663	504011 7976606	17W	AN22A	AN22B	2021-08-16	16:35	2021-08-16	17:05	0.50	3	Sa/Bo	Released
1	GRCD	529.0	1990.0	U	A	16-Aug-21	Angling - Jigging	AN23	DPF	503202 7976607	-	17W	AN23	-	2021-08-16	17:10	2021-08-16	17:45	0.58	15	Bo	Released
2	ARCH	552.0	2030.0	U	A	16-Aug-21	Angling - Jigging	AN23	DPF	503202 7976607	-	17W	AN23	-	2021-08-16	17:10	2021-08-16	17:45	0.58	15	Bo	Released
3	GRCD	454.0	1120.0	U	U	16-Aug-21	Angling - Jigging	AN23	DPF	503202 7976607	-	17W	AN23	-	2021-08-16	17:10	2021-08-16	17:45	0.58	15	Bo	Released
4	GRCD	504.0	810.0	U	A	16-Aug-21	Angling - Jigging	AN23	DPF	503202 7976607	-	17W	AN23	-	2021-08-16	17:10	2021-08-16	17:45	0.58	15	Bo	Released
1	GRCD	702.0	4130.0	U	U	17-Aug-21	Angling - Jigging	AN24	IPF	505720 7978481	-	17W	AN24	-	2021-08-17	8:35	2021-08-17	8:55	0.33	20	Bo	Released
2	GRCD	441.0	1100.0	U	U	17-Aug-21	Angling - Jigging	AN24	IPF	505720 7978481	-	17W	AN24	-	2021-08-17	8:35	2021-08-17	8:55	0.33	20	Bo	Released
3	SHSC	363.0	610.0	U	U	17-Aug-21	Angling - Jigging	AN24	IPF	505720 7978481	-	17W	AN24	-	2021-08-17	8:35	2021-08-17	8:55	0.33	20	Bo	Released
4	SHSC	345.0	600.0	U	U	17-Aug-21	Angling - Jigging	AN24	IPF	505720 7978481	-	17W	AN24	-	2021-08-17	8:35	2021-08-17	8:55	0.33	20	Bo	Released
1	FHSC	294.0	280.0	U	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
2	ARSC	213.0	150.0	U	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
3	SHSC	265.0	270.0	U	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
4	FHSC	287.0	270.0	F	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
5	ARSC	212.0	150.0	U	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
6	SHSC	203.0	110.0	U	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
7	SHSC	296.0	380.0	U	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
8	SHSC	255.0	230.0	U	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
9	FHSC	247.0	180.0	F	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
10	FHSC	272.0	200.0	F	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
11	FHSC	260.0	210.0	F	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
12	FHSC	239.0	130.0	F	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
13	FHSC	264.0	200.0	M	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
14	FHSC	240.0	180.0	F	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
15	ARSC	185.0	100.0	U	A	17-Aug-21	Angling - Jigging	AN25	IPF	505185 7977668	505159 797793	17W	AN25A	AN25B	2021-08-17	9:03	2021-08-17	9:49	0.77	2	Bo/Sa	Released
1	GRCD	489.0	1340.0	U	U	17-Aug-21	Angling - Jigging	AN26	DPF	503333 7976681	-	17W	AN26	-	2021-08-17	10:35	2021-08-17	11:10	0.58	30	Bo	Mortality
2	GRCD	477.0	1410.0	U	U	17-Aug-21	Angling - Jigging	AN26	DPF	503333 7976681	-	17W	AN26	-	2021-08-17	10:35	2021-08-17	11:10	0.58	30	Bo	Released
3	SHSC	415.0	1010.0	U	U	17-Aug-21	Angling - Jigging	AN26	DPF	503333 7976681	-	17W	AN26	-	2021-08-17	10:35	2021-08-17	11:10	0.58	30	Bo	Released
4	SHSC	278.0	360.0	U	U	17-Aug-21	Angling - Jigging	AN26	DPF	503333 7976681	-	17W	AN26	-	2021-08-17	10:35	2021-08-17	11:10	0.58	30	Bo	Released
5	SHSC	384.0	720.0	U	U	17-Aug-21	Angling - Jigging	AN26	DPF	503333 7976681	-	17W	AN26	-	2021-08-17	10:35	2021-08-17	11:10	0.58	30	Bo	Released
6	SHSC	335.0	600.0	U	U	17-Aug-21	Angling - Jigging	AN26	DPF	503333 7976681	-	17W	AN26	-	2021-08-17	10:35	2021-08-17	11:10	0.58	30	Bo	Released
7	SHSC	390.0	970.0	U	U	17-Aug-21	Angling - Jigging	AN26	DPF	503333 7976681	-	17W	AN26	-	2021-08-17	10:35	2021-08-17	11:10	0.58	30	Bo	Released
1	SHSC	233.0	140.0	U	U	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
2	FHSC	318.0	370.0	M	A	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
3	ARSC	233.0	140.0	U	U	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released

Table 3. 2021 Fishing Catch Data, Milne Inlet

4	SHSC	264.0	260.0	U	U	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
5	FHSC	260.0	170.0	M	U	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
6	SHSC	247.0	220.0	U	U	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
7	SHSC	237.0	150.0	F	U	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
8	SHSC	233.0	130.0	U	U	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
9	SHSC	214.0	150.0	U	U	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
10	FHSC	211.0	100.0	M	A	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
11	FHSC	244.0	230.0	U	U	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
12	SHSC	223.0	210.0	U	U	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
13	FHSC	275.0	240.0	F	U	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
14	FHSC	326.0	330.0	F	A	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
15	FHSC	303.0	320.0	F	A	17-Aug-21	Angling - Jigging	AN27	IPF	505147 7977215	505090 7976907	17W	AN27A	AN27B	2021-08-17	13:29	2021-08-17	14:13	0.73	4	Bo/Sa	Released
1	FHSC	201.0	80.0	F	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
2	FHSC	295.0	300.0	M	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
3	FHSC	245.0	160.0	F	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
4	FHSC	275.0	180.0	F	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
5	FHSC	272.0	220.0	F	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
6	FHSC	313.0	320.0	M	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
7	FHSC	275.0	220.0	M	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
8	FHSC	283.0	170.0	M	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
9	FHSC	251.0	160.0	M	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
10	FHSC	240.0	120.0	M	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
11	FHSC	286.0	220.0	F	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
12	FHSC	262.0	170.0	M	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
13	FHSC	238.0	150.0	M	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
14	FHSC	256.0	140.0	F	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
15	FHSC	216.0	100.0	F	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
16	FHSC	213.0	90.0	M	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
17	FHSC	187.0	50.0	M	A	17-Aug-21	Angling - Jigging	AN28	DPF	503139 7976515	503106 7976496	17W	AN28A	AN28B	2021-08-17	15:06	2021-08-17	15:44	0.63	3	Sa/Bo	Released
1	FHSC	239.0	150.0	M	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
2	FHSC	223.0	100.0	F	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
3	FHSC	220.0	110.0	F	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
4	FHSC	229.0	130.0	F	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
5	FHSC	214.0	100.0	M	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
6	FHSC	236.0	150.0	F	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
7	FHSC	197.0	80.0	F	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
8	FHSC	231.0	140.0	F	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
9	FHSC	239.0	170.0	F	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
10	FHSC	194.0	80.0	F	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
11	FHSC	191.0	70.0	F	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
12	FHSC	204.0	90.0	M	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
13	FHSC	220.0	120.0	M	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
14	FHSC	198.0	70.0	M	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
15	FHSC	209.0	90.0	F	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
16	FHSC	200.0	80.0	M	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
17	FHSC	179.0	60.0	M	A	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
18	ARSC	128.0	30.0	U	U	18-Aug-21	Angling - Jigging	AN29	DPF	503913 7976488	503907 7976600	17W	AN29A	AN29B	2021-08-18	8:47	2021-08-18	9:44	0.95	1	Sa/Bo	Released
1	GRCD	404.0	780.0	U	A	18-Aug-21	Angling - Jigging	AN30	DPF	503350 7976667	-	17W	AN30	-	2021-08-18	11:00	2021-08-18	11:40	0.67	25	Bo	Released
2	GRCD	515.0	1800.0	U	A	18-Aug-21	Angling - Jigging	AN30	DPF	503350 7976667	-	17W	AN30	-	2021-08-18	11:00	2021-08-18	11:40	0.67	25	Bo	Released
3	GRCD	530.0	1960.0	U	A	18-Aug-21	Angling - Jigging	AN30	DPF	503350 7976667	-	17W	AN30	-	2021-08-18	11:00	2021-08-18	11:40	0.67	25	Bo	Released
4	GRCD	590.0	2510.0	U	A	18-Aug-21	Angling - Jigging	AN30	DPF	503350 7976667	-	17W	AN30	-	2021-08-18	11:00	2021-08-18	11:40	0.67	25	Bo	Released
5	SHSC	363.0	560.0	U	A	18-Aug-21	Angling - Jigging	AN30	DPF	503350 7976667	-	17W	AN30	-	2021-08-18	11:00	2021-08-18	11:40	0.67	25	Bo	Released
1	FHSC	261.0	160.0	F	A	18-Aug-21	Angling - Jigging	AN31	DPF	504096 7976617	504006 7976600	17W	AN31A	AN31B	2021-08-18	13:47	2021-08-18	14:33	0.77	1	Sa/Bo	Released
2	ARSC	122.0	10.0	U	U	18-Aug-21	Angling - Jigging	AN31	DPF	504096 7976617	504006 7976600	17W	AN31A	AN31B	2021-08-18	13:47	2021-08-18	14:33	0.77	1	Sa/Bo	Released
3	ARSC	131.0	30.0	U	U	18-Aug-21	Angling - Jigging	AN31	DPF	504096 7976617	504006 7976600	17W	AN31A	AN31B	2021-08-18	13:47	2021-08-18	14:33	0.77	1	Sa/Bo	Released
4	ARSC	127.0	30.0	U	U	18-Aug-21	Angling - Jigging	AN31	DPF	504096 7976617	504006 7976600	17W	AN31A	AN31B	2021-08-18	13:47	2021-08-18	14:33	0.77	1	Sa/Bo	Released
5	ARSC	145.0	20.0	U	U	18-Aug-21	Angling - Jigging	AN31	DPF	504096 7976617	504006 7976600	17W	AN31A	AN31B	2021-08-18	13:47	2021-08-18	14:33	0.77	1	Sa/Bo	Released
6	ARSC	120.0	20.0	U	U	18-Aug-21	Angling - Jigging	AN31	DPF	504096 7976617	504006 7976600	17W	AN31A	AN31B	2021-08-18	13:47	2021-08-18	14:33	0.77	1	Sa/Bo	Released
7	ARSC	124.0	50.0	U	U	18-Aug-21	Angling - Jigging	AN31	DPF	504096 7976617	504006 7976600	17W	AN31A	AN31B	2021-08-18	13:47	2021-08-18	14:33	0.77	1	Sa/Bo	Released
8	ARSC	128.0	20.0	U	U	18-Aug-21	Angling - Jigging	AN31	DPF	504096 7976617	504006 7976600	17W	AN31A	AN31B	2021-08-18	13:47	2021-08-18	14:33	0.77	1	Sa/Bo	Released
9	ARSC	147.0	40.0	F	A	18-Aug-21	Angling - Jigging	AN31	DPF	504096 7976617	504006 7976600	17W	AN31A	AN31B	2021-08-18	13:47	2021-08-18	14:33	0.77	1	Sa/Bo	Released
10	ARSC	129.0	30.0	U	U	18-Aug-21	Angling - Jigging	AN31	DPF	504096 7976617	504006 7976600	17W	AN31A	AN31B	2021-08-18	13:47	2021-08-18	14:33	0.77	1	Sa/Bo	Released
11	ARSC	139.0	20.0	U	U	18-Aug-21	Angling - Jigging	AN31	DPF	504096 7976617	504006 7976600	17W	AN31A	AN31B	2021-08-18	13:47	2021-08-18	14:33	0.77	1	Sa/Bo	Released
1	GRCD	469.0	1220.0	U	A	18-Aug-21	Angling - Jigging	AN32	DPF	503218 7976603	-	17W	AN32	-	2021-08-18	15:50	2021-08-18	16:15	0.42	15	-	Released
2	GRCD	522.0	1710.0	U	A	18-Aug-21	Angling - Jigging	AN32	DPF	503218 7976603	-	17W	AN32	-	2021-08-18	15:50	2021-08-18	16:15	0.42	15	-	Released
NFC	-	-	-	-	-	07-Aug-21	Fukui Trap	FT01	DPF	502897 7976383		17W	FT01		2021-08-07	10:42	2021-08-11	8:25	93.72	-	Sa	-
1	FHSC	210.0	110.0	M	A	07-Aug-21	Fukui Trap	FT02	IPF	502660 7976305		17W	FT02		2021-08-07	10:47	2021-08-11	8:32	93.75	-	Sa/Gr	Released
2	FHSC	191.0	80.0	U	U	07-Aug-21	Fukui Trap	FT02	IPF	502660 7976305		17W	FT02		2021-08-07	10:47	2021-08-11	8:32	93.75	-	Sa/Gr	Released
3	ARSC	128.0	20.0	U	U	07-Aug-21	Fukui Trap	FT02	IPF	502660 7976305		17W	FT02		2021-08-07	10:47	2021-08-11	8:32	93.75	-	Sa/Gr	Released
1	FHSC	125.0	15.0	U	U	07-Aug-21	Fukui Trap	FT03	IPF	502268 7976436		17W	FT03		2021-08-07	10:50	2021-08-11	8:38	93.80	-	Sa	Released

1	FHSC	195.0	75.0	M	A	07-Aug-21	Fukui Trap	FT04	IPF	501468 7976188		17W	FT04		2021-08-07	10:54	2021-08-11	8:45	93.85	-	Sa	Released
2	FHSC	171.0	47.0	F	A	07-Aug-21	Fukui Trap	FT04	IPF	501468 7976188		17W	FT04		2021-08-07	10:54	2021-08-11	8:45	93.85	-	Sa	Released
3	FHSC	262.0	150.0	M	A	07-Aug-21	Fukui Trap	FT04	IPF	501468 7976188		17W	FT04		2021-08-07	10:54	2021-08-11	8:45	93.85	-	Sa	Released
1	ARSC	111.0	14.0	U	U	07-Aug-21	Fukui Trap	FT05	DPF	502725 7976384		17W	FT05		2021-08-07	11:03	2021-08-11	8:28	93.42	-	-	Released
NFC	-	-	-	-	-	11-Aug-21	Fukui Trap	FT06	DPF	503487 7976650		17W	FT06		2021-08-11	8:54	2021-08-16	9:25	120.52	-	Sa/Bo	-
1	ARSC	164.0	50.0	U	U	11-Aug-21	Fukui Trap	FT07	DPF	503435 7976594		17W	FT07		2021-08-11	9:00	2021-08-16	9:35	120.58	-	Sa/Bo	Released
2	ARSC	124.0	30.0	U	U	11-Aug-21	Fukui Trap	FT07	DPF	503435 7976594		17W	FT07		2021-08-11	9:00	2021-08-16	9:35	120.58	-	Sa/Bo	Released
3	ARSC	112.0	25.0	U	U	11-Aug-21	Fukui Trap	FT07	DPF	503435 7976594		17W	FT07		2021-08-11	9:00	2021-08-16	9:35	120.58	-	Sa/Bo	Released
1	FHSC	271.0	190.0	F	A	11-Aug-21	Fukui Trap	FT08	DPF	503476 7976593		17W	FT08		2021-08-11	9:02	2021-08-11	9:30	120.47	-	Sa/Bo	Released
NFC	-	-	-	-	-	11-Aug-21	Fukui Trap	FT09	DPF	503375 7976642		17W	FT09		2021-08-11	9:09	2021-08-16	9:20	120.18	-	Sa/Bo	-
NFC	-	-	-	-	-	11-Aug-21	Fukui Trap	FT10	DPF	503838 7976679		17W	FT10		2021-08-11	9:16	2021-08-16	9:45	120.48	-	Sa/Bo	-
1	ARSC	221.0	150.0	U	U	16-Aug-21	Fukui Trap	FT11	DPF	504051 7976629		17W	FT11		2021-08-16	9:46	2021-08-18	15:25	53.65	-	Sa/Bo/Co	Released
2	ARSC	181.0	100.0	U	U	16-Aug-21	Fukui Trap	FT11	DPF	504051 7976629		17W	FT11		2021-08-16	9:46	2021-08-18	15:25	53.65	-	Sa/Bo/Co	Released
1	ARSC	110.0	60.0	U	U	16-Aug-21	Fukui Trap	FT12	DPF	504154 7976587		17W	FT12		2021-08-16	9:49	2021-08-18	15:23	53.57	-	Sa	Released
NFC	-	-	-	-	-	16-Aug-21	Fukui Trap	FT13	IPF	504549 7976635		17W	FT13		2021-08-16	9:53	2021-08-18	15:05	53.20	-	-	-
1	ARSC	156.0	80.0	U	U	16-Aug-21	Fukui Trap	FT14	IPF	504611 7976704		17W	FT14		2021-08-16	9:56	2021-08-18	15:10	53.23	-	Bo	Released
2	ARSC	137.0	50.0	U	U	16-Aug-21	Fukui Trap	FT14	IPF	504611 7976704		17W	FT14		2021-08-16	9:56	2021-08-18	15:10	53.23	-	Bo	Released
1	ARCH	610.0	2330.0	U	A	03-Aug-21	Gill Net	GN01	DPF	502785 7976226	502818 7976314	17W	GN01A	GN01B	2021-08-03	14:29	2021-08-03	16:14	1.75	1.75	Sa	Released
2	ARCH	620.0	2656.0	U	A	03-Aug-21	Gill Net	GN01	DPF	502785 7976226	502818 7976314	17W	GN01A	GN01B	2021-08-03	14:29	2021-08-03	16:14	1.75	1.75	Sa	Released
1	ARCH	339.0	375.0	U	U	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
2	ARCH	503.0	1227.0	U	A	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
3	ARCH	400.0	640.0	U	U	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
4	ARCH	489.0	1222.0	U	A	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
5	ARCH	540.0	1601.0	U	A	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
6	ARCH	703.0	2433.0	U	A	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
7	ARCH	440.0	825.0	U	A	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
8	ARCH	413.0	639.0	U	A	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
9	ARCH	494.0	1172.0	U	A	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
10	ARCH	355.0	412.0	U	U	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
11	ARCH	400.0	619.0	U	U	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
12	ARCH	486.0	1047.0	U	A	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
13	FHSC	170.0	40.0	M	J	03-Aug-21	Gill Net	GN02	DPF	502982 7976335	502924 7976414	17W	GN02A	GN02B	2021-08-03	15:03	2021-08-03	16:30	1.45	3.5	Sa/Co	Released
1	ARCH	549.0	1348.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
2	ARCH	528.0	1374.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
3	ARCH	649.0	2139.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Mortality
4	ARCH	345.0	394.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Mortality
5	FHSC	236.0	159.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
6	FHSC	262.0	169.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
7	FHSC	181.0	56.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
8	FHSC	224.0	112.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
9	FHSC	220.0	105.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
10	FHSC	168.0	45.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
11	FHSC	189.0	77.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
12	FHSC	181.0	66.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
13	FHSC	181.0	66.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
14	SHSC	280.0	278.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
15	ARCH	479.0	822.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
16	FHSC	220.0	98.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
17	FHSC	262.0	159.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
18	FHSC	252.0	166.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
19	FHSC	260.0	168.0	-	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
20	FHSC	239.0	141.0	M	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
21	FHSC	231.0	139.0	U	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
22	FHSC	192.0	64.0	M	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
23	FHSC	262.0	179.0	M	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
24	FHSC	169.0	42.0	U	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
25	FHSC	185.0	54.0	M	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
26	SHSC	132.0	18.0	U	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
27	FHSC	190.0	150.0	U	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
28	FHSC	187.0	66.0	U	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
29	FHSC	191.0	61.0	M	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
30	ARSC	130.0	25.0	U	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
31	ARSC	125.0	25.0	U	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
32	FHSC	172.0	46.0	U	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
33	FHSC	167.0	39.0	U	-	06-Aug-21	Gill Net	GN03	DPF	502890 7976249	502832 7976323	17W	GN03A	GN03B	2021-08-06	11:28	2021-08-06	13:28	2.00	1.75	Sa	Released
1	ARCH	491.0	865.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
2	ARCH	379.0	467.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
3	ARCH	352.0	498.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
4	ARCH	391.0	576.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
5	ARCH	384.0	479.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released

Table 3. 2021 Fishing Catch Data, Milne Inlet

6	ARCH	533.0	1388.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
7	ARCH	486.0	1003.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
8	ARCH	451.0	742.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
9	ARCH	491.0	1030.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
10	ARCH	214.0	105.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
11	FHSC	262.0	189.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
12	FHSC	276.0	251.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
13	FHSC	271.0	195.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
14	FHSC	168.0	46.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
15	FHSC	271.0	176.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
16	FHSC	245.0	143.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
17	FHSC	246.0	191.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
18	FHSC	210.0	100.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
19	FHSC	249.0	167.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
20	FHSC	239.0	130.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
21	FHSC	281.0	262.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
22	FHSC	210.0	95.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
23	FHSC	243.0	158.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
24	FHSC	115.0	16.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
25	FHSC	161.0	29.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
26	FHSC	181.0	40.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
27	FHSC	222.0	98.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
28	FHSC	186.0	57.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
29	FHSC	171.0	60.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
30	ARCH	522.0	1192.0	U	A	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
31	ARCH	396.0	520.0	U	U	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
32	ARCH	535.0	1226.0	U	A	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
33	ARCH	337.0	339.0	U	U	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
34	ARCH	359.0	397.0	U	U	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
35	FHSC	224.0	99.0	M	A	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
36	FHSC	290.0	217.0	M	A	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
37	FHSC	249.0	132.0	M	A	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
38	FHSC	249.0	154.0	F	A	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
39	FHSC	180.0	46.0	U	U	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
40	FHSC	246.0	143.0	M	A	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
41	FHSC	189.0	60.0	U	U	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
42	FHSC	252.0	165.0	M	A	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
43	FHSC	210.0	71.0	U	U	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
44	FHSC	206.0	89.0	M	U	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
45	FHSC	262.0	228.0	U	A	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Released
46	ARCH	479.0	822.0	-	-	06-Aug-21	Gill Net	GN04	DPF	503020 7976384	502970 7976461	17W	GN04A	GN04B	2021-08-06	12:08	2021-08-06	16:08	4.00	3.5	Sa	Mortality
1	ARCH	464.0	1110.0	U	A	07-Aug-21	Gill Net	GN05	DPF	504373 7976453	504337 7976543	17W	GN05A	GN05B	2021-08-07	13:00	2021-08-07	14:58	1.97	1.75	Co/Sa	Released
2	ARCH	294.0	310.0	U	U	07-Aug-21	Gill Net	GN05	DPF	504373 7976453	504337 7976543	17W	GN05A	GN05B	2021-08-07	13:00	2021-08-07	14:58	1.97	1.75	Co/Sa	Released
3	ARCH	509.0	1220.0	U	A	07-Aug-21	Gill Net	GN05	DPF	504373 7976453	504337 7976543	17W	GN05A	GN05B	2021-08-07	13:00	2021-08-07	14:58	1.97	1.75	Co/Sa	Mortality
4	ARCH	355.0	500.0	U	U	07-Aug-21	Gill Net	GN05	DPF	504373 7976453	504337 7976543	17W	GN05A	GN05B	2021-08-07	13:00	2021-08-07	14:58	1.97	1.75	Co/Sa	Mortality
5	ARCH	321.0	370.0	U	J	07-Aug-21	Gill Net	GN05	DPF	504373 7976453	504337 7976543	17W	GN05A	GN05B	2021-08-07	13:00	2021-08-07	14:58	1.97	1.75	Co/Sa	Mortality
6	FHSC	240.0	150.0	U	U	07-Aug-21	Gill Net	GN05	DPF	504373 7976453	504337 7976543	17W	GN05A	GN05B	2021-08-07	13:00	2021-08-07	14:58	1.97	1.75	Co/Sa	Released
7	FHSC	206.0	120.0	U	U	07-Aug-21	Gill Net	GN05	DPF	504373 7976453	504337 7976543	17W	GN05A	GN05B	2021-08-07	13:00	2021-08-07	14:58	1.97	1.75	Co/Sa	Released
1	ARCH	664.0	2510.0	-	A	07-Aug-21	Gill Net	GN06	IPF	504515 7976457	504417 7976547	17W	GN06A	GN06B	2021-08-07	13:12	2021-08-07	15:12	2.00	2	Co/Sa	Released
2	ARCH	437.0	750.0	-	U	07-Aug-21	Gill Net	GN06	IPF	504515 7976457	504417 7976547	17W	GN06A	GN06B	2021-08-07	13:12	2021-08-07	15:12	2.00	2	Co/Sa	Released
3	ARCH	142.0	27.2	-	-	07-Aug-21	Gill Net	GN06	IPF	504515 7976457	504417 7976547	17W	GN06A	GN06B	2021-08-07	13:12	2021-08-07	15:12	2.00	2	Co/Sa	Released
4	ARCH	136.0	22.9	-	-	07-Aug-21	Gill Net	GN06	IPF	504515 7976457	504417 7976547	17W	GN06A	GN06B	2021-08-07	13:12	2021-08-07	15:12	2.00	2	Co/Sa	Released
5	FHSC	117.0	11.1	-	-	07-Aug-21	Gill Net	GN06	IPF	504515 7976457	504417 7976547	17W	GN06A	GN06B	2021-08-07	13:12	2021-08-07	15:12	2.00	2	Co/Sa	Released
6	FHSC	199.0	100.0	U	U	07-Aug-21	Gill Net	GN06	IPF	504515 7976457	504417 7976547	17W	GN06A	GN06B	2021-08-07	13:12	2021-08-07	15:12	2.00	2	Co/Sa	Released
7	FHSC	195.0	90.0	U	U	07-Aug-21	Gill Net	GN06	IPF	504515 7976457	504417 7976547	17W	GN06A	GN06B	2021-08-07	13:12	2021-08-07	15:12	2.00	2	Co/Sa	Released
8	FHSC	230.0	130.0	U	U	07-Aug-21	Gill Net	GN06	IPF	504515 7976457	504417 7976547	17W	GN06A	GN06B	2021-08-07	13:12	2021-08-07	15:12	2.00	2	Co/Sa	Released
9	ARCH	145.0	24.5	-	-	07-Aug-21	Gill Net	GN06	IPF	504515 7976457	504417 7976547	17W	GN06A	GN06B	2021-08-07	13:12	2021-08-07	15:12	2.00	2	Co/Sa	Mortality
1	ARCH	574.0	2400.0	U	A	08-Aug-21	Gill Net	GN07	DPF	502960 7976323	502922 7976403	17W	GN07A	GN07B	2021-08-08	8:13	2021-08-08	10:50	2.62	5.5	Sa	Released
2	ARCH	613.0	2770.0	U	A	08-Aug-21	Gill Net	GN07	DPF	502960 7976323	502922 7976403	17W	GN07A	GN07B	2021-08-08	8:13	2021-08-08	10:50	2.62	5.5	Sa	Released
3	ARCH	630.0	3490.0	U	A	08-Aug-21	Gill Net	GN07	DPF	502960 7976323	502922 7976403	17W	GN07A	GN07B	2021-08-08	8:13	2021-08-08	10:50	2.62	5.5	Sa	Released
4	FHSC	195.0	60.0	U	A	08-Aug-21	Gill Net	GN07	DPF	502960 7976323	502922 7976403	17W	GN07A	GN07B	2021-08-08	8:13	2021-08-08	10:50	2.62	5.5	Sa	Released
5	FHSC	168.0	60.0	U	A	08-Aug-21	Gill Net	GN07	DPF	502960 7976323	502922 7976403	17W	GN07A	GN07B	2021-08-08	8:13	2021-08-08	10:50	2.62	5.5	Sa	Released
6	FHSC	178.0	50.0	U	A	08-Aug-21	Gill Net	GN07	DPF	502960 7976323	502922 7976403	17W	GN07A	GN07B	2021-08-08	8:13	2021-08-08	10:50	2.62	5.5	Sa	Released
7	FHSC	175.0	50.0	U	A	08-Aug-21	Gill Net	GN07	DPF	502960 7976323	502922 7976403	17W	GN07A	GN07B	2021-08-08	8:13	2021-08-08	10:50	2.62	5.5	Sa	Released
8	FHSC	195.0	90.0	U	A	08-Aug-21	Gill Net	GN07	DPF	502960 7976323	502922 7976403	17W	GN07A	GN07B	2021-08-08	8:13	2021-08-08	10:50	2.62	5.5	Sa	Released
9	FHSC	305.0	320.0	U	A	08-Aug-21	Gill Net	GN07	DPF	502960 7976323	502922 7976403	17W	GN07A	GN07B	2021-08-08	8:13	2021-08-08	10:50	2.62	5.5	Sa	Released
10	FHSC	270.0	210.0	U	A	08-Aug-21	Gill Net	GN07	DPF	502960 7976323	502922 7976403	17W	GN07A	GN07B	2021-08-08	8:13	2021-08-08	10:50	2.62	5.5	Sa	Released
11	FHSC	257.0	195.0	U	A	08-Aug-21	Gill Net	GN07	DPF	502960 7976323	502922 7976403	17W	GN07A	GN07B	2021-08-08	8:13	2021-08-08	10:50	2.62	5.5	Sa	Released
12	FHSC	344.0	352.0	F	A	08-Aug-21	Gill Net	GN07	DPF	502960 7976323	502922 7976403	17W	GN07A	GN07B	2021-08-08	8:13	2021-08-08	10:50	2.62	5.5	Sa	Euthanized
1	ARCH	645.0	2730.0	U	A	09-Aug-21	Gill Net	GN08	DPF	503099 7976436	503061 7976511	17W	GN08A	GN08B	2021-08-09	7:32	2021-08-09	9:00	1.47	6.75	Bo/Co/Sa	Released

2	ARCH	557.0	1980.0	U	A	09-Aug-21	Gill Net	GN08	DPF	503099 7976436	503061 7976511	17W	GN08A	GN08B	2021-08-09	7:32	2021-08-09	9:00	1.47	6.75	Bo/Co/Sa	Released
3	ARCH	474.0	1170.0	U	A	09-Aug-21	Gill Net	GN08	DPF	503099 7976436	503061 7976511	17W	GN08A	GN08B	2021-08-09	7:32	2021-08-09	9:00	1.47	6.75	Bo/Co/Sa	Mortality
4	ARCH	403.0	610.0	U	U	09-Aug-21	Gill Net	GN08	DPF	503099 7976436	503061 7976511	17W	GN08A	GN08B	2021-08-09	7:32	2021-08-09	9:00	1.47	6.75	Bo/Co/Sa	Released
5	SHSC	394.0	790.0	U	A	09-Aug-21	Gill Net	GN08	DPF	503099 7976436	503061 7976511	17W	GN08A	GN08B	2021-08-09	7:32	2021-08-09	9:00	1.47	6.75	Bo/Co/Sa	Released
6	SHSC	244.0	180.0	U	A	09-Aug-21	Gill Net	GN08	DPF	503099 7976436	503061 7976511	17W	GN08A	GN08B	2021-08-09	7:32	2021-08-09	9:00	1.47	6.75	Bo/Co/Sa	Released
7	FHSC	194.0	45.0	U	A	09-Aug-21	Gill Net	GN08	DPF	503099 7976436	503061 7976511	17W	GN08A	GN08B	2021-08-09	7:32	2021-08-09	9:00	1.47	6.75	Bo/Co/Sa	Released
8	FHSC	177.0	30.0	U	A	09-Aug-21	Gill Net	GN08	DPF	503099 7976436	503061 7976511	17W	GN08A	GN08B	2021-08-09	7:32	2021-08-09	9:00	1.47	6.75	Bo/Co/Sa	Released
9	FHSC	200.0	80.0	U	A	09-Aug-21	Gill Net	GN08	DPF	503099 7976436	503061 7976511	17W	GN08A	GN08B	2021-08-09	7:32	2021-08-09	9:00	1.47	6.75	Bo/Co/Sa	Released
10	FHSC	186.0	80.0	U	A	09-Aug-21	Gill Net	GN08	DPF	503099 7976436	503061 7976511	17W	GN08A	GN08B	2021-08-09	7:32	2021-08-09	9:00	1.47	6.75	Bo/Co/Sa	Released
11	FHSC	298.0	124.0	F	A	09-Aug-21	Gill Net	GN08	DPF	503099 7976436	503061 7976511	17W	GN08A	GN08B	2021-08-09	7:32	2021-08-09	9:00	1.47	6.75	Bo/Co/Sa	Euthanized
1	ARCH	584.0	2510.0	U	A	10-Aug-21	Gill Net	GN09	IPF	502602 7976235	502624 7976319	17W	GN09A	GN09B	2021-08-10	7:30	2021-08-10	8:40	1.17	2	Gr/Sa/Co	Released
2	ARCH	398.0	660.0	U	A	10-Aug-21	Gill Net	GN09	IPF	502602 7976235	502624 7976319	17W	GN09A	GN09B	2021-08-10	7:30	2021-08-10	8:40	1.17	2	Gr/Sa/Co	Released
3	ARCH	465.0	1110.0	F	A	10-Aug-21	Gill Net	GN09	IPF	502602 7976235	502624 7976319	17W	GN09A	GN09B	2021-08-10	7:30	2021-08-10	8:40	1.17	2	Gr/Sa/Co	Mortality
1	ARCH	314.0	340.0	U	U	11-Aug-21	Gill Net	GN10	IPF	504760 7976619	504755 7976706	17W	GN10A	GN10B	2021-08-11	12:09	2021-08-11	16:09	4.00	2.5	Gr/Sa/Co	Released
2	ARCH	319.0	390.0	U	U	11-Aug-21	Gill Net	GN10	IPF	504760 7976619	504755 7976706	17W	GN10A	GN10B	2021-08-11	12:09	2021-08-11	16:09	4.00	2.5	Gr/Sa/Co	Released
3	ARCH	427.0	760.0	U	A	11-Aug-21	Gill Net	GN10	IPF	504760 7976619	504755 7976706	17W	GN10A	GN10B	2021-08-11	12:09	2021-08-11	16:09	4.00	2.5	Gr/Sa/Co	Released
4	ARCH	384.0	620.0	U	A	11-Aug-21	Gill Net	GN10	IPF	504760 7976619	504755 7976706	17W	GN10A	GN10B	2021-08-11	12:09	2021-08-11	16:09	4.00	2.5	Gr/Sa/Co	Released
5	ARCH	470.0	1110.0	U	A	11-Aug-21	Gill Net	GN10	IPF	504760 7976619	504755 7976706	17W	GN10A	GN10B	2021-08-11	12:09	2021-08-11	16:09	4.00	2.5	Gr/Sa/Co	Released
6	ARCH	379.0	-	U	A	11-Aug-21	Gill Net	GN10	IPF	504760 7976619	504755 7976706	17W	GN10A	GN10B	2021-08-11	12:09	2021-08-11	16:09	4.00	2.5	Gr/Sa/Co	Released
7	ARCH	559.0	-	U	A	11-Aug-21	Gill Net	GN10	IPF	504760 7976619	504755 7976706	17W	GN10A	GN10B	2021-08-11	12:09	2021-08-11	16:09	4.00	2.5	Gr/Sa/Co	Released
8	ARCH	750.0	-	U	A	11-Aug-21	Gill Net	GN10	IPF	504760 7976619	504755 7976706	17W	GN10A	GN10B	2021-08-11	12:09	2021-08-11	16:09	4.00	2.5	Gr/Sa/Co	Released
9	ARCH	485.0	-	U	A	11-Aug-21	Gill Net	GN10	IPF	504760 7976619	504755 7976706	17W	GN10A	GN10B	2021-08-11	12:09	2021-08-11	16:09	4.00	2.5	Gr/Sa/Co	Released
10	ARCH	439.0	-	U	A	11-Aug-21	Gill Net	GN10	IPF	504760 7976619	504755 7976706	17W	GN10A	GN10B	2021-08-11	12:09	2021-08-11	16:09	4.00	2.5	Gr/Sa/Co	Mortality
1	FHSC	234.0	120.0	F	A	14-Aug-21	Gill Net	GN11	DPF	503366 7976479	503426 7976550	17W	GN11A	GN11B	2021-08-14	14:03	2021-08-14	16:03	2.00	1.5	Sa	Released
2	FHSC	188.0	50.0	F	A	14-Aug-21	Gill Net	GN11	DPF	503366 7976479	503426 7976550	17W	GN11A	GN11B	2021-08-14	14:03	2021-08-14	16:03	2.00	1.5	Sa	Released
1	ARCH	375.0	470.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
2	ARCH	243.0	120.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
3	ARCH	305.0	270.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
4	ARCH	484.0	1250.0	U	A	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
5	ARCH	501.0	1440.0	U	A	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
6	ARCH	533.0	1990.0	U	A	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
7	ARCH	433.0	870.0	U	A	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Mortality
8	ARCH	510.0	1270.0	U	A	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
9	ARCH	615.0	2490.0	U	A	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
10	ARCH	410.0	570.0	U	A	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
11	ARCH	289.0	150.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
12	ARCH	333.0	410.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
13	ARCH	271.0	240.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
14	ARCH	299.0	270.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
15	ARCH	280.0	220.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
16	ARCH	291.0	280.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
17	ARCH	294.0	260.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
18	ARCH	255.0	190.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
19	ARCH	128.0	10.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Released
20	ARCH	470.0	1020.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Mortality
21	ARCH	290.0	270.0	U	A	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Mortality
22	ARCH	254.0	200.0	U	-	15-Aug-21	Gill Net	GN12	REF	522147 7995861	522054 7995887	17X	GN12A	GN12B	2021-08-15	10:45	2021-08-15	12:45	2.00	1.5	Gr/Co	Mortality
1	ARCH	392.0	500.0	U	A	15-Aug-21	Gill Net	GN13	REF	522182 7996077	522089 7996100	17X	GN13A	GN13B	2021-08-15	11:00	2021-08-15	13:00	2.00	1.5	Gr/Co	Released
2	ARCH	281.0	230.0	U	-	15-Aug-21	Gill Net	GN13	REF	522182 7996077	522089 7996100	17X	GN13A	GN13B	2021-08-15	11:00	2021-08-15	13:00	2.00	1.5	Gr/Co	Released
3	ARCH	520.0	1590.0	U	A	15-Aug-21	Gill Net	GN13	REF	522182 7996077	522089 7996100	17X	GN13A	GN13B	2021-08-15	11:00	2021-08-15	13:00	2.00	1.5	Gr/Co	Released
4	ARCH	575.0	2300.0	U	A	15-Aug-21	Gill Net	GN13	REF	522182 7996077	522089 7996100	17X	GN13A	GN13B	2021-08-15	11:00	2021-08-15	13:00	2.00	1.5	Gr/Co	Released
5	ARCH	260.0	200.0	U	-	15-Aug-21	Gill Net	GN13	REF	522182 7996077	522089 7996100	17X	GN13A	GN13B	2021-08-15	11:00	2021-08-15	13:00	2.00	1.5	Gr/Co	Released
6	FHSC	-	224.0	F	A	15-Aug-21	Gill Net	GN13	REF	522182 7996077	522089 7996100	17X	GN13A	GN13B	2021-08-15	11:00	2021-08-15	13:00	2.00	1.5	Gr/Co	Euthanized
7	FHSC	-	234.0	F	A	15-Aug-21	Gill Net	GN13	REF	522182 7996077	522089 7996100	17X	GN13A	GN13B	2021-08-15	11:00	2021-08-15	13:00	2.00	1.5	Gr/Co	Euthanized
1	ARCH	462.0	1170.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
2	ARCH	402.0	520.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
3	ARCH	375.0	580.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
4	ARCH	400.0	710.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
5	ARCH	418.0	750.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
6	ARCH	475.0	1310.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
7	ARCH	336.0	410.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
8	ARCH	434.0	950.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
9	ARCH	521.0	760.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
10	ARCH	285.0	280.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
11	ARCH	442.0	920.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
12	ARCH	409.0	690.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
13	ARCH	314.0	300.0	U	-	15-Aug-21	Gill Net	GN14	REF	523116 7996895	523021 7996932	17X	GN14A	GN14B	2021-08-15	14:20	2021-08-15	15:05	0.75	2.65	Co/Bo/Sa	Released
1	ARCH	248.0	160.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
2	ARCH	374.0	490.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
3	ARCH	416.0	740.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released

4	ARCH	370.0	700.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
5	ARCH	490.0	1590.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
6	ARCH	409.0	800.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
7	ARCH	487.0	1420.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
8	ARCH	428.0	910.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
9	ARCH	365.0	500.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
10	ARCH	402.0	740.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
11	ARCH	430.0	930.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
12	ARCH	422.0	760.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
13	ARCH	334.0	410.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
14	ARCH	348.0	560.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
15	ARCH	385.0	640.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
16	ARCH	305.0	350.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
17	ARCH	333.0	390.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
18	ARCH	404.0	800.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Released
19	ARCH	460.0	1030.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Mortality
20	ARCH	421.0	890.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Mortality
21	ARCH	351.0	510.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Mortality
22	ARCH	304.0	270.0	U	U	15-Aug-21	Gill Net	GN15	REF	523133 7996676	523068 7996739	17X	GN15A	GN15B	2021-08-15	14:35	2021-08-15	15:35	1.00	-	Sa/Co	Mortality
1	ARCH	472.0	1070.0	U	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
2	SHSC	249.0	180.0	U	U	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
3	FHSC	223.0	180.0	F	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
4	ARCH	737.0	4430.0	U	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
5	ARCH	440.0	960.0	U	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
6	ARCH	352.0	490.0	U	U	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
7	FHSC	238.0	150.0	M	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
8	FHSC	187.0	70.0	F	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
9	FHSC	235.0	150.0	M	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
10	FHSC	210.0	100.0	M	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
11	FHSC	248.0	190.0	M	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
12	FHSC	243.0	200.0	M	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
13	FHSC	245.0	190.0	F	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
14	FHSC	275.0	270.0	F	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
15	FHSC	301.0	350.0	F	A	16-Aug-21	Gill Net	GN16	IPF	505148 7976959	505061 7976967	17W	GN16A	GN16B	2021-08-16	9:00	2021-08-16	12:15	3.25	#REF!	Sa/Bo	Released
1	ARCH	452.0	920.0	U	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
2	ARCH	335.0	390.0	U	U	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
3	ARCH	289.0	270.0	U	U	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
4	ARCH	343.0	510.0	U	U	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
5	ARCH	434.0	810.0	U	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
6	FHSC	246.0	200.0	M	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
7	FHSC	247.0	210.0	M	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
8	FHSC	234.0	160.0	F	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
9	FHSC	180.0	100.0	F	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
10	FHSC	236.0	170.0	M	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
11	FHSC	298.0	360.0	F	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
12	FHSC	256.0	210.0	F	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
13	FHSC	240.0	160.0	F	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
14	FHSC	217.0	130.0	F	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
15	FHSC	186.0	80.0	F	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
16	FHSC	189.0	80.0	M	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
17	FHSC	210.0	120.0	F	A	16-Aug-21	Gill Net	GN17	IPF	505080 7979223	505080 7977223	17W	GN17A	GN17B	2021-08-16	9:20	2021-08-16	12:25	3.08	#REF!	Sa/Bo	Released
1	ARCH	187.0	50.0	-	-	17-Aug-21	Gill Net	GN18	DPF	504274 7976478	504304 7976549	17W	GN18A	GN18B	2021-08-17	8:10	2021-08-17	12:10	4.17	#REF!	Sa	Released
2	ARCH	340.0	470.0	-	-	17-Aug-21	Gill Net	GN18	DPF	504274 7976478	504304 7976549	17W	GN18A	GN18B	2021-08-17	8:10	2021-08-17	12:10	4.17	#REF!	Sa	Released
1	ARCH	691.0	4990.0	U	A	17-Aug-21	Gill Net	GN19	IPF	504573 7976595	504541 7976668	17W	GN19A	GN19B	2021-08-17	8:25	2021-08-17	12:25	4.00	-	Bo/Sa	Released
2	ARCH	594.0	2500.0	U	U	17-Aug-21	Gill Net	GN19	IPF	504573 7976595	504541 7976668	17W	GN19A	GN19B	2021-08-17	8:25	2021-08-17	12:25	4.00	-	Bo/Sa	Released
3	ARCH	627.0	3280.0	U	U	17-Aug-21	Gill Net	GN19	IPF	504573 7976595	504541 7976668	17W	GN19A	GN19B	2021-08-17	8:25	2021-08-17	12:25	4.00	-	Bo/Sa	Released
4	ARCH	290.0	300.0	U	U	17-Aug-21	Gill Net	GN19	IPF	504573 7976595	504541 7976668	17W	GN19A	GN19B	2021-08-17	8:25	2021-08-17	12:25	4.00	-	Bo/Sa	Released
5	FHSC	291.0	280.0	F	A	17-Aug-21	Gill Net	GN19	IPF	504573 7976595	504541 7976668	17W	GN19A	GN19B	2021-08-17	8:25	2021-08-17	12:25	4.00	-	Bo/Sa	Released
6	FHSC	216.0	80.0	M	A	17-Aug-21	Gill Net	GN19	IPF	504573 7976595	504541 7976668	17W	GN19A	GN19B	2021-08-17	8:25	2021-08-17	12:25	4.00	-	Bo/Sa	Released
7	FHSC	234.0	100.0	F	A	17-Aug-21	Gill Net	GN19	IPF	504573 7976595	504541 7976668	17W	GN19A	GN19B	2021-08-17	8:25	2021-08-17	12:25	4.00	-	Bo/Sa	Released
8	FHSC	239.0	120.0	F	A	17-Aug-21	Gill Net	GN19	IPF	504573 7976595	504541 7976668	17W	GN19A	GN19B	2021-08-17	8:25	2021-08-17	12:25	4.00	-	Bo/Sa	Released
9	FHSC	219.0	100.0	F	A	17-Aug-21	Gill Net	GN19	IPF	504573 7976595	504541 7976668	17W	GN19A	GN19B	2021-08-17	8:25	2021-08-17	12:25	4.00	-	Bo/Sa	Released
10	FHSC	189.0	60.0	M	A	17-Aug-21	Gill Net	GN19	IPF	504573 7976595	504541 7976668	17W	GN19A	GN19B	2021-08-17	8:25	2021-08-17	12:25	4.00	-	Bo/Sa	Released
1	ARCH	303.0	290.0	U	U	17-Aug-21	Gill Net	GN20	IPF	505191 7977496	505111 7977501	17W	GN20A	GN20B	2021-08-17	12:50	2021-08-17	16:35	3.75	#REF!	Sa/Bo	Released
2	ARCH	387.0	610.0	U	U	17-Aug-21	Gill Net	GN20	IPF	505191 7977497	505111 7977502	17W	GN20A	GN20B	2021-08-17	12:50	2021-08-17	16:35	3.75	#REF!	Sa/Bo	Mortality
3	SHSC	323.0	410.0	U	A	17-Aug-21	Gill Net	GN20	IPF	505191 7977498	505111 7977503	17W	GN20A	GN20B	2021-08-17	12:50	2021-08-17	16:35	3.75	#REF!	Sa/Bo	Released
4	SHSC	269.0	220.0	U	A	17-Aug-21	Gill Net	GN20	IPF	505191 7977499	505111 7977504	17W	GN20A	GN20B	2021-08-17	12:50	2021-08-17	16:35	3.75	#REF!	Sa/Bo	Released
5	FHSC	249.0	140.0	F	A	17-Aug-21	Gill Net	GN20	IPF	505191 7977500	505111 7977505	17W	GN20A	GN20B	2021-08-17	12:50	2021-08-17	16:35	3.75	#REF!	Sa/Bo	Released
6	FHSC	345.0	160.0	F	A	17-Aug-21	Gill Net	GN20	IPF	505191 7977501	505111 7977506	17W	GN20A	GN20B	2021-08-17	12:50	2021-08-17	16:35	3.75	#REF!	Sa/Bo	Released
7	FHSC	218.0	90.0	F	A	17-Aug-21	Gill Net	GN20	IPF	505191 7977502	505111 7977507	17W	GN20A	GN20B	2021-08-17	12:50	2021-08-17	16:35	3.75	#REF!	Sa/Bo	Released

8	FHSC	191.0	50.0	M	A	17-Aug-21	Gill Net	GN20	IPF	505191 7977503	505111 7977508	17W	GN20A	GN20B	2021-08-17	12:50	2021-08-17	16:35	3.75	#REF!	Sa/Bo	Released
9	FHSC	194.0	50.0	F	A	17-Aug-21	Gill Net	GN20	IPF	505191 7977504	505111 7977509	17W	GN20A	GN20B	2021-08-17	12:50	2021-08-17	16:35	3.75	#REF!	Sa/Bo	Released
10	ARSC	216.0	150.0	U	A	17-Aug-21	Gill Net	GN20	IPF	505191 7977505	505111 7977510	17W	GN20A	GN20B	2021-08-17	12:50	2021-08-17	16:35	3.75	#REF!	Sa/Bo	Released
11	GRCD	449.0	890.0	U	A	17-Aug-21	Gill Net	GN20	IPF	505191 7977506	505111 7977511	17W	GN20A	GN20B	2021-08-17	12:50	2021-08-17	16:35	3.75	#REF!	Sa/Bo	Released
1	ARCH	283.0	270.0	-	-	17-Aug-21	Gill Net	GN21	IPF	505264 7977779	505201 7977808	17W	GN21A	GN21B	2021-08-17	12:43	2021-08-17	16:20	3.62	#REF!	Bo/Gr	Released
2	ARCH	226.0	130.0	-	-	17-Aug-21	Gill Net	GN21	IPF	505264 7977779	505201 7977808	17W	GN21A	GN21B	2021-08-17	12:43	2021-08-17	16:20	3.62	#REF!	Bo/Gr	Released
3	ARCH	380.0	540.0	-	-	17-Aug-21	Gill Net	GN21	IPF	505264 7977779	505201 7977808	17W	GN21A	GN21B	2021-08-17	12:43	2021-08-17	16:20	3.62	#REF!	Bo/Gr	Released
4	ARCH	332.0	430.0	-	-	17-Aug-21	Gill Net	GN21	IPF	505264 7977779	505201 7977808	17W	GN21A	GN21B	2021-08-17	12:43	2021-08-17	16:20	3.62	#REF!	Bo/Gr	Mortality
5	SHSC	237.0	150.0	-	-	17-Aug-21	Gill Net	GN21	IPF	505264 7977779	505201 7977808	17W	GN21A	GN21B	2021-08-17	12:43	2021-08-17	16:20	3.62	#REF!	Bo/Gr	Released
6	FHSC	251.0	230.0	F	A	17-Aug-21	Gill Net	GN21	IPF	505264 7977779	505201 7977808	17W	GN21A	GN21B	2021-08-17	12:43	2021-08-17	16:20	3.62	#REF!	Bo/Gr	Released
7	FHSC	247.0	190.0	F	A	17-Aug-21	Gill Net	GN21	IPF	505264 7977779	505201 7977808	17W	GN21A	GN21B	2021-08-17	12:43	2021-08-17	16:20	3.62	#REF!	Bo/Gr	Released
8	SHSC	242.0	230.0	U	A	17-Aug-21	Gill Net	GN21	IPF	505264 7977779	505201 7977808	17W	GN21A	GN21B	2021-08-17	12:43	2021-08-17	16:20	3.62	#REF!	Bo/Gr	Released
9	ARSC	89.0	20.0	U	U	17-Aug-21	Gill Net	GN21	IPF	505264 7977779	505201 7977808	17W	GN21A	GN21B	2021-08-17	12:43	2021-08-17	16:20	3.62	#REF!	Bo/Gr	Released
1	ARCH	228.0	110.0	U	U	18-Aug-21	Gill Net	GN22	IPF	502249 7976266	502215 7976347	17A	GN22A	GN22B	2021-08-18	8:15	2021-08-18	12:08	3.88	-	Sa	Released
1	ARCH	470.0	1250.0	U	U	18-Aug-21	Gill Net	GN23	IPF	502432 7976273	502457 7976361	17W	GN23A	GN23B	2021-08-18	8:30	2021-08-18	12:15	3.75	#REF!	Sa	Mortality
2	ARCH	354.0	450.0	U	U	18-Aug-21	Gill Net	GN23	IPF	502432 7976273	502457 7976361	17W	GN23A	GN23B	2021-08-18	8:30	2021-08-18	12:15	3.75	#REF!	Sa	Released
3	ARCH	465.0	1110.0	U	U	18-Aug-21	Gill Net	GN23	IPF	502432 7976273	502457 7976361	17W	GN23A	GN23B	2021-08-18	8:30	2021-08-18	12:15	3.75	#REF!	Sa	Released
1	ARCH	528.0	1880.0	U	A	18-Aug-21	Gill Net	GN24	DPF	503721 7976365	503721 7976453	17W	GN24A	GN24B	2021-08-18	13:20	2021-08-18	16:40	3.33	#REF!	Sa	Released
2	FHSC	235.0	150.0	F	A	18-Aug-21	Gill Net	GN24	DPF	503721 7976365	503721 7976453	17W	GN24A	GN24B	2021-08-18	13:20	2021-08-18	16:40	3.33	#REF!	Sa	Released
3	FHSC	230.0	140.0	F	A	18-Aug-21	Gill Net	GN24	DPF	503721 7976365	503721 7976453	17W	GN24A	GN24B	2021-08-18	13:20	2021-08-18	16:40	3.33	#REF!	Sa	Released
4	FHSC	124.0	120.0	F	A	18-Aug-21	Gill Net	GN24	DPF	503721 7976365	503721 7976453	17W	GN24A	GN24B	2021-08-18	13:20	2021-08-18	16:40	3.33	#REF!	Sa	Released
5	FHSC	200.0	80.0	F	A	18-Aug-21	Gill Net	GN24	DPF	503721 7976365	503721 7976453	17W	GN24A	GN24B	2021-08-18	13:20	2021-08-18	16:40	3.33	#REF!	Sa	Released
6	FHSC	229.0	120.0	F	A	18-Aug-21	Gill Net	GN24	DPF	503721 7976365	503721 7976453	17W	GN24A	GN24B	2021-08-18	13:20	2021-08-18	16:40	3.33	#REF!	Sa	Released
7	FHSC	160.0	130.0	F	A	18-Aug-21	Gill Net	GN24	DPF	503721 7976365	503721 7976453	17W	GN24A	GN24B	2021-08-18	13:20	2021-08-18	16:40	3.33	#REF!	Sa	Released
8	FHSC	206.0	120.0	F	A	18-Aug-21	Gill Net	GN24	DPF	503721 7976365	503721 7976453	17W	GN24A	GN24B	2021-08-18	13:20	2021-08-18	16:40	3.33	#REF!	Sa	Released
9	FHSC	188.0	80.0	F	A	18-Aug-21	Gill Net	GN24	DPF	503721 7976365	503721 7976453	17W	GN24A	GN24B	2021-08-18	13:20	2021-08-18	16:40	3.33	#REF!	Sa	Released
10	ARSC	135.0	50.0	U	U	18-Aug-21	Gill Net	GN24	DPF	503721 7976365	503721 7976453	17W	GN24A	GN24B	2021-08-18	13:20	2021-08-18	16:40	3.33	#REF!	Sa	Released
11	FHSC	148.0	50.0	F	A	18-Aug-21	Gill Net	GN24	DPF	503721 7976365	503721 7976453	17W	GN24A	GN24B	2021-08-18	13:20	2021-08-18	16:40	3.33	#REF!	Sa	Released
12	FHSC	159.0	60.0	F	A	18-Aug-21	Gill Net	GN24	DPF	503721 7976365	503721 7976453	17W	GN24A	GN24B	2021-08-18	13:20	2021-08-18	16:40	3.33	#REF!	Sa	Released
1	ARCH	191.0	110.0	U	U	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Released
2	ARCH	430.0	750.0	U	A	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Released
3	ARCH	282.0	260.0	U		18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Mortality
4	ARCH	285.0	260.0	U	U	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Mortality
5	ARCH	266.0	160.0	U	U	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Mortality
6	ARCH	490.0	1240.0	U	A	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Mortality
7	ARCH	324.0	350.0	U	A	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Released
8	FHSC	195.0	90.0	M	A	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Released
9	FHSC	179.0	80.0	F	A	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Released
10	FHSC	212.0	110.0	M	A	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Released
11	FHSC	223.0	110.0	M	A	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Released
12	ARCH	615.0	3220.0	U	U	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Released
13	ARCH	398.0	710.0	-	-	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Mortality
14	ARSC	108.0	10.0	U	U	18-Aug-21	Gill Net	GN25	DPF	504141 7976594	504230 7976604	17W	GN25A	GN25B	2021-08-18	13:44	2021-08-18	17:20	3.60	#REF!	-	Released
1	FHSC	280.0	250.0	M	A	02-Aug-21	Hoop Net	HN01	DPF	503021 7976416	503017 7976420	17W	157	-	2021-08-02	10:45	2021-08-04	14:50	52.08	#REF!	Co/Sa	Released
2	FHSC	247.0	184.0	M	A	02-Aug-21	Hoop Net	HN01	DPF	503021 7976416	503017 7976420	17W	157	-	2021-08-02	10:45	2021-08-04	14:50	52.08	#REF!	Co/Sa	Released
3	FHSC	293.0	204.0	M	A	02-Aug-21	Hoop Net	HN01	DPF	503021 7976416	503017 7976420	17W	157	-	2021-08-02	10:45	2021-08-04	14:50	52.08	#REF!	Co/Sa	Released
1	FHSC	189.0	72.0	U	U	02-Aug-21	Hoop Net	HN02	DPF	503145 7976480	503137 7976480	17W	HN02	-	2021-08-02	11:03	2021-08-07	12:34	121.52	#REF!	Co/Sa/Bo	Released
1	FHSC	157.0	40.0	M	U	08-Aug-21	Hoop Net	HN03	DPF	503003 7976400	-	17W	HN03	-	2021-08-08	8:30	2021-08-11	10:40	74.17	#REF!	-	Released
2	FHSC	160.0	40.0	F	U	08-Aug-21	Hoop Net	HN03	DPF	503003 7976400	-	17W	HN03	-	2021-08-08	8:30	2021-08-11	10:40	74.17	#REF!	-	Released
3	FHSC	138.0	10.0	U	U	08-Aug-21	Hoop Net	HN03	DPF	503003 7976400	-	17W	HN03	-	2021-08-08	8:30	2021-08-11	10:40	74.17	#REF!	-	Released
1	FHSC	248.0	150.0	M	A	08-Aug-21	Hoop Net	HN04	DPF	504028 7976600	-	17W	-	-	2021-08-08	8:40	2021-08-11	12:13	75.55	#REF!	-	Released
2	FHSC	178.0	50.0	U	U	08-Aug-21	Hoop Net	HN04	DPF	504028 7976600	-	17W	-	-	2021-08-08	8:40	2021-08-11	12:13	75.55	#REF!	-	Released
3	FHSC	145.0	45.0	U	U	08-Aug-21	Hoop Net	HN04	DPF	504028 7976600	-	17W	-	-	2021-08-08	8:40	2021-08-11	12:13	75.55	#REF!	-	Released
4	FHSC	166.0	50.0	U	U	08-Aug-21	Hoop Net	HN04	DPF	504028 7976600	-	17W	-	-	2021-08-08	8:40	2021-08-11	12:13	75.55	#REF!	-	Released
5	FHSC	186.0	60.0	M	A	08-Aug-21	Hoop Net	HN04	DPF	504028 7976600	-	17W	-	-	2021-08-08	8:40	2021-08-11	12:13	75.55	#REF!	-	Released
NFC	-	-	-	-	-	11-Aug-21	Hoop Net	HN05	DPF	504136 7976559	-	17W	HN05	-	2021-08-11	11:31	2021-08-16	14:00	122.48	#REF!	Sa	-
NFC	-	-	-	-	-	11-Aug-21	Hoop Net	HN06	DPF	504068 7976564	-	17W	HN06	-	2021-08-11	11:51	2021-08-16	14:15	122.40	#REF!	Bo	-
NFC	-	-	-	-	-	16-Aug-21	Hoop Net	HN07	IPF	504563 7976634	-	17W	-	-	2021-08-16	14:35	2021-08-16	15:00	48.42	#REF!	-	-
NFC	-	-	-	-	-	09-Aug-21	Long Line	LL01	IPF	502570 7976487	502680 7976630	17W	LL01A	LL01B	2021-08-09	16:00	2021-08-10	7:30	15.50	#REF!	-	-
NFC	-	-	-	-	-	09-Aug-21	Long Line	LL02	IPF	504720 7976812	504740 7977008	17W	LL02A	LL02B	2021-08-10	8:15	2021-08-11	12:13	27.97	#REF!	-	-
NFC	-	-	-	-	-	09-Aug-21	Long Line	LL03	IPF	502193 7976782	502359 7976919	17W	LL03A	LL03	2021-08-11	14:30	2021-08-12	8:00	17.50	#REF!	-	-
NFC	-	-	-	-	-	19-Aug-21	Trawling	TR01	IPF	502222 7977862	501962 7977448	17W	TR01A	TR01B	2021-08-19	8:53	2021-08-19	9:10	0.28	31	-	-
1	UNSN	102.0	-	U	U	19-Aug-21	Trawling	TR02	IPF	501699 7976664	501981 7977507	17W	TR02A	TR02B	2021-08-19	9:37	2021-08-19	10:07	0.50	32.5	-	Euthanized
2	UNCD	63.0	-	U	U	19-Aug-21	Trawling	TR02	IPF	501699 7976664	501981 7977507	17W	TR02A	TR02B	2021-08-19	9:37	2021-08-19	10:07	0.50	32.5	-	Released
3	RBSC	71.0	-	U	U	19-Aug-21	Trawling	TR02	IPF	501699 7976664	501981 7977507	17W	TR02A	TR02B	2021-08-19	9:37	2021-08-19	10:07	0.50	32.5	-	Released
4	UNSC	93.0	-	U	U	19-Aug-21	Trawling	TR02	IPF	501699 7976664	501981 7977507	17W	TR02A	TR02B	2021-08-19	9:37	2021-08-19	10:07	0.50	32.5	-	Released
5	ATPO	47.0	-	U	U	19-Aug-21	Trawling	TR02	IPF	501699 7976664	501981 7977507	17W	TR02A	TR02B	2021-08-19	9:37	2021-08-19	10:07	0.50	32.5	-	Euthanized
1	RBSC	134.0	-	U	U	19-Aug-21	Trawling	TR03	IPF	502407 7978007	502720 7978457	17W	TR03A	TR03B	2021-08-19	10:58	2021-08-19	11:40	0.70	50	-	Released
2	RBSC	82.0	-	U	U	19-Aug-21	Trawling	TR03	IPF	502407 7978007	502720 7978457	17W	TR03A	TR03B	2021-08-19	10:58	2021-08-19	11:40	0.70	50	-	Released
3	UNCD	58.0	-	U	U	19-Aug-21	Trawling	TR03	IPF	502407 7978007	502720 7978457	17W	TR03A	TR03B	2021-08-19	10:58	2021-08-19	11:40	0.70	50	-	Released

Table 3. 2021 Fishing Catch Data, Milne Inlet

1	STSC	101.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released
2	STSC	145.0	30.0	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released
3	STSC	150.0	30.0	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released
4	SAEP	121.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released
5	RBSC	118.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Euthanized
6	ARSC	108.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released
7	UNCD	99.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released
8	STSC	122.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
9	RBSC	74.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Euthanized
10	RBSC	114.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released
11	RBSC	109.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released
12	RBSC	92.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
13	RBSC	93.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
14	RBSC	99.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
15	RBSC	95.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
16	RBSC	87.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
17	RBSC	95.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
18	RBSC	88.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
19	RBSC	92.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
20	RBSC	95.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
21	RBSC	96.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
22	RBSC	91.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
23	RBSC	108.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
24	RBSC	98.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released
25	RBSC	117.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released
26	RBSC	91.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
27	RBSC	98.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
28	RBSC	93.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
29	RBSC	96.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
30	RBSC	116.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
31	RBSC	94.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
32	RBSC	94.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
33	RBSC	110.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
34	RBSC	110.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
35	RBSC	97.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
36	RBSC	91.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
37	RBSC	94.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
38	RBSC	87.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
39	RBSC	99.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
40	RBSC	96.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
41	RBSC	102.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
42	RBSC	97.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
43	RBSC	89.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
44	RBSC	93.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
45	RBSC	94.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
46	RBSC	89.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
47	RBSC	80.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
48	RBSC	99.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
49	RBSC	88.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
50	RBSC	84.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released
51	RBSC	100.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
52	AALG	72.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Euthanized
53	AALG	69.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Euthanized
54	UNCD	59.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
55	UNCD	69.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
56	UNCD	72.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
57	UNCD	73.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
58	UNCD	72.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
59	UNCD	63.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
60	UNCD	66.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
61	UNCD	70.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Mortality
62	STSC	90.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released
63	UNSC	86.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Euthanized
64	UNSC	90.0	-	U	U	19-Aug-21	Trawling	TR04	DPF	503009 7976604	503945 7976822	17W	TR04A	TR04B	2021-08-19	13:02	2021-08-19	13:35	0.55	30	-	Released

[1] NFC = no fish caught

[2] AALG = Arctic alligatorfish; ARCH = Arctic char; ARSC = Arctic sculpin; ATPO = Atlantic poacher; FHSC = Fourhorn sculpin; GRCD = Greenland cod; RBSC = Ribbed sculpin; SAEP = Saddled eelpout; SHSC = Shorthorn sculpin; STSC = Arctic staghorn sculpin; UNCD = Unknown cod; UNPO = Unk

[3] DPF = direct project footprint; IPF = indirect project footprint

[4] Bo = Boulder; Co = Cobble; Gr = Gravel; Sa = Sand

Table 4. 2022 Fishing Catch Data, Milne Inlet

Fish Number[1]	Species Code[2]	Length (mm)	Weight (g)	Sex	Stage	Date	Capture Method	Site	Area[3]	Start UTM (NAD 83)	End UTM (NAD 83)	Zone	Start Waypoint	End Waypoint	Start/Set Date	Start Time	End/Pull Date	End Time	Total Hours	Average Water Depth (m)	Substrate Type[4]	Released / Mortality / Euthanized
NFC	-	-	-	-	-	02-08-2022	Angling - Jigging	AJ01	IPF	503217 7976609	- -	17W	AJ01	-	02-08-2022	9:05	02-08-2022	9:35	0.50	15	Bo	-
1	FHSC	242	162.6	M	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Euthanized
2	FHSC	258	187.1	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Euthanized
3	FHSC	233	138	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
4	FHSC	179	54	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
5	FHSC	191	73	M	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
6	FHSC	210	78	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
7	FHSC	203	86	M	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
8	FHSC	214	124	M	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
9	FHSC	154	32	U	J	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
10	FHSC	228	124	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
11	FHSC	195	63	M	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
12	FHSC	206	81	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
13	FHSC	217	102	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
14	FHSC	207	82	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
15	FHSC	213	98	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
16	FHSC	194	75	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
17	FHSC	272	231	M	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
18	FHSC	229	112	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
19	FHSC	170	38	U	J	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
20	FHSC	245	124	M	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
21	FHSC	200	73	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
22	FHSC	191	65	F	A	03-08-2022	Angling - Jigging	AJ02	DPF	503219 7976551	- -	17W	AJ02	-	03-08-2022	14:06	03-08-2022	14:36	0.50	1	Bo	Released
1	GRCD	706	4260	U	A	04-08-2022	Angling - Jigging	AJ03	IPF	505722 7978486	- -	17W	AJ03	-	04-08-2022	8:20	04-08-2022	8:50	0.50	20	Bo	Released
2	SHSC	322	460	U	A	04-08-2022	Angling - Jigging	AJ03	IPF	505722 7978486	- -	17W	AJ03	-	04-08-2022	8:20	04-08-2022	8:50	0.50	20	Bo	Released
1	FHSC	149	20	U	J	04-08-2022	Angling - Jigging	AJ04	DPF	504012 7976601	- -	17W	AJ04	-	04-08-2022	13:20	04-08-2022	13:40	0.33	1.5	Sa/Bo	Released
1	FHSC	191	60	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
2	FHSC	182	80	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
3	FHSC	174	45	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
4	FHSC	191	65	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
5	FHSC	171	50	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
6	FHSC	84	55	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
7	FHSC	151	50	U	U	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
8	FHSC	83	60	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
9	FHSC	188	60	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
10	FHSC	200	70	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
11	FHSC	195	70	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
12	FHSC	162	40	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
13	FHSC	157	40	F	U	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
14	FHSC	194	80	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
15	FHSC	190	70	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
16	FHSC	201	85	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
17	FHSC	133	65	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
18	FHSC	149	30	U	J	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
19	FHSC	195	70	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
20	FHSC	254	184.7	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
21	FHSC	306	353.1	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
22	FHSC	260	166.7	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
23	FHSC	266	249.3	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
24	FHSC	214	96.6	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
25	FHSC	278	211.4	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
26	FHSC	240	136.1	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
27	FHSC	230	111.4	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
28	FHSC	218	107.2	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
29	FHSC	230	118.5	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
30	FHSC	267	209.1	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
31	FHSC	267	209.1	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
32	FHSC	225	115.5	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized
33	FHSC	204	96	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
34	FHSC	210	83	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
35	FHSC	218	104	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
36	FHSC	224	134	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
37	FHSC	203	109	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
38	FHSC	201	74	F	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
39	FHSC	207	78	M	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Released
40	FHSC	247	142.8	A	A	05-08-2022	Angling - Jigging	AJ05	DPF	503148 7976501	- -	17W	AJ05	-	05-08-2022	10:32	05-08-2022	11:51	1.32	2	Sa/Bo	Euthanized

Table 4. 2022 Fishing Catch Data, Milne Inlet

1	FHSC	264	213	F	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
2	FHSC	250	145	F	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
3	FHSC	200	82	M	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
4	FHSC	240	153	M	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
5	FHSC	288	258	M	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
6	FHSC	254	149	M	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
7	FHSC	227	116	M	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
8	FHSC	205	73	F	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
9	FHSC	197	71	M	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
10	FHSC	261	175	M	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
11	FHSC	210	100	M	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
12	FHSC	189	60	M	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
13	FHSC	226	108	F	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
14	FHSC	264	171	F	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
15	FHSC	225	95	M	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
16	FHSC	234	133	M	A	05-08-2022	Angling - Jigging	AJ06	DPF	503211 7976565	- -	17W	AJ06	-	05-08-2022	13:13	05-08-2022	13:43	0.50	3	Sa/Bo	Released
1	FHSC	200	110	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
2	FHSC	203	80	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
3	FHSC	194	90	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
4	FHSC	183	80	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
5	FHSC	199	85	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
6	FHSC	194	70	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
7	FHSC	194	60	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
8	FHSC	196	85	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
9	FHSC	245	150.1	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Euthanized
10	FHSC	222	115.3	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Euthanized
11	FHSC	217	101.3	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Euthanized
12	FHSC	242	144.2	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Euthanized
13	FHSC	252	169.2	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Euthanized
14	FHSC	212	180	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Euthanized
15	FHSC	257	141.8	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Euthanized
16	FHSC	252	165.1	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Euthanized
17	FHSC	246	154.8	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Euthanized
18	FHSC	241	121	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
19	FHSC	212	89	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
20	FHSC	207	82	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
21	FHSC	239	139	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
22	FHSC	217	99	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
23	FHSC	230	107	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
24	FHSC	214	92	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
25	FHSC	217	87	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
26	FHSC	239	115	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
27	FHSC	187	65	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
28	FHSC	224	106	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
29	FHSC	218	108	M	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
30	FHSC	214	86	F	A	06-08-2022	Angling - Jigging	AJ07	DPF	503221 7976581	- -	17W	AJ07	-	06-08-2022	13:17	06-08-2022	14:00	0.72	3	Sa/Bo	Released
NFC	-	-	-	-	-	08-08-2022	Angling - Jigging	AJ08	IPF	504950 7976588	- -	17W	AJ08	-	08-08-2022	8:31	08-08-2022	9:05	0.57	10	Rocky drop off	-
1	SHSC	354	580	U	U	08-08-2022	Angling - Jigging	AJ09	DPF	503986 7976664	- -	17W	AJ09	-	08-08-2022	9:37	08-08-2022	10:00	0.38	6	Bo	Released
1	GRCD	468	1610	U	A	11-08-2022	Angling - Jigging	AJ10	DPF	503213 7976613	- -	17W	AJ10	-	11-08-2022	10:46	11-08-2022	11:05	0.32	15	Blast Rock	Released
2	SHSC	260	300	U	A	11-08-2022	Angling - Jigging	AJ10	DPF	503213 7976613	- -	17W	AJ10	-	11-08-2022	10:46	11-08-2022	11:05	0.32	15	Blast Rock	Released
3	SHSC	277	360	U	A	11-08-2022	Angling - Jigging	AJ10	DPF	503213 7976613	- -	17W	AJ10	-	11-08-2022	10:46	11-08-2022	11:05	0.32	15	Blast Rock	Released
4	SHSC	232	260	U	A	11-08-2022	Angling - Jigging	AJ10	DPF	503213 7976613	- -	17W	AJ10	-	11-08-2022	10:46	11-08-2022	11:05	0.32	15	Blast Rock	Released
1	GRCD	505	1570	U	A	13-08-2022	Angling - Jigging	AJ11	IPF	505718 7978472	- -	17W	AJ11	-	13-08-2022	11:20	13-08-2022	11:40	0.33	20	Bo	Released
2	GRCD	528	2290	U	A	13-08-2022	Angling - Jigging	AJ11	IPF	505718 7978472	- -	17W	AJ11	-	13-08-2022	11:20	13-08-2022	11:40	0.33	20	Bo	Released
3	GRCD	574	2490	U	A	13-08-2022	Angling - Jigging	AJ11	IPF	505718 7978472	- -	17W	AJ11	-	13-08-2022	11:20	13-08-2022	11:40	0.33	20	Bo	Released
4	SHSC	323	450	U	A	13-08-2022	Angling - Jigging	AJ11	IPF	505718 7978472	- -	17W	AJ11	-	13-08-2022	11:20	13-08-2022	11:40	0.33	20	Bo	Released
5	SHSC	280	260	U	A	13-08-2022	Angling - Jigging	AJ11	IPF	505718 7978472	- -	17W	AJ11	-	13-08-2022	11:20	13-08-2022	11:40	0.33	20	Bo	Released
1	SHSC	290	470	U	A	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released
2	SHSC	243	220	U	A	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released
3	SHSC	318	430	U	A	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released
4	SHSC	255	270	U	A	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released
5	SHSC	192	90	U	A	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released
6	SHSC	188	100	U	A	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released
7	SHSC	172	60	U	A	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released
8	SHSC	160	50	U	U	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released
9	SHSC	210	80	U	A	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released
10	SHSC	186	90	U	A	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released
11	SHSC	185	100	U	A	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released
12	SHSC	171	50	U	U	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released
13	SHSC	158	50	U	A	14-08-2022	Angling - Jigging	AJ12	IPF	505124 7977155	- -	17W	AJ12	-	14-08-2022	9:20	14-08-2022	9:55	0.58	3	Sa/Bo	Released

Appendix 6B

Table 4. 2022 Fishing Catch Data, Milne Inlet

NFC	-	-	-	-	-	14-08-2022	Angling - Jigging	AJ13	DPF	503209 7976628	- -	17W	AJ13	-	14-08-2022	14:09	14-08-2022	15:24	1.25	15	Bo/Co/Sa	-
1	SHSC	354	595	A	UN	10-08-2022	Angling - Jigging	AJREF2	REF	511514 7997614	- -	17W	AJREF2	-	10-08-2022	14:50	10-08-2022	15:00	0.17	2	-	Released
2	SHSC	214	110	A	UN	10-08-2022	Angling - Jigging	AJREF2	REF	511514 7997614	- -	17W	AJREF2	-	10-08-2022	14:50	10-08-2022	15:00	0.17	2	-	Released
3	SHSC	197	100	A	UN	10-08-2022	Angling - Jigging	AJREF2	REF	511514 7997614	- -	17W	AJREF2	-	10-08-2022	14:50	10-08-2022	15:00	0.17	2	-	Released
4	SHSC	246	200	A	UN	10-08-2022	Angling - Jigging	AJREF2	REF	511514 7997614	- -	17W	AJREF2	-	10-08-2022	14:50	10-08-2022	15:00	0.17	2	-	Released
5	SHSC	280	310	A	UN	10-08-2022	Angling - Jigging	AJREF2	REF	511514 7997614	- -	17W	AJREF2	-	10-08-2022	14:50	10-08-2022	15:00	0.17	2	-	Released
6	SHSC	175	40	A	UN	10-08-2022	Angling - Jigging	AJREF2	REF	511514 7997614	- -	17W	AJREF2	-	10-08-2022	14:50	10-08-2022	15:00	0.17	2	-	Released
7	SHSC	216	125	A	UN	10-08-2022	Angling - Jigging	AJREF2	REF	511514 7997614	- -	17W	AJREF2	-	10-08-2022	14:50	10-08-2022	15:00	0.17	2	-	Released
8	SHSC	208	100	A	UN	10-08-2022	Angling - Jigging	AJREF2	REF	511514 7997614	- -	17W	AJREF2	-	10-08-2022	14:50	10-08-2022	15:00	0.17	2	-	Released
9	SHSC	197	100	A	UN	10-08-2022	Angling - Jigging	AJREF2	REF	511514 7997614	- -	17W	AJREF2	-	10-08-2022	14:50	10-08-2022	15:00	0.17	2	-	Released
10	SHSC	190	80	A	UN	10-08-2022	Angling - Jigging	AJREF2	REF	511514 7997614	- -	17W	AJREF2	-	10-08-2022	14:50	10-08-2022	15:00	0.17	2	-	Released
11	SHSC	180	80	A	UN	10-08-2022	Angling - Jigging	AJREF2	REF	511514 7997614	- -	17W	AJREF2	-	10-08-2022	14:50	10-08-2022	15:00	0.17	2	-	Released
12	SHSC	200	100	A	UN	10-08-2022	Angling - Jigging	AJREF2	REF	511514 7997614	- -	17W	AJREF2	-	10-08-2022	14:50	10-08-2022	15:00	0.17	2	-	Released
1	ARSC	224	130	U	A	10-08-2022	Angling - Jigging	AJREF3	REF	509027 8000823	- -	17W	AJREF3	-	10-08-2022	15:30	10-08-2022	15:45	0.25	2	Bo/Gr	Released
2	ARSC	220	130	U	A	10-08-2022	Angling - Jigging	AJREF3	REF	509027 8000823	- -	17W	AJREF3	-	10-08-2022	15:30	10-08-2022	15:45	0.25	2	Bo/Gr	Released
3	SHSC	345	200	U	A	10-08-2022	Angling - Jigging	AJREF3	REF	509027 8000823	- -	17W	AJREF3	-	10-08-2022	15:30	10-08-2022	15:45	0.25	2	Bo/Gr	Released
1	SHSC	213	95	U	A	10-08-2022	Angling - Jigging	AJREF4	REF	506316 7993979	- -	17W	PHAB8	-	10-08-2022	16:16	10-08-2022	16:26	0.17	3	Bo	Released
1	FHSC	249	160	M	A	04-08-2022	Angling - Trolling	AT01	IPF	505168 7977369	505117 7977124	17W	AT01S	AT01D	04-08-2022	10:06	04-08-2022	10:42	0.60	5	Bo/Co/Gr	Released
2	ARSC	136	30	U	A	04-08-2022	Angling - Trolling	AT01	IPF	505168 7977369	505117 7977124	17W	AT01S	AT01D	04-08-2022	10:06	04-08-2022	10:42	0.60	5	Bo/Co/Gr	Released
1	FHSC	192	60	M	A	04-08-2022	Angling - Trolling	AT02	DPF	503139 7976499	503077 7976441	17W	AT02S	AT02E	04-08-2022	15:46	04-08-2022	15:58	0.20	3	Sa/Bo	Released
2	FHSC	214	110	M	A	04-08-2022	Angling - Trolling	AT02	DPF	503139 7976499	503077 7976441	17W	AT02S	AT02E	04-08-2022	15:46	04-08-2022	15:58	0.20	3	Sa/Bo	Released
3	FHSC	197	77	F	A	04-08-2022	Angling - Trolling	AT02	DPF	503139 7976499	503077 7976441	17W	AT02S	AT02E	04-08-2022	15:46	04-08-2022	15:58	0.20	3	Sa/Bo	Released
4	FHSC	207	92	F	A	04-08-2022	Angling - Trolling	AT02	DPF	503139 7976499	503077 7976441	17W	AT02S	AT02E	04-08-2022	15:46	04-08-2022	15:58	0.20	3	Sa/Bo	Released
5	FHSC	182	57	M	A	04-08-2022	Angling - Trolling	AT02	DPF	503139 7976499	503077 7976441	17W	AT02S	AT02E	04-08-2022	15:46	04-08-2022	15:58	0.20	3	Sa/Bo	Released
NFC	-	-	-	-	-	05-08-2022	Angling - Trolling	AT03	DPF	503890 7976647	503915 7976603	17W	AT03S	AT03E	05-08-2022	10:15	05-08-2022	10:21	0.10	1.5	Sa/Bo	-
1	GRCD	445	830	-	A	06-08-2022	Angling - Trolling	AT04	DPF	503225 7976606	502879 7976483	17W	AT04S	AT04E	06-08-2022	8:34	06-08-2022	9:00	0.43	3	Sa/Bo	Released
2	ARCH	620	275	-	A	06-08-2022	Angling - Trolling	AT04	DPF	503225 7976606	502879 7976483	17W	AT04S	AT04E	06-08-2022	8:34	06-08-2022	9:00	0.43	3	Sa/Bo	Released
1	FHSC	294	260	F	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
2	FHSC	259	220	F	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
3	FHSC	332	450	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
4	FHSC	199	50	U	U	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
5	FHSC	290	260	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
6	FHSC	240	130	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
7	FHSC	248	160	F	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
8	FHSC	281	270	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
9	FHSC	225	105	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
10	FHSC	229	130	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
11	FHSC	226	120	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
12	FHSC	228	100	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
13	FHSC	170	30	U	U	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
14	FHSC	264	150	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
15	FHSC	240	145	F	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
16	FHSC	202	70	F	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
17	FHSC	237	140	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
18	FHSC	172	30	U	U	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
19	FHSC	216	80	F	U	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
20	FHSC	207	60	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
21	FHSC	180	30	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
22	FHSC	203	70	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
23	FHSC	209	80	M	A	11-08-2022	Angling - Trolling	AT05	DPF	503207 7976607	503115 7976508	17W	AT05S	AT05E	11-08-2022	8:58	11-08-2022	9:46	0.80	4	Sa/Co	Released
NFC	-	-	-	-	-	13-08-2022	Angling - Trolling	AT06	DPF	502884 7976390	502845 7976364	17W	AT06S	AT06E	13-08-2022	16:20	13-08-2022	16:38	0.30	12	-	-
NFC	-	-	-	-	-	13-08-2022	Angling - Trolling	AT06	DPF	502884 7976390	502845 7976364	17W	AT06S	AT06E	13-08-2022	16:20	13-08-2022	16:40	0.33	13	Sa/Co	-
1	SHSC	260	340	U	A	14-08-2022	Angling - Trolling	AT07S	DPF	504225 7976667	504606 7976722	17W	AT07S	AT07E	14-08-2022	11:00	14-08-2022	11:45	0.75	8	-	Released
2	SHSC	176	70	U	A	14-08-2022	Angling - Trolling	AT07S	DPF	504225 7976667	504606 7976722	17W	AT07S	AT07E	14-08-2022	11:00	14-08-2022	11:45	0.75	8	-	Released
3	SHSC	219	180	U	A	14-08-2022	Angling - Trolling	AT07S	DPF	504225 7976667	504606 7976722	17W	AT07S	AT07E	14-08-2022	11:00	14-08-2022	11:45	0.75	8	-	Released
4	SHSC	205	150	U	A	14-08-2022	Angling - Trolling	AT07S	DPF	504225 7976667	504606 7976722	17W	AT07S	AT07E	14-08-2022	11:00	14-08-2022	11:45	0.75	8	-	Released
5	FHSC	245	240	F	A	14-08-2022	Angling - Trolling	AT07S	DPF	504225 7976667	504606 7976722	17W	AT07S	AT07E	14-08-2022	11:00	14-08-2022	11:45	0.75	8	-	Released
1	GRCD	578	2240	U	A	14-08-2022	Angling - Trolling	AT08	IPF	505308 7978093	505297 7977948	17W	AT08S	AT08E	14-08-2022	15:25	14-08-2022	15:58	0.55	15	Bo	Released
2	SHSC	313	450	U	A	14-08-2022	Angling - Trolling	AT08	IPF	505308 7978093	505297 7977948	17W	AT08S	AT08E	14-08-2022	15:25	14-08-2022	15:58	0.55	15	Bo	Released
NFC	-	-	-	-	-	01-08-2022	Fukui Trap	FT01	DPF	503215 7976561	- -	17W	FT01	-	01-08-2022	15:51	03-08-2022	9:50	41.98	2	Bo	-
NFC	-	-	-	-	-	01-08-2022	Fukui Trap	FT02	DPF	503204 7976540	- -	17W	FT02	-	01-08-2022	15:55	03-08-2022	9:58	42.05	2	Bo	-
NFC	-	-	-	-	-	01-08-2022	Fukui Trap	FT03	DPF	503115 7976522	- -	17W	FT03	-	01-08-2022	15:57	03-08-2022	10:00	42.05	10	Bo	-
1	FHSC	174	60	F	A	01-08-2022	Fukui Trap	FT04	IPF	502740 7976275	- -	17W	FT04	-	01-08-2022	16:07	03-08-2022	9:10	41.05	2	Sa	Released
NFC	-	-	-	-	-	01-08-2022	Fukui Trap	FT05	IPF	502664 7976287	- -	17W	FT05	-	01-08-2022	16:10	03-08-2022	9:15	41.08	2	Sa	-
NFC	-	-	-	-	-	01-08-2022	Fukui Trap	FT06	IPF	502661 7976441	- -	17W	FT06	-	01-08-2022	16:15	03-08-2022	9:20	41.08	18	Sa	-
NFC	-	-	-	-	-	03-08-2022	Fukui Trap	FT07	IPF	502508 7976537	- -	17W	FT07	-	03-08-2022	9:20	05-08-2022	8:30	47.17	15	Sa	-
NFC	-	-	-	-	-	03-08-2022	Fukui Trap	FT08	IPF	502392 7976461	- -	17W	FT08	-	03-08-2022	9:23	05-08-2022	8:40	47.28	2	Sa	-
NFC	-	-	-	-	-	03-08-2022	Fukui Trap	FT09	IPF	502287 7976432	- -	17W	FT09	-	03-08-2022	9:28	05-08-2022	8:50	47.37	2	Sa	-
1	FHSC	169	50	M	A	03-08-2022	Fukui Trap	FT10	DPF	502980 7976395	- -	17W	FT10	-	03-08-2022	10:17	05-08-2022	9:05	46.80	2	Bo/Sa	Released
NFC	-	-	-	-	-	03-08-2022	Fukui Trap	FT11	DPF	502883 7976346	- -	17W	FT11	-	03-08-2022	10:20	05-08-2022	9:10	46.83	2	Bo/Sa	-

Table 4. 2022 Fishing Catch Data, Milne Inlet

NFC	-	-	-	-	-	03-08-2022	Fukui Trap	FT12	DPF	502897 7976391	- -	17W	FT12	-	03-08-2022	10:24	05-08-2022	9:15	46.85	2	Bo/Sa	-
NFC	-	-	-	-	-	05-08-2022	Fukui Trap	FT13	DPF	503869 7976636	- -	17W	FT13	-	05-08-2022	8:45	09-08-2022	8:10	95.42	1	Sa/Gr	-
1	FHSC	194	100	F	A	05-08-2022	Fukui Trap	FT14	DPF	503911 7976549	- -	17W	FT14	-	05-08-2022	8:50	09-08-2022	8:10	95.33	1	Sa	Released
1	GRCD	472	1200	U	U	05-08-2022	Fukui Trap	FT15	DPF	503925 7976707	- -	17W	FT15	-	05-08-2022	8:55	09-08-2022	8:05	95.17	12	Bo/Co/Sa	Released
NFC	-	-	-	-	-	05-08-2022	Fukui Trap	FT16	IPF	504683 7976765	- -	17W	FT16	-	05-08-2022	9:30	09-08-2022	8:35	95.08	22	Bo/Co/Sa	-
1	ARSC	104	20	U	U	05-08-2022	Fukui Trap	FT17	IPF	504713 7976713	- -	17W	FT17	-	05-08-2022	9:40	09-08-2022	8:45	95.08	2	Bo/Co	Released
1	SHSC	166	90	U	U	05-08-2022	Fukui Trap	FT18	IPF	504844 7976638	- -	17W	FT18	-	05-08-2022	9:45	09-08-2022	8:50	95.08	12	Co/Sa	Released
NFC	-	-	-	-	-	09-08-2022	Fukui Trap	FT19	DPF	504032 7976602	- -	17W	FT19	-	09-08-2022	8:20	13-08-2022	8:30	96.17	2	-	-
NFC	-	-	-	-	-	09-08-2022	Fukui Trap	FT20	DPF	504072 7976570	- -	17W	FT20	-	09-08-2022	8:25	13-08-2022	8:25	96.00	2	Bo/Sa	-
1	ARSC	167	80	U	A	09-08-2022	Fukui Trap	FT21	IPF	505098 7976838	- -	17W	FT21	-	09-08-2022	8:40	13-08-2022	7:35	94.92	15	Co/Sa	Released
2	HBEP	187	30	U	U	09-08-2022	Fukui Trap	FT21	IPF	505098 7976838	- -	17W	FT21	-	09-08-2022	8:40	13-08-2022	7:35	94.92	15	Co/Sa	Released
NFC	-	-	-	-	-	09-08-2022	Fukui Trap	FT22	IPF	505135 7977043	- -	17W	FT22	-	09-08-2022	9:55	13-08-2022	7:50	93.92	1	Sa/Bo	-
1	SHSC	144	50	U	A	09-08-2022	Fukui Trap	FT23	IPF	505180 7977407	- -	17W	FT23	-	09-08-2022	9:03	13-08-2022	8:00	94.95	2	Sa	Released
1	FHSC	155	35	M	A	09-08-2022	Fukui Trap	FT24	DPF	504064 7976674	- -	17W	FT24	-	09-08-2022	16:30	13-08-2022	8:10	87.67	12	Sa	Released
1	SAEP	168	25	U	A	09-08-2022	Fukui Trap	FT24	DPF	504064 7976674	- -	17W	FT24	-	09-08-2022	16:30	13-08-2022	8:10	87.67	12	Sa	Released
NFC	-	-	-	-	-	13-08-2022	Fukui Trap	FT25	IPF	505076 7977076	- -	17W	FT25	-	13-08-2022	7:40	14-08-2022	15:07	31.45	11	Co/Sa	-
NFC	-	-	-	-	-	13-08-2022	Fukui Trap	FT26	IPF	505149 7977299	- -	17W	FT26	-	13-08-2022	8:00	14-08-2022	15:12	31.20	2	Sa/Bo	-
NFC	-	-	-	-	-	13-08-2022	Fukui Trap	FT27	IPF	505161 7977602	- -	17W	FT27	-	13-08-2022	8:05	14-08-2022	15:18	31.22	2	Co/Bo	-
NFC	-	-	-	-	-	13-08-2022	Fukui Trap	FT28	DPF	504217 7976641	- -	17W	FT28	-	13-08-2022	8:20	14-08-2022	14:50	30.50	15	Sa	-
NFC	-	-	-	-	-	13-08-2022	Fukui Trap	FT29	DPF	504331 7976564	- -	17W	FT29	-	13-08-2022	8:32	14-08-2022	14:55	30.38	2.5	Sa	-
NFC	-	-	-	-	-	13-08-2022	Fukui Trap	FT30	DPF	504411 7976544	- -	17W	FT30	-	13-08-2022	8:35	14-08-2022	15:30	30.92	2.5	Sa/Co	-
1	ARCH	450	1200	F	A	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Mortality
2	ARCH	755	5390	U	A	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Released
3	ARCH	534	2310	U	A	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Released
4	ARCH	521	1760	F	A	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Mortality
5	ARCH	457	1110	F	A	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Mortality
6	ARCH	559	2110	M	A	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Mortality
7	ARCH	545	1810	M	A	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Mortality
8	ARCH	429	1000	F	A	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Mortality
9	ARCH	426	1080	M	A	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Mortality
10	FHSC	157	349	U	A	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Released
11	FHSC	255	200	U	A	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Released
12	FHSC	144	20	U	U	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Released
13	ARCH	601	2790	U	A	01-08-2022	Gill Net	GN01	DPF	503107 7976434	503092 7976539	17W	GN01S	GN01D	01-08-2022	9:30	01-08-2022	13:20	3.83	6	Sa/Co/Bo	Released
1	FHSC	198	755	U	A	01-08-2022	Gill Net	GN02	IPF	502604 7976229	502624 7976318	17W	GN02S	GN02D	01-08-2022	9:58	01-08-2022	13:30	3.53	1.5	Sa	Released
2	ARCH	744	5000	U	A	01-08-2022	Gill Net	GN02	IPF	502604 7976229	502624 7976318	17W	GN02S	GN02D	01-08-2022	9:58	01-08-2022	13:30	3.53	1.5	Sa	Released
3	ARCH	580	2430	U	A	01-08-2022	Gill Net	GN02	IPF	502604 7976229	502624 7976318	17W	GN02S	GN02D	01-08-2022	9:58	01-08-2022	13:30	3.53	1.5	Sa	Released
4	FHSC	180	60	U	U	01-08-2022	Gill Net	GN02	IPF	502604 7976229	502624 7976318	17W	GN02S	GN02D	01-08-2022	9:58	01-08-2022	13:30	3.53	1.5	Sa	Released
5	FHSC	185	70	U	U	01-08-2022	Gill Net	GN02	IPF	502604 7976229	502624 7976318	17W	GN02S	GN02D	01-08-2022	9:58	01-08-2022	13:30	3.53	1.5	Sa	Released
6	ARCH	516	1520	M	A	01-08-2022	Gill Net	GN02	IPF	502604 7976229	502624 7976318	17W	GN02S	GN02D	01-08-2022	9:58	01-08-2022	13:30	3.53	1.5	Sa	Mortality
7	ARCH	525	1890	M	A	01-08-2022	Gill Net	GN02	IPF	502604 7976229	502624 7976318	17W	GN02S	GN02D	01-08-2022	9:58	01-08-2022	13:30	3.53	1.5	Sa	Mortality
8	ARCH	328	390	M	J	01-08-2022	Gill Net	GN02	IPF	502604 7976229	502624 7976318	17W	GN02S	GN02D	01-08-2022	9:58	01-08-2022	13:30	3.53	1.5	Sa	Mortality
1	ARCH	332	530	U	U	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
2	ARCH	236	140	U	J	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
3	FHSC	245	130	F	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
4	FHSC	248	120	F	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
5	FHSC	273	210	F	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
6	FHSC	221	180	F	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
7	FHSC	225	130	M	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
8	FHSC	258	270	M	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
9	FHSC	255	210	M	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
10	FHSC	234	140	M	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
11	FHSC	257	190	M	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
12	FHSC	277	280	M	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
13	FHSC	252	200	M	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
14	FHSC	245	110	M	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
15	ARCH	522	1750	U	A	04-08-2022	Gill Net	GN03	IPF	505195 7977496	505141 7977420	17W	GN03S	GN03D	04-08-2022	9:31	04-08-2022	12:00	2.48	2.5	Bo/Co/Gr	Released
1	ARCH	395	770	U	A	04-08-2022	Gill Net	GN04	IPF	505142 7977064	505077 7977023	17W	GN04S	GN04D	04-08-2022	9:49	04-08-2022	11:45	1.93	5	Sa/Co	Released
2	ARCH	663	3300	U	A	04-08-2022	Gill Net	GN04	IPF	505142 7977064	505077 7977023	17W	GN04S	GN04D	04-08-2022	9:49	04-08-2022	11:45	1.93	5	Sa/Co	Released
3	ARCH	495	1390	M	A	04-08-2022	Gill Net	GN04	IPF	505142 7977064	505077 7977023	17W	GN04S	GN04D	04-08-2022	9:49	04-08-2022	11:45	1.93	5	Sa/Co	Mortality
4	ARCH	676	4050	U	A	04-08-2022	Gill Net	GN04	IPF	505142 7977064	505077 7977023	17W	GN04S	GN04D	04-08-2022	9:49	04-08-2022	11:45	1.93	5	Sa/Co	Released
5	ARCH	353	420	U	A	04-08-2022	Gill Net	GN04	IPF	505142 7977064	505077 7977023	17W	GN04S	GN04D	04-08-2022	9:49	04-08-2022	11:45	1.93	5	Sa/Co	Released
6	ARCH	225	80	U	U	04-08-2022	Gill Net	GN04	IPF	505142 7977064	505077 7977023	17W	GN04S	GN04D	04-08-2022	9:49	04-08-2022	11:45	1.93	5	Sa/Co	Released
7	FHSC	242	110	M	A	04-08-2022	Gill Net	GN04	IPF	505142 7977064	505077 7977023	17W	GN04S	GN04D	04-08-2022	9:49	04-08-2022	11:45	1.93	5	Sa/Co	Released
8	FHSC	227	120	M	A	04-08-2022	Gill Net	GN04	IPF	505142 7977064	505077 7977023	17W	GN04S	GN04D	04-08-2022	9:49	04-08-2022	11:45	1.93	5	Sa/Co	Released
1	ARCH	579	1800	U	U	04-08-2022	Gill Net	GN05	DPF	504357 7976466	504347 7976559	17W	GN05S	GN05D	04-08-2022	12:50	04-08-2022	14:57	2.12	1.5	Sa	Released
1	FHSC	240	136.7	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Euthanized
2	FHSC	220	105.1	M	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Euthanized
3	FHSC	322	435	U	U	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
4	FHSC	209	95	M	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released

Table 4. 2022 Fishing Catch Data, Milne Inlet

5	FHSC	203	77	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
6	FHSC	231	115	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
7	FHSC	207	75	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
8	FHSC	224	99	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
9	FHSC	161	88	U	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
10	FHSC	204	72	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
11	FHSC	208	126	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
12	FHSC	219	110	M	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
13	FHSC	211	83	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
14	FHSC	183	55	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
15	FHSC	176	58	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
16	FHSC	203	82	M	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
17	FHSC	220	96	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
18	FHSC	183	60	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
19	FHSC	192	63	M	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
20	FHSC	197	74	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
21	FHSC	179	52	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
22	FHSC	160	38	F	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
23	FHSC	169	48	M	A	04-08-2022	Gill Net	GN06	DPF	503917 7976503	503853 7976561	17W	GN06S	GN06D	04-08-2022	13:15	04-08-2022	15:15	2.00	1.5	Sa	Released
1	ARCH	434	950	U	A	07-08-2022	Gill Net	GN07	IPF	505163 7976895	505137 7976814	17W	GN07S	GN07E	07-08-2022	12:01	07-08-2022	13:25	1.40	3.5	Bo/Sa	Released
2	FHSC	226	110	M	A	07-08-2022	Gill Net	GN07	IPF	505163 7976895	505137 7976814	17W	GN07S	GN07E	07-08-2022	12:01	07-08-2022	13:25	1.40	4.5	Bo/Sa	Released
3	FHSC	258	185	F	A	07-08-2022	Gill Net	GN07	IPF	505163 7976895	505137 7976814	17W	GN07S	GN07E	07-08-2022	12:01	07-08-2022	13:25	1.40	5.5	Bo/Sa	Released
4	FHSC	221	110	F	A	07-08-2022	Gill Net	GN07	IPF	505163 7976895	505137 7976814	17W	GN07S	GN07E	07-08-2022	12:01	07-08-2022	13:25	1.40	6.5	Bo/Sa	Released
5	FHSC	234	175	F	A	07-08-2022	Gill Net	GN07	IPF	505163 7976895	505137 7976814	17W	GN07S	GN07E	07-08-2022	12:01	07-08-2022	13:25	1.40	7.5	Bo/Sa	Released
6	FHSC	220	-	M	A	07-08-2022	Gill Net	GN07	IPF	505163 7976895	505137 7976814	17W	GN07S	GN07E	07-08-2022	12:01	07-08-2022	13:25	1.40	8.5	Bo/Sa	Released
7	ARCH	420	750	U	A	07-08-2022	Gill Net	GN07	IPF	505163 7976895	505137 7976814	17W	GN07S	GN07E	07-08-2022	12:01	07-08-2022	13:25	1.40	9.5	Bo/Sa	Mortality
8	SHSC	295	350	U	A	07-08-2022	Gill Net	GN07	IPF	505163 7976895	505137 7976814	17W	GN07S	GN07E	07-08-2022	12:01	07-08-2022	13:25	1.40	10.5	Bo/Sa	Released
9	ARSC	220	180	U	A	07-08-2022	Gill Net	GN07	IPF	505163 7976895	505137 7976814	17W	GN07S	GN07E	07-08-2022	12:01	07-08-2022	13:25	1.40	11.5	Bo/Sa	Released
1	FHSC	210	85	M	A	07-08-2022	Gill Net	GN08	DPF	504104 7976627	504184 7976646	17W	GN08S	GNO8E	07-08-2022	12:30	07-08-2022	13:45	1.25	4	Bo/Sa	Released
2	ARCH	429	1008	U	A	07-08-2022	Gill Net	GN08	DPF	504104 7976627	504184 7976646	17W	GN08S	GNO8E	07-08-2022	12:30	07-08-2022	13:45	1.25	4	Bo/Sa	Mortality
NFC	-	-	-	-	-	08-08-2022	Gill Net	GN09	DPF	503551 7976418	503540 7976508	17W	GN09S	GN09D	08-08-2022	8:06	08-08-2022	11:30	3.40	1.5	Sa	-
1	ARCH	340	450	U	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
2	FHSC	173	55	M	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
3	FHSC	214	11	M	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
4	FHSC	199	85	F	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
5	FHSC	201	80	F	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
6	FHSC	141	40	U	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
7	FHSC	210	100	M	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
8	FHSC	158	35	U	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
9	FHSC	161	35	M	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
10	FHSC	203	90	F	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
11	FHSC	184	50	M	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
12	FHSC	169	45	U	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
13	FHSC	152	35	U	A	08-08-2022	Gill Net	GN10	IPF	504512 7976467	504431 7976503	17W	GN10S	GN10D	08-08-2022	8:17	08-08-2022	11:00	2.72	2	Gr/Co/Sa	Released
1	ARCH	312	340	U	A	08-08-2022	Gill Net	GN11	DPF	503147 7976465	503083 7976538	17W	GN11S	GN11D	08-08-2022	15:51	08-08-2022	17:10	1.32	2	Sa/Bo	Released
2	ARCH	634	3210	U	A	08-08-2022	Gill Net	GN11	DPF	503147 7976465	503083 7976538	17W	GN11S	GN11D	08-08-2022	15:51	08-08-2022	17:10	1.32	2	Sa/Bo	Released
3	ARCH	275	200	U	A	08-08-2022	Gill Net	GN11	DPF	503147 7976465	503083 7976538	17W	GN11S	GN11D	08-08-2022	15:51	08-08-2022	17:10	1.32	2	Sa/Bo	Released
4	FHSC	164	40	M	A	08-08-2022	Gill Net	GN11	DPF	503147 7976465	503083 7976538	17W	GN11S	GN11D	08-08-2022	15:51	08-08-2022	17:10	1.32	2	Sa/Bo	Released
5	FHSC	182	70	M	A	08-08-2022	Gill Net	GN11	DPF	503147 7976465	503083 7976538	17W	GN11S	GN11D	08-08-2022	15:51	08-08-2022	17:10	1.32	2	Sa/Bo	Released
6	FHSC	211	125	F	A	08-08-2022	Gill Net	GN11	DPF	503147 7976465	503083 7976538	17W	GN11S	GN11D	08-08-2022	15:51	08-08-2022	17:10	1.32	2	Sa/Bo	Released
7	FHSC	208	65	M	A	08-08-2022	Gill Net	GN11	DPF	503147 7976465	503083 7976538	17W	GN11S	GN11D	08-08-2022	15:51	08-08-2022	17:10	1.32	2	Sa/Bo	Released
8	FHSC	168	60	M	A	08-08-2022	Gill Net	GN11	DPF	503147 7976465	503083 7976538	17W	GN11S	GN11D	08-08-2022	15:51	08-08-2022	17:10	1.32	2	Sa/Bo	Released
9	FHSC	154	50	U	U	08-08-2022	Gill Net	GN11	DPF	503147 7976465	503083 7976538	17W	GN11S	GN11D	08-08-2022	15:51	08-08-2022	17:10	1.32	2	Sa/Bo	Released
10	FHSC	106	10	U	U	08-08-2022	Gill Net	GN11	DPF	503147 7976465	503083 7976538	17W	GN11S	GN11D	08-08-2022	15:51	08-08-2022	17:10	1.32	2	Sa/Bo	Released
1	FHSC	101	10	U	U	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
2	FHSC	254	220	F	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
3	FHSC	190	70	F	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
4	FHSC	139	40	F	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
5	FHSC	163	50	M	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
6	FHSC	157	35	M	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
7	FHSC	204	180	F	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
8	FHSC	202	80	F	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
9	FHSC	169	65	M	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
10	ARCH	541	2200	M	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Mortality
11	ARCH	700	2860	M	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Mortality
12	ARCH	430	1280	U	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
13	FHSC	188	60	M	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
14	FHSC	188	60	F	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
15	FHSC	206	80	M	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
16	FHSC	192	60	M	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released

Table 4. 2022 Fishing Catch Data, Milne Inlet

17	FHSC	175	50	U	U	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
18	FHSC	160	40	U	U	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
19	FHSC	182	60	F	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
20	FHSC	165	50	M	A	11-08-2022	Gill Net	GN12	DPF	503016 7976389	502941 7976420	17W	GN12S	GN12D	11-08-2022	8:22	11-08-2022	11:50	3.47	2	Sa	Released
1	ARCH	324	500	U	F	11-08-2022	Gill Net	GN13	IPF	502691 7976239	502721 7976325	17W	GN13S	GN13E	11-08-2022	8:35	11-08-2022	12:20	3.75	1.5	Sa	Mortality
2	ARCH	255	220	U	A	11-08-2022	Gill Net	GN13	IPF	502691 7976239	502721 7976325	17W	GN13S	GN13E	11-08-2022	8:35	11-08-2022	12:20	3.75	1.5	Sa	Released
3	ARCH	642	3220	U	A	11-08-2022	Gill Net	GN13	IPF	502691 7976239	502721 7976325	17W	GN13S	GN13E	11-08-2022	8:35	11-08-2022	12:20	3.75	1.5	Sa	Mortality
4	FHSC	204	85	M	A	11-08-2022	Gill Net	GN13	IPF	502691 7976239	502721 7976325	17W	GN13S	GN13E	11-08-2022	8:35	11-08-2022	12:20	3.75	1.5	Sa	Released
5	FHSC	175	70	M	A	11-08-2022	Gill Net	GN13	IPF	502691 7976239	502721 7976325	17W	GN13S	GN13E	11-08-2022	8:35	11-08-2022	12:20	3.75	1.5	Sa	Released
1	ARCH	326	350	U	A	13-08-2022	Gill Net	GN14	IPF	505265 7977776	505183 7977801	17W	GN14S	GN14D	13-08-2022	10:30	13-08-2022	12:30	2.00	6.5	-	Released
2	ARCH	385	650	U	A	13-08-2022	Gill Net	GN14	IPF	505265 7977776	505183 7977801	17W	GN14S	GN14D	13-08-2022	10:30	13-08-2022	12:30	2.00	6.5	-	Released
3	ARCH	356	450	U	A	13-08-2022	Gill Net	GN14	IPF	505265 7977776	505183 7977801	17W	GN14S	GN14D	13-08-2022	10:30	13-08-2022	12:30	2.00	6.5	-	Mortality
4	ARCH	225	150	U	A	13-08-2022	Gill Net	GN14	IPF	505265 7977776	505183 7977801	17W	GN14S	GN14D	13-08-2022	10:30	13-08-2022	12:30	2.00	6.5	-	Released
5	ARCH	434	1100	U	A	13-08-2022	Gill Net	GN14	IPF	505265 7977776	505183 7977801	17W	GN14S	GN14D	13-08-2022	10:30	13-08-2022	12:30	2.00	6.5	-	Released
6	ARCH	301	350	U	A	13-08-2022	Gill Net	GN14	IPF	505265 7977776	505183 7977801	17W	GN14S	GN14D	13-08-2022	10:30	13-08-2022	12:30	2.00	6.5	-	Released
7	ARCH	315	390	U	U	13-08-2022	Gill Net	GN14	IPF	505265 7977776	505183 7977801	17W	GN14S	GN14D	13-08-2022	10:30	13-08-2022	12:30	2.00	6.5	-	Mortality
1	ARCH	685	3950	U	A	13-08-2022	Gill Net	GN15	IPF	505296 7978014	505243 7977967	17W	GN15S	GN15E	13-08-2022	10:40	13-08-2022	12:40	2.00	2.5	-	Released
2	ARCH	679	4190	U	A	13-08-2022	Gill Net	GN15	IPF	505296 7978014	505243 7977967	17W	GN15S	GN15E	13-08-2022	10:40	13-08-2022	12:40	2.00	2.5	-	Released
3	ARCH	700	3830	U	A	13-08-2022	Gill Net	GN15	IPF	505296 7978014	505243 7977967	17W	GN15S	GN15E	13-08-2022	10:40	13-08-2022	12:40	2.00	2.5	-	Released
4	ARCH	555	2250	U	A	13-08-2022	Gill Net	GN15	IPF	505296 7978014	505243 7977967	17W	GN15S	GN15E	13-08-2022	10:40	13-08-2022	12:40	2.00	2.5	-	Released
5	ARCH	741	4940	U	A	13-08-2022	Gill Net	GN15	IPF	505296 7978014	505243 7977967	17W	GN15S	GN15E	13-08-2022	10:40	13-08-2022	12:40	2.00	2.5	-	Released
6	ARCH	537	2500	U	A	13-08-2022	Gill Net	GN15	IPF	505296 7978014	505243 7977967	17W	GN15S	GN15E	13-08-2022	10:40	13-08-2022	12:40	2.00	2.5	-	Released
7	ARCH	510	1830	U	A	13-08-2022	Gill Net	GN15	IPF	505296 7978014	505243 7977967	17W	GN15S	GN15E	13-08-2022	10:40	13-08-2022	12:40	2.00	2.5	-	Released
8	ARCH	219	140	U	J	13-08-2022	Gill Net	GN15	IPF	505296 7978014	505243 7977967	17W	GN15S	GN15E	13-08-2022	10:40	13-08-2022	12:40	2.00	2.5	-	Mortality
9	ARCH	314	370	U	J	13-08-2022	Gill Net	GN15	IPF	505296 7978014	505243 7977967	17W	GN15S	GN15E	13-08-2022	10:40	13-08-2022	12:40	2.00	2.5	-	Mortality
10	ARCH	222	120	U	J	13-08-2022	Gill Net	GN15	IPF	505296 7978014	505243 7977967	17W	GN15S	GN15E	13-08-2022	10:40	13-08-2022	12:40	2.00	2.5	-	Released
11	FHSC	215	140	F	A	13-08-2022	Gill Net	GN15	IPF	505296 7978014	505243 7977967	17W	GN15S	GN15E	13-08-2022	10:40	13-08-2022	12:40	2.00	2.5	-	Released
1	ARCH	434	1090	-	-	13-08-2022	Gill Net	GN16	IPF	505198 7977544	505108 7977590	17W	GN16S	GN16D	13-08-2022	10:55	13-08-2022	12:00	1.08	4.5	Sa/Co	Released
2	FHSC	248	200	F	A	13-08-2022	Gill Net	GN16	IPF	505198 7977544	505108 7977590	17W	GN16S	GN16D	13-08-2022	10:55	13-08-2022	12:00	1.08	4.5	Sa/Co	Released
3	FHSC	232	140	F	A	13-08-2022	Gill Net	GN16	IPF	505198 7977544	505108 7977590	17W	GN16S	GN16D	13-08-2022	10:55	13-08-2022	12:00	1.08	4.5	Sa/Co	Released
4	FHSC	202	70	M	A	13-08-2022	Gill Net	GN16	IPF	505198 7977544	505108 7977590	17W	GN16S	GN16D	13-08-2022	10:55	13-08-2022	12:00	1.08	4.5	Sa/Co	Released
5	SHSC	205	110	U	A	13-08-2022	Gill Net	GN16	IPF	505198 7977544	505108 7977590	17W	GN16S	GN16D	13-08-2022	10:55	13-08-2022	12:00	1.08	4.5	Sa/Co	Released
6	SHSC	230	180	U	A	13-08-2022	Gill Net	GN16	IPF	505198 7977544	505108 7977590	17W	GN16S	GN16D	13-08-2022	10:55	13-08-2022	12:00	1.08	4.5	Sa/Co	Released
7	FHSC	170	60	M	A	13-08-2022	Gill Net	GN16	IPF	505198 7977544	505108 7977590	17W	GN16S	GN16D	13-08-2022	10:55	13-08-2022	12:00	1.08	4.5	Sa/Co	Released
1	ARCH	747	4970	U	A	13-08-2022	Gill Net	GN17	DPF	502962 7976310	502915 7976399	17W	GN17S	GN17D	13-08-2022	15:20	13-08-2022	16:45	1.42	4.5	Sa/Co	Released
2	ARCH	305	390	U	J	13-08-2022	Gill Net	GN17	DPF	502962 7976310	502915 7976399	17W	GN17S	GN17D	13-08-2022	15:20	13-08-2022	16:45	1.42	4.5	Sa/Co	Released
3	ARCH	334	510	U	J	13-08-2022	Gill Net	GN17	DPF	502962 7976310	502915 7976399	17W	GN17S	GN17D	13-08-2022	15:20	13-08-2022	16:45	1.42	4.5	Sa/Co	Released
4	ARCH	371	810	U	J	13-08-2022	Gill Net	GN17	DPF	502962 7976310	502915 7976399	17W	GN17S	GN17D	13-08-2022	15:20	13-08-2022	16:45	1.42	4.5	Sa/Co	Released
5	FHSC	154	30	F	A	13-08-2022	Gill Net	GN17	DPF	502962 7976310	502915 7976399	17W	GN17S	GN17D	13-08-2022	15:20	13-08-2022	16:45	1.42	4.5	Sa/Co	Released
6	FHSC	168	50	M	A	13-08-2022	Gill Net	GN17	DPF	502962 7976310	502915 7976399	17W	GN17S	GN17D	13-08-2022	15:20	13-08-2022	16:45	1.42	4.5	Sa/Co	Released
7	FHSC	145	35	F	A	13-08-2022	Gill Net	GN17	DPF	502962 7976310	502915 7976399	17W	GN17S	GN17D	13-08-2022	15:20	13-08-2022	16:45	1.42	4.5	Sa/Co	Released
8	FHSC	149	45	F	A	13-08-2022	Gill Net	GN17	DPF	502962 7976310	502915 7976399	17W	GN17S	GN17D	13-08-2022	15:20	13-08-2022	16:45	1.42	4.5	Sa/Co	Released
1	ARCH	632	2750	U	A	13-08-2022	Gill Net	GN18	IPF	502390 7976283	502435 7976360	17W	GN18S	GN18D	13-08-2022	15:30	13-08-2022	16:53	1.38	2	Sa	Released
2	ARCH	614	2150	U	A	13-08-2022	Gill Net	GN18	IPF	502390 7976283	502435 7976360	17W	GN18S	GN18D	13-08-2022	15:30	13-08-2022	16:53	1.38	2	Sa	Released
3	ARCH	373	560	U	U	13-08-2022	Gill Net	GN18	IPF	502390 7976283	502435 7976360	17W	GN18S	GN18D	13-08-2022	15:30	13-08-2022	16:53	1.38	2	Sa	Released
4	ARCH	374	590	U	U	13-08-2022	Gill Net	GN18	IPF	502390 7976283	502435 7976360	17W	GN18S	GN18D	13-08-2022	15:30	13-08-2022	16:53	1.38	2	Sa	Released
5	ARCH	309	240	U	J	13-08-2022	Gill Net	GN18	IPF	502390 7976283	502435 7976360	17W	GN18S	GN18D	13-08-2022	15:30	13-08-2022	16:53	1.38	2	Sa	Released
6	ARCH	335	360	U	J	13-08-2022	Gill Net	GN18	IPF	502390 7976283	502435 7976360	17W	GN18S	GN18D	13-08-2022	15:30	13-08-2022	16:53	1.38	2	Sa	Released
1	ARCH	363	520	U	U	14-08-2022	Gill Net	GN19	DPF	504141 7976580	504225 7976637	17W	GN19S	GN19D	14-08-2022	8:50	14-08-2022	12:03	3.22	7.5	Sa/Bo	Released
2	FHSC	148	45	U	U	14-08-2022	Gill Net	GN19	DPF	504141 7976580	504225 7976637	17W	GN19S	GN19D	14-08-2022	8:50	14-08-2022	12:03	3.22	7.5	Sa/Bo	Released
3	FHSC	144	30	U	U	14-08-2022	Gill Net	GN19	DPF	504141 7976580	504225 7976637	17W	GN19S	GN19D	14-08-2022	8:50	14-08-2022	12:03	3.22	7.5	Sa/Bo	Released
4	FHSC	237	145	M	A	14-08-2022	Gill Net	GN19	DPF	504141 7976580	504225 7976637	17W	GN19S	GN19D	14-08-2022	8:50	14-08-2022	12:03	3.22	7.5	Sa/Bo	Released
5	FHSC	219	100	M	A	14-08-2022	Gill Net	GN19	DPF	504141 7976580	504225 7976637	17W	GN19S	GN19D	14-08-2022	8:50	14-08-2022	12:03	3.22	7.5	Sa/Bo	Released
6	FHSC	231	140	F	A	14-08-2022	Gill Net	GN19	DPF	504141 7976580	504225 7976637	17W	GN19S	GN19D	14-08-2022	8:50	14-08-2022	12:03	3.22	7.5	Sa/Bo	Released
NFC	-	-	-	-	-	14-08-2022	Gill Net	GN20	IPF	504761 7976633	504808 7976702	17W	GN20S	GN20D	14-08-2022	9:10	14-08-2022	11:52	2.70	2.5	Sa/Co	-
1	ARCH	131	15	U	U	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
2	ARCH	590	3000	U	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
3	ARCH	690	3780	U	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Mortality
4	ARCH	675	3500	U	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
5	ARCH	456	1100	U	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
6	ARCH	547	2180	U	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
7	ARCH	553	2460	U	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
8	ARCH	545	2330	U	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
9	ARCH	557	2200	U	U	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
10	ARCH	374	600	U	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
11	ARCH	376	610	U	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
12	ARCH	330	450	U	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
13	ARCH	370	550	U	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
14	FHSC	200	135	F	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Released
15	ARCH	380	590	M	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Mortality

16	ARCH	444	1040	U	J	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Mortality
17	ARCH	478	1490	F	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Mortality
18	ARCH	451	1030	M	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Mortality
19	ARCH	531	1760	F	A	14-08-2022	Gill Net	GN21	IPF	502537 7976250	502579 7976330	17W	GN21S	GN21D	14-08-2022	12:45	14-08-2022	16:11	3.43	5	Sa	Mortality
1	ARCH	677	3890	U	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
2	ARCH	775	4350	U	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
3	ARCH	552	2170	U	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
4	ARCH	621	2950	U	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
5	ARCH	477	1510	U	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
6	ARCH	530	2190	U	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
7	ARCH	585	2610	U	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
8	FHSC	233	140	M	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
9	FHSC	196	70	M	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
10	FHSC	210	110	F	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
11	FHSC	154	50	F	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
12	FHSC	190	80	M	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
13	FHSC	222	140	M	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
14	FHSC	174	60	F	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
15	FHSC	145	35	F	U	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
16	ARCH	390	820	F	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Mortality
17	ARCH	590	2620	F	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Mortality
18	ARCH	544	2010	F	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Mortality
19	ARCH	540	2200	M	A	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Mortality
20	ARCH	168	58	U	J	14-08-2022	Gill Net	GN22	DPF	503106 7976431	503082 7976516	17W	GN22S	GN22D	14-08-2022	12:52	14-08-2022	16:35	3.72	6.5	Bo/Co/Sa	Released
NFC	-	-	-	-	-	10-08-2022	Gill Net	GNREF1	REF	512155 7989017	512071 7988995	17W	GNREF1S	GNREF1D	10-08-2022	10:43	10-08-2022	12:05	1.37	1.5	Sa/Bo	-
NFC	-	-	-	-	-	10-08-2022	Gill Net	GNREF2	REF	512013 7988845	511919 7988853	17W	GNREF2S	GNREF2D	10-08-2022	10:55	10-08-2022	12:15	1.33	1.5	Bo/Sa/Co	-
1	FHSC	282	353	F	A	01-08-2022	Hoop Net	HN01	DPF	503008 7976390	- -	17W	HN01	-	01-08-2022	7:44	03-08-2022	10:40	50.93	0.8	Sa/Co Beach	Euthanized
2	FHSC	185	68	U	A	01-08-2022	Hoop Net	HN01	DPF	503008 7976390	- -	17W	HN01	-	01-08-2022	7:44	03-08-2022	10:40	50.93	0.8	Sa/Co Beach	Released
3	FHSC	182	70	M	A	01-08-2022	Hoop Net	HN01	DPF	503008 7976390	- -	17W	HN01	-	01-08-2022	7:44	03-08-2022	10:40	50.93	0.8	Sa/Co Beach	Released
1	FHSC	282	353	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Euthanized
2	FHSC	239	163	M	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Euthanized
3	FHSC	245	215.7	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Euthanized
4	FHSC	254	208.2	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Euthanized
5	FHSC	260	190.8	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Euthanized
6	FHSC	180	57	M	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
7	FHSC	192	71	M	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
8	FHSC	235	104	M	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
9	FHSC	228	114	M	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
10	FHSC	208	75	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
11	FHSC	205	81	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
12	FHSC	231	128	M	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
13	FHSC	185	66	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
14	FHSC	196	77	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
15	FHSC	211	95	M	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
16	ARSC	150	37	U	U	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
17	FHSC	285	259.6	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Euthanized
18	FHSC	229	147.8	M	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Euthanized
19	FHSC	237	120	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Euthanized
20	FHSC	233	114.4	M	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Euthanized
21	FHSC	245	159.6	M	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Euthanized
22	FHSC	241	202.3	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Euthanized
23	FHSC	212	92	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
24	FHSC	197	85	M	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
25	FHSC	157	8	U	U	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
26	FHSC	214	108	M	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
27	FHSC	205	93	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
28	FHSC	234	147	F	A	01-08-2022	Hoop Net	HN02	DPF	503131 7976472	- -	17W	HN02	-	01-08-2022	8:15	03-08-2022	10:50	50.58	0.8	Sa/Co Beach	Released
1	FHSC	153	30	M	J	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Released
2	FHSC	146	30	M	J	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Released
3	FHSC	162	90	M	J	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Released
4	FHSC	230	94.4	M	A	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Euthanized
5	FHSC	143	35	M	A	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Released
6	FHSC	233	150	M	A	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Released
7	FHSC	158	50	F	A	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Released
8	FHSC	144	40	M	U	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Released
9	FHSC	135	35	M	U	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Released
10	FHSC	132	25	M	U	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Released
11	FHSC	144	50	M	U	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Released
12	FHSC	139	55	M	U	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Released
13	FHSC	143	50	M	U	03-08-2022	Hoop Net	HN03	DPF	503444 7976596	- -	17W	HN03	-	03-08-2022	11:27	08-08-2022	16:05	124.63	1.6	Bo/Sa, armour interface	Released

Appendix 6B

Table 4. 2022 Fishing Catch Data, Milne Inlet

1	FHSC	210	85	M	A	03-08-2022	Hoop Net	HN04	DPF	503929 7976592	- -	17W	HN04	-	03-08-2022	12:06	08-08-2022	16:30	124.40	1.5	Bo/Sa, armour interface	Released
2	FHSC	165	70	M	A	03-08-2022	Hoop Net	HN04	DPF	503929 7976592	- -	17W	HN04	-	03-08-2022	12:06	08-08-2022	16:30	124.40	1.5	Bo/Sa, armour interface	Released
3	FHSC	160	50	F	A	03-08-2022	Hoop Net	HN04	DPF	503929 7976592	- -	17W	HN04	-	03-08-2022	12:06	08-08-2022	16:30	124.40	1.5	Bo/Sa, armour interface	Released
4	FHSC	135	30	M	A	03-08-2022	Hoop Net	HN04	DPF	503929 7976592	- -	17W	HN04	-	03-08-2022	12:06	08-08-2022	16:30	124.40	1.5	Bo/Sa, armour interface	Released
5	FHSC	134	30	F	A	03-08-2022	Hoop Net	HN04	DPF	503929 7976592	- -	17W	HN04	-	03-08-2022	12:06	08-08-2022	16:30	124.40	1.5	Bo/Sa, armour interface	Released
NFC	-	-	-	-	-	08-08-2022	Hoop Net	HN05	IPF	504564 7976631	- -	17W	HN05	-	08-08-2022	16:12	13-08-2022	7:30	111.30	1.5	Bo/Sa/Co	-
1	FHSC	202	100	M	A	08-08-2022	Hoop Net	HN06	DPF	504131 7976549	- -	17W	HN06	-	08-08-2022	16:47	13-08-2022	7:30	110.72	1	Sa/Bo	Released
NFC	-	-	-	-	-	13-08-2022	Hoop Net	HN07	IPF	504558 7976647	- -	17W	HN07	-	13-08-2022	7:36	15-08-2022	8:50	49.23	1.5	Bo/Sa/Co/Gr	-
1	FHSC	176	50	M	A	13-08-2022	Hoop Net	HN08	DPF	503050 7976442	- -	17W	HN08	-	13-08-2022	9:00	14-08-2022	8:10	23.17	1.15	Sa/Gr/Co	Released
2	FHSC	219	70	M	A	13-08-2022	Hoop Net	HN08	DPF	503050 7976442	- -	17W	HN08	-	13-08-2022	9:00	14-08-2022	8:10	23.17	1.15	Sa/Gr/Co	Released
3	SHSC	175	80	U	A	13-08-2022	Hoop Net	HN08	DPF	503050 7976442	- -	17W	HN08	-	13-08-2022	9:00	14-08-2022	8:10	23.17	1.15	Sa/Gr/Co	Released
4	FHSC	188	70	F	A	13-08-2022	Hoop Net	HN08	DPF	503050 7976442	- -	17W	HN08	-	13-08-2022	9:00	14-08-2022	8:10	23.17	1.15	Sa/Gr/Co	Released
5	FHSC	220	130	M	A	13-08-2022	Hoop Net	HN08	DPF	503050 7976442	- -	17W	HN08	-	13-08-2022	9:00	14-08-2022	8:10	23.17	1.15	Sa/Gr/Co	Released
NFC	-	-	-	-	-	14-08-2022	Hoop Net	HN09	IPF	504366 7976489	- -	17W	HN09	-	14-08-2022	8:30	15-08-2022	8:55	24.42	1.75	Sa	-
1	STSC	131	30	U	U	15-08-2022	Trawling	TR01	IPF	502058 7977608	502490 7978248	17W	TR01S	TR01E	15-08-2022	13:41	15-08-2022	14:09	0.47	50	-	Released
2	RBSC	114	10	U	U	15-08-2022	Trawling	TR01	IPF	502058 7977608	502490 7978248	17W	TR01S	TR01E	15-08-2022	13:41	15-08-2022	14:09	0.47	50	-	Released
3	RBSC	117	15	U	U	15-08-2022	Trawling	TR01	IPF	502058 7977608	502490 7978248	17W	TR01S	TR01E	15-08-2022	13:41	15-08-2022	14:09	0.47	50	-	Released
4	RBSC	117	10	U	U	15-08-2022	Trawling	TR01	IPF	502058 7977608	502490 7978248	17W	TR01S	TR01E	15-08-2022	13:41	15-08-2022	14:09	0.47	50	-	Released
5	RBSC	122	10	U	U	15-08-2022	Trawling	TR01	IPF	502058 7977608	502490 7978248	17W	TR01S	TR01E	15-08-2022	13:41	15-08-2022	14:09	0.47	50	-	Released
6	RBSC	109	10	U	U	15-08-2022	Trawling	TR01	IPF	502058 7977608	502490 7978248	17W	TR01S	TR01E	15-08-2022	13:41	15-08-2022	14:09	0.47	50	-	Released
7	RBSC	95	5	U	U	15-08-2022	Trawling	TR01	IPF	502058 7977608	502490 7978248	17W	TR01S	TR01E	15-08-2022	13:41	15-08-2022	14:09	0.47	50	-	Released
8	RBSC	96	5	U	U	15-08-2022	Trawling	TR01	IPF	502058 7977608	502490 7978248	17W	TR01S	TR01E	15-08-2022	13:41	15-08-2022	14:09	0.47	50	-	Released
9	RBSC	113	10	U	U	15-08-2022	Trawling	TR01	IPF	502058 7977608	502490 7978248	17W	TR01S	TR01E	15-08-2022	13:41	15-08-2022	14:09	0.47	50	-	Released
10	POCD	105	10	U	U	15-08-2022	Trawling	TR01	IPF	502058 7977608	502490 7978248	17W	TR01S	TR01E	15-08-2022	13:41	15-08-2022	14:09	0.47	50	-	Euthanized
11	SPSC	64	5	U	U	15-08-2022	Trawling	TR01	IPF	502058 7977608	502490 7978248	17W	TR01S	TR01E	15-08-2022	13:41	15-08-2022	14:09	0.47	50	-	Euthanized
12	SPSC	59	3	U	U	15-08-2022	Trawling	TR01	IPF	502058 7977608	502490 7978248	17W	TR01S	TR01E	15-08-2022	13:41	15-08-2022	14:09	0.47	50	-	Released
1	POCD	87	9.4	U	J	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
2	STSC	145	46.6	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
3	STSC	93	12	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
4	STSC	142	36.1	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
5	STSC	127	26.8	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
6	STSC	138	33.7	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
7	STSC	124	15.6	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Mortality
8	STSC	99	13.7	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
9	RBSC	113	10.4	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
10	RBSC	115	9.8	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
11	RBSC	102	7.3	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
12	RBSC	104	7.4	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
13	RBSC	121	11.3	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
14	RBSC	112	8.9	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
15	SPSC	70	4.8	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
16	SPSC	68	4.1	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
17	SPSC	63	2.4	U	U	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Released
18	POCD	72	2.2	U	J	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Mortality
19	POCD	72	2.4	U	J	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Mortality
20	POCD	72	3	U	J	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Mortality
21	POCD	72	2.2	U	J	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Mortality
22	POCD	74	2.8	U	J	15-08-2022	Trawling	TR02	DPF	502305 7976619	503338 7976862	17W	TR02S	TR02E	15-08-2022	15:13	15-08-2022	15:54	0.68	30	-	Mortality

[1] NFC = no fish caught

[2] ARCH = Arctic char; ARSC = Arctic sculpin; FHSC = Fourhorn sculpin; GRCD = Greenland cod; HBEP = Half-barred eelpout; POCD = Polar cod; RBSC = Ribbed sculpin; SAEP = Saddled eelpout; SHSC = Shorthorn sculpin; SPSC = Spatulate sculpin; STSC = Arctic staghorn sculpin

[3] DPF = direct project footprint; IPF = indirect project footprint

[4] Bo = Boulder; Co = Cobble; Gr = Gravel; Sa = Sand

APPENDIX 6C

Photographs

Photo 1: Angling – jigging effort AN-J01 below the West Ore Dock in the DPF (Direct Project Footprint).

Photo 2: Fukui trap sets FT30 deployed on East Beach, east of the Freight Dock barge ramp in the IPF (Indirect Project Footprint).

Photo 3: Gill net effort GN01 deployed off West Beach in the DPF.

Photo 4: Hoop net effort HN08 deployed at low tide on the southeast side of Milne Port in the IPF.

Photo 5: Trawling effort TR01 being deployed on the northwest side of Milne Port in the IPF.

Photo 6: Fourhorn Sculpin (*Myoxocephalus quadricornis*) captured in hoop net effort HN01, undergoing fish health processing (see Chapter 7.0).

Photo 7: Arctic Char (*Salvelinus alpinus*) accidental mortality captured in gill net effort GN12, undergoing opportunistic fish health processing (see Chapter 7.0).

Photo 8: Shorthorn Sculpin (*Myoxocephalus scorpius*) captured in gill net set GN07 on the east side of Milne Port in the IPF.

Photo 9: Ribbed Sculpin (*Triglops pingelii*) captured in trawling effort TR01.

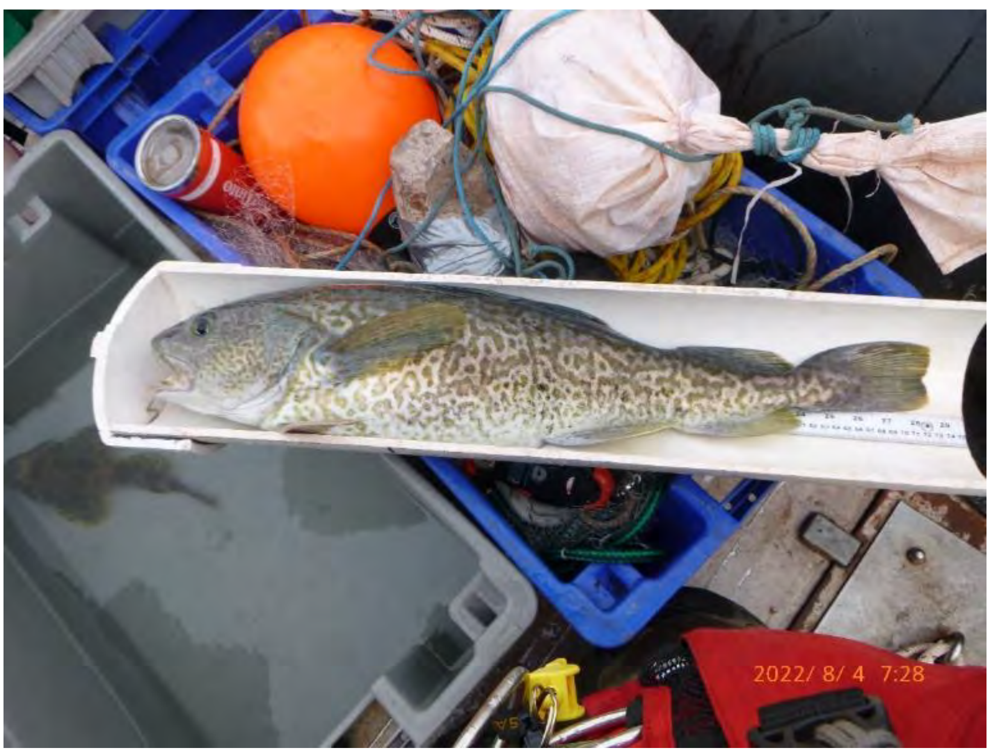

Photo 10: Greenland Cod (*Gadus ogac*) captured in angling (jigging) effort AN-J03 in the IPF.

Photo 11: Arctic Staghorn Sculpin (*Gymnocanthus tricuspis*) captured in trawling effort TR01.

Photo 12: Arctic Sculpin (*Myoxocephalus scorpioides*) captured in hoop net effort HN02 in the DPF.

Photo 13: Juvenile polar cod (*Boreogadus saida*) captured in trawling effort TR01.

Photo 14: Saddled Eelpout (*Lycodes mucosus*) captured in Fukui trap FT24.

Photo 15: Spatulate Sculpin *(Icelus spatulata*) captured in trawling effort TR01.

Photo 16: Halfbarred Pout (*Gymnelus hemifasciatus*) captured in Fukui trap FT21.

APPENDIX 6D

Supplementary Figures and Tables

Table 1. Length (mm) Summary Statistics from Catch Data by Taxon, Milne Port (2022)

Fishing Gear	Direct Project Footprint					Indirect Project Footprint				
	No. Fish Caught	Mean	SD	Min	Max	No. Fish Caught	Mean	SD	Min	Max
Arctic Char	**36**	**510.17**	**141.28**	**168**	**775**	**62**	**452.55**	**151.41**	**131**	**744**
Angling - Trolling	1	620.00	-	620	620	-	-	-	-	-
Gill Net	35	507.03	142.06	168	775	62	452.55	151.41	131	744
Arctic Sculpin	**1**	**150.00**	**-**	**150**	**150**	**4**	**156.75**	**49.39**	**104**	**220**
Angling - Trolling	-	-	-	-	-	1	136.00	-	136	136
Fukui Trap	-	-	-	-	-	2	135.50	44.55	104	167
Gill Net	-	-	-	-	-	1	220.00	-	220	220
Hoop Net	1	150.00	-	150	150	-	-	-	-	-
Arctic Staghorn Sculpin	**7**	**124.00**	**20.64**	**93**	**145**	**1**	**131.00**	**-**	**131**	**131**
Trawling	7	124.00	20.64	93	145	1	131.00	-	131	131
Fourhorn Sculpin	**262**	**205.19**	**39.82**	**83**	**332**	**44**	**213.98**	**34.85**	**141**	**277**
Angling - Jigging	109	213.40	36.48	83	306	-	-	-	-	-
Angling - Trolling	29	227.17	38.75	170	332	1	249.00	-	249	249
Fukui Trap	3	172.67	19.76	155	194	1	174.00	-	174	174
Gill Net	68	188.74	36.31	101	322	42	214.10	34.72	141	277
Hoop Net	53	199.25	42.56	132	285	-	-	-	-	-
Greenland Cod	**3**	**461.67**	**14.57**	**445**	**472**	**5**	**578.20**	**77.83**	**505**	**706**
Angling - Jigging	1	468.00	-	468	468	4	578.25	89.87	505	706
Angling - Trolling	1	445.00	-	445	445	1	578.00	-	578	578
Fukui Trap	1	472.00	-	472	472	-	-	-	-	-
Halfbarred Pout	**-**	**-**	**-**	**-**	**-**	**1**	**187.00**	**-**	**187**	**187**
Fukui Trap	-	-	-	-	-	1	187.00	-	187	187
Polar Cod	**6**	**74.83**	**6.01**	**72**	**87**	**1**	**105.00**	**-**	**105**	**105**
Trawling	6	74.83	6.01	72	87	1	105.00	-	105	105
Ribbed Sculpin	**6**	**111.17**	**7.08**	**102**	**121**	**8**	**110.38**	**9.91**	**95**	**122**
Trawling	6	111.17	7.08	102	121	8	110.375	9.91	95	122
Saddled Eelpout	**1**	**168.00**	**-**	**168**	**168**	**-**	**-**	**-**	**-**	**-**
Fukui Trap	1	168.00	-	168	168	-	-	-	-	-
Shorthorn Sculpin	**9**	**239.78**	**56.14**	**175**	**354**	**22**	**227.55**	**61.47**	**144**	**323**
Angling - Jigging	4	280.75	52.24	232	354	16	228.31	61.21	158	323
Angling - Trolling	4	215.00	34.94	176	260	1	313.00	-	313	313
Fukui Trap	-	-	-	-	-	2	155.00	15.56	144	166
Gill Net	-	-	-	-	-	3	243.33	46.46	205	295
Hoop Net	1	175.00	-	175	175	-	-	-	-	-
Spatulate Sculpin	**3**	**67.00**	**3.61**	**63**	**70**	**2**	**61.50**	**3.54**	**59**	**64**
Trawling	3	67.00	3.61	63	70	2	61.50	3.54	59	64

Table 2. Weight (g) Summary Statistics from Catch Data by Taxon, Milne Port (2022)

Fishing Gear	Direct Project Footprint					Indirect Project Footprint				
	No. Fish Caught	Mean	SD	Min	Max	No. Fish Caught	Mean	SD	Min	Max
Arctic Char	**36**	**1897.53**	**1325.34**	**58**	**5390**	**62**	**1511.85**	**1350.96**	**15**	**5000**
Angling - Trolling	1	275.00	-	275	275	-	-	-	-	-
Gill Net	35	1943.89	1314.74	58	5390	62	1511.86	1350.96	15	5000
Arctic Sculpin	**1**	**37.00**	**-**	**37**	**37**	**4**	**77.50**	**73.20**	**20**	**180**
Angling - Trolling	-	-	-	-	-	1	30.00	-	30	30
Fukui Trap	-	-	-	-	-	2	50.00	42.43	20	80
Gill Net	-	-	-	-	-	1	180.00	-	180	180
Hoop Net	1	37.00	-	37	37	-	-	-	-	-
Arctic Staghorn Sculpin	**7**	**26.36**	**13.17**	**12**	**46.6**	**1**	**30.00**	**-**	**30**	**30**
Trawling	7	26.357	13.17	12	46.6	1	30.00	-	30	30
Fourhorn Sculpin	**262**	**103.34**	**68.20**	**8**	**450**	**44**	**131.30**	**116.76**	**11**	**755**
Angling - Jigging	109	108.60	54.06	20	353.1	-	-	-	-	-
Angling - Trolling	29	130.21	94.04	30	450	1	160.00	-	160	160
Fukui Trap	3	61.67	34.03	35	100	1	60.00	-	60	60
Gill Net	68	85.76	68.38	10	435	42	132.34	119.018	11	755
Hoop Net	53	102.75	74.03	8	353	-	-	-	-	-
Greenland Cod	**3**	**1213.33**	**390.17**	**830**	**1610**	**5**	**2570.00**	**1006.21**	**1570**	**4260**
Angling - Jigging	1	1610.00	-	1610	1610	4	2652.50	1142.17	1570	4260
Angling - Trolling	1	830.00	-	830	830	1	2240.00	-	2240	2240
Fukui Trap	1	1200.00	-	1200	1200	-	-	-	-	-
Halfbarred Pout	**-**	**-**	**-**	**-**	**-**	**1**	**30.00**	**-**	**30**	**30**
Fukui Trap	-	-	-	-	-	1	30.00	-	30	30
Polar Cod	**6**	**3.67**	**2.83**	**2.2**	**9.4**	**1**	**10.00**	**-**	**10**	**10**
Trawling	6	3.67	2.83	2.2	9.4	1	10.00	-	10	10
Ribbed Sculpin	**6**	**9.18**	**1.62**	**7.3**	**11.3**	**8**	**9.38**	**3.20**	**5**	**15**
Trawling	6	9.18	1.62	7.3	11.3	8	9.38	3.20	5	15
Saddled Eelpout	**1**	**25.00**	**-**	**25**	**25**	**-**	**-**	**-**	**-**	**-**
Fukui Trap	1	25.00	-	25	25	-	-	-	-	-
Shorthorn Sculpin	**9**	**257.78**	**161.00**	**70**	**580**	**22**	**202.73**	**160.12**	**50**	**470**
Angling - Jigging	4	375.00	142.71	260	580	16	201.88	165.42	50	470
Angling - Trolling	4	185.00	113.28	70	340	1	450.00	-	450	450
Fukui Trap	-	-	-	-	-	2	70.00	28.28	50	90
Gill Net	-	-	-	-	-	3	213.33	123.42	110	350
Hoop Net	1	80.00	-	80	80	-	-	-	-	-
Spatulate Sculpin	**3**	**3.77**	**1.23**	**2.4**	**4.8**	**2**	**4.00**	**1.41**	**3**	**5**
Trawling	3	3.77	1.23	2.4	4.8	2	4.00	1.41	3	5

LEGEND

- 2020 ANGLING (JIGGING) SAMPLING LOCATION
- 2021 ANGLING (JIGGING) SAMPLING LOCATION
- 2022 ANGLING (JIGGING) SAMPLING LOCATION
- 2020 ANGLING (JIGGING) SAMPLING LOCATION
- 2020 ANGLING (TROLLING) SAMPLING LOCATION
- 2021 ANGLING (JIGGING) SAMPLING LOCATION
- 2021 ANGLING (TROLLING) SAMPLING LOCATION
- 2022 ANGLING (TROLLING) SAMPLING LOCATION
- BATHYMETRIC CONTOUR (25 m INTERVAL)
- INTERMITTENT WATERCOURSE
- WATERCOURSE
- INDIRECT PROJECT FOOT PRINT (IPF)
- DIRECT PROJECT FOOT PRINT (DPF)
- WATERBODY

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REFERENCE(S)
BATHYMETRY CREATED BY GOLDER FROM MULTIPLE DATA SOURCES. FREIGHT DOCK DATA PROVIDED BY HATCH, MARCH 4, 2020. ADDITIONAL MILNE PORT INFRASTRUCTURE DATA OBTAINED FROM CLIENT, MAY 2, 2020 AND MAY 28, 2018. HYDROGRAPHY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. MILNE PORT IMAGERY CAPTURED AUGUST 2020 © 2020 DIGITAL GLOBE, INC. ADDITIONAL IMAGERY COPYRIGHT © 20190802 ESRI AND ITS LICENSORS. SOURCE: MAXAR VIVID. USED UNDER LICENSE, ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 17 DATUM: NAD 83

CLIENT
BAFFINLAND IRON MINES CORPORATION

PROJECT
MARY RIVER PROJECT

CONSULTANT
wsp

YYYY-MM-DD	2023-01-13
DESIGNED	BG
PREPARED	AA
REVIEWED	
APPROVED	

TITLE
ANGLING SAMPLE LOCATIONS IN MILNE PORT; MEEMP 2020, 2021, AND 2022

PROJECT NO.	CONTROL	REV.	FIGURE
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25mm
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- 2020 FUKUI TRAP SAMPLING LOCATION
- 2021 FUKUI TRAP SAMPLING LOCATION
- 2022 FUKUI TRAP SAMPLING LOCATION
- BATHYMETRIC CONTOUR (25 m INTERVAL)
- INTERMITTENT WATERCOURSE
- WATERCOURSE
- INDIRECT PROJECT FOOT PRINT (IPF)
- DIRECT PROJECT FOOT PRINT (DPF)
- WATERBODY

0 250 500

1:12,000 METRES

REFERENCE(S)

BATHYMETRY CREATED BY GOLDER FROM MULTIPLE DATA SOURCES. FREIGHT DOCK DATA PROVIDED BY HATCH, MARCH 4, 2020. ADDITIONAL MILNE PORT INFRASTRUCTURE DATA OBTAINED FROM CLIENT, MAY 2, 2020 AND MAY 28, 2018. HYDROGRAPHY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. MILNE PORT IMAGERY CAPTURED AUGUST 2020 © 2020 DIGITAL GLOBE, INC. ADDITIONAL IMAGERY COPYRIGHT © 20190802 ESRI AND ITS LICENSORS. SOURCE: MAXAR VIVID. USED UNDER LICENSE, ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 17 DATUM: NAD 83

CLIENT	BAFFINLAND IRON MINES CORPORATION
PROJECT	MARY RIVER PROJECT
CONSULTANT	wsp
YYYY-MM-DD	2023-01-13
DESIGNED	BG
PREPARED	AA
REVIEWED	
APPROVED	
TITLE	FUKUI TRAP DEPLOYMENT LOCATIONS IN MILNE PORT; MEEMP 2020, 2021, AND 2022
PROJECT NO.	166372401
CONTROL	64000-04
REV.	0
FIGURE	6-2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

LEGEND

- BATHYMETRIC CONTOUR (25 m INTERVAL)
- 2020 GILLNET SAMPLING LOCATION
- 2021 GILLNET SAMPLING LOCATION
- 2022 GILLNET SAMPLING LOCATION
- INTERMITTENT WATERCOURSE
- WATERCOURSE
- INDIRECT PROJECT FOOT PRINT (IPF)
- DIRECT PROJECT FOOT PRINT (DPF)
- WATERBODY

0 250 500

1:12,000 METRES

REFERENCE(S)

BATHYMETRY CREATED BY GOLDER FROM MULTIPLE DATA SOURCES. FREIGHT DOCK DATA PROVIDED BY HATCH, MARCH 4, 2020. ADDITIONAL MILNE PORT INFRASTRUCTURE DATA OBTAINED FROM CLIENT, MAY 2, 2020 AND MAY 28, 2018. HYDROGRAPHY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. MILNE PORT IMAGERY CAPTURED AUGUST 2020 © 2020 DIGITAL GLOBE, INC. ADDITIONAL IMAGERY COPYRIGHT © 20190802 ESRI AND ITS LICENSORS. SOURCE: MAXAR VIVID. USED UNDER LICENSE, ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 17 DATUM: NAD 83

CLIENT
BAFFINLAND IRON MINES CORPORATION

PROJECT
MARY RIVER PROJECT

CONSULTANT
wsp

YYYY-MM-DD	2023-01-13
DESIGNED	BG
PREPARED	AA
REVIEWED	
APPROVED	

TITLE
GILL NET DEPLOYMENT LOCATIONS IN MILNE PORT; MEEMP 2020, 2021, AND 2022

PROJECT NO.	CONTROL	REV.	FIGURE
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25mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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LEGEND

- 2020 HOOP NET SAMPLING LOCATION
- 2021 HOOP NET SAMPLING LOCATION
- 2022 HOOP NET SAMPLING LOCATION
- BATHYMETRIC CONTOUR (25 m INTERVAL)
- INTERMITTENT WATERCOURSE
- WATERCOURSE
- INDIRECT PROJECT FOOT PRINT (IPF)
- DIRECT PROJECT FOOT PRINT (DPF)
- WATERBODY

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REFERENCE(S)

BATHYMETRY CREATED BY GOLDER FROM MULTIPLE DATA SOURCES. FREIGHT DOCK DATA PROVIDED BY HATCH, MARCH 4, 2020. ADDITIONAL MILNE PORT INFRASTRUCTURE DATA OBTAINED FROM CLIENT, MAY 2, 2020 AND MAY 28, 2018. HYDROGRAPHY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. MILNE PORT IMAGERY CAPTURED AUGUST 2020 © 2020 DIGITAL GLOBE, INC. ADDITIONAL IMAGERY COPYRIGHT © 20190802 ESRI AND ITS LICENSORS. SOURCE: MAXAR VIVID. USED UNDER LICENSE, ALL RIGHTS RESERVED.
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PROJECT
MARY RIVER PROJECT

CONSULTANT

YYYY-MM-DD	2023-01-17
DESIGNED	BG
PREPARED	AA
REVIEWED	
APPROVED	

TITLE
HOOP NET DEPLOYMENT LOCATIONS IN MILNE PORT; MEEMP 2020, 2021, AND 2022

PROJECT NO.	CONTROL	REV.	FIGURE
166372401	64000-04	0	6-4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

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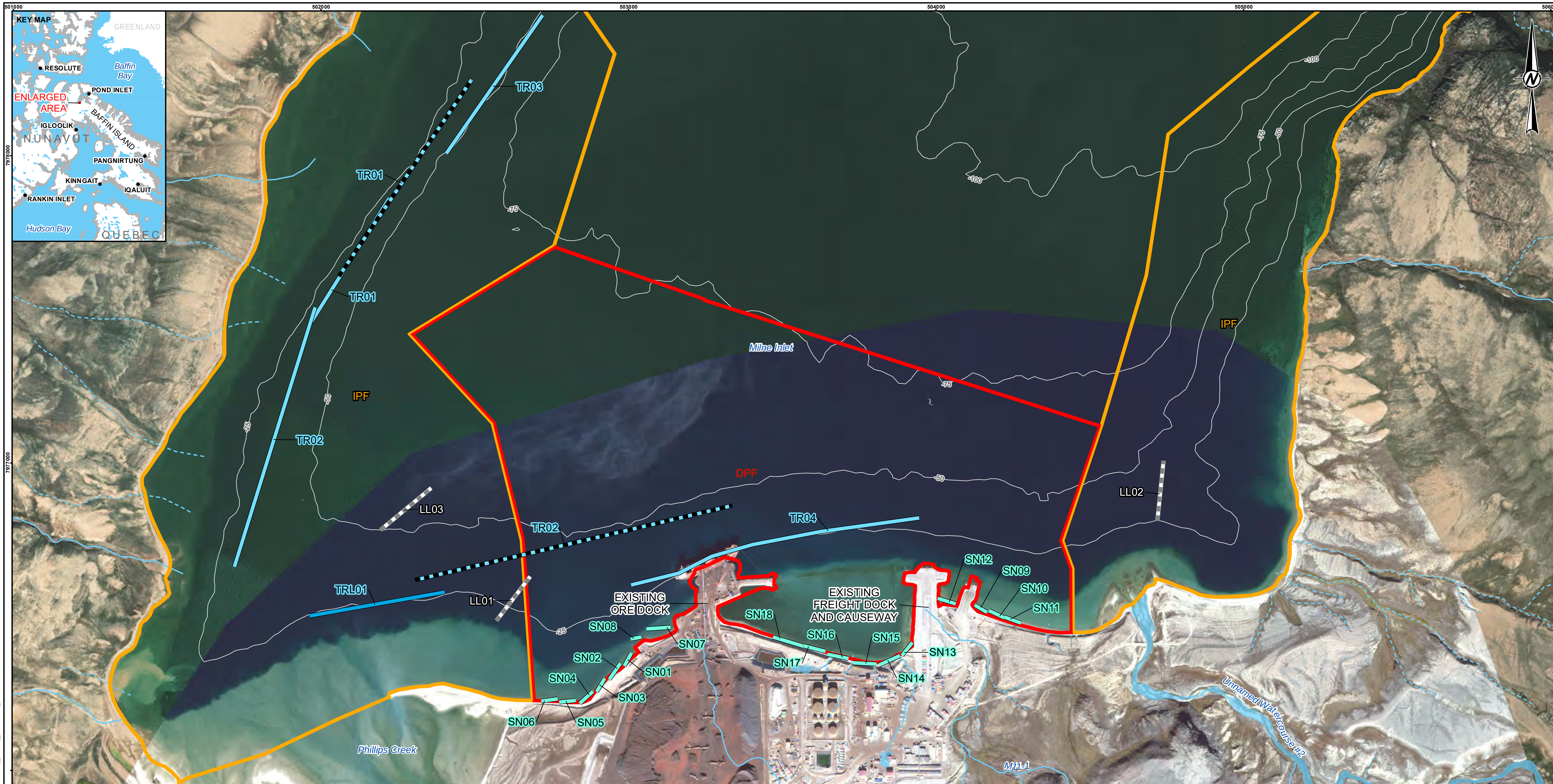

LEGEND

- 2020 SEINE NET SAMPLE LOCATION
- 2020 TRAWLING SAMPLE LOCATION
- 2021 LONG LINE SAMPLE LOCATION
- 2021 TRAWLING SAMPLE LOCATION
- 2022 TRAWLING SAMPLING LOCATION
- BATHYMETRIC CONTOUR (25 m INTERVAL)
- INTERMITTENT WATERCOURSE
- WATERCOURSE
- INDIRECT PROJECT FOOT PRINT (IPF)
- DIRECT PROJECT FOOT PRINT (DPF)
- WATERBODY

0 250 500

1:12,500 METRES

REFERENCE(S)

BATHYMETRY CREATED BY GOLDER FROM MULTIPLE DATA SOURCES. FREIGHT DOCK DATA PROVIDED BY HATCH, MARCH 4, 2020. ADDITIONAL MILNE PORT INFRASTRUCTURE DATA OBTAINED FROM CLIENT, MAY 2, 2020 AND MAY 28, 2018. HYDROGRAPHY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. MILNE PORT IMAGERY CAPTURED AUGUST 2020 © 2020 DIGITAL GLOBE, INC. ADDITIONAL IMAGERY COPYRIGHT © 20190802 ESRI AND ITS LICENSORS. SOURCE: MAXAR VIVID. USED UNDER LICENSE, ALL RIGHTS RESERVED.
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CLIENT
BAFFINLAND IRON MINES CORPORATION

PROJECT
MARY RIVER PROJECT

CONSULTANT

YYYY-MM-DD	2023-01-20
DESIGNED	BG
PREPARED	AA
REVIEWED	
APPROVED	

TITLE
LONGLINING, SEINE NET AND TRAWLING SAMPLE LOCATIONS IN MILNE PORT; MEEMP 2020, 2021, AND 2022.

PROJECT NO.	CONTROL	REV.	FIGURE
166372401	64000-04	0	6-5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

Table 3. Fish Catch Data for 2010 - 2022 MEEMP Fish Sampling Program (Combined Fishing Methods).

Family / Common Name	Taxonomic ID	2010	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
		Number of Fish										
Agonidae												
Arctic Alligatorfish	*Aspidophoroides olrikii*	0	0	0	0	0	0	0	0	0	2	0
Atlantic Poacher	*Leptagonus decagonus*	0	0	0	0	0	0	0	0	0	1	0
Ammodytidae												
Sandlance	*Ammodytes* spp.	0	0	0	0	0	1	1	1	6	0	0
Cottidae												
Atlantic Hookear Sculpin	*Artediellus atlanticus*	0	0	3	1	0	0	0	0	0	0	0
Arctic Staghorn Sculpin	*Gymnocanthus tricuspis*	3	2	0	2	0	0	0	0	11	5	8
Spatulate Sculpin	*Icelus spatulata*	0	0	0	0	0	0	0	0	0	0	5
Longhorn Sculpin	*Myoxocephalus octodecemspinosus*	0	0	4	2	2	0	0	0	0	0	0
Fourhorn Sculpin	*Myoxocephalus quadricornis*	7	3	39	13	18	28	147	106	388	295	306
Arctic Sculpin	*Myoxocephalus scorpioides*	0	0	4	1	0	6	3	0	13	47	5
Shorthorn Sculpin	*Myoxocephalus scorpius*	50	4	10	8	18	21	78	66	74	37	31
Ribbed Sculpin	*Triglops pingelii*	0	0	0	0	0	0	0	0	0	47	14
Unidentified Sculpin	Cottidae indet.	0	0	0	12	0	0	3	0	84[1]	3	0
Cyclopteridae												
Common Lumpfish	*Cyclopterus lumpus*	0	0	1	0	0	0	0	0	0	0	0
Gadidae												
Polar Cod[2]	*Boreogadus saida*	0	0	0	0	0	0	1	0	70	0	7
Greenland Cod	*Gadus ogac*	4	0	1	0	0	0	0	0	57	48	8
Unidentified Cod	Gadidae indet.	0	0	0	0	0	0	0	0	0	11	0
Gasterosteidae												
Ninespine Stickleback	*Pungitius pungitius*	0	0	0	0	0	0	0	1	0	0	0
Liparidae												

Family / Common Name	Taxonomic ID	2010	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
		Number of Fish										
Unidentified Snailfish[3]	Liparidae indet.	0	0	0	0	0	0	0	0	0	1	0
Salmonidae												
Arctic Char	*Salvelinus alpinus*	11	6	3	67	157	23	169	105	148	105	98
Stichaeidae												
Fourline Snakeblenny	*Eumesogrammus parecisus*	0	0	1	2	2	0	0	0	1	0	1
Zoarcidae												
Halfbarred Pout	*Gymnelus hemifasciatus*	0	0	0	0	0	0	0	0	0	0	1
Fishdoctor	*Gymnelis viridis*	0	1	0	3	0	0	0	0	0	0	0
Saddled Eelpout	*Lycodes mucosus*	0	0	0	0	0	0	0	0	0	1	1
Indeterminate												
Unidentified Species	-	0	0	0	0	0	0	1	0	0	0	0
Total Taxonomic Richness		**5**	**5**	**9**	**10**	**5**	**5**	**8**	**5**	**11**	**13**	**11**
Total Fish Captures		**75**	**16**	**67**	**111**	**197**	**79**	**403**	**279**	**852**	**603**	**484**

[1] For the Unidentified Sculpin captured in 2021, taxonomic lab results (Biologica) determined the majority of the fish to be in the genus *Myoxocephalus*; The species identification was unknown; however, results suggest it was potentially *M. aenaeus*. Nine of the unidentified sculpin were only able to be taxonomically identified to genus *Triglops*; results suggest it was potentially *T. pingelii.*

[2] Fish species *Arctogadus glacialis* and *Boreogadus saida* both use the common name Polar Cod. The 2018 report (Golder 2019) indicated an Arctic Cod was captured, referred to as *A. glacialis*. Review of the catch record and field photographs indicate this was actually *B. saida* and was corrected in the 2020 MEEMP report (Golder 2021). Since 2020, field programs and taxonomic identifications by the lab have indicated subsequent catches of juvenile cod have been polar cod (*B. saida*) and the occurrence of *A. glacialis* in the record was corrected in this report.

[3] Taxonomic lab results (Biologica) identified the 2021 Unidentified Snailfish from Genus *Liparis*. The species was determined be either *L. gibbus* or *L. tunicatus*, however identifying features were not clear.

Table 4. Total Catch (n) for Grouped Taxon by Fishing Method, Year, and Fishing Area (2020 – 2022)

Fishing Method	Year	Fishing Area	Arctic Char	Fourhorn Sculpin	Greenland Cod	Shorthorn Sculpin	Other Sculpin	Other Fish	Total per Area	Total per Year
Angling – Jigging	2020	DPF	1	145	38	36	4	0	224	250
		IPF	1	0	16	9	0	0	26	
	2021	DPF	5	135	33	11	26	0	210	260
		IPF	0	15	14	17	4	0	50	
	2022	DPF	0	109	1	4	0	0	114	134
		IPF	0	0	4	16	0	0	20	
Angling – Trolling	2020	DPF	0	0	0	0	0	0	0	1
		IPF	0	0	0	1	0	0	1	
	2021	IPF	0	0	0	0	0	0	0	0
	2022	DPF	1	29	1	4	0	0	35	39
		IPF	0	1	1	1	1	0	4	
Fukui Trap	2020	DPF	0	17	0	2	13	3	35	43
		IPF	0	1	0	1	6	0	8	
	2021	DPF	0	1	0	0	7	0	8	17
		IPF	0	6	0	0	3	0	9	
	2022	DPF	0	3	1	0	0	1	5	11
		IPF	0	1	0	2	2	1	6	
Gill Net	2020	DPF	80	113	0	17	11	1	222	306
		IPF	64	15	0	5	0	0	84	
	2021	DPF	59	87	0	4	4	0	154	242
		IPF	41	39	1	5	2	0	88	
	2022	DPF	35	68	0	0	0	0	103	211
		IPF	62	42	0	3	1	0	108	
Hoop Net	2020	DPF	0	70	1	3	3	0	77	84
		IPF	1	3	2	0	1	0	7	
	2021	DPF	0	12	0	0	0	0	12	12
		IPF	0	0	0	0	0	0	0	
	2022	DPF	0	53	0	1	1	0	55	55
		IPF	0	0	0	0	0	0	0	
Longlining	2021	IPF	0	0	0	0	0	0	0	0
Seine Net	2020	DPF	1	24	0	0	51	3	79	79
Trawling	2020	IPF	0	0	0	0	19	70	89	89
	2021	DPF	0	0	0	0	52	12	64	72
		IPF	0	0	0	0	4	4	8	
	2022	DPF	0	0	0	0	16	6	22	34
		IPF	0	0	0	0	11	1	12	

Table 5. Statistical Testing Results for CPUE of All Fish Species Combined, for Select Fishing Methods (2020-2022).

Model				Post-Hoc Testing		
Variable	**Chi square**	**Df**	**P value**	**Contrast**	**Effect size (%)**	**P value**
Angling – Jigging						
Area	0.646	1	0.422	-	-	-
Year	0.129	2	0.938	-	-	-
Area:Year	0.864	2	0.649	-	-	-
Angling – Trolling						
Area	0.207	1	0.649	-	-	-
Year	5.920	1	**0.015**	2022 - 2020	+1,258	Not tested, because only 2 groups
Fukui Trap						
Area	3.085	1	0.079	-	-	-
Year	4.022	2	0.134	-	-	-
Area:Year	0.710	2	0.701	-	-	-
Gill Net						
Area	2.726	1	0.099	-	-	-
Year	3.733	2	0.155	-	-	-
Area:Year	2.882	2	0.237	-	-	-
Hoop Net						
Area	12.717	1	**<0.001**	DPF - IPF	+637	Not tested, because only 2 groups
Year	4.208	2	0.122	-	-	-

Note: Cells highlighted blue and bold indicate statistically significant results (p-value <0.05). Post-hoc testing was only conducted for significant results. Area includes DPF (Direct Project Footprint) and IPF (Indirect Project Footprint). Df = degrees of freedom; Diff = the direction of the contrast, where the second value is used as the baseline.

Table 6. Statistical Testing Results for CPUE of Fourhorn Sculpin, for Select Fishing Methods (2020-2022).

Model				Post-Hoc Testing		
Variable	**Chi square**	**Df**	**P value**	**Contrast**	**Effect size (%)**	**P value**
Angling – Jigging						
Area	3.909	1	**0.048**	DPF - IPF	340	Not tested, because only 2 groups
Year	4.069	2	0.131	-	-	-
Angling – Trolling						
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
Fukui Trap						
Area	0.293	1	0.589	-	-	-
Year	2.636	2	0.268	-	-	-
Area:Year	6.066	2	**0.048**	2020: DPF - IPF	59	0.659
				2021: DPF - IPF	-92	**0.025**
				2022: DPF - IPF	201	0.343
Gill Net						
Area	6.417	1	**0.011**	DPF - IPF	106	Not tested, because only 2 groups
Year	2.604	2	0.272	-	-	-
Area:Year	2.156	2	0.340	-	-	-
Hoop Net						
Area	10.554	1	**0.001**	DPF - IPF	1,144	Not tested, because only 2 groups
Year	2.696	2	0.260	-	-	-

Note: Cells highlighted blue and bold indicate statistically significant results (p-value <0.05). Post-hoc testing was only conducted for significant results. Area includes DPF (Direct Project Footprint) and IPF (Indirect Project Footprint). Df = degrees of freedom; Diff = the direction of the contrast, where the second value is used as the baseline.

Table 7. Statistical Testing Results for CPUE of Arctic Char, for Select Fishing Methods (2020-2022).

Model				Post-Hoc Testing		
Variable	Chi square	Df	P value	Contrast	Effect size (%)	P value
Angling – Jigging						
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
Angling – Trolling						
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
Fukui Trap						
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
Gill Net						
Area	0.237	1	0.627	-	-	-
Year	2.615	2	0.270	-	-	-
Area:Year	1.301	2	0.522	-	-	-
Hoop Net						
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

Note: Cells highlighted blue and bold indicate statistically significant results (p-value <0.05). Post-hoc testing was only conducted for significant results. Area includes DPF (Direct Project Footprint) and IPF (Indirect Project Footprint). Df = degrees of freedom; Diff = the direction of the contrast, where the second value is used as the baseline.

APPENDIX 6E

Power Analysis

POWER ANALYSIS – FISH COMMUNITY CPUE

This section presents the results of a power analysis undertaken for the 2022 fish catch-per-unit-effort (CPUE).

METHODS

A Type I error is concluding there is a significant effect when none exists (i.e., a false positive). Alpha (α) is the probability of committing a Type I error. A Type II error is the probability of concluding there is no significant effect when there is a real effect of some specified magnitude (i.e., a false negative). Beta (β) is the probability of committing a Type II error. The power of a statistical test (1 - β) is the probability of detecting a real effect.

In this analysis, the Type I error-rate (α), also referred to as the significance level, was set to 0.05. The desired minimum statistical power was 80%, which corresponds to a type II error-rate of 0.2. Power analyses were conducted to assess the power of statistical tests under three effect sizes – detection of a reduction of 20%, 30%, and 40% in catch per unit effort in the DPF relative to the IPF area. A range of sample sizes was assessed for each gear type, to evaluate whether increasing effort within the logistical constraints associated with the sampling would result in sufficient (>80%) statistical power.

Data Simulation following Effect Size Application

The power to detect statistically significant effects was estimated using residual bootstrapping in R v. 4.2.1 (R 2022), following the approach of Fox and Weisberg (2018). The general approach was to simulate data based on the model selected for interpretation, the observed sample size (or the sample size of choice), and the variability estimated by the original model, and re-run the models that were used for the original analysis using the simulated data. The data simulation and analysis were repeated 1,000 times, and the proportion of repetitions where the *P*-values of interest were significant ($P<0.05$) was interpreted as the statistical power of the test.

To produce simulated data, the original model was used to predict values of the response variable, and the dispersion estimated by the original negative binomial model were calculated and retained. The predicted values were then adjusted according to the effect size, depending on analysis (see below for details). For each iteration of the simulation, the adjusted predicted values and the dispersion from the original model were used to generate a randomly drawn sample of negative binomial counts, to produce a set of simulated data. Generating the randomly drawn sample around the effect size-adjusted predictions was done to create a level of variability in the simulated data that was similar to the observed data. The simulated data were then analyzed using the same model structure as the original analysis.

In the analysis of 2020-2022 data, where the question of interest was the detection of a reduction in fish CPUE at the DPF relative to the IPF, the effect was applied as percentage relative to the values predicted for the IPF. That is, an increasing effect size resulted in a larger difference between the IPF and DPF areas. The simulated data were analyzed using the same model as the original analysis described in the main report, and the *P*-values for the effect of area on the response variable were retained, which included both the main effect of area and an interaction with area (for models that included at interaction). If any of these *P*-values were less than 0.05, it was considered a statistically significant result. The proportion of repetitions with *P*-values less than 0.05 was interpreted as the statistical power of the overall regression for that effect size. The power analysis was performed on three effect sizes – CPUE reductions of 20%, 30%, and 40% relative to the IPF, and a range of sample sizes, depending on fishing gear.

Power Analysis – Reporting of Results

Power curves were produced, showing statistical power as a function of sample size and effect size in percentages. Horizontal lines were added to visualize statistical power values of 0.8 (hereafter sufficient power) and 0.9 (hereafter high power), and the observed effect size was provided in the results.

RESULTS

The power analysis indicated that fish CPUE data had sufficient power to detect a 20% reduction in CPUE for all species combined using gill nets (for sample sizes of 12 nets per area or higher, given the observed fishing duration) or angling-jigging (for sample sizes of 14 sampling events per area or higher [given the observed fishing duration per event]; Figure 1). For Fourhorn Sculpin, a 20% reduction in CPUE relative to the IPF did not have sufficient power under any of the assessed sample sizes, however a sample size of 25 gill nets or higher per area would likely result in sufficient power (Figure 2). For Arctic Char, the only assessed gear type was gill nets, and collected data had sufficient power to detect a 20% reduction in CPUE relative to the IPF for sample sizes of 12 nets per area or higher (Figure 3). Overall, an increase in sample size would only result in sufficient power to detect a 20% reduction in CPUE for angling-jigging (for all species combined) and gill nets (for Fourhorn Sculpin).

For a reduction of 40% relative to the IPF, sufficient power would be achieved for the following combinations of species, sampling gear, sample size, and effect sizes:

- All fish combined:
  - Angling-jigging – at 10 sampling events per area (given the observed fishing length per event); 8 sampling events are also likely to be sufficient, although this sample size was not assessed.
  - Angling-trolling – at 11 sampling events per area (given the observed fishing length per event).
  - Gill nets – at 12 samples per area (given the observed deployment time per sampling); 10 sampling events are also likely to be sufficient, although this sample size was not assessed.
  - Hoop nets – at 24 nets per area (given the observed deployment time per sampling)
- Fourhorn Sculpin:
  - Gill nets – at 12 samples per area (given the observed deployment time per sampling); 10 sampling events are also likely to be sufficient, although this sample size was not assessed.
- Arctic Char:
  - Gill nets – at 12 samples per area (given the observed deployment time per sampling); 10 sampling events are also likely to be sufficient, although this sample size was not assessed

Sufficient power was not achieved even at 40% effect size and maximum assessed sample sizes for Fourhorn Sculpin sampled by angling-jigging and hoop nets.

The observed effect sizes for the analyzed CPUE data ranged from -37 (for Arctic Char sampled in gill nets in 2022) to +1,144 (for Fourhorn Sculpin sampled in gill nets; Table 1). While observed effect sizes were often large, sample sizes in the dataset were often small and inconsistent between years and areas. For example, 17 angling-jigging sampling events took place at the DPF in 2020, but only seven in the IPF in 2020, and only five in the IPF in 2022. The inconsistency in sample size likely reduced the statistical power of the analysis for the all-species-combined dataset. For Fourhorn Sculpin data, all effect sizes except for one were large (>100%), resulting in sufficient power to detect a statistical significance in the original model. For Arctic Char, two of the three effect sizes were small (≤10%), consistent with the lack of statistical significance in the original model.

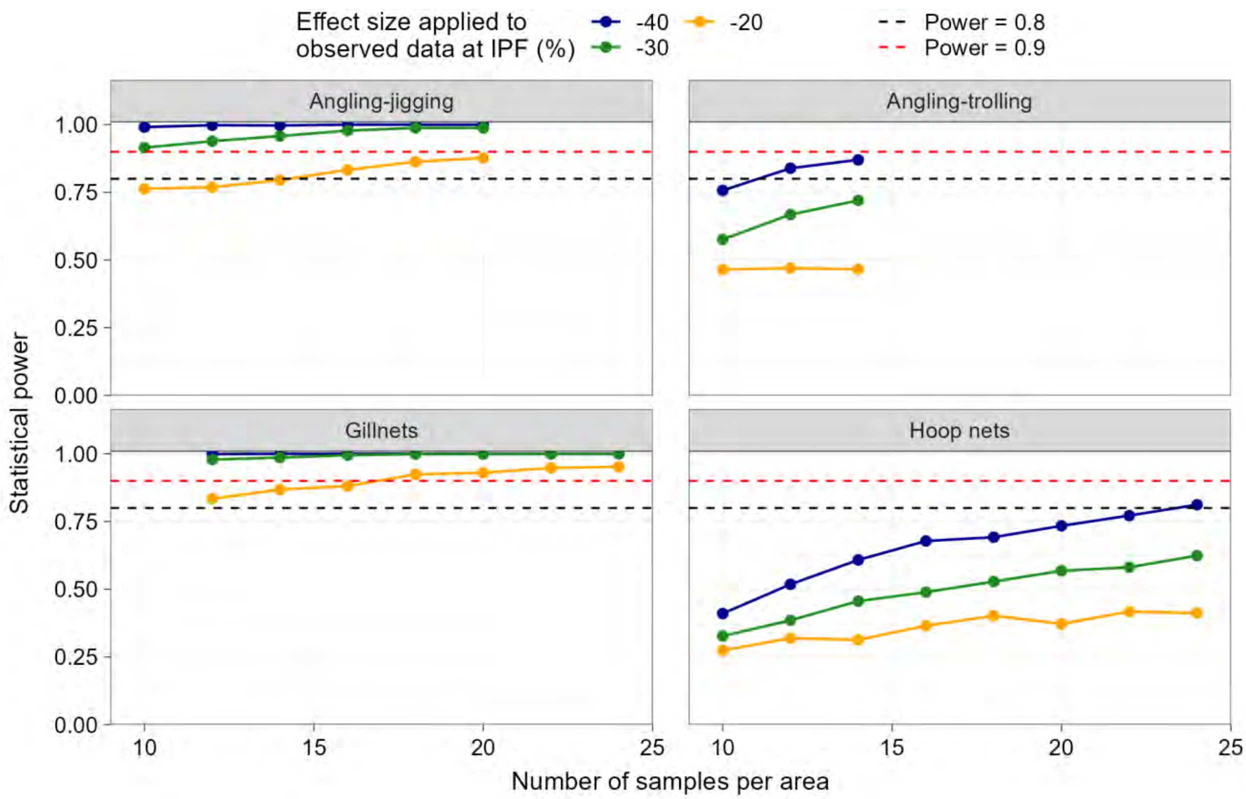

Figure 1: Statistical power of the models of fish CPUE for all species combined to detect a significant effect of area based on CPUE data collected in 2020-2022.

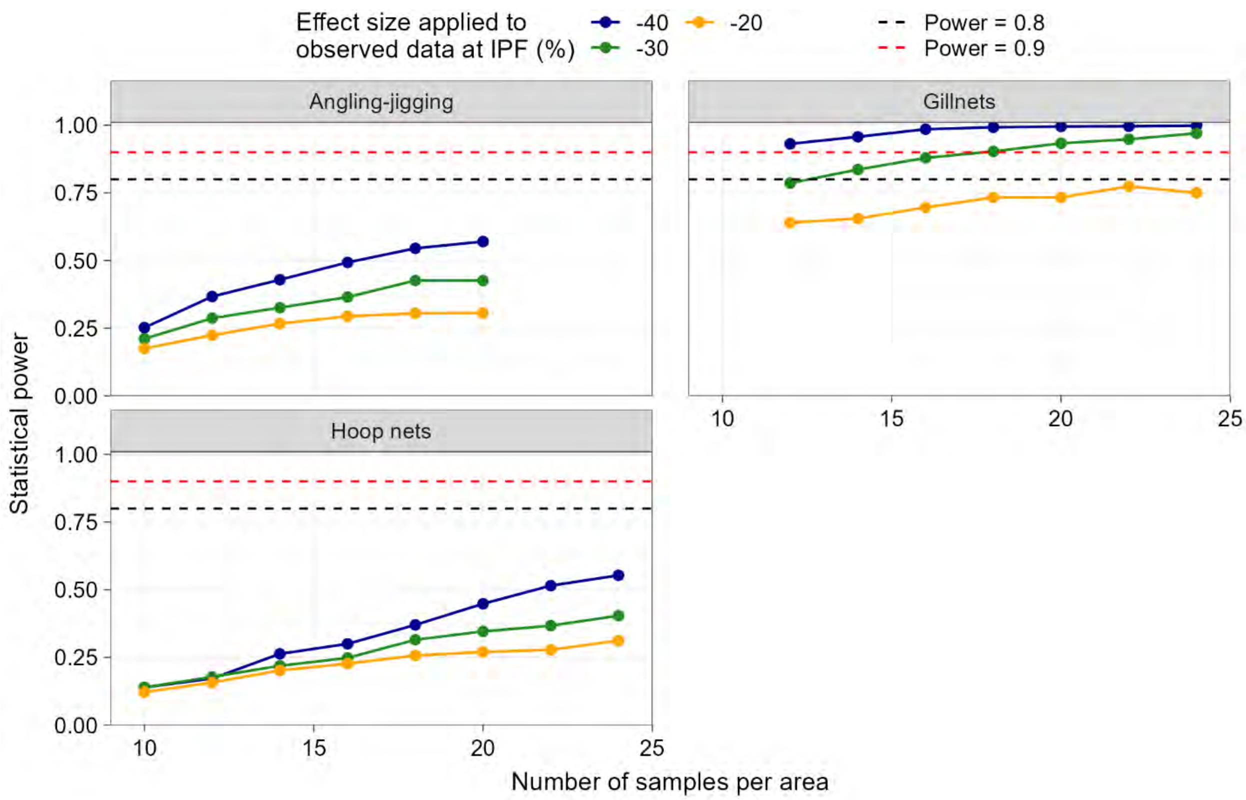

Figure 2: Statistical power of the models of Fourhorn Sculpin data to detect a significant effect of area based on CPUE data collected in 2020-2022.

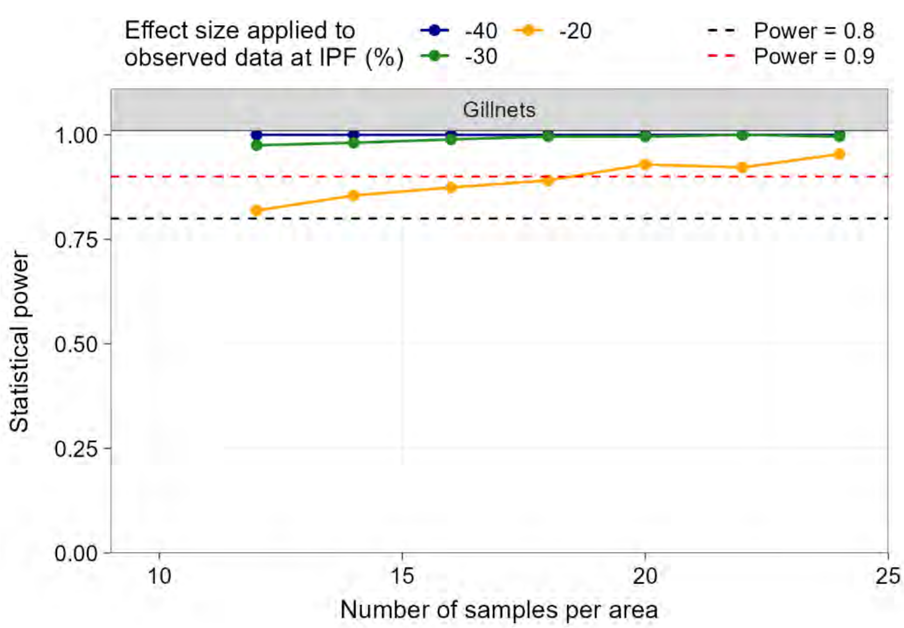

Figure 3: Statistical power of the models of Arctic Char data to detect a significant effect of area based on CPUE data collected in 2020-2022.

Table 1: Observed effect sizes for analyses of fish CPUE data from 2020-2022.

Species	Gear	Observed effect sizes (%)		
		2020	2021	2022
All fish combined	Angling-jigging	+19	+2	+99
	Angling-trolling	+36		
	Gill nets	+92	+58	-11
	Hoop nets	+637		
Fourhorn Sculpin	Angling-jigging	+340		
	Angling-trolling	+235	+129	+25
	Gill nets	+1,144		
Arctic Char	Gill nets	+1	+10	-37

Note: where no interaction between area and year was included in the original model, the effect size is identical between years.

SUMMARY

Overall, statistical power was high for gillnet sampling and lowest for angling-trolling (all species combined) and hoop nets (all species combined and Fourhorn Sculpin analyses). For some gear types, angling-trolling (all species combined), the power to detect a -20% effect size relative to the IPF remained low even if sample sizes increased. For some combinations of gear and species, such as angling-jigging and hoop nets for Fourhorn sculpin, none of the assessed sample sizes and effect sizes resulted in sufficient power.

An increase in sample size to 11 angling-trolling sampling events per area would result in sufficient power (>0.8) to detect a -40% effect size for the analysis of all species combined. Similarly, an increase in sample size to 24 hoop net deployments per area would result in sufficient power (>0.8) to detect a -40% effect size for the analysis of all species combined. For Fourhorn Sculpin, only gillnet sampling had sufficient power to detect a -40% effect size at any of the examined sample sizes for the assessed gear types.

Implications of Power Analysis Results

The results indicated that gillnet sampling offers the highest statistical power for analysis of all species combined, as well as for species-specific Fourhorn Sculpin and Arctic Char data. However, since gillnet sampling is typically lethal, it may affect abundance if used often. Therefore, increased sample sizes for non-lethal gear types should also be considered. The increase in sample size, combined with setting -40% effect sizes as the desired difference to detect would achieve sufficient power for most gear types for both all-species combined and Arctic Char analyses.

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REPORT

Chapter 7.0 Fish Health and Tissue Chemistry

2022 Milne Port Marine Environmental Effects Monitoring Program (MEEMP) and Non-Indigenous Species and Aquatic Invasive Species (NIS/AIS) Monitoring Program

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ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Definitions
ANCOVA	analysis of covariance
ANOVA	analysis of variance
BC MOE	British Columbia Ministry of Environment
Biologica	Biologica Environmental Services Ltd.
BV labs	Bureau Veritas Laboratories
COC	chain of custody
COPCs	constituents of potential concern
CRC ICPMS	collision reaction cell inductively coupled plasma mass spectrometry
DL	detection limit
dw	dry weight
EEM	Environmental Effects Monitoring
ERP	Early Revenue Phase
FEIS	2012 Final Environmental Impact Statement
g	gram
GSI	gonadosomatic index
km	kilometre
K-S Test	Kolmogorov-Smirnov test
$\log_{10}$	$\log_{10}$-transformed data
LSI	liver somatic index
MDMER	Metal and Diamond Mining Effluent Regulations
MEEMP	Marine Environmental Effects Monitoring Program
mg/kg	milligrams per kilogram
nm	milligram
Min	minimum
Max	maximum
MSI	mantle somatic index
n	sample size
n/a	not applicable
nc	not calculated
PAH	polycyclic aromatic hydrocarbon
PC	Project Certificate

Acronym or Abbreviation	Definitions
P-value	probability value
QA/QC	quality assurance and quality control
ROV	Remote operated vehicle
RPD	relative percent differences
SD	Standard Deviation
SE	Standard Error
SR	studentized residuals
ww	wet weight
Y	year

7.0 FISH HEALTH AND TISSUE CHEMISTRY

7.1 Introduction

This chapter presents the results of the 2022 fish health and tissue chemistry monitoring program, a component of the larger Marine Environmental Effects Monitoring Program (MEEMP) conducted in Milne Inlet during the 2022 open-water season. The fish health and tissue chemistry component was developed in consideration of the potential Project-related impacts to the marine environment as identified in the 2012 Final Environmental Impact Statement (FEIS) and subsequent addenda, as well as monitoring requirements outlined in the Project Certificate (PC) Conditions described in Chapter 1.0, Table 1-2. Those related to the monitoring of Fish Health include PC Conditions No. 76, 83 (a), 99 (a), 99 (b) (ii), 99 (c), 113, and 114.

7.1.1 Objectives

The MEEMP objectives are outlined in Section 1.3 for the overall program. The objectives specific to the fish health and tissue chemistry component are:

- Better align the MEEMP with the Metal and Diamond Mining Effluent Regulations (MDMER) Environmental Effects Monitoring (EEM) program (Government of Canada 2002) through the selection of sentinel species and measurements of additional health indicators to monitor for effects from the Project.
- Evaluate the health of the sentinel species, Fourhorn Sculpin (*Myoxocephalus quadricornis*) and wrinkled rock-borer (*Hiatella arctica*), through the assessment of established endpoints (see Section 7.2), length-frequency distributions, length-weight relationships, and visual assessment of internal and external abnormalities.
- Compile current and historic tissue chemistry data for Arctic Char (*Salvelinus alpinus*), Fourhorn Sculpin, and *Hiatella arctica*, and assess concentrations of constituents of potential concern (COPCs).

7.2 Study Design

The fish health and tissue chemistry components of the MEEMP were designed to monitor for potential Project-related impacts and changes to fish health and communities through collection of fish population data using a combination of active and passive fishing methods, and through analysis of tissue chemistry parameters in sentinel species, as well as incidental mortalities of Arctic Char. During baseline and early MEEMP surveys, fish tissue sampling was limited to incidental Arctic Char mortalities, the numbers of which fluctuated from year to year and did not always yield adequate samples to support a meaningful statistical analysis.

In 2018, a local shellfish species, *Hiatella arctica*, was added to the MEEMP as an additional effects indicator for the fish sampling program. *Hiatella arctica* is a resident species in the Project area, easily identifiable and measurable in the field, and abundant in the study area (Golder 2018). Measurement endpoints for *Hiatella arctica* in 2018 and 2019 included age and tissue chemistry analysis.

In 2020, changes to the fish health and tissue chemistry program were implemented to better align the MEEMP with the Metal and Diamond Mining Effluent Regulations (MDMER) Environmental Effects Monitoring (EEM) program (Government of Canada 2002). Fourhorn Sculpin and *Hiatella arctica* (the Wrinkled Rock-Borer) were selected as sentinel species to monitor for effects from the Project. Lethal target sample sizes were established for Fourhorn Sculpin and *Hiatella arctica* as part of the 2020 fish health program. Fish health effect indicators included measures of energy use (i.e., growth, reproduction), energy storage (i.e., condition) and survival (i.e., age), in addition to supporting endpoints (as appropriate for each species) such as length, body weight, the prevalence of external and internal abnormalities, organ weights, stomach fullness, parasite presence/absence, sex, life stage, and state-of-maturity (Section 7.4.1; Appendix 7B).

For fish tissue chemistry, concentrations of total metals[1] and polycyclic aromatic hydrocarbons (PAHs) were measured (Section 7.4.2; Appendix 7C) from each species (i.e., Arctic Char, Fourhorn Sculpin, and *Hiatella arctica*) and compared to MEEMP data from previous years, where possible. Historic data available for comparison varied for each species, with data extending intermittently back to 2010 for Arctic Char, and back to 2018 for Fourhorn Sculpin and *Hiatella arctica*.

7.2.1 Modifications to the Program (2022)

In 2022, a reconnaissance survey was undertaken during the August field program in an effort to identify a suitable reference area for the fish health and tissue chemistry component of the MEEMP, should one be required in future years. Sampling effort was focused near the mouth of Koluktoo Bay, an area north of Milne Port, and near the Tugaat River estuary, similar to reconnaissance work completed near the Tugaat River estuary in 2021. Water quality, sediment quality and fish community sampling was undertaken as part of the reconnaissance survey and a summary of the methods and results of the reconnaissance survey is provided in Appendix 7A. No other significant modifications were made to the fish health and tissue chemistry MEEMP component in 2022.

7.3 Materials and Methods

7.3.1 Field Methodology

Fish community sampling was conducted at various locations near Milne Port, approximately 80 km Northwest of the Mary River Project (17W 503687m E, 7976357m N) from 1 to 14 August 2022 (Figure 6-1 to Figure 6-5). Fishing effort included both active (i.e., angling (jigging and trolling), seine, and trawling) and passive (i.e., Fukui traps, hoop nets, and gillnetting) capture methods. Captured fish were enumerated and measured for length and weight. Capture methods are described in detail in Section 6.3.1 of Chapter 6.0—Fishing Efforts and Catch Data. A subsample of 40 Fourhorn Sculpin were retained for fish health sampling to meet target sample sizes of 20 adult males and 20 adult females. Incidental mortalities of Arctic Char were retained for analysis of age, stomach contents, and tissue metals concentrations. All other fish were released alive back into Milne Inlet.

The primary method of capture for Fourhorn Sculpin in 2022 was angling. Similar angling methods were used in 2021, and included targeted fishing efforts along coarse rock substrate at the Ore Dock following observations of high numbers of this species during habitat offset monitoring (Golder 2020b). In Remotely Operated Vehicle (ROV) footage, Fourhorn Sculpin were observed in relatively high abundances along the western and eastern sides of the Ore Dock in coarse rock habitat at depths between 1 m and 5 m. Angling (i.e., jigging) efforts were focused on these locations, fishing from a stationary position, with two to five rods and lines deployed from the

[1] Includes metals, metalloids, and non-metals. Metals are broadly defined as elements which are good conductors of electricity and heat, which form cations by loss of electrons, and which yield basic oxides and hydroxides (Wood et al. 2012). Metalloids share some but not all properties of metals, while non-metals mostly lack characteristics of metals.

field vessel anchored adjacent to the riprap. Hooks or spoon lures (i.e., flashers) were lowered into the riprap at the target depth, then flicked upward to attract fish within the coarse rock habitat.

The *Hiatella arctica* specimens were collected opportunistically from benthic infauna samples, with a target subsample of 40 individuals retained for fish health and tissue chemistry sampling. Collection methods for benthic infauna are described in Section 4.3.1 in Chapter 4.0—Benthic Infauna. Each benthic sample was checked for the presence of *Hiatella arctica*. Samples to be retained for the fish health and tissue chemistry program were obtained from benthic grab samples collected from the northwestern, western, eastern, and northeastern transects (Figure 3-1), with the majority of collections occurring from the western and eastern transects. In benthic grab samples where *Hiatella arctica* numbers were greatest, a maximum of five individuals were selected. Specimens were selected for processing if the shell was intact, greater than 15 mm in length, and had no indications of damage to the umbo or hinge area.

7.3.1.1 Fish Processing

Fourhorn Sculpin retained for fish health sampling were held live in aerated 70 litre totes containing water from Milne Inlet until they were lethally processed at Milne Port. Both external and internal assessments were completed on lethally sampled fish following standardized procedures consistent with MDMER EEM program requirements (Environment Canada 2012). Total lengths (± 1 mm) and total body weights (± 0.001 g) of the fish were documented, and external observations of fish features (i.e., body form, eyes, skin, thymus, opercula, gills, pseudobranchs, fins, vent, and parasites) were recorded. Abnormal features (e.g., wounds, tumours, parasites, fin fraying, gill parasites, or lesions) were described in detail and photographed. Fish were sacrificed by a concussive blow to the head followed by cervical dislocation (i.e., cutting the spinal cord behind the head). Each fish was handled using new nitrile gloves and dissected on a cutting board covered in a clean sheet of plastic wrap that was changed between fish. The condition of the internal organs (e.g., liver, spleen, gall bladder, and kidneys) was assessed immediately after opening the body cavity and documented. Any abnormalities in size, shape, or colouration of the internal organs were documented. Liver weight and an estimate of percent mesenteric fat were recorded. The gonads of each fish were removed, weighed (± 0.001 g), and photographed before assigning sex and maturity stage, based on the macroscopic features described in Table 7-1. Parasite presence and predominance were recorded, and parasite weight was documented if large parasites (e.g., tapeworms) were observed in the body cavity.

Stomachs and ageing structures (i.e., otoliths[2]) were collected from Fourhorn Sculpin and incidental mortalities of Arctic Char. Sagittal otoliths were extracted as the primary aging structure, wrapped in parchment paper, and stored dry in individually labelled coin envelopes until submission for aging analysis. Stomach fullness was recorded, and the stomachs were removed, placed in individually labelled Nalgene containers, and preserved with 10% formalin. For Fourhorn Sculpin and Arctic Char, one muscle sample (> 10 g) without skin was collected from the left dorsal side of each fish using a fillet knife rinsed with 10% nitric acid then deionized ultrafiltered water. The fillets were weighed (± 0.001 g), placed on ice in individually labelled Ziploc bags, and stored frozen until submission for metals analysis. A second muscle sample (> 10 g) without skin was collected from the right dorsal side of each fish using a fillet knife rinsed with acetone then deionized ultrafiltered water. The fillets were weighed

[2] Otoliths are paired bony structures located behind the eyes in fish. Counting the annual growth rings on the otoliths is a common technique in estimating the age of many fish species.

(± 0.001 g) on tared aluminum foil, wrapped in aluminum foil, placed on ice in individually labelled Ziploc bags, and stored frozen for PAH analysis.

Those *Hiatella arctica* retained for fish health sampling were selected based on the external condition of the shell (i.e., > 15 mm long with intact valves and no visible damage to the umbo). Individuals were measured along the largest axis (± 1 mm) and weighed (± 0.001 g), and then placed on ice in individually labelled Ziploc bags and stored frozen until submitted for further processing and tissue chemistry analysis.

Table 7-1: Gonad Maturity Stages for Male and Female Fish Used During the Fish Health Assessment, 2022

Sex	Stage	Code	Macroscopic features
Female	Unknown stage	10	Unable to determine stage.
	Immature	11	Small ovaries, often clear, blood vessels indistinct.
	Early Stage Development	12	Enlarging ovaries, blood vessels more distinct. Granular in appearance.
	Late Stage Development	13	Large ovaries filling the body cavity, prominent blood vessels. Individual oocytes visible.
	Ripe	14	Eggs released with gentle pressure on abdomen.
	Spent	15	Deflated ovaries, blood vessels prominent.
	Reabsorbing	16	Small atretic oocytes throughout the ovaries, which are hard and white.
	Resting	17	Small ovaries, blood vessels reduced but present.
Male	Unknown stage	20	Unable to determine stage.
	Immature	21	Small testes, often clear and threadlike.
	Early Stage Development	22	Small testes, semi-translucent, but easily identified.
	Late Stage Development	23	Testes large, firm and lobate. White to purplish in colour. Granular appearance.
	Ripe	24	Milt released with gentle pressure on abdomen.
	Spent	25	Small and deflated testes. Blood vessels obvious. Violet-pink in colour.
	Reabsorbing	26	Not typically observed in males.
	Resting	27	Small testes, often threadlike.

Notes: Table modified from Brown-Peterson et al. (2011).

7.3.2 Laboratory Methodology

Samples collected from both fish species and *Hiatella arctica* were submitted for further laboratory analysis. Arctic Char and Fourhorn Sculpin tissue samples were submitted for tissue chemistry analysis, and stomachs were submitted for contents analysis. Ageing structures from both fish species were submitted for age determination. Collected *Hiatella arctica* (i.e., whole animals) were sent to a laboratory specialized in marine invertebrates (Biologica Environmental Services Ltd.) for additional processing (Section 7.3.2.1) and subsequent submission of tissues for tissue chemistry analysis.

7.3.2.1 Bivalve Processing

Frozen *Hiatella arctica* were processed by Biologica Environmental Services Ltd. (Biologica; Victoria, BC). *Hiatella arctica* were measured for total length, as well as wet weight (ww) of the whole organism, shells, soft tissues, and gonads. Shell dry weight (dw) was also measured. Ages of *Hiatella arctica* were determined using shells (Section 7.3.2.2)

7.3.2.2 Age

Otoliths extracted from Fourhorn Sculpin and Arctic Char were examined by North/South Consultants Inc. (Winnipeg, MB) to determine the age of the fish. Whole otoliths from individual fish were mounted on microscope slides to estimate age based on the number of annuli (i.e., growth rings) visible under a dissecting microscope.

For *Hiatella arctica* ageing, each shell was sectioned through the umbo-rim axis using a lapidary saw with a diamond-impregnated blade and polished using progressively finer grit sandpaper. Polished shells were etched in a solution of 1% hydrochloric acid for one minute, rinsed with tap water, and dried. An acetate peel of the polished umbo surface was mounted on a slide and examined using a dissecting microscope. Distinct, continuous growth lines were counted to determine the age of the shell.

To verify that data quality objectives were met, 10% of both fish and *Hiatella arctica* age estimates were independently verified by a second qualified biologist.

7.3.2.3 Stomach Contents

Enumeration and taxonomic identification of stomach contents for Arctic Char and Fourhorn Sculpin were conducted by Biologica. Percent fullness and percent digestion was recorded for each stomach before dissection and identification based on the professional judgement of the taxonomist. Prey items were identified to the lowest practical taxonomic level (e.g., species when possible) using published methods and taxonomic references. Digested and unidentifiable materials were categorized (e.g., unidentified insect parts, digested tissue, non-food, and others). The taxonomic composition within each stomach was determined as percentages of major invertebrate groups by abundance. Results are provided in Appendix 7B in Tables 7B-4 and 7B-5.

7.3.2.4 Tissue Chemistry

Tissue samples collected from eight Arctic Char (muscle), eight Fourhorn Sculpin (muscle), and eight *Hiatella arctica* (composite soft tissue samples) were submitted to Bureau Veritas Laboratories (BV Labs; Burnaby, BC) for tissue chemistry analyses (Appendix 7C, Table 7C-1). *Hiatella arctica* composites were composed of two to three individuals to satisfy weight requirements for metals analysis (Appendix 7C, 7C-2). For PAH analysis, *Hiatella arctica* composite samples comprised four to six individuals to satisfy weight requirements (Appendix 7C, 7C-2). Moisture content and metals concentrations for fish and *Hiatella arctica* were measured in percent and milligrams per kilogram (mg/kg) ww, respectively. Moisture content was determined by oven drying and metals concentrations were determined by collision reaction cell inductively coupled plasma mass spectrometry. Concentrations of PAHs for fish and *Hiatella arctica* were measured in mg/kg ww by gas chromatography mass spectrometry. Achieved detection limits (DL) for fish and *Hiatella arctica* are presented in Appendix 7C, Tables 7C-3 to 7C-8. Certificate of analysis forms are provided in Appendix 7E.

7.3.3 Data Analysis

Descriptive statistics (i.e., sample size, mean, median, standard deviation [SD], standard error [SE], minimum, and maximum values) were calculated for fish health and tissue chemistry data collected in 2022, as well as fish health endpoints and tissue concentrations of metals and PAHs in Arctic Char, Fourhorn Sculpin, and *Hiatella arctica* available from 2018 to 2021.

Fish health indices for Fourhorn Sculpin were calculated as follows:

$$Condition\ factor = \left(\frac{total\ weight}{total\ length^3}\right) \times 100{,}000$$

$$Gonadosomatic\ index\ (GSI) = \left(\frac{gonad\ weight}{total\ weight}\right) \times 100$$

$$Liver\ somatic\ index\ (LSI) = \left(\frac{liver\ weight}{total\ weight}\right) \times 100$$

Fish health indices for *Hiatella arctica* were calculated as follows:

$$Condition\ factor = \left(\frac{total\ wet\ weight}{total\ length^3}\right) \times 10{,}000$$

$$Mantle\ somatic\ index\ (MSI) = \left(\frac{gonad\ wet\ weight}{soft\ tissue\ wet\ weight - gonad\ wet\ weight}\right) \times 100$$

Weight and length measurements were reported in units of grams (g) and millimetres (mm), respectively.

7.3.3.1 Fish Health Endpoints

For Fourhorn Sculpin and *Hiatella arctica,* fish health endpoints were compared using statistical methods.

Comparisons were conducted separately by sex for the Fourhorn Sculpin endpoints presented in Table 7-2 to detect potential differences between 2020, 2021, and 2022. Differences in age were assessed using analysis of variance (ANOVA). Differences in mean size-at-age, condition, relative liver weight, and relative gonad weight among years were assessed using analysis of covariance (ANCOVA). Data analyzed by ANCOVA were $\log_{10}$ transformed prior to analysis if it increased the coefficient of determination (R^2). Significant differences between years were determined using an alpha (α) of 0.10 (i.e., *P*-values (*P*) < 0.1 were considered significant).

Table 7-2: Statistical Procedures Used to Evaluate Fourhorn Sculpin Health

Indicator	Endpoint	Response Variable (y)	Covariate (x)	Statistical Procedure
Survival	Age	Age	n/a	ANOVA
Growth	Size-at-Age	Total Length	Age	ANCOVA
Condition	Condition	Total Weight	Total Length	ANCOVA
	Relative Liver Weight	Liver Weight	Total Weight	ANCOVA
Reproduction	Relative Gonad Weight	Gonad Weight	Total Weight	ANCOVA

ANOVA = analysis of variance; ANCOVA = analysis of covariance.

For *Hiatella arctica*, statistical comparisons were conducted for fish health endpoints presented in Table 7-3 to detect potential differences between 2020, 2021, and 2022. The differences in length-frequency distributions among years were assessed using the non-parametric two-sample Kolmogorov-Smirnov (K-S) test. The K-S test compares the cumulative relative distributions of total length between years by comparing the maximum percent difference between the two cumulative relative frequency distributions to a critical value. The test assesses whether the maximum percent difference is large enough to indicate that the two distributions are from different populations. K-S test *P*-values were adjusted using Holm's correction for multiple comparisons (Holm 1979). Differences in total weights (i.e., whole animal ww) were assessed using ANOVA. Differences in condition were assessed using ANCOVA. Differences in relative gonad weights were assessed between 2021 and 2022, as gonad tissues were not weighed in 2020. Similar to Fourhorn Sculpin, data analyzed by ANCOVA were log_{10} transformed prior to analysis if it increased the coefficient of determination (R^2). Significant differences between years were determined using an α of 0.10 (i.e., $P < 0.1$ was considered significant).

Table 7-3: Statistical Procedures Used to Evaluate *Hiatella arctica* Health

Indicator	Endpoint	Response Variable (y)	Covariate (x)	Statistical Procedure
Survival	Length-frequency	Total Length	n/a	K-S test[(a)]
Growth	Total Weight (whole animal wet weight)	Total Weight	n/a	ANOVA
Condition	Condition	Total Weight	Total Length	ANCOVA
Reproduction	Mantle Somatic Index	Gonad Weight	Tissue Weight	ANCOVA

K-S test = Kolmogorov-Smirnov test; ANOVA = analysis of variance; ANCOVA = analysis of covariance; n/a = not applicable.

(a) *P*-values were adjusted using Holm's correction for multiple comparisons (Holm 1979).

7.3.3.2 Tissue Chemistry

Differences in tissue concentrations of COPCs, including aluminum, iron, magnesium, mercury, and selenium were compared among years (i.e., 2018 to 2022). Values below DL were substituted with half the DL and included in statistical comparisons (US EPA 1998). These COPCs were identified based on the primary constituents of the Project iron ore (i.e., aluminum, magnesium, and iron), as well as metals with existing regulatory guidelines for fish tissue (i.e., mercury and selenium).

Aluminum, magnesium, and iron were compared among years using analysis of variance (ANOVA). Differences in tissue concentrations of mercury and selenium in Arctic Char and Fourhorn Sculpin were compared among years using analysis of covariance (ANCOVA), with length as a covariate. For *Hiatella arctica,* length was not a significant predictor of tissue concentrations of mercury and selenium (i.e., the linear regression relationship was not significant), therefore, comparisons were made among years using ANOVA. Significant differences between years were determined using an α of 0.10 (i.e., $P < 0.1$ was considered significant).

Tissue chemistry data were presented visually using boxplots, where the median value was indicated within each box and the first and third quartiles were represented by the lower and upper bounds of each box, respectively. Lower and upper whiskers were calculated as 1.5 times the interquartile range beyond the first and third quartile. Observations outside the upper and lower whiskers were plotted as individual points. Whiskers were extended to the minimum and maximum values within the dataset that fell within the fences. Any values below a DL were not included, and DLs were indicated on boxplots.

7.3.3.3 Testing Assumptions for Statistical Analysis

The assumptions of ANOVA and ANCOVA are that the residuals of the data, after being fit to the model, are normally distributed and have equal variance among groups. The assumption of normality was assessed using the Shapiro-Wilk test, while Levene's test was used to assess equality of variances. Significant differences in assumptions were evaluated using an α of 0.01 (i.e., *P*-values < 0.01 indicated assumptions were not met). If the assumptions of normality and equality of variance were not met, the data were $\log_{10}$-transformed and the assumptions were re-assessed. When the assumptions of ANOVA or ANCOVA could not be met using a $\log_{10}$ transformation, the nonparametric rank ANOVA or rank ANCOVA was used and post hoc pairwise comparisons made using a Tukey Honest Significant Difference (Tukey HSD) test on rank values.

In addition to the assumptions of normality and equality of variance, ANCOVA has the additional assumption that the parameter regression slopes are parallel among sampling areas. To test this assumption, the ANCOVA was conducted by first fitting separate regression models for each sampling area using a general linear model that included an interaction term between the sampling area and covariate:

Full ANCOVA model: $$y = \beta_0 + \beta_1(x) + \beta_2(Year) + \beta_3(x) \times (Year) + \varepsilon$$

where y is the response variable, x is the covariate, $Year$ is the sampling year indicator variable, and ε is the error term. If the coefficient β_3 of the $(x) \times (Year)$ interaction term was not significant (i.e., *P* > 0.01), then the slopes were considered parallel and the ANCOVA proceeded by testing the significance of the coefficient β_2 of the $(Year)$ term in the reduced ANCOVA model that fits separate regressions for each area, but with a common regression slope:

Reduced ANCOVA model: $$y = \beta_0 + \beta_1(x) + \beta_2(Year) + \varepsilon$$

When a significant interaction was observed, the regression slopes were considered statistically significantly different. When the covariate was a strong predictor of the response variable, and the ANCOVA had a high coefficient of determination ($R^2 > 0.80$), the test for parallel slopes had high power to detect a difference that may not be practically significant. In this case, when the interaction term in the full ANCOVA model was significant, the slopes were fixed as parallel by fitting the reduced ANCOVA model (because the reduced model explained almost as much [i.e., within 2%] of the variability in the response variable as the full model). In this case, the ANCOVA proceeded under the assumption that the regression slopes between groups were practically similar (Barrett et al. 2010). If slopes could not be considered practically parallel (difference in $R^2 > 0.02$), then endpoints were compared at the least and greatest overlapping covariate values (Section A1.7, Environment Canada 2012).

Statistical outliers were evaluated using studentized residuals (SR) from the ANOVA and ANCOVA models. A magnitude of 3.5 for the SR was used to identify unusual observations. When an outlier was detected, the validity of the value was examined. If the outlier was determined to be the result of data entry error, the error was corrected; if the outlier was not the result of data entry error and could not be resolved otherwise, the outlier was removed from the analysis and documented. All statistical comparisons were completed using R version 4.1.1 (R Core Team 2021).

7.3.3.4 Relative Percent Difference

The relative percent differences (RPDs) in effect endpoints between years were calculated when significant differences in endpoints were observed, by expressing the difference as a percentage of the mean as follows:

$$Relative\ Percent\ Difference\ (RPD) = \frac{|\bar{x}_{Year1} - \bar{x}_{Year2}|}{\bar{x}_{(Year1+Year2)}} * 100$$

where $\bar{x}$ is the mean of the endpoint, and $Year_1$ and $Year_2$ refer to the years being compared. If the statistical comparison was conducted on log_{10}-transformed data, then the RPD was calculated using geometric means. For effect endpoints analyzed using rank ANOVA, RPDs were calculated using medians. For effect endpoints analyzed using ANCOVA, RPDs were calculated using least squares means.

To confirm that differences in tissue concentrations between years were real and less likely to be attributed to low concentrations of target constituents, analytical variability, and spatial and temporal variation, an RPD of 100% was used to differentiate the types of expected variability from those of potential biological importance (Environment Canada 2012).

7.3.3.5 Power Analysis

Power analyses were performed to determine the minimum detectable difference of fish health end points and future tissue chemistry comparisons using the existing 2020 to 2022 fish health dataset and 2018 to 2022 tissue chemistry dataset. Target sample sizes for fish health endpoints were 20 Fourhorn Sculpin of each sex (40 total) and 40 *Hiatella arctica*, and eight samples (24 total) for tissue chemistry for each fish species (i.e., Arctic Char, Fourhorn Sculpin, *Hiatella arctica*). These sample sizes were used to calculate the sensitivity of future comparisons to detect differences by expressing the minimum detectable difference as a percent change relative to the mean. Type I (α) and Type II (β) error rates were set to 0.10 (Environment Canada 2012). Power analyses were conducted using the power and sample size function in G*Power 3.1 (Faul et al., 2007).

7.3.4 Guideline Comparison

Tissue concentrations of mercury and selenium for Arctic Char, Fourhorn Sculpin, and *Hiatella arctica* sampled from 2018 to 2022 were compared to applicable tissue quality guidelines. Mercury concentrations were compared to Health Canada's Maximum Levels for Chemical Contaminants in Foods mercury consumption guideline of 0.5 mg/kg ww (Health Canada 2015). Selenium concentrations were compared to the British Columbia Ministry of Environment (BC MOE) fish tissue guidelines and invertebrate tissue guidelines of 4 mg/kg dw (BC MOE 2014). Relevant guidelines were not available for other tissue chemistry parameters.

7.3.5 Quality Management

The field and laboratory quality assurance and quality control (QA/QC) procedures were implemented at each stage of the fish survey (i.e., field sampling, data entry, sample shipment, laboratory analyses, data analyses and report preparation) to produce technically sound and scientifically defensible results.

7.3.5.1 Field QA/QC

As part of practices for field operations for this program, the following QA/QC procedures were undertaken:

- Detailed specific work instructions outlining each field task were provided to the field personnel prior to the field programs.
- A pre-field meeting with the field crew and project team lead was conducted to review the specific work instructions so that procedures were understood.
- Samples were collected by experienced personnel and were labelled, preserved, and shipped according to laboratory instructions described in Golder TP 8.1-3, Fish Inventory Methods (unpublished information) and Golder TP 8.16-0, Fish Health Assessment – Metals (unpublished information).
- Fish identification was recorded to species, where possible, with identifications verified using fish field guides.
- Field equipment (e.g., electronic scales and water quality meters) were regularly calibrated according to manufacturer's recommendations.
- Detailed field notes were recorded in pencil in waterproof field notebooks, on waterproof pre-printed field data sheets, or directly entered electronically into an excel spreadsheet.
- Field data (i.e., datasheets, notebook, and electronic spreadsheets) were checked at the end of each day for completeness and accuracy.

Samples were documented and tracked using chain of custody (COC) forms and receipt of samples by the analytical laboratory was confirmed. Field crews were responsible for managing sample shipment to the analytical laboratories. Prior to sample shipment, field crews confirmed the following:

- Required samples were collected and accounted for.
- COC and analytical request forms were completed and correct.
- Proper sample labelling and documentation procedures were followed.

7.3.5.2 Data Analysis QA/QC

Field-collected data, datasheets, and field notebooks were reviewed for completeness and unexpected values or trends. At minimum, 10% of the field data entered electronically were verified by a second person to identify transcription errors. If any errors were identified, a 100% quality check was implemented. Results of statistical data analyses were reviewed by an independent biologist experienced in statistical analysis. Tables containing data summaries and statistical results were reviewed and values were verified by a second, independent individual.

7.3.5.2.1 Tissue Chemistry

The fish tissue chemistry dataset was visually assessed for outliers using scatterplots, and erroneous values were corrected, if possible (i.e., if values were identified as data entry errors). Statistical analyses and data summary tables were independently reviewed and verified by a second individual experienced in statistical analysis. Internal laboratory QA/QC at BV Labs included analysis of duplicates to evaluate the variance in the measurement, matrix spikes to evaluate sample matrix interference, method blanks to identify laboratory contamination, reagent blanks to determine any analytical contamination, spiked samples to evaluate method accuracy, surrogates to evaluate extraction efficiency, and QC standards used as an independent check of method accuracy. Upon receipt of the tissue chemistry data from BV Labs, standard checks were performed to screen for potential data quality issues by:

- Confirming that each requested variable was analyzed.
- Reviewing the reported units.
- Reviewing any hold time exceedances.
- Reviewing internal laboratory QA/QC results.

Most results met the laboratory quality acceptance criteria for representativeness (e.g., no detected concentrations in procedural blanks) and accuracy (e.g., spiked blanks, containing a known amount of analyte, within acceptable range). Lab duplicate control limits for several parameters were the exception, as RPD limits were exceeded as follows:

- Copper, manganese, and phosphorus control limits for Arctic Char were exceeded by 5%, 6%, and 4%, respectively. Other quality control parameters were met, and data were considered acceptable.
- Copper control limit for Fourhorn Sculpin was exceeded by 5%. Other quality control parameters were met, and copper data were considered acceptable.
- Arsenic, cadmium, chromium, and nickel control limits for *Hiatella arctica* were exceeded by 62%, 116%, 120%, and 61%, respectively. Other quality control parameters were met, and data were considered acceptable.

Overall, the fish tissue chemistry data were considered reliable and representative of site conditions at the time of sampling.

7.4 Results

In 2022, fish health data were collected for Fourhorn Sculpin and *Hiatella arctica*, and tissue chemistry samples were submitted for analysis of metals and PAHs from Fourhorn Sculpin, Arctic Char and *Hiatella arctica*. Fish health data collected in 2022 are provided in Appendix 7B, Tables 7B-1 to 7B-3. Tissue chemistry data collected in 2022 are provided in Appendix 7C, Tables 7C-3 to 7C-8. Fish health and tissue chemistry data collected in previous sampling years are provided in past MEEMP Reports (e.g., Golder 2019, 2020, 2021).

7.4.1 Fish Health

7.4.1.1 Fourhorn Sculpin

A total of 40 Fourhorn Sculpin were processed from the Milne Port area during the 2022 fish health assessment, including 20 females and 20 males. Summary statistics for processed fish are provided in Table 7-4. Length-frequency distributions for Fourhorn Sculpin were left-skewed for both female and male fish (Figure 7-1), indicating a strong presence of small size classes in the population. At the time of sampling, female Fourhorn Sculpin were longer (RPD 7%) and heavier (RPD 31%), based on median total length and total weight, respectively, than male Fourhorn Sculpin, showing greater energy stores, based on comparisons of median LSI (RPD 19%). Both sexes had median ages of 7, with females ranging from 5 to 9 years and males ranging from 5 to 10 years. Female Fourhorn Sculpin ranged in length from 225 mm to 306 mm and in weight from 116 g to 353 g. Female condition factor ranged from 0.90 to 1.57, LSI ranged from 2.15 to 7.35, and GSI ranged from 1.83 to 5.16. Male Fourhorn Sculpin ranged in length from 212 mm to 278 mm and in weight from 84.0 g to 211 g. Male condition factor ranged from 0.78 to 1.23, LSI ranged from 1.82 to 4.87 and GSI ranged from 2.47 to 5.04. No difference in relative weight was observed between female and male Fourhorn Sculpin (P = 0.136; Figure 7-2).

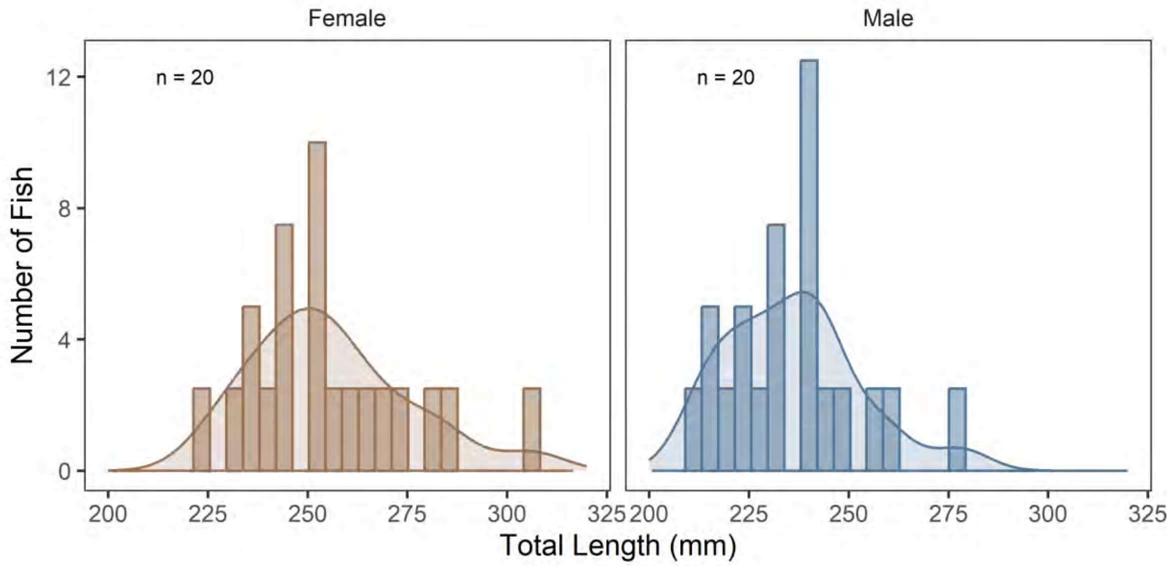


Figure 7-1: Length-Frequency Distributions of Female and Male Fourhorn Sculpin Sampled from the Milne Port Area, 2022

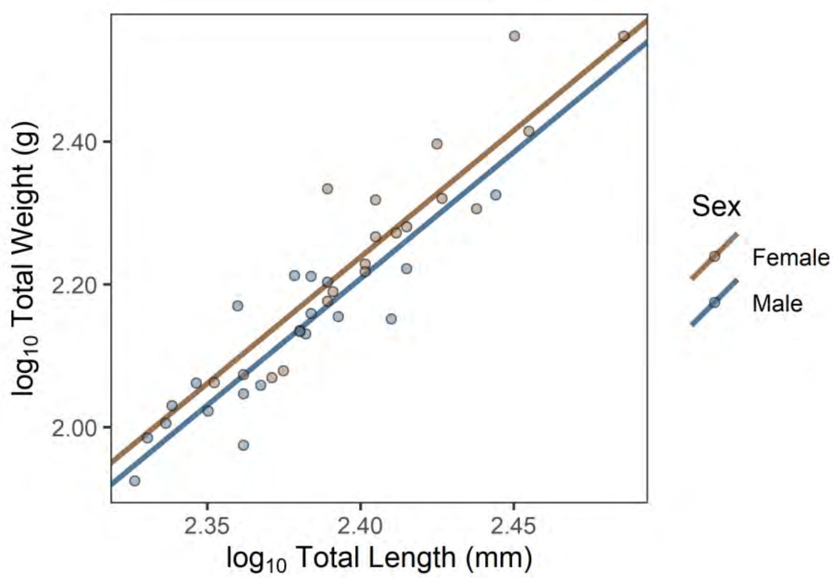


Figure 7-2: Length-Weight Relationship for Female and Male Fourhorn Sculpin Sampled from the Milne Port Area, 2022

Table 7-4: Descriptive Statistics for Fourhorn Sculpin Fish Health Endpoints Processed from the Milne Port Area, 2020 to 2022

Parameter	2020							2021							2022						
	n	Min	Max	Median	Mean	SD	SE	N	Min	Max	Median	Mean	SD	SE	n	Min	Max	Median	Mean	SD	SE
Female																					
Total Length (mm)	22	194	310	216	226	32	6.9	20	205	344	249	255	40	9.00	20	225	306	253	255.65	20.1	4.49
Total Weight (g)	22	65.3	380	89.4	123	77.7	16.5	20	78.8	351	138	166	84.9	18.9	20	116	353	186	193	69.0	15.4
Carcass Weight (g)	22	54.2	238	72.6	94.5	50.0	10.6	20	49.6	234	86.1	102	51.0	11.4	20	61.4	203	97	104	38.9	8.69
Condition Factor	22	0.75	1.28	0.96	0.97	0.12	0.03	20	0.82	1.14	0.93	0.94	0.08	0.02	20	0.90	1.57	1.07	1.12	0.18	0.04
Liver Weight (g)	22	0.84	16.3	2.36	4.37	4.08	0.87	20	1.95	23.9	5.82	6.83	5.05	1.13	20	3.07	17.3	6.40	8.10	4.66	1.04
LSI	22	1.29	5.09	2.76	3.11	1.16	0.25	20	2.48	7.45	3.88	3.89	1.05	0.24	20	2.15	7.35	3.91	4.09	1.59	0.36
Gonad Weight (g)	22	1.05	16.3	3.26	4.52	3.84	0.82	20	1.40	81.8	4.71	10.3	17.6	3.94	20	2.37	18.2	5.76	6.39	3.59	0.80
GSI	22	1.33	4.99	3.53	3.38	1.09	0.23	20	1.78	24.38	3.67	4.76	4.80	1.07	20	1.83	5.16	3.28	3.22	0.86	0.19
Age (y)	22	4	8	5	5.4	1.1	0.2	20	3	10	6	6.2	2.0	0.50	20	5	9	7	7.0	1.0	0.22
Male																					
Total Length (mm)	21	189	276	215	214	21	4.6	20	209	281	229	237	24	5.50	20	212	278	236	236	16.7	3.74
Total Weight (g)	21	65.4	230	89.1	98.2	37.7	8.24	20	74.0	196	111	121	38.8	8.67	20	84	211	136	132	31.7	7.08
Carcass Weight (g)	21	54.5	169	70.0	78.3	28.0	6.12	20	47.0	146	72.6	80.8	30.0	6.71	20	50.1	129	80	78	19.6	4.38
Condition Factor	21	0.82	1.19	0.95	0.96	0.10	0.02	20	0.71	1.01	0.90	0.89	0.08	0.02	20	0.78	1.23	0.98	0.99	0.11	0.03
Liver Weight (g)	21	0.607	8.08	2.14	2.54	1.67	0.37	20	1.11	8.75	2.23	2.85	1.77	0.40	20	1.77	7.77	3.95	4.18	1.65	0.37
LSI	21	0.86	4.09	2.56	2.47	0.87	0.19	20	1.49	5.53	2.02	2.27	0.93	0.21	20	1.82	4.87	3.24	3.12	0.78	0.17
Gonad Weight (g)	21	1.42	10.7	3.84	4.06	2.30	0.50	20	2.07	10.1	4.76	5.17	2.19	0.49	20	2.56	9.26	4.48	4.92	1.86	0.42
GSI	21	2.02	5.88	4.09	4.03	1.27	0.28	20	2.51	6.40	4.24	4.23	1.14	0.25	20	2.47	5.04	3.46	3.67	0.79	0.18
Age (y)	21	4	9	5	5.6	1.5	0.3	20	3	12	6	6.6	2.1	0.50	20	5	10	7	6.8	1.1	0.24

n = sample size; Min = minimum; Max = maximum; SD = standard deviation; SE = standard error; GSI = gonadosomatic index; LSI = liver somatic index

Table 7-5: Summary of Statistical Comparisons Between 2020, 2021, and 2022 for Fourhorn Sculpin, Milne Port Area

Effect Indicator	Endpoint[(a)]	Statistical Test	Number of Outliers	*n*			Least Squares Mean			Overall *P*-value	Post-hoc *P*-value			Relative Percent Difference (%)			Power Analysis[(b)]	
				2020	2021	2022	2020	2021	2022		2020* 2021	2020* 2022	2021* 2022	2020* 2021	2020* 2022	2021* 2022	Minimum Detectable Difference[(c)]	Sensitivity[(d)]
Female																		
Survival	Age	$ANOVA_{rank}$	0	22	20	20	5	6	7	**<0.001**	0.235	**<0.001**	**0.019**	-	33	15	0.75	12%
Growth	Size-at-Age	ANCOVA	0	22	20	20	240	254	240	**0.027**	**0.055**	1.000	**0.061**	6	-	6	9.24	4%
Condition	Condition	$ANCOVA_{log10}$	0	22	20	20	2.15	2.12	2.19	**<0.001**	0.215	**0.044**	**<0.001**	-	9	16	8.2 | 8.7	6% | 6%
	Relative Liver Weight	$ANCOVA_{log10}$	0	22	20	20	0.66	0.72	0.69	0.369	-	-	-	-	-	-	0.736 | 0.865	15% | 18%
Reproduction	Relative Gonad Weight	$ANCOVA_{log10}$	1	22	19	20	0.69	0.69	0.59	**0.044**	0.990	**0.071**	**0.071**	-	23	22	0.668 | 0.783	15% | 17%
Male																		
Survival	Age	$ANOVA_{rank}$	0	21	20	20	5	6	7	**0.008**	0.121	**0.006**	0.464	-	33	-	0.85	14%
Growth	Size-at-Age	ANCOVA	0	21	20	20	221	234	231	**0.021**	**0.021**	**0.095**	0.809	6	5	-	7.84	3%
Condition	Condition	$ANCOVA_{log10}$	0	21	20	20	2.05	2.02	2.07	**0.008**	0.103	0.690	**0.007**	-	-	10	5.8 | 6.1	5% | 5%
	Relative Liver Weight	$ANCOVA_{log10}$	0	21	20	20	0.44	0.37	0.51	**0.014**	0.353	0.302	**0.010**	-	-	31	0.419 | 0.495	15% | 18%
Reproduction	Relative Gonad Weight	$ANCOVA_{log10}$	0	21	20	20	0.64	0.65	0.59	0.244	-	-	-	-	-	-	0.584 | 0.677	14% | 16%

Notes: Statistically significant values are indicated in **bold**. Power analysis was completed assuming normality. Supporting information for statistical model results are provided in Appendix 7B, Table 7B-6. Statistical outliers are provided in Appendix 7B, Table 7B-8.

(a) For model components, please see Table 7-2.

(b) For log_{10}-transformed models, power analysis was completed for differences less than and greater than the mean. Minimum detectable difference and sensitivity were determined using back-transformed values and are presented as: differences lower than | greater than the mean.

(c) Minimum detectable difference expressed as difference from the overall mean.

(d) Sensitivity is the minimum detectable difference expressed as a percent change in the overall mean.

n = sample size; log_{10} = log_{10}-transformed data; rank = rank-transformed data; ANOVA = analysis of variance; ANCOVA = analysis of covariance; - = not calculated.

7.4.1.1.1 Survival – Age

Ages of Fourhorn Sculpin were compared between 2020, 2021, and 2022. Ages of both male and female Fourhorn Sculpin captured in 2020, 2021, and 2022 were similar (Table 7-4; Figure 7-3). Mean ages for female Fourhorn Sculpin were statistically significantly greater in 2022 than in 2020 and 2021 (differing by 33% and 15%, respectively); 2020 and 2021 were not statistically significantly different from each other (Table 7-5). Female ages ranged from 4 to 8 years in 2020, from 3 to 10 years in 2021, and from 5 to 9 years in 2022. For male Fourhorn Sculpin, mean ages were statistically significantly greater in 2022 than 2020 (differing by 33%) but did not differ between 2020 and 2021 or between 2021 and 2022 (Table 7-5). Male ages ranged from 4 to 9 years in 2020, from 3 to 12 years in 2021, and from 5 to 10 in 2022.

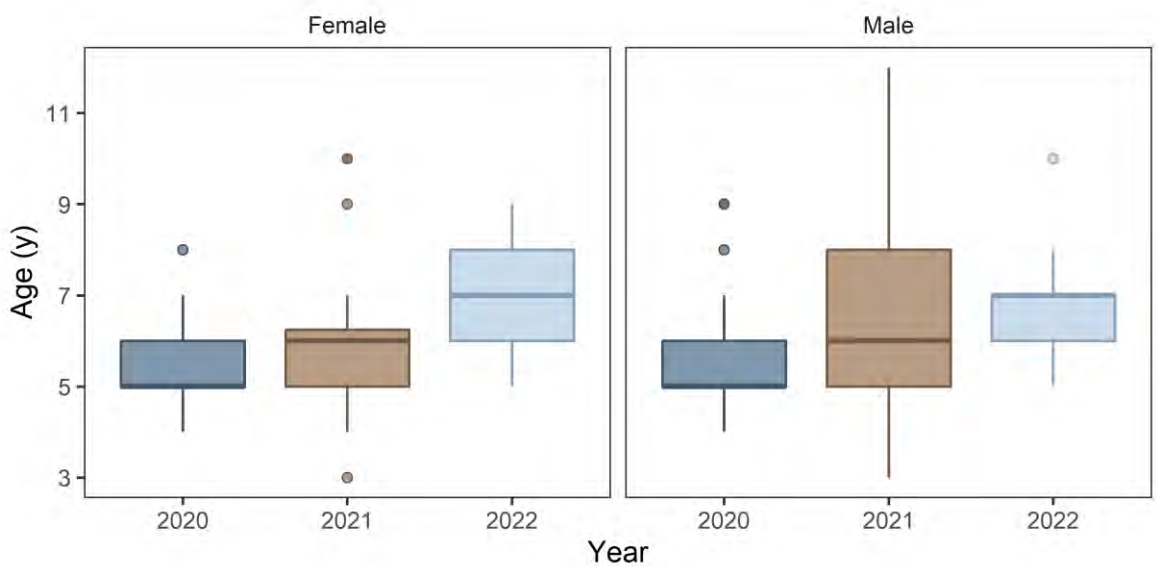


Figure 7-3: Boxplots of Ages of Female and Male Fourhorn Sculpin Sampled from the Milne Port Area, 2020 to 2022

7.4.1.1.2 Growth – Size-at-Age

Size-at-age was compared between 2020, 2021, and 2022 using total length-at-age (Figure 7-4). For female Fourhorn Sculpin, size-at-age was greater in 2021 than 2020 and 2022 (differing by 6%, in both years); 2020 and 2022 did not differ significantly from each other (Table 7-5). For male Fourhorn Sculpin, size-at age was lower in 2020 than either 2021 or 2022, which did not differ significantly from each other (Table 7-5).

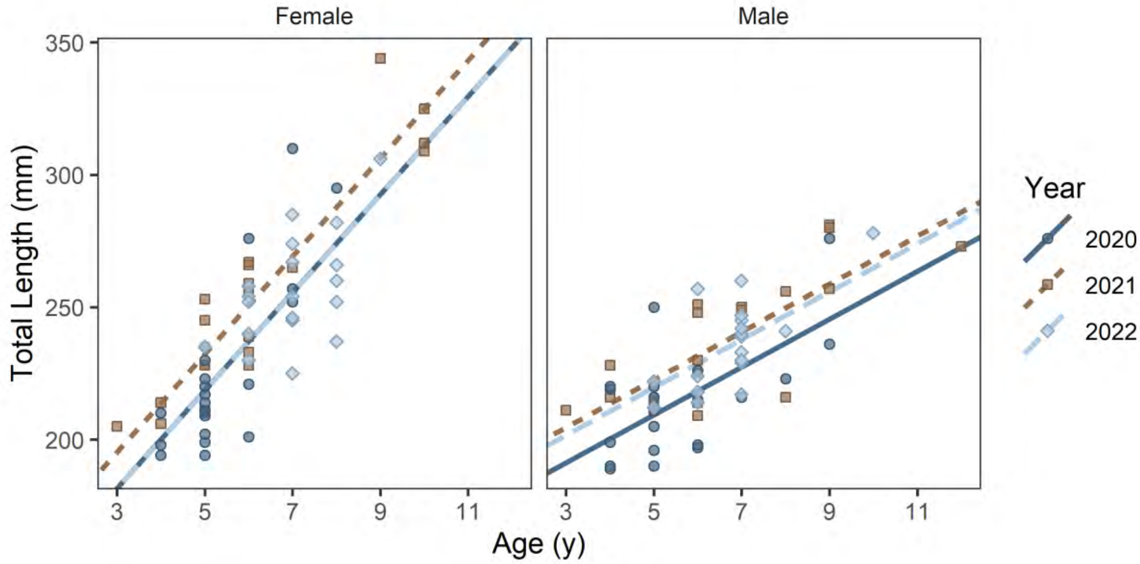


Figure 7-4: Size-at-Age Relationships for Female and Male Fourhorn Sculpin Sampled from the Milne Port Area, 2020 to 2022

7.4.1.1.3 Condition

Condition of Fourhorn Sculpin was compared between 2020, 2021, and 2022 using relative weight (as weight-at-length) and relative liver weight (as liver weight-at-total weight). Relative weight differed significantly between years for both sexes (Table 7-5; Figure 7-5). For female Fourhorn Sculpin, relative weight was greater in 2022 than 2020 and 2021 (differing by 9% and 16%, respectively), while 2020 and 2021 did not differ significantly from each other (Table 7-5). For male Fourhorn Sculpin, relative weight was greater in 2022 than 2021 (differing by 10%), but did not differ significantly among other sampling years (Table 7-5). For females, condition factor ranged from 0.75 to 1.28 in 2020, 0.82 to 1.14 in 2021, and 0.90 to 1.57 in 2022; for males, condition factor ranged from 0.82 to 1.19 in 2020, 0.71 to 1.01 in 2021, and 0.78 to 1.23 in 2022 (Table 7-4).

Relative liver weight did not differ significantly between years for female Fourhorn Sculpin. For male Fourhorn Sculpin, relative liver weight was, however, significantly greater in 2022 compared with 2021 (differing by 31%), but did not differ among other sampling years (Table 7-5; Figure 7-6).

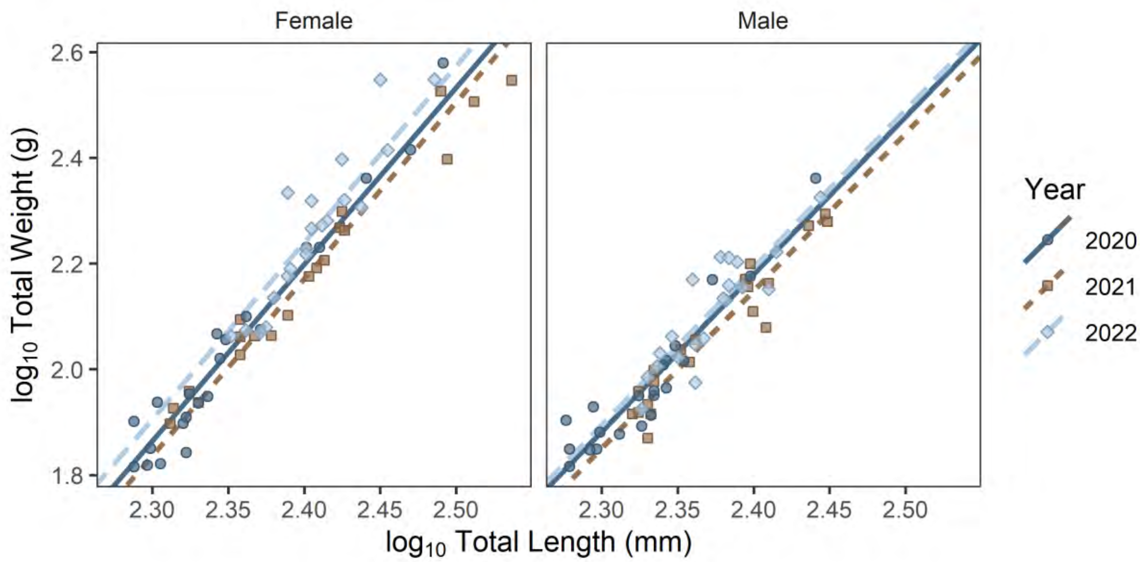


Figure 7-5: Weight-at-Length Relationships for Female and Male Fourhorn Sculpin Sampled from the Milne Port Area, 2020 to 2022.

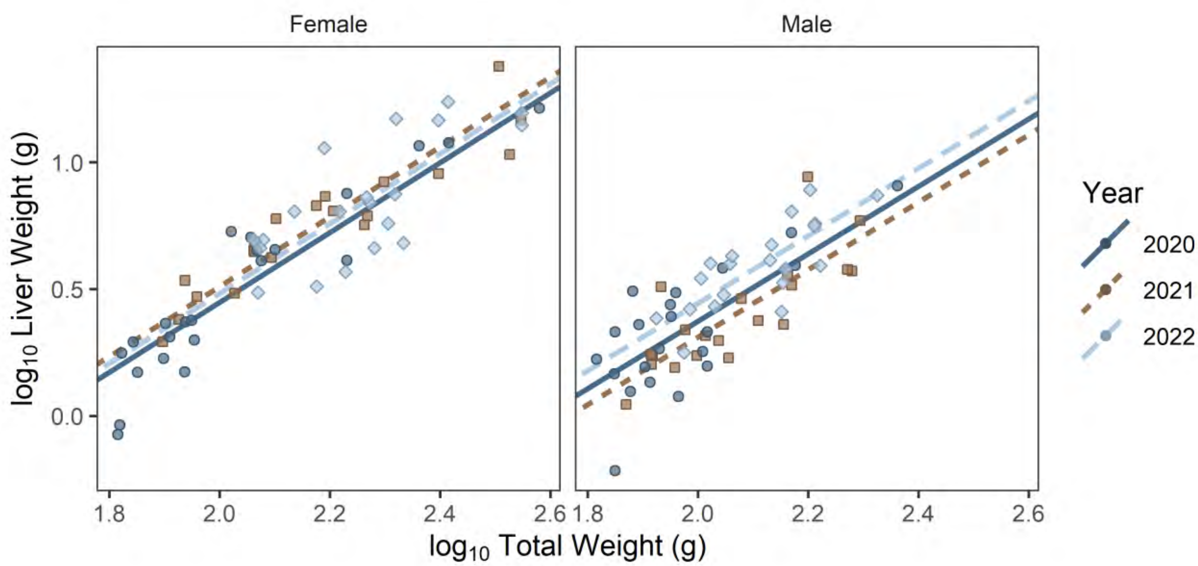
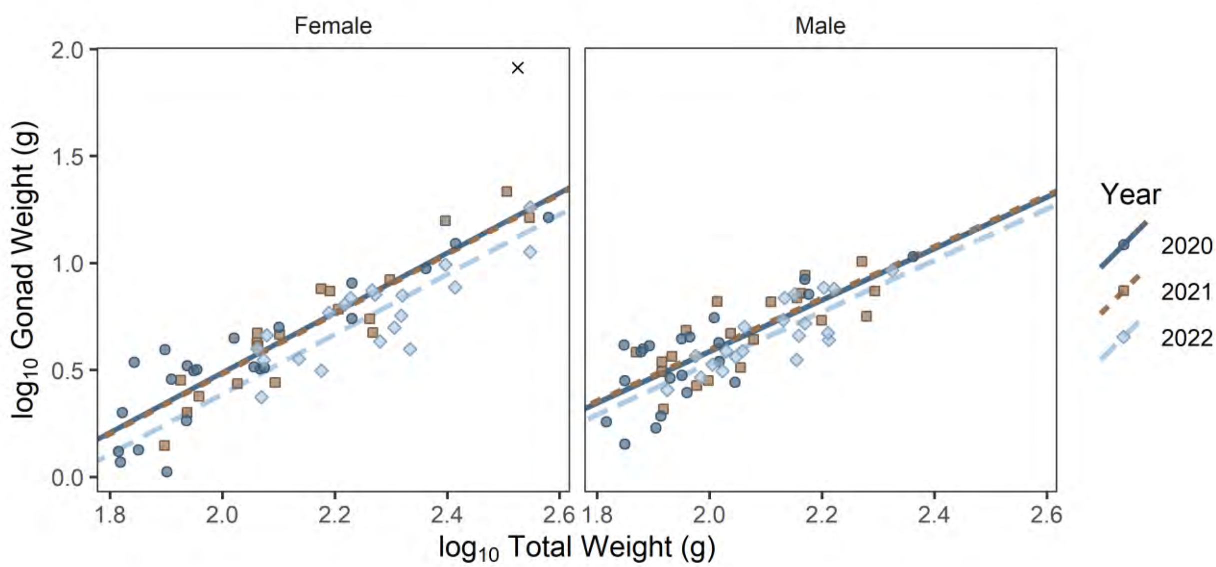


Figure 7-6: Relative Liver Weight for Female and Male Fourhorn Sculpin Sampled from the Milne Port Area, 2020 to 2022.

7.4.1.1.4 Reproduction – Relative Gonad Weight

Relative gonad weights were compared between 2020, 2021, and 2022 using relationships between gonad weight and total weight in female and male Fourhorn Sculpin (Figure 7-7). Relative gonad weight was significantly lower in 2022 than 2020 or 2021 for female Fourhorn Sculpin, differing by 23% and 22%, respectively; relative gonad weight did not differ between 2020 and 2021 (Table 7-5). No significant difference in relative gonad weight was found for male Fourhorn Sculpin (Table 7-5).



x = outlier.

Figure 7-7: Relative Gonad Weight for Female and Male Fourhorn Sculpin Sampled from the Milne Port Area, 2020 to 2022.

7.4.1.1.5 Abnormalities

Few abnormalities were observed in Fourhorn Sculpin sampled from the Milne Port area (Table 7-6). No external abnormalities or parasites were observed on any individuals. Internal abnormalities primarily consisted of variation in liver colour, with light, pale, or discoloured livers observed for five females and 17 males. Liver colour, however, is closely tied to perfusion (i.e., fresh circulating blood), time elapsed between sacrifice and observation, and is subject to observer bias. Liver colour is, therefore, considered a less reliable indicator of changes in fish health relative to other observations. Internal parasites observed in Fourhorn Sculpin consisted of cysts embedded within the body cavity, including on the heart, stomach, and intestines, and were present in two females and one male.

Table 7-6: Number and Description of External and Internal Abnormalities Observed in Fourhorn Sculpin Sampled from the Milne Port Area, 2022

Parameter	Female	Male	Description
External			
Body Deformity	0	0	-
Eyes	0	0	-
Skin	0	0	-
Thymus	0	0	-
Opercula	0	0	-
Gills	0	0	-
Pseudobranchs	0	0	-
Fins	0	0	-

Parameter	Female	Male	Description
Vent	0	0	-
Parasitization	0	0	-
Internal			
Liver	5	17	Pale coloration or general discolouration[(a)]
Spleen	0	0	-
Gall bladder	0	0	-
Gonad	0	0	-
Kidney	0	0	-
Parasitization	2	1	Cysts on internal organs

(a) Pale liver colouration/general discolouration is typically associated with a lack of perfusion following sacrifice and cessation of the heart beating; pale or discoloured livers were noted and documented but are not considered further.

- = not applicable.

7.4.1.2 *Hiatella arctica*

Hiatella arctica were collected from the Milne Port area from 2018 to 2022. In 2018 and 2019, samples were submitted for tissue chemistry analysis, but with the exception of age in 2019, additional supporting biological data were not recorded. In 2020, 2021, and 2022, *Hiatella arctica* were processed for fish health endpoints, including length, weight, and age, with a subset of samples submitted for tissue chemistry analysis (Section 7.3.2.4). While gonad weights were not recorded in 2020, these data were recorded in 2021 and 2022. Biological data for *Hiatella arctica* are summarized in Table 7-7.

In 2022, a total of 40 *Hiatella arctica* were processed for fish health endpoints. The processed individuals ranged in length from 23.7 mm to 38.0 mm and ranged in whole animal wet weight from 1.56 g to 6.08 g. Length data showed little skew or multimodality (Figure 7-8). Length exhibited a strong relationship with total weight ($P < 0.001$; $R^2 = 0.74$). Gonad weights ranged from 0.006 g to 0.099 g, with a median value of 0.022 g; MSI ranged from 0.75 to 3.85 with a median value of 1.84. *Hiatella arctica* sampled from the Milne Port area ranged in age from 6 to 34 years, with a median age of 17. Median condition factor in 2022 was 1.69.

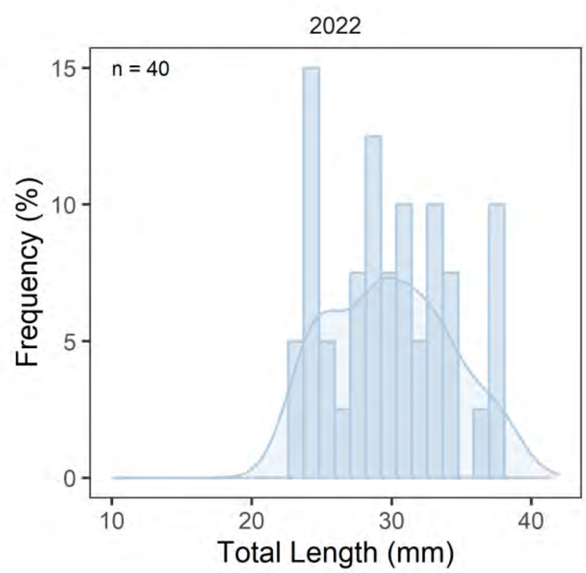


Figure 7-8: Length-Frequency Distribution of *Hiatella arctica* Sampled from the Milne Port Area, 2022

Table 7-7: Descriptive Statistics for *Hiatella arctica* Health Endpoints from the Milne Port Area, 2020 to 2022

Parameter	2020							2021							2022						
	n	Min	Max	Median	Mean	SD	SE	n	Min	Max	Median	Mean	SD	SE	n	Min	Max	Median	Mean	SD	SE
Total Length (mm)	50	25.36	34.54	29.09	29.20	2.30	0.32	35	17.47	35.07	30.45	29.33	4.25	0.72	40	23.67	37.99	29.53	29.91	4.262	0.673
Whole Animal ww (g)	50	2.75	6.39	4.06	4.32	1.07	0.15	35	0.480	8.12	3.98	4.02	1.75	0.297	40	1.558	6.082	3.086	3.325	1.151	0.182
Shell ww (g)	50	0.799	3.30	1.52	1.65	0.533	0.075	35	0.218	5.13	2.06	2.21	1.16	0.197	40	0.673	4.58	1.69	1.87	0.774	0.122
Shell dw (g)	50	0.747	3.18	1.43	1.56	0.516	0.073	35	0.114	4.72	1.79	1.90	1.03	0.174	40	0.541	4.19	1.54	1.68	0.701	0.111
Tissue ww (g)	5	1.21	4.01	2.56	2.67	0.680	0.096	35	0.235	2.87	1.90	1.78	0.703	0.118	40	0.617	2.81	1.33	1.37	0.497	0.078
Condition factor	50	1.13	2.54	1.70	1.73	0.34	0.05	35	0.90	2.25	1.41	1.48	0.30	0.05	40	0.98	2.68	1.69	1.71	0.37	0.06
Gonad ww (g)	-	-	-	-	-	-	-	35	0.0023	0.0798	0.0360	0.0365	0.0181	0.0031	40	0.006	0.099	0.022	0.029	0.021	0.0033
MSI	-	-	-	-	-	-	-	35	0.90	6.13	1.97	2.23	1.20	0.20	40	0.75	3.85	1.84	2.03	0.86	0.14
Age (y)	50	10	49	23	25	12	1.6	35	1	39	17	19.2	8.1	1.4	39	6	34	17	17.4	6.4	1.0

ww = wet weight; dw = dry weight; MSI = Mantle Somatic Index; n = sample size; min = minimum; max = maximum; SD = standard deviation; SE = standard error, - = not collected/not measured.

Table 7-8: Summary of Statistical Comparisons for *Hiatella arctica* Health Endpoints at Milne Port between 2020, 2021, and 2022

Species	Effect Indicator	Endpoint	Covariate		Statistical Test	Number of Outliers	*n*			Least Squares Mean			*Overall P*-value	Post-hoc *P*-value			Relative Percent Difference (%)			Power Analysis(f)	
							2020	2021	2022	2020	2021	2022		2020* 2021	2020* 2022	2021* 2022	2020* 2021	2020* 2022	2021* 2022	Minimum Detectable Difference(g)	Sensitivity(h)
Hiatella arctica	Survival	Length Frequency	n/a		K-S Test(b)	0	50	36	44	n/a	n/a	n/a	n/a	0.288	0.344	0.771	nc	nc	nc	n/a	n/a
	Growth	Whole Animal Wet Weight	n/a		ANOVA	0	50	35	44	4.329	4.021	4.603	0.216	nc	nc	nc	nc	nc	nc	0.571	13%
	Condition	Condition	Length		ANCOVA$_{log10}$(c)	0	50	29	32	0.66	0.62	0.65	0.138	nc	nc	nc	nc	nc	nc	0.324 | 0.350	7% | 8%
	Reproduction	Mantle Somatic Index	Tissue Weight	0.6172 g	ANCOVA$_{log10}$(d,e)	0	-	34	40	-	-1.76	-2.08	**<0.001**	-	-	**0.004**	-	-	70	0.001 | 0.001	2% | 2%
				2.8094 g							-1.34	-1.16				**0.038**			41		

Notes: Statistically significant values are indicated in bold. Power analysis was completed assuming normality. Supporting information for statistical model results are provided in Appendix 7B, Table 7B-7.

(a) For model components, please see Table 7-3.

(b) *P*-values adjusted using Holm's correction for multiple comparisons (Holm 1979).

(c) ANCOVA completed only in range of overlapping total length between years (i.e., 25 to 38 mm) following Section A1.7 in Environment Canada (2012). See Figure 7-8 for *Hiatella arctica* length-frequency distributions in 2020, 2021, and 2022.

(d) ANCOVA completed only in range of overlapping soft tissue weights between years (i.e., 0.60 to 2.87 g ww) following Section A1.7 in Environment Canada (2012).

(e) The R^2 value for the full model was less than the threshold (0.534 < 0.800) for assessing if slopes are practically parallel (Barrett et al., 2010); therefore, mantle somatic index was compared at the smallest and largest overlapping covariate values among study years, following Section A1.7 in Environment Canada (2012).

(f) For log_{10}-transformed models, power analysis was completed for differences less than and greater than the mean. Minimum detectable difference and sensitivity were determined using back-transformed values and are presented as: differences lower than | greater than the mean.

(g) Minimum Detectable Difference expressed as difference from the overall mean.

(h) Sensitivity is the minimum detectable difference expressed as a percent change in the overall mean.

n = sample size; log_{10} = log_{10}-transformed data; K-S Test = Kolmogorov-Smirnov test; ANOVA = analysis of variance; ANCOVA = analysis of covariance; n/a = not applicable; nc = not calculated.

7.4.1.2.1 Survival – Length-Frequency

Length-frequency distributions of *Hiatella arctica* were compared between 2020, 2021, and 2022 (Figure 7-9). Results of the Kolmogorov-Smirnov tests indicate there was no significant differences between years for *Hiatella arctica* (Table 7-8); however, the range of lengths was greater in 2021 than in 2020 or 2022 (Table 7-7), with more individuals less than 25 mm being collected.

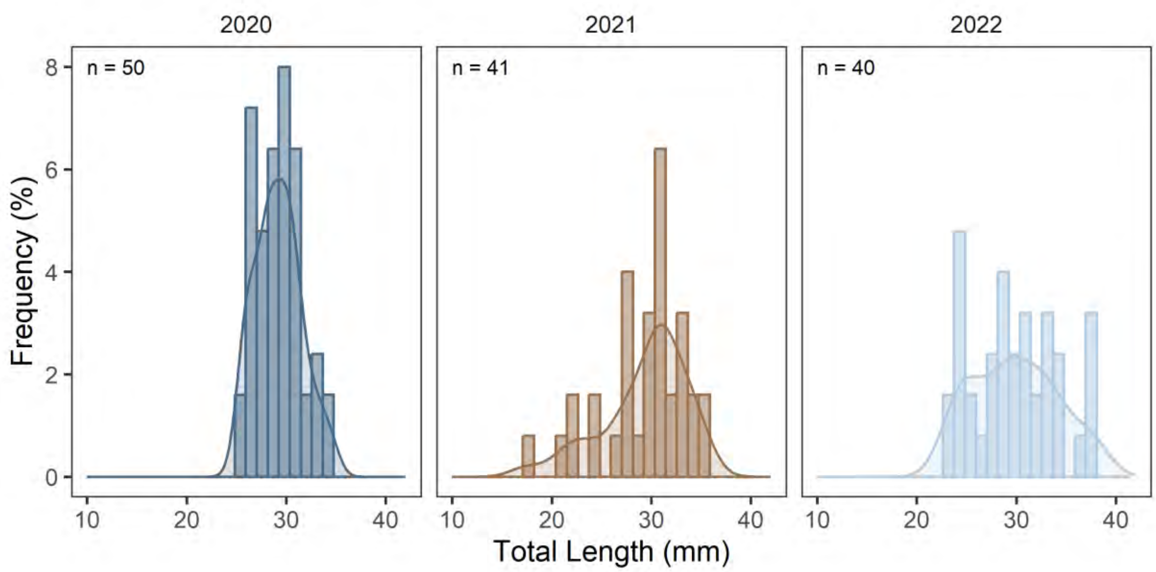


Figure 7-9: Length-Frequency Distribution for *Hiatella arctica* captured from the Milne Port Area, 2020 to 2022.

7.4.1.2.2 Growth – Whole Animal Wet Weight

Whole animal wet weight was compared between 2020, 2021, and 2022 for *Hiatella arctica* (Figure 7-10). The range of weights were similar among sampling years (Table 7-7), and there were no significant differences among years (Table 7-9).

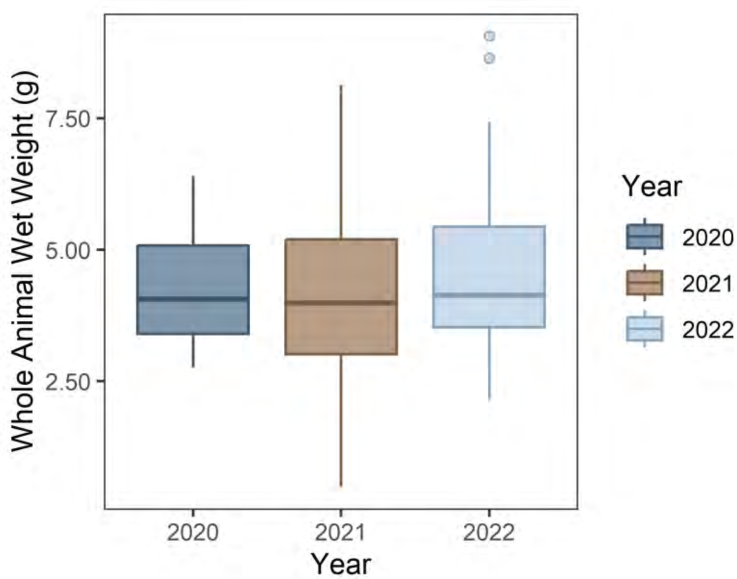
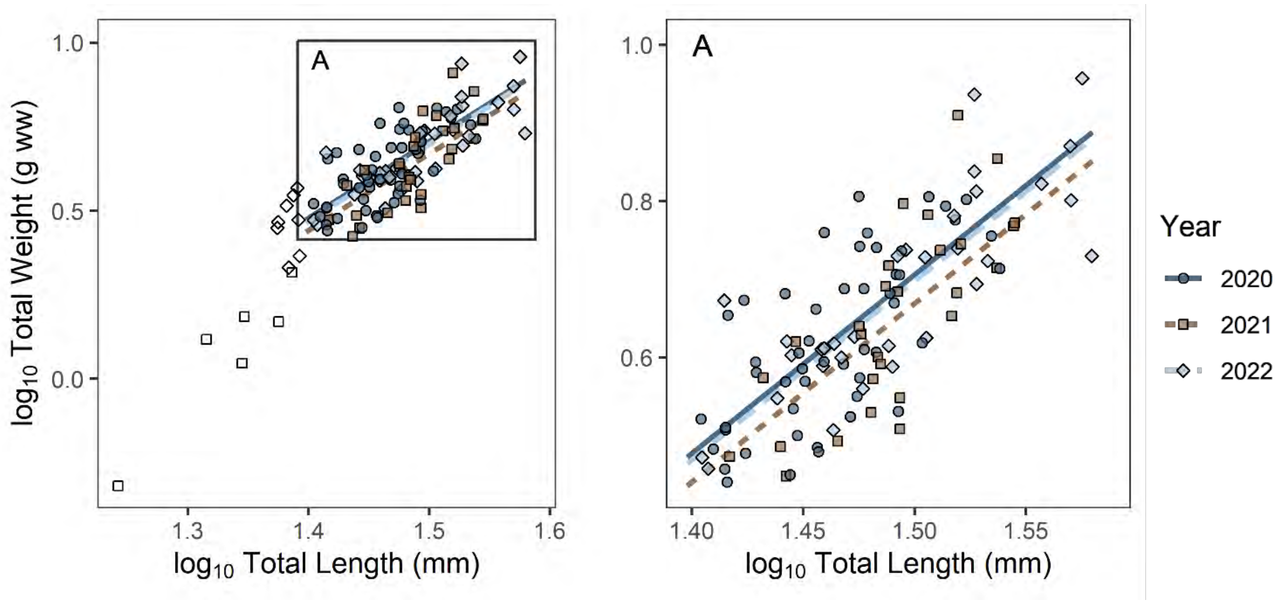


Figure 7-10: Boxplot of Whole Animal Wet Weight of *Hiatella arctica* captured from the Milne Port Area, 2020 to 2022.

7.4.1.2.3 Condition

Condition of *Hiatella arctica* was compared between 2020, 2021, and 2022 using relative weight (total weight-at-length). Given the differences in the range of total length of *Hiatella arctica* between years (Figure 7-9), differences in relative weight were evaluated over the shared range of lengths (i.e., 25 to 38 mm; Environment Canada 2012; Figure 7-11). Relative weight did not differ significantly among sampling years (Table 7-8).

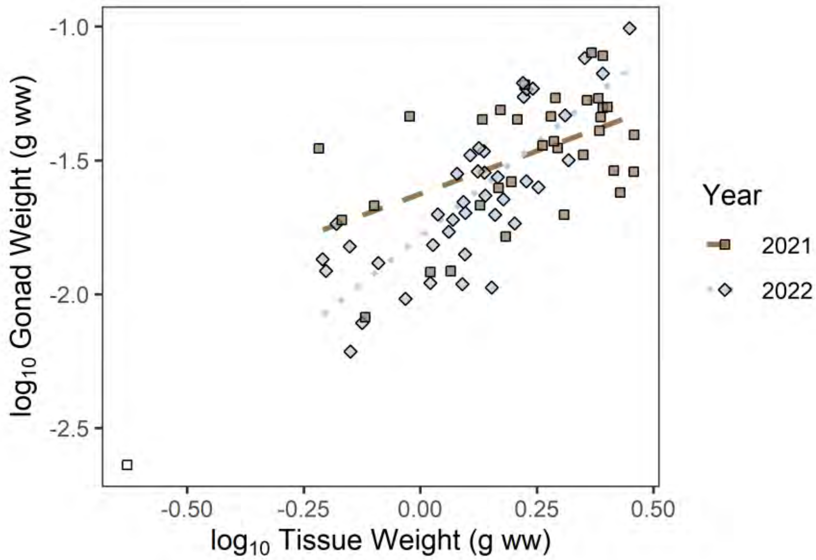


□, ◇ = omitted from ANCOVA.
The portion of the data contained in inset 'A' is shown in more detail at right.

Figure 7-11: Relationship between Total Weight and Total Length of *Hiatella arctica* Captured from the Milne Port Area, 2020 to 2022.

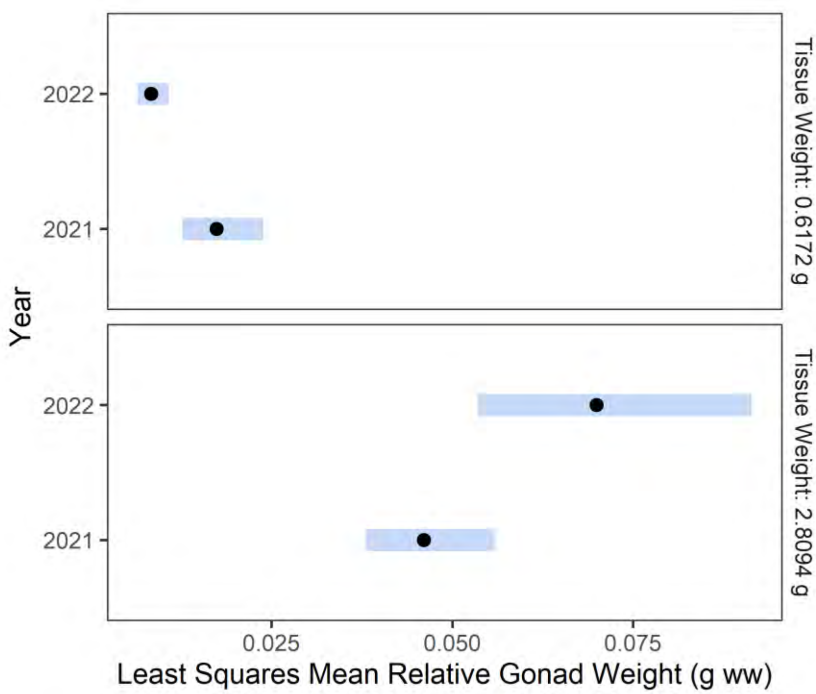
7.4.1.2.4 Reproduction – Mantle Somatic Index

Mantle somatic index (MSI) of *Hiatella arctica* was compared between 2021 and 2022, as gonad tissues were not weighed in 2020. Mantle somatic index was evaluated as relative gonad weight (gonad weight-at-tissue weight; Figure 7-12). A significant interaction term (p_{β_3}= 0.004) and a coefficient of determination below the threshold for evaluating practically parallel slopes (R^2: 0.53 < 0.80) required that MSI be compared at the least and greatest overlapping covariate values (Figure 7-13). At low tissue weight (0.6172 g), relative gonad weight was significantly greater in 2021 than 2022 (70%), while at high tissue weight (2.8094 g), relative gonad weight was significantly lower in 2021 than 2022 (41%).



□ = omitted from ANCOVA.

Figure 7-12: Relationship between Gonad Weight and Soft Tissue Weight of *Hiatella arctica* captured from the Milne Port Area, 2021 to 2022.



Values were back transformed from the log_{10} scale. Blue bars represent 90% confidence intervals. See Table 7-8 for statistical model information.

Figure 7-13: Least Squares Mean Relative Gonad Weights of *Hiatella arctica* Captured from the Milne Port Area, 2021 to 2022.

7.4.2 Fish Tissue Chemistry

A total of 381 fish tissue samples have been submitted for metals analysis and 101 fish tissue samples have been submitted for PAH analysis from the Milne Port Area from 2010 to 2022. A summary of sample sizes by species and year are provided in Appendix 7C; Table 7C-1. The analyses presented herein focus on data collected since 2018. Visual comparisons of the entire data series, including years prior to 2018, are shown in Appendix 7D.

In 2022, a total of 24 samples from three species were submitted for metals analysis, supplementing data collected since 2018 to produce a total dataset of 309 samples for metals from the Milne Port area (i.e., Arctic Char [n = 97], Fourhorn Sculpin [n = 54], indeterminate sculpin [n = 30], and *Hiatella arctica* [n = 128]). An additional 38 samples were analyzed for PAHs in 2022, supplementing data collected since 2020 to produce a total dataset of 86 samples for PAHs from the Milne Port area (i.e., Arctic Char [n = 26], Fourhorn Sculpin [n = 8], and *Hiatella arctica* [n = 4]). Results for individual species are described in the following sections.

7.4.2.1 Arctic Char

Tissue Metals

From 2010 to 2022, a total of 156 Arctic Char were analyzed for metals from the Milne Port area; during the period spanning 2018 to 2022, a total of 97 Arctic Char were analyzed for metals from the Milne Port area. Summary statistics for metals concentrations from Arctic Char collected from 2018 to 2022 are provided in Table 7-9 (data from all years are presented as boxplots in Appendix 7D, Figures 7D-1 to 7D-36). Statistical comparisons for COPCs (i.e., aluminum, iron, magnesium, mercury, and selenium) among years (i.e., 2018 to 2022) are provided in Table 7-10 and Appendix 7C, Table 7-11. Statistical outliers removed from the analyses are provided in Table 7-11.

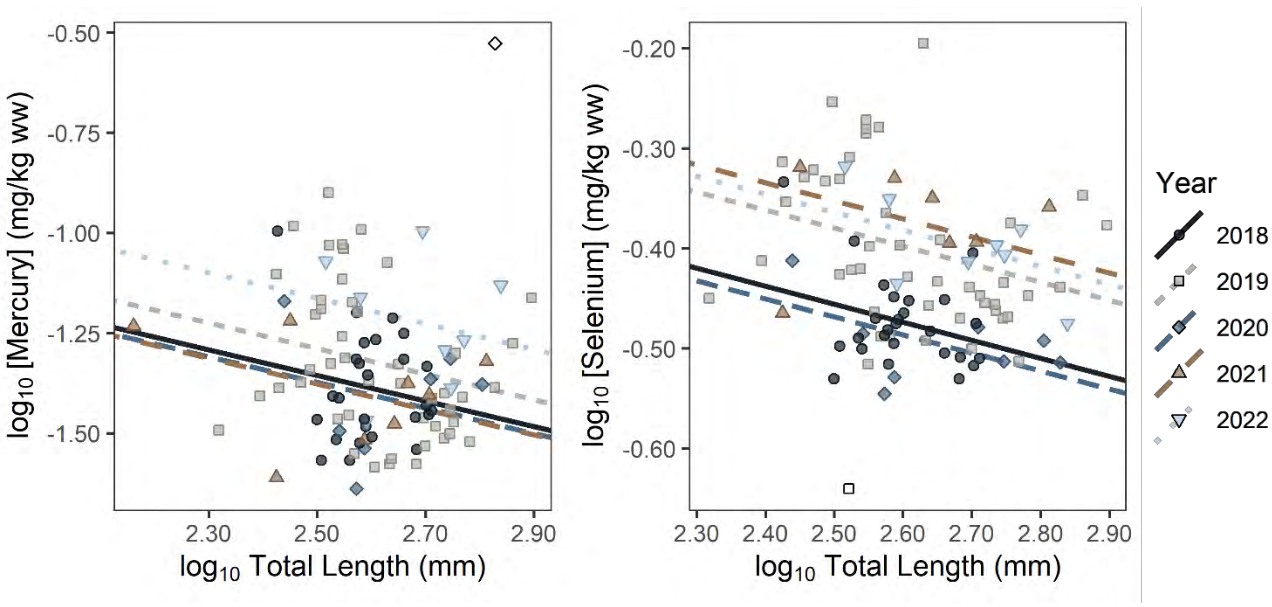
From 2018 to 2022, concentrations of many metals were similar among years while others demonstrated notable inter-annual variability (e.g., copper, iron, selenium, zinc; Appendix 7D, Figures 7D-1 to 7D-36). Among COPCs, no significant differences were observed for iron, while significant differences were observed among years for aluminum, magnesium, mercury, and selenium (Table 7-10):

- Aluminum concentrations were lowest in 2018, then increased by 124% to 2019, before declining 122% from 2019 to 2021. Concentrations in 2022 were within the range of those measured in 2021 (Figure 7D-1).
- Magnesium concentrations were significantly lower in 2018 when compared to 2019 (6%), 2020 (6%), 2021 (8%), and 2022 (11%), but did not differ among other years. The RPDs for magnesium concentration among years were comparatively small and concentrations were similar to those observed from 2010 and 2017 (Figure 7D-17).
- Mercury concentrations, after accounting for variation in fish size, were significantly greater in 2022 when compared to 2018 (44%) and 2021 (48%) but did not differ among other years. Concentrations of mercury decreased with increasing fish length in all sampling years (Figure 7-14; Figure 7D-19).
- Concentrations of selenium decreased with fish length and were significantly greater in 2019, 2021, and 2022 when compared to 2018 and 2020 (RPD range: 18% to 27%) but did not differ among other years (Figure 7-14; Figure 7D-25).

A power analysis for COPCs indicated that target sample sizes of eight fish of mixed sex per sampling area would be sufficient to detect differences in effect sizes ranging from 5% for magnesium to 155% for aluminum (Table 7-10).

Mercury concentrations decreased with increasing fish length (Figure 7-14). While this relationship between mercury and fish length differs from that observed for many other piscivorous species, where mercury generally increases with fish size, this inverse relationship has been previously documented for anadromous Arctic Char, whose mercury concentrations are related to freshwater residency time (i.e., mercury concentrations decrease once fish migrate into the marine environment; Riget and Aastrup 2000).

Mercury concentrations for all Arctic Char sampled from 2018 to 2022 were below Health Canada's Maximum Levels for Chemical Contaminants in Foods mercury consumption guideline of 0.5 mg/kg ww (Health Canada 2015). Selenium concentrations for Arctic Char were also below the BC MOE fish tissue guidelines of 4 mg/kg dw (BC MOE 2014), with tissue concentrations in Arctic Char from the Milne Port area ranging from 0.730 to 2.2 mg/kg dw from 2018 to 2022.



Note: One data point was removed from selenium analysis due to high leverage (Appendix 7D, Figure 7D-37).

◇, □ = outliers; g = grams; mg = milligram; kg = kilogram; ww = wet weight.

Figure 7-14: Concentrations of Mercury and Selenium in Relation to Total Length for Arctic Char Sampled from the Milne Port Area, 2018 to 2022.

Polycyclic Aromatic Hydrocarbons

From 2010 to 2021, a total of 30 Arctic Char were analyzed for polycyclic aromatic hydrocarbons (PAHs) from the Milne Port area. In 2022, a total of 26 Arctic Char were analyzed for PAHs in muscle tissue. Concentrations of PAHs were generally below DLs for most parameters analyzed in Arctic Char (Appendix 7C, Table 7C-6), with the exceptions of acenaphthene, fluoranthene, fluorene, methylnaphthalene, naphthalene, phenanthrene, and pyrene. Concentrations of these seven PAHs were above DLs in one or more samples (Appendix 7C, Table 7C-6), and values ranged from 0.00022 to 0.00843 mg/kg ww. In 2022, DLs for PAHs were two to three orders of magnitude lower (i.e., better) than in previous years due to differing methodology used in 2022. When compared with DLs from previous sampling years (e.g., 2021: 0.050 to 0.070 mg/kg ww), all PAH concentrations measured in 2022 would have been below 2021 DLs.

Tissue chemistry results for Arctic Char were within FEIS predictions, and subsequent addenda, indicating a potential for statistically non-significant, low magnitude effects to fish health and condition.

Table 7-9: Descriptive Statistics for Arctic Char Tissue Chemistry Data Analyzed from 2018 to 2022

Parameter	2018 (*n* = 26)							2019 (*n* = 47)						
	>DL (%)	Min	Max	Median	Mean	SD	SE	>DL (%)	Min	Max	Median	Mean	SD	SE
Aluminum	31	<0.20	0.81	<0.20	0.20	0.18	0.04	96	<0.20	9.48	0.41	0.66	1.36	0.20
Antimony	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic	100	0.305	1.150	0.461	0.527	0.218	0.043	100	0.329	2.850	0.811	0.799	0.374	0.055
Barium	4	<0.010	0.013	<0.010	<0.010	<0.010	<0.010	34	<0.010	0.036	<0.010	<0.010	<0.010	<0.010
Beryllium	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	4	<0.20	0.21	<0.20	<0.20	<0.20	<0.20	0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cadmium	96	<0.0010	0.0207	0.0030	0.0062	0.0059	0.0012	96	<0.0010	0.0235	0.0052	0.0062	0.0052	<0.0010
Calcium	100	43	248	76	87	45	9	100	57	791	147	164	118	17
Chromium	50	<0.010	0.050	<0.010	0.014	0.013	<0.010	75	<0.010	0.043	0.012	0.014	<0.010	<0.010
Cobalt	100	0.0030	0.0111	0.0047	0.0049	0.0015	0.0003	100	0.0024	0.0130	0.0043	0.0049	0.0022	0.0003
Copper	100	0.347	0.688	0.500	0.508	0.088	0.017	100	0.285	0.739	0.394	0.414	0.090	0.013
Iron	100	3.02	5.77	4.36	4.36	0.74	0.14	100	2.30	20.60	3.95	4.49	2.74	0.40
Lead	38	<0.0010	0.0026	<0.0010	<0.0010	<0.0010	<0.0010	85	<0.0010	0.0054	0.0016	0.0018	<0.0010	<0.0010
Magnesium	100	263	310	285	282	12	2	100	257	366	301	303	22	3
Manganese	100	0.067	0.134	0.090	0.093	0.015	0.003	100	0.060	0.316	0.092	0.101	0.038	0.006
Mercury	100	0.0271	0.1010	0.0379	0.0431	0.0159	0.0031	100	0.0260	0.1260	0.0423	0.0522	0.0246	0.0036
Molybdenum	0	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Nickel	81	<0.010	0.037	0.014	0.015	<0.010	<0.010	79	<0.010	0.024	0.013	0.013	<0.010	<0.010
Phosphorus	100	2820	3210	3000	2992	105	21	100	2490	3300	2900	2877	187	27
Potassium	100	4030	4660	4390	4411	159	31	100	2960	4920	4060	3978	438	64
Selenium	100	0.295	0.464	0.330	0.338	0.037	0.007	100	0.229	0.638	0.375	0.401	0.080	0.012
Silver	8	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sodium	100	360	796	489	501	96	19	100	313	1240	700	711	233	34
Strontium	100	0.079	0.637	0.176	0.196	0.114	0.022	100	0.139	1.720	0.433	0.480	0.264	0.039
Thallium	100	0.00211	0.00644	0.00294	0.00311	0.00082	0.00016	100	0.00124	0.00600	0.00216	0.00246	0.00102	0.00015
Tin	4	<0.020	0.036	<0.020	<0.020	<0.020	<0.020	9	<0.020	0.032	<0.020	<0.020	<0.020	<0.020
Titanium	100	0.085	0.154	0.125	0.125	0.016	0.003	100	0.416	0.574	0.486	0.489	0.034	0.005
Uranium	4	<0.00040	0.00058	<0.00040	<0.00040	<0.00040	<0.00040	13	<0.00040	0.00091	<0.00040	<0.00040	<0.00040	<0.00040
Vanadium	0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Zinc	100	4.50	7.74	5.48	5.66	0.91	0.18	100	4.43	15.10	6.95	7.63	2.84	0.41

All concentrations reported are in milligram per kilogram wet weight (mg/kg ww).

> = greater than; DL = detection limit; SD = Standard deviation; SE = standard error.

Table 7-10 (continued): Descriptive Statistics for Arctic Char Tissue Chemistry Data Analyzed from 2018 to 2022

Parameter	2020 (n = 8)							2021 (n = 8)						
	>DL (%)	Min	Max	Median	Mean	SD	SE	>DL (%)	Min	Max	Median	Mean	SD	SE
Aluminum	100	0.28	0.62	0.43	0.42	0.11	0.04	38	<0.20	8.11	<0.20	1.14	2.81	<0.20
Antimony	13	<0.0010	0.0094	<0.0010	0.0016	0.0032	0.0011	50	<0.0010	0.0045	<0.0010	0.0013	0.0014	<0.0010
Arsenic	100	0.389	33.200	0.830	4.875	11.449	4.048	100	0.101	5.540	2.765	2.556	1.975	0.698
Barium	63	<0.010	0.068	0.017	0.024	0.024	<0.010	13	<0.010	0.123	<0.010	0.020	0.042	0.015
Beryllium	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0	<0.0010	<0.0013	<0.0010	<0.0010	<0.0010	<0.0010
Boron	0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	13	<0.20	0.27	<0.20	0.12	0.06	0.02
Cadmium	100	0.0012	0.0171	0.0032	0.0062	0.0061	0.0021	63	<0.0010	0.0020	0.0015	0.0013	<0.0010	<0.0010
Calcium	100	39	506	113	219	193	68	100	60	425	145	197	137	49
Chromium	75	<0.010	1.520	0.030	0.217	0.527	0.186	38	<0.010	0.111	<0.010	0.020	0.037	0.013
Cobalt	100	0.0029	0.0057	0.0035	0.0038	0.0010	0.0004	100	0.0030	0.0171	0.0039	0.0059	0.0048	0.0017
Copper	100	0.165	0.347	0.326	0.305	0.059	0.021	100	0.299	0.607	0.397	0.425	0.097	0.034
Iron	100	2.39	16.80	4.71	5.92	4.50	1.59	100	3.11	87.15	3.97	14.50	29.37	10.38
Lead	100	0.0012	0.0052	0.0023	0.0024	0.0013	0.0005	75	<0.0010	0.0624	0.0029	0.0107	0.0211	0.0074
Magnesium	100	219	348	303	300	37	13	100	270	377	309	314	32	11
Manganese	100	0.056	0.180	0.125	0.115	0.045	0.016	100	0.060	0.579	0.084	0.148	0.175	0.062
Mercury	100	0.0230	0.2970	0.0425	0.0728	0.0916	0.0324	100	0.0245	0.0604	0.0408	0.0421	0.0129	0.0046
Molybdenum	13	<0.0040	0.0105	<0.0040	<0.0040	<0.0040	<0.0040	13	<0.0040	0.0122	<0.0040	0.0033	0.0036	<0.0040
Nickel	63	<0.010	0.029	0.014	0.015	0.010	<0.010	25	<0.010	0.052	<0.010	0.013	0.017	<0.010
Phosphorus	100	2350	3950	3125	3206	471	167	100	2980	3370	3140	3141	153	54
Potassium	100	4190	5360	4655	4696	433	153	100	4030	5010	4535	4551	286	101
Selenium	100	0.285	0.387	0.315	0.320	0.031	0.011	100	0.183	0.480	0.421	0.396	0.096	0.034
Silver	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0	<0.0010	<0.0013	<0.0010	<0.0010	<0.0010	<0.0010
Sodium	100	242	633	332	367	119	42	100	235	422	282	296	59	21
Strontium	100	0.088	1.590	0.344	0.585	0.553	0.196	100	0.103	1.120	0.259	0.348	0.328	0.116
Thallium	100	0.00071	0.00324	0.00203	0.00203	0.00071	0.00025	100	0.00149	0.00868	0.00238	0.00323	0.00231	0.00082
Tin	75	<0.020	0.038	0.028	0.026	<0.020	<0.020	13	<0.020	0.069	<0.020	<0.020	0.021	<0.020
Titanium	100	0.119	0.167	0.143	0.144	0.018	0.007	100	0.423	1.050	0.442	0.517	0.216	0.076
Uranium	25	<0.00040	0.00112	<0.00040	<0.00040	<0.00040	<0.00040	13	<0.00040	0.00774	<0.00040	0.00114	0.00266	0.00094
Vanadium	0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Zinc	100	3.78	5.54	4.62	4.57	0.70	0.25	100	4.39	9.82	4.83	5.56	1.83	0.65

mg/kg = milligram per kilogram wet weight; > = greater than; DL = detection limit; SD = Standard deviation; SE = standard error.

Table 7-10 (continued): Descriptive Statistics for Arctic Char Tissue Chemistry Data Analyzed from 2018 to 2022

Parameter	2022 (n = 8)						
	>DL (%)	Min	Max	Median	Mean	SD	SE
Aluminum	38	<0.50	1.3	<0.50	<0.50	0.39	0.14
Antimony	75	<0.0020	0.019	0.0031	0.0046	0.0059	0.0021
Arsenic	100	0.37	0.72	0.53	0.52	0.12	0.043
Barium	75	<0.010	0.041	0.020	0.019	0.012	0.0043
Beryllium	0	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Bismuth	0	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013
Boron	0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cadmium	88	<0.0013	0.021	0.0028	0.0048	0.0065	0.0023
Calcium	100	87	1400	130	360	460	160
Chromium	13	<0.025	0.033	<0.025	<0.025	0.0072	0.0026
Cobalt	100	0.0037	0.050	0.0071	0.012	0.015	0.0054
Copper	100	0.27	0.58	0.32	0.36	0.098	0.035
Iron	100	3.5	10	4.2	5.4	2.4	0.84
Lead	100	0.0025	0.013	0.0044	0.0054	0.0035	0.0012
Magnesium	100	260	360	320	310	30	11
Manganese	100	0.059	0.26	0.10	0.13	0.076	0.027
Mercury	100	0.034	0.10	0.062	0.064	0.023	0.0081
Molybdenum	0	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080
Nickel	75	<0.010	0.041	0.013	0.018	0.014	0.0049
Phosphorus	100	2600	3500	3100	3100	340	120
Potassium	100	4100	5200	4400	4500	410	140
Selenium	100	0.34	0.48	0.40	0.40	0.045	0.016
Silver	25	<0.0013	0.0014	<0.0013	<0.0013	0.00035	0.00012
Sodium	100	270	460	320	340	68	24
Strontium	100	0.17	3.0	0.22	0.80	1.1	0.37
Thallium	100	0.0016	0.0037	0.0020	0.0023	0.00077	0.00027
Tin	0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Titanium	100	0.50	0.74	0.62	0.63	0.080	0.028
Uranium	75	<0.00040	0.0018	0.00081	0.00095	0.00064	0.00023
Vanadium	0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Zinc	100	3.9	8.1	5.0	5.2	1.3	0.46

mg/kg = milligram per kilogram wet weight; > = greater than; DL = detection limit; SD = Standard deviation; SE = standard error.

Table 7-10: Summary of Inter-annual Comparisons of Constituents of Potential Concern in Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Samples Collected from the Milne Port Area from 2018 to 2022.

Species	Parameter	Test	*P*-value	Least Squares Mean					Post-hoc *P*-value										Relative Percent Difference (%)[d]										Power Analysis[e]	
				2018	2019	2020	2021	2022	2018* 2019	2018* 2020	2018* 2021	2018* 2022	2019* 2020	2019* 2021	2019* 2022	2020* 2021	2020* 2022	2021* 2022	2018* 2019	2018* 2020	2018* 2021	2018* 2022	2019* 2020	2019* 2021	2019* 2022	2020* 2021	2020* 2022	2021* 2022	Minimum Detectable Difference[f]	Sensitivity[g]
Arctic Char	Aluminum	ANOVA$_{rank}$	**<0.001**	0.100	0.410	0.425	0.100	0.250	**<0.001**	**0.010**	0.959	**0.033**	1.000	**0.040**	0.989	**0.056**	0.998	0.365	122	124	-	86	-	122	-	124	-	-	0.901	155%
	Iron	ANOVA$_{rank}$	0.455	4.36	3.95	4.71	3.97	4.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.67	82%
	Magnesium	ANOVA$_{rank}$	**<0.001**	284.5	301	302.5	309	319	**<0.001**	**0.031**	**0.004**	**0.002**	1.000	0.882	0.765	0.982	0.948	1.000	6	6	8	11	-	-	-	-	-	-	15.6	5%
	Mercury	ANCOVA$_{log}$$^{(a)}$	**0.027**	-1.39	-1.32	-1.41	-1.41	-1.20	0.438	0.999	0.998	**0.037**	0.700	0.622	0.277	1.000	0.102	**0.084**	-	-	-	44	-	-	-	-	-	48	5.26 | 6.89	24% | 31%
	Selenum	ANCOVA$_{log}$$^{(a,b)}$	**<0.001**	-0.48	-0.40	-0.49	-0.37	-0.39	**<0.001**	0.986	**0.001**	**0.003**	**0.002**	0.802	0.962	**0.003**	**0.008**	0.996	18	-	24	21	20	-	-	27	24	-	0.256 | 0.283	10% | 11%
Fourhorn Sculpin	Aluminum	ANOVA$_{log}$	**<0.001**	-	0.33	-0.50	-0.30	-0.15	-	-	-	-	**<0.001**	**<0.001**	**0.001**	0.518	**0.086**	0.726	-	-	-	-	149	125	101	-	78	-	0.564 | 0.930	39% | 65%
	Iron	ANOVA$_{log}$	**0.018**	-	0.95	0.80	0.83	0.78	-	-	-	-	0.104	0.275	**0.062**	0.977	0.998	0.934	-	-	-	-	-	-	38	-	-	-	1.72 | 2.28	25% | 33%
	Magnesium	ANOVA$_{log}$	0.858	-	2.44	2.46	2.44	2.44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25.7 | 28.3	9% | 10%
	Mercury	ANCOVA$_{log}$$^{(a, c)}$	**<0.001**	-	-0.94	-0.96	-0.84	-0.74	-	-	-	-	0.974	0.157	**<0.001**	0.209	**0.003**	0.277	-	-	-	-	-	-	46	-	50	-	1.30 | 1.58	18% | 21%
	Selenum	ANCOVA$_{log}$$^{(a, c)}$	**0.016**	-	-0.31	-0.38	-0.35	-0.31	-	-	-	-	**0.022**	0.342	0.999	0.757	**0.086**	0.448	-	-	-	-	15	-	-	-	15	-	0.186 | 0.204	9% | 9%
Hiatella arctica	Aluminum	ANOVA$_{rank}$	**<0.001**	520.5	893.5	685.5	825.5	712.5	**<0.001**	0.422	**0.058**	0.430	0.400	0.961	0.391	0.928	1.000	0.925	53	-	45	-	-	-	-	-	-	-	225	30%
	Iron	ANOVA$_{log}$	**<0.001**	3.09	3.33	3.28	3.34	3.30	**<0.001**	0.092	**0.021**	**0.079**	0.969	1.000	0.995	0.978	1.000	0.994	53	43	55	47	-	-	-	-	-	-	460 | 611	25% | 33%
	Magnesium	ANOVA$_{log}$	**<0.001**	3.39	3.59	3.49	3.52	3.44	**<0.001**	0.520	0.255	0.910	0.479	0.795	0.119	0.996	0.978	0.873	45	-	-	-	-	-	-	-	-	-	665 | 850	22% | 28%
	Mercury	ANOVA$_{rank}$	**0.070**	0.0227	0.0300	0.0305	0.0305	0.0300	**0.064**	0.333	0.373	0.269	0.995	0.998	0.984	1.000	1.000	1.000	28	-	-	-	-	-	-	-	-	-	0.0089	28%
	Selenum	ANOVA$_{rank}$	**0.002**	1.21	1.395	1.24	1.37	1.355	**0.001**	0.911	**0.073**	0.230	0.518	0.996	1.000	0.606	0.852	0.993	14	-	12	-	-	-	-	-	-	-	0.156	12%

Notes: Significant differences indicated in **bold**. Supporting information for statistical model results are provided in Appendix 7C, Table 7C-9.

(a) Length was included as a covariate for ANCOVA.

(b) One value was removed due to high leverage (Figure 7-12; Appendix 7D, Figure 7D-37). See Appendix 7C, Table 7C-10 for model results that included this value.

(c) Parameter concentrations were compared at 217 mm length due to narrow range of covariate overlap.

(d) Relative Percent Difference was calculated using arithmetic least squares means for untransformed models, geometric least squares means for log-transformed models, or medians for rank-transformed models.

(e) For log_{10}-transformed models, power analysis was completed for differences less than and greater than the mean. Minimum detectable difference and sensitivity were determined using back-transformed values and are presented as: differences lower than | greater than the mean.

(f) Minimum Detectable Difference expressed as difference from the overall mean.

(g) Sensitivity is the minimum detectable difference expressed as a percent change in the overall mean.

P-value = probability value; RPD = relative percent difference; ANOVA = analysis of variance; ANCOVA = analysis of covariance; log = log_{10}-transformed data; rank = rank-transformed data; - = not calculated.

Table 7-11: Outliers Omitted from Statistical Comparisons of Tissue Chemistry

Species	Parameter	Year	Age (y)	Length (mm)	Weight (g)	Concentration (mg/kg ww)	Studentized Residuals
Arctic Char	Aluminum	2021	4	145	24.5	8.11	4.1
	Mercury	2020	9	674	3910	0.297	4.3
	Selenium	2021	4	145	24.5	0.183	-[(a)]
		2019	12	332	370	0.229	-4.2
Hiatella arctica	Iron	2019	21	-	-	374	-4.1

(a) Value removed due to high leverage (Appendix 7D, Figure 7D-37 for leverage plot).

7.4.2.2 Fourhorn Sculpin

Tissue Metals

A total of 54 Fourhorn Sculpin samples were analyzed for metals from the Milne Port area from 2019 to 2022, including 30 samples in 2019, eight in 2020, eight in 2021, and eight in 2022. Summary statistics for metals concentrations are provided in Table 7-12 and these results are presented as boxplots in Appendix 7D, Figures 7D-1 to 7D-36. Statistical comparisons for COPCs among years are provided in Table 7-10, and outliers removed from the analyses are provided in Table 7-11.

Concentrations of metals in Fourhorn Sculpin were generally more variable than Arctic Char (Section 7.4.2.1). Significant differences were observed among years for COPCs including aluminum, iron, mercury, and selenium, but not for magnesium (Table 7-10):

- Aluminum concentrations decreased significantly from 2019 to 2020 by 149%, but increased significantly from 2020 to 2022 by 78%. Concentrations of aluminum measured in 2022 remained below concentrations measured in 2019. (Figure 7D-1).
- Iron concentrations decreased significantly from 2019 to 2022 by 38%, but did not differ among other years (Figure 7D-14).
- Mercury concentrations were significantly greater, after accounting for variation in fish size, in 2022 when compared to 2019 (46%) and 2020 (50%) but did not differ among other years. Concentrations of mercury increased with increasing fish length in all sampling years (Figure 7-15; Figure 7D-19).
- Selenium concentrations were significantly greater in 2022 compared to 2020 (15%; Figure 7-15) but did not differ significantly with other years. In addition, concentrations in 2019 were also significantly greater than 2020. Concentrations of selenium increased with increasing fish length in all sampling years (Figure 7-15; Figure 7D-25).
- A power analysis for COPCs indicated that target sample sizes of eight fish per sampling area would be sufficient to detect differences in effect sizes ranging from 9% for selenium to 65% for aluminum.

Mercury concentrations for all Fourhorn Sculpin sampled from 2019 to 2022 were below Health Canada's Maximum Levels for Chemical Contaminants in Foods mercury consumption guideline of 0.5 mg/kg ww (Health Canada 2015). Selenium concentrations for Fourhorn Sculpin were also below BC MOE fish tissue guidelines of 4 mg/kg dw (BC MOE 2014), with tissue concentrations in Fourhorn Sculpin from the Milne Port area ranging from 0.345 to 2.630 mg/kg dw from 2019 to 2020.

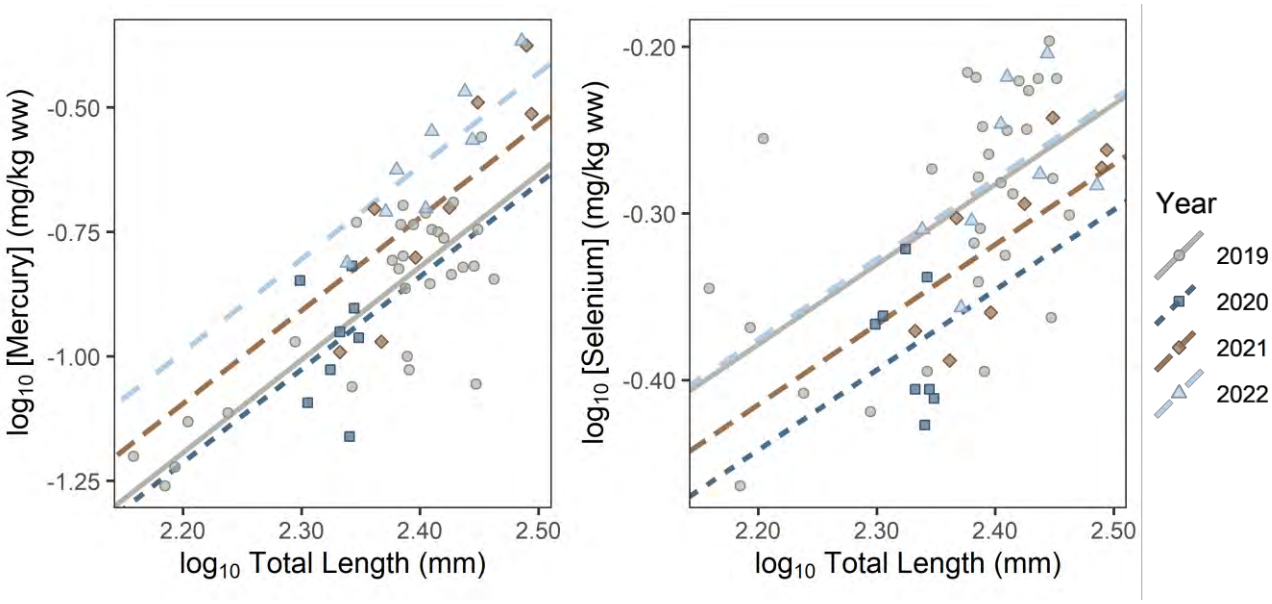


Figure 7-15: Concentrations of Mercury and Selenium in Relation to Total Length for Fourhorn Sculpin Sampled from the Milne Port Area, 2019 to 2022.

Polycyclic Aromatic Hydrocarbons

From 2020 to 2022, a total of 24 Fourhorn Sculpin samples have been analyzed for PAHs, comprising eight samples per sampling year. In 2022, the eight Fourhorn Sculpin were analyzed for PAHs in muscle tissue. Polycyclic aromatic hydrocarbons were below DL for all parameters analyzed in Fourhorn Sculpin (Appendix 7C, Table 7C-7).

Tissue chemistry results from Fourhorn Sculpin for metals and PAHs were within FEIS predictions, and subsequent ERP addenda, indicating a potential for statistically non-significant, low magnitude effects on fish health and condition.

Table 7-12: Descriptive Statistics for Fourhorn Sculpin Tissue Chemistry Data Analyzed from 2019 to 2022

Parameter	2019 (*n* = 30)							2020 (*n* = 8)						
	>DL (%)	Min	Max	Median	Mean	SD	SE	>DL (%)	Min	Max	Median	Mean	SD	SE
Aluminum	100	0.75	11.40	1.92	2.85	2.41	0.44	88	<0.20	1.23	0.29	0.40	0.35	<0.20
Antimony	50	<0.0020	0.0030	<0.0020	<0.0020	<0.0020	<0.0020	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic	100	0.510	6.630	1.780	1.800	1.080	0.200	100	1.700	3.310	2.190	2.370	0.620	0.220
Barium	100	0.030	0.400	0.145	0.146	0.087	0.016	100	0.027	0.086	0.057	0.054	0.021	0.007
Beryllium	0	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth	87	<0.0013	0.0052	0.0029	0.0027	<0.0013	<0.0013	63	<0.0010	0.0052	0.0014	0.0018	0.0016	<0.0010
Boron	77	<0.20	0.60	0.24	0.23	<0.20	<0.20	0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cadmium	100	0.0055	0.1300	0.0246	0.0367	0.0338	0.0062	88	<0.0010	0.0088	0.0023	0.0028	0.0026	<0.0010
Calcium	100	472	4290	2245	2234	1205	220	100	612	907	708	757	114	40
Chromium	70	<0.025	0.163	0.031	0.040	0.035	<0.025	100	0.023	0.496	0.158	0.202	0.170	0.060
Cobalt	100	0.0045	0.0239	0.0123	0.0122	0.0041	0.0007	100	0.0048	0.0080	0.0062	0.0061	0.0010	0.0004
Copper	100	0.278	1.030	0.557	0.590	0.207	0.038	100	0.315	1.010	0.427	0.496	0.227	0.080
Iron	100	3.56	24.40	8.97	9.91	4.63	0.84	100	3.74	10.20	6.31	6.59	2.05	0.73
Lead	100	0.0055	0.0544	0.0148	0.0185	0.0115	0.0021	100	0.0013	0.0047	0.0018	0.0022	0.0011	0.0004
Magnesium	100	189	414	273	281	45	8	100	263	304	295	290	14	5
Manganese	100	0.149	0.870	0.337	0.365	0.157	0.027	100	0.255	0.409	0.302	0.315	0.049	0.017
Mercury	100	0.0550	0.2760	0.1510	0.1430	0.0530	0.0100	100	0.0690	0.1520	0.1110	0.1100	0.0290	0.0100
Molybdenum	13	<0.0080	0.0124	<0.0080	<0.0080	<0.0080	<0.0080	63	<0.0040	0.0104	0.0053	0.0049	<0.0040	<0.0040
Nickel	100	0.014	0.054	0.030	0.031	0.010	0.002	75	<0.010	0.020	0.015	0.013	<0.010	<0.010
Phosphorus	100	1750	4280	2645	2784	698	127	100	2560	2930	2780	2741	130	46
Potassium	100	2210	3640	2900	2860	344	63	100	3860	4260	4055	4034	123	44
Selenium	100	0.344	0.636	0.525	0.510	0.080	0.015	100	0.374	0.477	0.412	0.419	0.037	0.013
Silver	10	<0.0013	0.0023	<0.0013	<0.0013	<0.0013	<0.0013	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sodium	100	885	1680	1280	1262	197	36	100	481	736	546	567	89	32
Strontium	100	2.390	30.200	13.800	13.990	8.210	1.500	100	2.400	5.020	3.500	3.650	0.880	0.310
Thallium	97	<0.00040	0.00227	0.00087	0.00095	0.00043	<0.00040	100	0.00063	0.00143	0.00083	0.00090	0.00024	0.00009
Tin	63	<0.020	1.410	0.027	0.101	0.256	0.047	0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Titanium	100	0.270	1.000	0.450	0.480	0.160	0.029	100	0.168	0.223	0.211	0.205	0.018	0.007
Uranium	100	0.00045	0.02010	0.00352	0.00446	0.00405	0.00074	75	<0.00040	0.00142	0.00072	0.00067	<0.00040	<0.00040
Vanadium	0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0	0.010	0.010	0.010	0.010	0.000	0.000
Zinc	100	12.20	26.70	16.80	17.99	3.92	0.72	100	9.62	18.40	11.75	12.80	3.27	1.15

Notes: Fourhorn Sculpin were not collected in 2018.

mg/kg = milligram per kilogram wet weight; > = greater than; < = less than; DL = detection limit; n = sample size; min = minimum; max = maximum; SD = standard deviation; SE = standard error.

Table 7-13 (continued): Descriptive Statistics for Fourhorn Sculpin Tissue Chemistry Data Analyzed from 2019 to 2022

Parameter	2021 (*n* = 8)							2022 (*n* = 8)						
	>DL (%)	Mean	Mean	Mean	Mean	SD	SE	>DL (%)	Mean	Mean	Mean	Mean	SD	SE
Aluminum	100	0.28	1.25	0.53	0.56	0.31	0.11	88	<0.50	1.4	0.75	0.78	0.33	0.12
Antimony	88	<0.0010	0.0028	0.0013	0.0014	<0.0010	<0.0010	88	<0.0020	0.0044	0.0028	0.0027	0.00094	0.00033
Arsenic	100	2.070	4.890	3.635	3.400	1.029	0.364	100	1.8	5.9	3.3	3.5	1.4	0.49
Barium	88	<0.010	0.060	0.031	0.031	0.021	<0.010	75	<0.010	0.019	0.012	0.012	0.0050	0.0018
Beryllium	0	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	0	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Bismuth	88	<0.0010	0.0031	0.0019	0.0019	<0.0010	<0.0010	100	0.0016	0.0029	0.0022	0.0022	0.00041	0.00015
Boron	25	<0.20	0.54	<0.20	<0.20	<0.20	<0.20	0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cadmium	100	0.0041	0.0095	0.0055	0.0058	0.0017	0.0006	100	0.0027	0.012	0.0059	0.0057	0.0029	0.0010
Calcium	100	188	1190	485	540	370	131	100	100	140	120	120	15	5.4
Chromium	88	<0.010	0.038	0.020	0.021	0.011	<0.010	38	<0.025	0.030	<0.025	<0.025	0.0084	0.0030
Cobalt	100	0.0065	0.0119	0.0078	0.0083	0.0019	0.0007	100	0.0094	0.21	0.012	0.037	0.070	0.025
Copper	100	0.445	0.708	0.467	0.509	0.089	0.031	100	0.29	0.54	0.35	0.36	0.080	0.028
Iron	100	5.37	9.16	6.66	6.93	1.36	0.48	100	3.5	8.1	6.5	6.3	1.4	0.51
Lead	100	0.0037	0.0134	0.0054	0.0063	0.0031	0.0011	100	0.0054	0.032	0.0065	0.011	0.0090	0.0032
Magnesium	100	236	308	284	277	28	10	100	250	320	270	280	23	8.1
Manganese	100	0.182	0.347	0.263	0.265	0.053	0.019	100	0.12	0.26	0.18	0.19	0.055	0.020
Mercury	100	0.1020	0.4210	0.1985	0.2270	0.1133	0.0401	100	0.15	0.43	0.25	0.26	0.089	0.032
Molybdenum	0	<0.0040	<0.0080	<0.0040	<0.0040	<0.0040	<0.0040	0	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080
Nickel	100	0.015	0.079	0.023	0.028	0.021	0.007	100	0 .017	0.042	0.022	0.025	0.0084	0.0030
Phosphorus	100	2030	2690	2450	2408	215	76	100	1900	2300	2200	2100	120	42
Potassium	100	3420	3870	3680	3639	162	57	100	3400	3900	3600	3600	180	62
Selenium	100	0.409	0.572	0.503	0.491	0.061	0.021	100	0.44	0.63	0.53	0.53	0.062	0.022
Silver	13	<0.0010	0.0015	<0.0010	<0.0010	<0.0010	<0.0010	13	<0.0013	0.0017	<0.0013	<0.0013	0.00037	0.00013
Sodium	100	546	1010	748	755	157	56	100	500	770	580	600	94	33
Strontium	100	0.905	7.340	2.400	2.881	2.255	0.797	100	0.34	0.75	0.50	0.52	0.13	0.046
Thallium	100	0.00050	0.00104	0.00076	0.00075	0.00015	0.00005	100	0.00059	0.0011	0.00077	0.00083	0.00018	0.000065
Tin	50	<0.020	0.190	0.025	0.042	0.061	0.021	63	<0.020	0.042	0.023	0.023	0.013	0.0045
Titanium	100	0.300	0.516	0.369	0.371	0.065	0.023	100	0.42	0.50	0.46	0.46	0.030	0.011
Uranium	63	<0.00040	0.00141	0.00077	0.00067	0.00044	<0.00040	100	0.00075	0.0027	0.00099	0.0012	0.00065	0.00023
Vanadium	13	<0.020	0.056	<0.020	<0.020	<0.020	<0.020	0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Zinc	100	9.59	26.10	17.80	16.91	5.86	2.07	100	9.7	18	14	14	3.1	1.1

Notes: Fourhorn Sculpin were not collected in 2018.

mg/kg = milligram per kilogram wet weight; > = greater than; < = less than; DL = detection limit; n = sample size; min = minimum; max = maximum; SD = standard deviation; SE = standard error.

7.4.2.3 *Hiatella arctica*

Tissue Metals

A total of 128 *Hiatella arctica* samples were analyzed for metals from the Milne Port area from 2018 to 2022, including 24 samples in 2018, 80 in 2019, eight in 2020, eight in 2021, and eight in 2022. Summary statistics for *Hiatella arctica* metals concentrations are provided in Table 7-13 and these results are presented as boxplots in Appendix 7D, Figures 7D-1 to 7D-36. Statistical comparisons for COPCs among years are provided in Table 7-10, and outliers removed from analysis are provided in Table 7-11.

Concentrations of metals in *Hiatella arctica* tissue were generally similar among years with a few exceptions, such as chromium, nickel, and tin, which exhibited more variability and greater concentrations in 2020 relative to other years. Greater concentrations of most metals were observed for *Hiatella arctica* when compared to Arctic Char and Fourhorn Sculpin (Appendix 7D, Figures 7D-1 to 7D-36). Differences in species-specific bioaccumulation processes (e.g., filter feeder versus non-filter feeder) and tissue type (i.e., whole body versus muscle) likely contributed to the interspecies differences in tissue concentrations observed, with molluscs typically accumulating greater concentrations of some metals compared to fish (Bonsignore et al. 2018).

For COPCs, significant differences were observed among years for aluminum, iron, magnesium, mercury, and selenium (Table 7-10). Concentrations of these metals were significantly greater in 2019, when compared to 2018; concentrations in 2019 did not differ from 2020, 2021, or 2022 for all COPCs. Concentrations of aluminum and selenium were also significantly greater in 2021 than 2018. Iron concentrations were significantly greater in 2021 and 2022 compared to 2018. A power analysis for COPCs indicated that target sample sizes of eight specimens per sampling area would be sufficient to detect differences in effect sizes ranging from 12% for selenium to 33% for iron.

Concentrations of mercury and selenium in *Hiatella arctica* were compared with fish tissue and invertebrate tissue guidelines, respectively. While the mercury guideline is not intended for bivalves, comparisons can provide relevant context for tissue chemistry results. Mercury concentrations for all *Hiatella arctica* sampled from 2018 to 2022 were below Health Canada's Maximum Levels for Chemical Contaminants in Foods mercury consumption guideline of 0.5 mg/kg ww (Health Canada 2015). Selenium concentrations for *Hiatella arctica* exceeded BC MOE invertebrate tissue guidelines of 4 mg/kg dw (BC MOE 2014) in 94% of samples, with tissue concentrations in *Hiatella arctica* from the Milne Port area from 2018 to 2022 ranging from 2.236 to 11.235 mg/kg dw.

Polycyclic Aromatic Hydrocarbons

From 2020 to 2022, a total of 20 samples of *Hiatella arctica* were analyzed for PAHs. In 2022, four samples of *Hiatella arctica* were analyzed for PAHs in soft tissues. Polycyclic aromatic hydrocarbons were below DLs for all parameters analyzed in *Hiatella arctica* (Appendix 7C, Table 7C-8).

Tissue chemistry results for *Hiatella arctica* were within FEIS predictions, which indicated the potential for statistically non-significant, low magnitude effects on health and condition.

Table 7-13: Descriptive Statistics for *Hiatella arctica* Tissue Chemistry Data Analyzed from 2018 to 2022

Parameter	2018 (n = 30)							2019 (n = 8)							2020 (n = 8)						
	>DL (%)	Min	Max	Median	Mean	SD	SE	>DL (%)	Min	Max	Median	Mean	SD	SE	>DL (%)	Min	Max	Median	Mean	SD	SE
Aluminum	100	166.00	920.00	521.00	516.00	196.00	40.00	100	109.00	2370.00	894.00	909.00	355.00	40.00	100	333.00	1750.00	685.50	757.00	444.00	157.00
Antimony	100	0.0039	0.0094	0.0066	0.0064	0.0016	0.0003	100	0.0043	0.0424	0.0175	0.0180	0.0060	0.0007	100	0.0085	0.0354	0.0198	0.0189	0.0082	0.0029
Arsenic	100	1.420	4.120	2.410	2.440	0.680	0.140	100	1.560	6.310	2.780	2.930	1.030	0.120	100	2.400	3.360	2.560	2.680	0.330	0.120
Barium	100	2.120	20.500	7.870	9.200	5.230	1.070	100	3.320	32.700	8.540	10.710	6.330	0.710	100	5.310	20.100	8.820	10.680	4.970	1.760
Beryllium	100	0.0120	0.0531	0.0328	0.0330	0.0112	0.0023	100	0.0072	0.1460	0.0498	0.0509	0.0199	0.0022	100	0.0213	0.0966	0.0407	0.0442	0.0236	0.0083
Bismuth	100	0.0029	0.0119	0.0068	0.0069	0.0022	0.0004	100	0.0032	0.0248	0.0115	0.0117	0.0035	0.0004	100	0.0050	0.0236	0.0088	0.0099	0.0059	0.0021
Boron	100	3.28	8.95	6.05	5.96	1.44	0.29	100	3.06	16.70	8.45	8.86	2.67	0.30	100	4.36	13.20	6.63	6.97	2.76	0.98
Cadmium	100	0.2690	2.4900	0.5600	0.6840	0.4740	0.0970	100	0.1560	1.2700	0.4480	0.5020	0.2170	0.0240	100	0.4320	0.7550	0.6060	0.6170	0.1030	0.0360
Calcium	100	2010	11800	5065	5570	2544	519	100	1390	27000	6985	7905	4261	476	100	4020	10600	5445	6031	2293	811
Cesium	100	0.0270	0.1650	0.0906	0.0915	0.0355	0.0072	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	100	0.610	2.580	1.490	1.530	0.550	0.110	100	0.410	7.340	2.530	2.660	1.030	0.120	100	5.900	64.000	30.550	27.950	18.030	6.380
Cobalt	100	0.2210	1.7200	0.7080	0.7850	0.3910	0.0800	100	0.2910	3.9600	0.9970	1.2220	0.7470	0.0830	100	0.7570	2.4600	1.4450	1.4560	0.5360	0.1900
Copper	100	1.480	3.290	2.020	2.110	0.400	0.080	100	1.420	4.490	2.230	2.320	0.550	0.060	100	1.760	4.020	2.810	2.890	0.820	0.290
Iron	100	511.00	2310.00	1280.00	1330.00	512.00	104.00	100	374.00	7000.00	2210.00	2338.00	1034.00	116.00	100	904.00	3910.00	1985.00	2101.00	961.00	340.00
Lead	100	0.2030	1.8400	0.6920	0.7390	0.3490	0.0710	100	0.1500	3.4200	1.2200	1.2640	0.4920	0.0550	100	0.4290	4.3300	0.9930	1.3610	1.2700	0.4490
Lithium	100	0.71	3.88	2.27	2.25	0.83	0.17	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	100	1190	5500	2565	2640	1073	219	100	1190	11600	3870	4126	1625	182	100	2370	5030	2980	3198	951	336
Manganese	100	4.800	327.000	71.300	89.600	74.800	15.300	100	14.300	634.000	87.800	136.900	136.100	15.200	100	73.900	271.000	141.500	155.600	72.300	25.500
Mercury	100	0.0110	0.0697	0.0227	0.0272	0.0145	0.0030	100	0.0150	0.0780	0.0300	0.0329	0.0138	0.0015	100	0.0220	0.0470	0.0305	0.0321	0.0087	0.0031
Molybdenum	100	0.1340	0.5180	0.2580	0.2630	0.1040	0.0210	100	0.1340	1.2700	0.2930	0.3720	0.1910	0.0210	100	0.2820	1.3000	0.7190	0.7080	0.3060	0.1080
Nickel	100	0.790	2.720	1.450	1.540	0.500	0.100	100	0.740	4.260	2.040	2.130	0.650	0.070	100	3.460	29.900	14.350	13.350	8.170	2.890
Phosphorus	100	726	2020	1190	1195	257	53	100	705	3160	1225	1395	546	61	100	1020	1570	1270	1289	205	72
Potassium	100	799	2120	1415	1432	268	55	100	871	1950	1200	1247	240	27	100	1260	1700	1445	1450	126	45
Rubidium	100	0.95	3.18	2.01	1.97	0.57	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	100	0.650	1.430	1.210	1.170	0.170	0.030	100	0.740	2.010	1.400	1.390	0.270	0.030	100	1.050	1.560	1.240	1.260	0.170	0.060
Silver	-	-	-	-	-	-	-	100	0.0019	0.0219	0.0049	0.0058	0.0036	0.0004	100	0.0035	0.0083	0.0047	0.0048	0.0016	0.0006
Sodium	100	1890	6480	3955	4110	1246	254	100	1680	5660	4205	4159	869	97	100	3250	4490	3785	3771	456	161
Strontium	100	9.230	46.200	19.750	21.540	9.230	1.880	100	7.440	89.900	15.950	19.940	13.360	1.490	100	10.300	30.200	14.850	16.190	6.230	2.200
Tellurium	25	<0.0040	0.0052	<0.0040	<0.0040	<0.0040	<0.0040	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	100	0.00470	0.03770	0.01290	0.01360	0.00750	0.00150	100	0.00370	0.06360	0.02100	0.02280	0.01070	0.00120	100	0.01070	0.04220	0.01900	0.01980	0.01010	0.00360
Tin	83	<0.020	0.352	0.033	0.046	0.067	<0.020	100	0.010	0.529	0.060	0.071	0.059	0.007	100	0.086	0.360	0.160	0.184	0.086	0.030
Titanium	-	-	-	-	-	-	-	100	4.600	109.000	33.700	34.400	14.800	1.600	100	13.800	63.200	25.200	27.600	15.700	5.500
Uranium	100	0.08200	0.18500	0.12000	0.12500	0.03000	0.00600	100	0.09000	0.43500	0.19700	0.20300	0.07200	0.00800	100	0.08700	0.27700	0.14200	0.15300	0.05600	0.02000
Vanadium	100	0.800	3.960	2.420	2.410	0.900	0.180	100	0.830	7.540	3.760	3.910	1.320	0.150	100	1.880	6.940	3.380	3.430	1.570	0.550
Zinc	100	7.06	14.40	11.55	11.26	1.83	0.37	100	8.61	20.90	13.65	13.65	2.30	0.56	100	11.50	17.90	12.70	13.30	2.07	0.73
Zirconium	100	0.222	1.190	0.707	0.718	0.271	0.055	-	-	-	-	-	-	-	-	-	-	-	-	-	-

mg/kg = milligram per kilogram wet weight; > = greater than; DL = detection limit; n = sample size; min = minimum; max = maximum; SD = Standard deviation; SE = standard error.

Table 7-14 (continued): Descriptive Statistics for *Hiatella arctica* Tissue Chemistry Data Analyzed from 2018 to 2022

Parameter	2021 (n = 8)							2022 (n = 8)						
	>DL (%)	Min	Max	Median	Mean	SD	SE	>DL (%)	Min	Max	Median	Mean	SD	SE
Aluminum	100	390.00	1500.00	825.50	854.25	411.12	145.35	100	410	1200	710	700	230	81
Antimony	100	0.0105	0.0323	0.0165	0.0184	0.0077	0.0027	100	0.015	0.030	0.026	0.024	0.0055	0.0020
Arsenic	100	2.190	6.240	3.085	3.620	1.485	0.525	100	2.2	3.4	3.0	2.9	0.52	0.19
Barium	100	5.200	13.900	9.220	9.844	3.126	1.105	100	3.5	33	9.1	12	10	3.5
Beryllium	100	0.0209	0.0808	0.0433	0.0449	0.0217	0.0077	100	0.021	0.065	0.038	0.038	0.013	0.0046
Bismuth	100	0.0055	0.0167	0.0095	0.0099	0.0040	0.0014	100	0.0051	0.017	0.0090	0.0099	0.0035	0.0012
Boron	100	4.75	11.80	7.47	7.74	2.84	1.00	100	4.6	13	8.8	9.1	2.9	1.0
Cadmium	100	0.5240	1.0000	0.8975	0.7920	0.1986	0.0702	100	0.58	1.1	0.84	0.83	0.17	0.060
Calcium	100	4050	12300	6590	7591	3418	1208	100	4700	9500	6000	6400	1500	530
Cesium	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	100	1.150	4.500	2.265	2.451	1.268	0.448	100	1.5	3.1	1.9	2.0	0.51	0.18
Cobalt	100	0.5670	3.2500	1.1630	1.3550	0.8967	0.3170	100	0.56	2.0	1.3	1.3	0.50	0.18
Copper	100	1.610	3.910	2.350	2.523	0.788	0.279	100	2.1	4.6	2.6	2.8	0.79	0.28
Iron	100	969.00	5170.00	2030.00	2499.88	1421.39	502.54	100	1500	3000	1900	2000	550	200
Lead	100	0.5570	2.0600	1.1885	1.2105	0.5726	0.2024	100	0.45	2.5	1.2	1.4	0.71	0.25
Lithium	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	100	2010	5720	3380	3574	1489	526	100	2000	3400	2900	2800	460	160
Manganese	100	54.900	611.000	163.000	193.588	178.284	63.033	100	59	280	170	160	78	28
Mercury	100	0.0230	0.0360	0.0305	0.0305	0.0039	0.0014	100	0.024	0.061	0.030	0.034	0.013	0.0045
Molybdenum	100	0.2160	0.6810	0.3100	0.3575	0.1588	0.0561	100	0.27	0.44	0.35	0.36	0.051	0.018
Nickel	100	1.150	2.930	1.885	2.035	0.809	0.286	100	1.3	2.8	1.9	1.9	0.49	0.17
Phosphorus	100	1100	1700	1460	1453	198	70	100	1100	1900	1500	1500	290	100
Potassium	100	1250	2090	1580	1628	250	88	100	1200	2100	1600	1600	250	88
Rubidium	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	100	1.200	1.680	1.370	1.396	0.156	0.055	100	1.2	1.5	1.4	1.3	0.10	0.036
Silver	100	0.0039	0.0413	0.0075	0.0113	0.0123	0.0044	100	0.0046	0.013	0.0070	0.0076	0.0029	0.0010
Sodium	100	2790	3860	3345	3328	410	145	100	3400	6300	5300	5200	1100	380
Strontium	100	11.000	44.700	24.700	26.425	11.506	4.068	100	19	49	27	31	9.9	3.5
Tellurium	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	100	0.01020	0.05470	0.01975	0.02444	0.01589	0.00562	100	0.0078	0.028	0.017	0.017	0.0063	0.0022
Tin	100	0.053	0.123	0.074	0.079	0.026	0.009	100	0.038	0.070	0.047	0.048	0.010	0.0036
Titanium	100	13.700	67.800	30.250	33.138	18.872	6.672	100	17	38	24	25	6.7	2.4
Uranium	100	0.10700	0.28100	0.15250	0.18000	0.06800	0.02404	100	0.13	0.22	0.16	0.16	0.029	0.010
Vanadium	100	1.760	5.420	3.345	3.549	1.548	0.547	100	1.5	4.8	3.1	3.2	1.1	0.38
Zinc	100	11.60	17.30	13.85	13.81	1.86	0.66	100	14	20	17	17	2.3	0.81
Zirconium	-	-	-	-	-	-	-	-	-	-	-	-	-	-

mg/kg = milligram per kilogram wet weight; > = greater than; DL = detection limit; n = sample size; min = minimum; max = maximum; SD = Standard deviation; SE = standard error.

7.5 Discussion

Detailed fish health data were collected for Fourhorn Sculpin and *Hiatella arctica* in 2020, 2021, and 2022 to align the MEEMP with future monitoring programs and with the MDMER EEM program. Based on internal and external examinations, Fourhorn Sculpin from the Milne Port area appeared to be healthy with few abnormalities observed. Comparisons of fish health endpoints for Fourhorn Sculpin between 2020, 2021, and 2022 indicated that Fourhorn Sculpin were significantly smaller in 2022 than in 2021, but did not differ in 2022 and 2020, relative to their age. Female Fourhorn Sculpin had greater relative gonad size in 2022 compared with previous years, while males had significantly greater relative liver size in 2022 compared with 2021. Variability in relative gonad and liver weights were expected due to natural interannual variation in Fourhorn Sculpin. Sample timing appeared to be appropriate for future assessments of reproductive endpoints for Fourhorn Sculpin, with all individuals assessed being in the late stages of gonadal recrudescence.

Comparisons of health endpoints for *Hiatella arctica* between 2020, 2021, and 2022 indicated that growth, as whole animal wet weight, and condition, as total weight relative to total length, did not differ significantly among sampling years. Observed variability in size and condition appear to reflect natural, interannual variability in this bivalve species. Mantle somatic index, representing gonad weight relative to tissue weight, differed between 2021 and 2022; relative gonad weight was significantly greater in 2021 compared to 2022 for small *Hiatella arctica* but, for large *Hiatella arctica*, relative gonad weight was significantly greater in 2022 compared to 2021. Given the limited data currently available for *Hiatella arctica* in Milne Inlet, it is unknown whether this difference represents expected variability within the species or indicates potential effects of localized stressors. Sample timing of *Hiatella arctica* appears to be appropriate for assessing reproductive endpoints, as gonads were retrieved from collected samples in 2021 and 2022. Timing of spawning for *Hiatella arctica* may be associated with phytoplankton biomass and varies with geographical location (Brandner et al. 2017). Gonadal development for this species may also be asynchronous, with multiple overlapping spawning events occurring throughout the year, potentially leading to a high degree of variability in gonad size regardless of sample timing. While MSI data from 2022 do not exhibit high variability, observed differences between 2021 and 2022 suggest interannual variability in gonadal development. Additional data collected in future years will improve understanding of the variability in gonadal development and condition for *Hiatella arctica*, thus improving the ability to draw conclusions regarding the optimal sampling time for *Hiatella arctica*.

A total of 24 and 38 samples were submitted for tissue chemistry analysis of metals and PAHs in 2022, respectively. Metal concentrations were generally above DLs and more variable among species and years. Concentrations of most COPCs were statistically significantly different among years but with relatively small magnitudes of differences; measured concentrations of COPCs in 2022 remained within the range of historical variability for all species.

- **Arctic Char**: Statistically significant differences were observed for aluminum, magnesium, mercury, and selenium. Aluminum concentrations have increased from 2018 to 2022 by 86% while magnesium, mercury, and selenium have increased by 11%, 44%, and 21%, respectively. No differences were observed for iron.
- **Fourhorn Sculpin**: Statistically significant differences were observed for aluminum, iron, mercury, and selenium among years. Aluminum and iron concentrations in Fourhorn Sculpin decreased significantly from 2019 to 2022 by 101% and 38%, respectively. Mercury concentrations have increased significantly from 2019 to 2022 by 46%, while selenium concentrations decreased significantly from 2019 to 2020 by 15% before increasing significantly from 2020 to 2022 by 15%. Magnesium concentrations did not differ significantly between years.

Hiatella arctica: Statistically significant differences were observed for aluminum, iron, magnesium, mercury, and selenium between 2018 and 2022, with the majority of differences stemming from comparisons to 2018 COPC concentrations. Among the COPCs, only iron concentrations were statistically significantly different in 2022 relative to 2018 concentrations. The RPDs for these differences were small, ranging from relative increases of 12% to 55%.

For all species, an effect size of 100% was used to differentiate random variability from those differences of potential biological importance (Environment Canada 2012). This approach was taken to validate that differences in concentrations of metals between years were real and less likely to be attributed to analytical variability, limitations of reporting (i.e., low concentrations of target contaminants), or spatial and temporal variation. Given this effect size, significant differences in concentrations of COPCs for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* between 2018 and 2022 likely reflect natural variability and were not considered to be Project-related. No consistent trends were observed in COPC concentrations for any species over the years monitored.

Molluscs tend to accumulate metals (from both natural and anthropogenic sources) to a greater degree compared to fish (Bonsignore et al. 2018), and this phenomena is reflected in the *Hiatella arctica* tissue chemistry results. Metals concentrations in *Hiatella arctica* were consistently greater than those measured in Arctic Char and Fourhorn Sculpin, occasionally by orders of magnitude. Species-specific differences in bioaccumulation processes and the tissue types analyzed (i.e., whole body versus muscle) contribute to the differences observed in tissue metals concentrations among the monitored species. *Hiatella arctica* is a long-lived, sedentary, filter feeding mollusc closely associated with the sediment; these life-history characteristics increase the potential of *Hiatella arctica* exposure to, and subsequent accumulation of, metals.

All tissue samples for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* collected from 2018 to 2022 were below Health Canada's Maximum Levels for Chemical Contaminants in Foods mercury consumption guideline of 0.5 mg/kg ww (Health Canada 2015). All tissue samples for Arctic Char and Fourhorn Sculpin were also below BC MOE fish tissue guidelines of 4 mg/kg dw for selenium (BC MOE 2014). *Hiatella arctica* tissues were also compared with fish tissue guidelines to provide additional context, despite these guidelines not being intended for use with bivalve tissues. Nearly all (94%) of *Hiatella arctica* tissue samples exceeded the BC MOE fish tissue selenium guideline.

Tissue concentrations of PAHs were below DL for Fourhorn Sculpin and *Hiatella arctica* analyzed in 2022, while concentrations of several PAHs were above DL for Arctic Char. Differences in methods used to analyze Arctic Char tissue samples in 2022 resulted in lower DLs compared to other species and previous sampling years; when compared with DLs from 2021, concentrations of all PAHs in Arctic Char would be below DLs in 2022. Therefore, it does not appear detectable concentrations of PAHs in 2022 represent an increase in concentrations, but rather an improvement in the analytical method resulting in improved detection.

Tissue chemistry results for all species were within FEIS predictions, and subsequent ERP addenda, which indicated the potential for statistically non-significant, low magnitude effects on health and condition.

7.6 Conclusions and Recommendations

The MEEMP has been designed to meet the objectives of the various conditions associated with PC No. 005 (Chapter 1.0, Table 1-2), as well as to provide results to help evaluate whether the marine environment is changing over time. Original FEIS predictions, and subsequent addenda, indicated the potential for low magnitude changes in some ecological parameters, such as water quality and Arctic Char tissue chemistry, but characterised these changes as not significant. Monitoring data align with these predictions overall, as observed changes have been small and are consistent with baseline data or established guidelines. Monitoring to date suggests that Project mitigation is functioning as intended and that Project activities are being managed in a way that has not adversely affected marine fish health. Moving forward, continued monitoring of proposed MEEMP components is recommended to maintain continuity in established time series data for Arctic Char, and the collection of fish health and tissue chemistry data for Fourhorn Sculpin and *Hiatella arctica,* to provide an ongoing dataset for use in monitoring efforts for both species into the future.

7.7 Closure

We trust this information is sufficient for your needs at this time. Should you have any questions or concerns, please do not hesitate to contact Phil Rouget, on behalf of the undersigned, at +1 250 419 4945.

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https://golderassociates.sharepoint.com/sites/11206g/deliverables (do not use)/issued to client_for wp/400-499/1663724-430g-r-rev0-64000/1663724-430g-r-rev0-64000-2022 meemp_7.0 fish health and tissue chemistry 28apr_23.docx

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APPENDIX 7A

Reference Area Reconnaissance Memo

TECHNICAL MEMORANDUM

DATE 28 April 2023 **Reference No.** 1663724-431-TM-Rev0-64000

TO Megan Lord-Hoyle, Vice-President, Sustainable Development
Baffinland Iron Mines Corp.

CC

FROM Nelson Zabel **EMAIL nelson_zabel@wsp.com**

PHASE 2 FISH HEALTH PROGRAM – 2022 REFERENCE AREA RECONNAISSANCE

1.0 INTRODUCTION

One of the monitoring objectives for the 2022 MEEMP included a reconnaissance survey to support selection of an appropriate reference area for the fish sampling program, as it is expected a fishing reference area will be beneficial to support the MEEMP fish health and tissue chemistry program in future years. To meet this objective, fish sampling was conducted in three areas: an unnamed area north of Milne Port in Milne Inlet, near Tugaat River, and in Kolutoo Bay, to evaluate whether these candidate areas are suitable for use as reference areas for Milne Port. Supporting water and sediment quality sampling occurred during fish sampling. This stand-alone sampling program was completed concurrently with the 2022 MEEMP field program but does not represent an addition to the MEEMP study design at this time. Results are summarized in the sections below.

2.0 WATER QUALITY

Exploratory water quality sampling was completed on 10 August 2022 alongside the 2022 MEEMP field program. Field water quality measurements and water samples were collected at one location: north of Milne Port at TGT-REF-1 (Figure 7A-1).

Sampling methods, quality assurance/quality control (QA/QC) measures, and results are summarized in the sections below.

2.1 Sampling Methods

A depth sounder was used to measure depth at each reference location prior to sampling. Field water quality measurements (i.e., pH, dissolved oxygen, salinity, conductivity, temperature, and turbidity) were taken below the surface at 1 metre due to the shallow depth in the area (-1.1 m Chart Datum), using a calibrated water quality meter. Water samples were collected just below the surface from the Baffinland Research Vessel using a 2.0 L vertically oriented Kemmerer bottle sampler. The sampler was washed with laboratory-grade detergent and then rinsed with site-water prior to sample collection at the station, samples were preserved in the field according to laboratory instructions and samples for dissolved analyses were filtered in the field using 0.45 µm filters. All samples were kept refrigerated until they were shipped on ice in coolers to ALS Canada Ltd. (ALS), a Canadian Association for Laboratory Accreditation Inc. (CALA) accredited analytical laboratory. Water samples were submitted for analysis of conventional parameters, major ions, nutrients, total and dissolved organic carbon, and total and dissolved metals. Samples were shipped within 48 hours of sample collection.

2.2 Data Analysis

Water quality data collected at TGT-REF-1 was screened against the applicable Canadian Council of Ministers of the Environment (CCME) water quality guidelines for the protection of marine aquatic life (CCME 1999, CCME 2002). A comparison was also made to water quality data collected at Milne Port in 2022.

2.3 Quality Assurance/Quality Control

Laboratory QA/QC reports were reviewed upon receipt to confirm adherence to sample hold times and laboratory data quality objectives (DQOs), and that the appropriate QA/QC information had been reported. Laboratory QA/QC included verification of recommended sample holding times and the analysis of laboratory control samples, laboratory duplicates, and spiked samples to assess precision and accuracy of analytical methods. Field blanks and duplicate samples were collected and reported as part of the MEEMP 2022 water quality sampling program and are applicable to the entire program; therefore, a field duplicate water sample was not specifically collected from the unnamed area (TGT-REF-1).

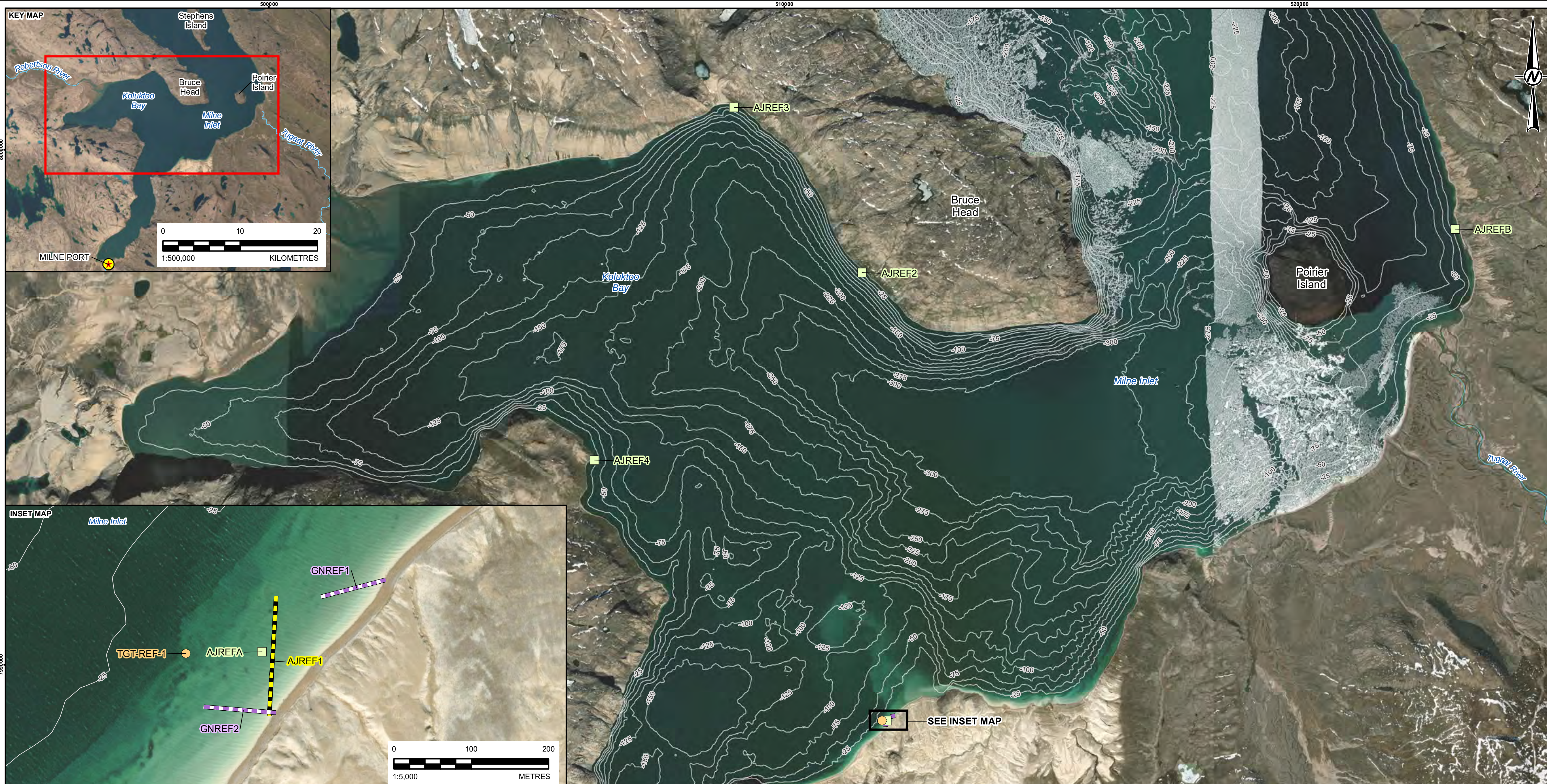
2.3.1 QA/QC Results

The 2022 water quality data for the exploratory reference site samples were considered valid and of acceptable quality to address the reconnaissance study objective, according to the following rationale:

- Chemical analysis of water quality samples was completed within sample hold time requirements. The only exceptions were nitrate, nitrite, pH, and turbidity which are commonplace for remote sampling locations.
- Data reported by the laboratory were considered reliable according to the accredited laboratory QA/QC assessment.

2.4 Results and Discussion

Parameter concentrations measured in water quality samples collected in the unnamed area at TGT-REF-1 were below CCME AW-F guidelines and within the concentration ranges documented for Milne Port in 2022 (see Table 1 in Appendix 2E). Similarly, dissolved oxygen, salinity, and temperature measurements at the 1 m depth at the unnamed area station were within ranges measured at MP05 and MP06 in Milne Port in 2022. Water quality in the unnamed area can therefore be considered comparable to Milne Port water quality based on this evaluation of data collected during the 2022 open-water season.



LEGEND

- ANGLING (JIGGING) SAMPLING LOCATION
- WATER QUALITY AND SEDIMENT QUALITY STATION
- ANGLING (TROLLING) SAMPLING LOCATION
- GILLNET SAMPLING LOCATION
- BATHYMETRIC CONTOUR (25 m INTERVAL)

0 2 4
1:75,000 METRES

REFERENCE(S)
BATHYMETRY CREATED BY GOLDER FROM MULTIPLE DATA SOURCES. HYDROGRAPHY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. IMAGERY COPYRIGHT © 20190630 ESRI AND ITS LICENSORS. SOURCE: MAXAR VIVID. USED UNDER LICENSE, ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 17 DATUM: NAD 83

CLIENT
BAFFINLAND IRON MINES CORPORATION

PROJECT
MARY RIVER PROJECT

CONSULTANT

YYYY-MM-DD	2023-04-27
DESIGNED	NZ
PREPARED	AA
REVIEWED	AL
APPROVED	AL

TITLE
2022 REFERENCE AREA RECONNAISSANCE

PROJECT NO.	CONTROL	REV.	FIGURE
166372401	64000-04	0	7A-1

3.0 SEDIMENT QUALITY

Exploratory sediment quality sampling was completed on 10 August 2022 alongside the 2022 MEEMP field program. Sediment samples were collected at one location: the unnamed area at TGT-REF-1 (Figure 7A-1).

Sampling methods, QA/QC measures, and sediment quality results are summarized in the sections below.

3.1 Sampling Methods

Bottom sediment samples were collected using a Van Veen (0.1 m^2) grab sampler. At the sampling location, a grab sample was collected to obtain a sufficient volume of surficial sediment for the laboratory analysis. Each grab sample was examined for acceptability based on the following criteria:

- The sampler was fully closed.
- There was adequate penetration depth (i.e., sediment volume greater than 25% full).
- The sample did not appear overfilled or disturbed, and the sample did not appear to have been collected on an angle.
- The sampler did not appear to be leaking sediment at a substantial rate (i.e., the top of the sediment profile did not appear to be sloping inwards).

Upon acceptance, the top 5 cm of sediment from the acceptable grab sample was removed from the center of the grab using a stainless-steel spoon and transferred to a stainless-steel bowl. The sediment sample was homogenized and aliquots of the homogenized sediment was transferred to clean, laboratory supplied containers. All samples were kept refrigerated until they were shipped on ice in coolers to ALS for analysis of particle size, moisture, total organic carbon (TOC), total metals, volatile organic compounds (VOCs), hydrocarbons (F1-F4), and total polycyclic aromatic hydrocarbons (PAHs).

3.2 Data Analysis

Sediment quality data collected at TGT-REF-1 near the unnamed area was screened against applicable CCME sediment quality guidelines (SQG) for the protection of marine aquatic life (CCME 1999, CCME 2002). Specifically, data were screened against Probable Effect Levels (PELs) and Interim Sediment Quality Guidelines (ISQGs). PELs were intended to represent concentrations above which adverse effects were predicted to occur frequently, based on a concurrence dataset with effects and concentrations from other sites. By comparison, the ISQG was intended to represent a concentration above which adverse biological effects may or may not occur (CCME 2002). The sediment sample from the unnamed area was also qualitatively compared against sediment samples collected at the shallowest depths from the 2020 MEEMP sampling program (the most recent radial program sampling year); i.e., only sediment samples collected from ~10-20 m water depths (Golder 2021a). These 10-20 m water depth samples were the most comparable to the reference station sample which was collected at a shallower depth.

3.3 Quality Assurance/Quality Control

The laboratory QA/QC reports were reviewed upon receipt to confirm adherence to sample hold times and laboratory DQOs, and that the appropriate QA/QC information had been reported. A field duplicate sample was collected and reported as part of the MEEMP 2022 water quality sampling program. This quality control sampling was applicable to the entire program; therefore, a field duplicate sample was not specifically collected from the unnamed area (TGT-REF-1).

3.3.1 QA/QC Results

The 2022 sediment quality data for the exploratory reference site sample was considered valid and of acceptable quality to address the objectives stated in Section 1.0, based on the following:

- Chemical analyses on sediment samples were completed within the sample hold time requirements.
- Data reported by the laboratory were considered reliable according to the accredited laboratory QA/QC assessment[1].
- Due to an issue with the sampling containers (i.e., lids were not secured tightly), VOCs and hydrocarbons (F1-F4) were not analyzed by the laboratory for reference sample TGT-REF-1.

3.4 Results and Discussion

Sediments in the unnamed area were primarily composed of sand (92%) with some silt (8%) and low TOC (1.1%; Table 7A-2). Sand content at the reference station was higher than most shallow MEEMP stations sampled near Milne Port in 2020, and TOC at the reference station was generally lower than the Milne Port stations (Golder 2021a). The sampling depth at the 2022 reference station was approximately -1.1 m CD which is considerably shallower than samples collected at Milne Port. Parameter concentrations measured in sediments from the unnamed area were below the applicable CCME sediment quality guidelines. For parameters without applicable guidelines, only strontium was higher than maximum concentrations documented at Milne Port in 2020 (Golder 2021a). Organic parameters (i.e., PAHs) were not detected in the unnamed area sediment sample.

Reconnaissance sampling in the reference area indicates that sediment quality in the unnamed area is comparable to Milne Port and reflects the natural minerology of the area.

4.0 FISH HEALTH

Fishing was completed on 10 August 2022 in several areas in Milne Inlet: unnamed area (17W 512013m E 7988924m N), near Tugaat River (17W 523026m E 7998463m N), and in Koluktoo Bay (17W 509027m E 7997614m N; Figure 7A-2) to identify potential reference areas, should they be required or determined useful in the future. Target species for collection were Fourhorn Sculpin (*Myoxocephalus quadricornis*) and wrinkled rock-

[1] A laboratory qualifier did exist but was regarding a laboratory control sample that has a recovery marginally outside of the laboratory recovery limits. Results were deemed to be unaffected by the accredited laboratory.

borer (*Hiatella arctica)*, a bivalve species. This work was completed concurrently with the 2022 MEEMP field program. Methods, quality assurance/quality control measures and results are summarized in the sections below.

4.1 Sampling Methods

Fishing effort included both active (i.e., angling) and passive (i.e., gill netting) capture methods. Captured fish were enumerated and measured for length and weight. Fourhorn Sculpin were retained for fish health sampling. All other fish were released alive back into the area they were caught. Fish processing methodology is described in Section 7.3.1 in Chapter 7.0 – Fish Health and Tissue Chemistry. Tissue chemistry samples for Fourhorn Sculpin captured and processed were collected and archived for potential future analysis. No tissue samples were processed for metals concentrations in 2022. No sampling for *H. arctica* occurred during the Reference Area Reconnaissance in 2022.

4.2 Data Analysis

Fish health data analysis was completed following the methods described in Section 7.3.3 of Chapter 7.0 – Fish Health and Tissue Chemistry. Briefly, descriptive statistics (i.e., sample size, mean, median, standard deviation [SD], standard error [SE], minimum, and maximum values) were calculated for Fourhorn Sculpin as well as fish health endpoints. These indices included condition factor, liversomatic index, and gonadosomatic index. Formulas for these indices are provided in Section 7.3.3 of Chapter 7.0.

4.3 Quality Assurance/Quality Control

The same field practices and operations used for the 2022 MEEMP field program were implemented for the fishing effort in the unnamed area, near Tugaat River, and in Koluktoo Bay, detailed in Section 7.3.5.1 of Chapter 7.0. Field and laboratory QA/QC procedures were implemented at each stage of the fish survey, including sampling, data entry, sample shipment, data analyses, laboratory analyses, and report preparation, to produce technically sound and scientifically defensible results.

4.4 Results

4.4.1 Fish Capture Data

A total of 24 fish were caught during the reference area reconnaissance (Table 7A-3). A total of seven fish were captured and processed from the unnamed area, including five Arctic Char (*Salvelinus alpinus*), one Arctic Sculpin (*Myoxocephalus scorpioides*), and one Fourhorn Sculpin. In the unnamed area, angling was the only successful method for capturing Fourhorn Sculpin. A total of 16 fish were captured and processed from Koluktoo Bay, including 14 Shorthorn Sculpin (*Myoxocephalus scorpius*) and two Arctic Sculpin. One Arctic Sculpin was captured near Tugaat River. No Fourhorn Sculpin were captured in Koluktoo Bay or near Tugaat River. Fourhorn Sculpin CPUE was notably lower in the unnamed area, near Tugaat River, and in Koluktoo Bay than in Milne Port (Table 7A-3).

Table 7A-3: Total Catch Per Unit Effort for Fish Captured from the Unnamed Area, Tugaat River and Koluktoo Bay Reference Area Reconnaissance Surveys, 2022

Site	Angling – Jigging				Gill Nets			
	Effort (h/rod)	Species	# of Fish Captured	CPUE (# fish/h/rod)	Effort (h)	Species	# of Fish Captured	CPUE (#fish/h)
Unnamed Area	2.13	ARCH	2	0.94	2.70	ARCH	3	1.11
		ARSC	1	0.47		ARSC	0	0
		FHSC	1	0.47		FHSC	0	0
Koluktoo Bay	1.17	ARSC	2	1.71	0	ARSC	-	-
		FHSC	0	0		FHSC	-	-
		SHSC	14	12.0		SHSC	-	-
Tugaat River	nd	ARSC	1	-	0	ARSC	-	-
Milne Port[(a)]	8.55	FHSC	109	12.7	42.55	FHSC	110	2.59

ARCH = Arctic Char; ARSC = Arctic Sculpin; FHSC = Fourhorn Sculpin; SHSC = Shorthorn Sculpin; h = hour; nd = no data.
(a) Fish capture data for Milne Port shown for comparison. CPUE calculated as an index of total abundance (Section 6.5.1, Chapter 6).

4.4.1.1 Fourhorn Sculpin

Only one Fourhorn Sculpin was captured in the unnamed area; no Fourhorn Sculpin were captured near Tugaat River or in Koluktoo Bay. The captured Fourhorn Sculpin was processed for fish health endpoints and identified as female (Table 7A-4). This female fish was longer, heavier, and older than the mean of female Fourhorn Sculpin caught in Milne Port.

Table 7A-4: Descriptive Statistics for Fourhorn Sculpin Fish Health Endpoints Processed from the Unnamed Area and Milne Port, 2022

Parameter	Unnamed Area		Milne Port						
	n	Value	n	Minimum	Maximum	Median	Mean	SD	SE
Female									
Total Length (mm)	1	284	20	225	306	253	255.65	20.1	4.49
Total Weight (g)	1	279	20	116	353	186	193	69.0	15.4
Carcass Weight (g)	1	148	20	61.4	203	97	104	38.9	8.69
Condition Factor	1	1.22	20	0.90	1.57	1.07	1.12	0.18	0.040
Liver Weight (g)	1	21.39	20	3.066	17.30	6.401	8.098	4.664	1.043
LSI	1	7.67	20	2.15	7.35	3.91	4.09	1.59	0.355
Gonad Weight (g)	1	13.93	20	2.366	18.21	5.7625	6.392	3.585	0.802
GSI	1	5.00	20	1.83	5.16	3.28	3.22	0.86	0.19
Age (y)	1	11	20	5	9	7	7.0	1.0	0.22

n = sample size; SD = standard deviation; SE = standard error; mm = millimeters; g = grams; y = years - = not applicable.

4.5 Discussion

The unnamed area, near the Tugaat River, and Koluktoo Bay do not appear to contain large enough populations of Fourhorn Sculpin to support target sample sizes for the MEEMP fish health program. Fourhorn Sculpin CPUE in the unnamed area was notably lower than in Milne Port (Table 7A-3): angling in the unnamed area was somewhat successful (CPUE: 0.47 fish/h/rod) while angling successfully captured many Fourhorn Sculpin in Milne Port (CPUE: 12.7 fish/h/rod). Gillnetting in the unnamed area was not successful in capturing Fourhorn Sculpin, compared to Milne Port (CPUE: 0 and 2.59 fish/h, respectively). No Fourhorn Sculpin were captured in Koluktoo Bay or near Tugaat River.

During the reconnaissance survey, fish habitat was observed; it differed between Milne Port and the unnamed area, near Tugaat River, and Koluktoo Bay, respectively. Milne Port is in a reasonably sheltered area in the southernmost portion of Milne Inlet, where habitats are relatively deep (ranging from 0 to more than 10 m) and have a steep slope prior to dropping off to deeper waters. Substrates around the Milne Port are nearly entirely boulders with some cobbles. In contrast, the unnamed area and the sampling areas near Tugaat River are located in the main body of Milne Inlet, approximately 28 km north of Milne Port. Littoral habitats at both reference areas were generally shallow (0 to 1.5 m in most areas), with long, gradual slopes primarily composed of sand, with occasional cobble and boulder reefs, prior to dropping off to deeper waters. Substrates in the unnamed area and near Tugaat River were composed of finer substrates, primarily cobbles and sand.

Koluktoo Bay is located approximately 20 km northwest of Milne Port. The Robertson River flows into the bay from the west. Fish sampling and habitat evaluation occurred primarily in the eastern half of the bay, away from the Robertson River. Habitat surveyed in this area was relatively shallow, composed primarily of angular boulders and cobbles that sloped gradually into deeper waters. Shorelines and littoral habitats were generally sandy, which continued into the bay until the boulder interface. Sampling areas were generally exposed to the westerly winds, in contrast with the protected, boulder-rich habitats of Milne Port.

Given the abundance of Fourhorn Sculpin in the Milne Port area and the observed differences in habitat composition and structure between the Milne Port and the unnamed area, near Tugaat River, and Koluktoo Bay, it is likely that the three candidate reference areas surveyed do not represent appropriate reference areas for the MEEMP Fish Health program.

5.0 CONCLUSIONS

Population densities of Fourhorn Sculpin in the unnamed area, near Tugaat River, and Koluktoo Bay do not appear to be adequate to support sample size requirements for the MEEMP fish health and tissue chemistry programs, which suggests that these areas may not be appropriate reference areas. Supporting water and sediment quality data collected near Tugaat River suggest the area was broadly comparable to Milne Port. Therefore, the 2022 sampling locations in the unnamed area, near Tugaat River, and Koluktoo Bay are not recommended for use as a fish health reference area based on data collected during the 2022 reconnaissance survey.

6.0 CLOSURE

We trust this information is sufficient for your needs at this time. Should you have any questions or concerns, please do not hesitate to contact Phil Rouget, on behalf of the undersigned, at +1 250 419 4945.

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Attachments: Tables 2A-1, 2A-2

https://golderassociates.sharepoint.com/sites/11206g/deliverables (do not use)/issued to client_for wp/400-499/1663724-431-tm-rev0-64000/1663724-431-tm-rev0-recon_memo 28apr_23.docx

Water Quality Screening
North Baffin Island, Nunavut, 2021

Sample ID / Date Sampled / Lab Sample ID / QAQC / Parent Sample ID / Parameter	CCME AW-M[1]	Lowest Detection Limit	Unit	TGT-REF-1 / 10-Aug-2022 / VA22B8899-001	MLP-4 / 10-Aug-2022 / VA22B8899-002
Anions + Nutrients					
Alkalinity, Total as CaCO3		1.0	mg/L	59.00	14.70
Bromide (Br)		5.0	mg/L	16.90	<5.0
Chloride (Cl)		50	mg/L	5580.00	<50
Fluoride (F)		0.2	mg/L	0.38	<0.20
Nitrate (as N)		0.010	mg/L	<0.010	0.09
Nitrite (as N)		0.010	mg/L	<0.010	<0.010
Ammonia (as N)		0.0050	mg/L	<0.050	<0.050
Total Kjeldahl Nitrogen		0.050	mg/L	<0.0050	<0.0050
Sulfate (SO4)		3.0	mg/L	806.00	<3.0
Phosphorus, Total		0.0020	mg/L	0.01	<0.0040
Phosphorus, Dissolved		0.0020	mg/L	0.01	<0.0020
Carbons					
Dissolved Organic Carbon		0.50	mg/L	1.65	0.78
Total Organic Carbon		0.50	mg/L	1.05	0.80
Field + Physical					
pH	**7.0 - 8.7**	0.1	pH units	7.86	7.02
Conductivity		2.0	µS/cm	17500.00	95.80
Total Dissolved Solids		10	mg/L	13800.00	65.00
Total Suspended Solids		2	mg/L	2.60	<2.0
Turbidity		0.10	NTU	0.47	<0.10
Salinity		1.0	PSU	10.40	<1.0
Hardness, Calcium Carbonate		1	mg/L	1940.00	25.90
Metals, Dissolved					
Aluminum		0.0050	mg/L	<0.0050	<0.0050
Antimony		0.0010	mg/L	<0.0010	<0.0010
Arsenic	**0.0125**	0.00040	mg/L	0.00054	<0.00040
Barium		0.0010	mg/L	0.01	<0.0010
Beryllium		0.00050	mg/L	<0.00050	<0.00050
Bismuth		0.00050	mg/L	<0.00050	<0.00050
Boron		0.30	mg/L	1.27	<0.30
Cadmium	**0.00012**	0.000010	mg/L	<0.000010	<0.000010
Calcium		1.0	mg/L	124.00	<1.0
Cesium		0.00050	mg/L	<0.00050	<0.00050
Chromium	**0.0015**	0.00050	mg/L	<0.00050	<0.00050
Cobalt		0.000050	mg/L	<0.000050	<0.000050
Copper		0.00020	mg/L	0.00	<0.00020
Gallium		0.00050	mg/L	<0.00050	<0.00050
Iron		0.010	mg/L	<0.010	<0.010
Lead		0.000050	mg/L	<0.000050	<0.000050
Lithium		0.020	mg/L	0.06	<0.020
Magnesium		1.0	mg/L	395.00	6.30
Manganese		0.00010	mg/L	0.00	<0.00010
Mercury	**0.000016**	0.0000050	mg/L	<0.0000050	<0.0000050
Molybdenum		0.00010	mg/L	0.00	0.00
Nickel		0.00050	mg/L	<0.00050	<0.00050
Phosphorus		0.050	mg/L	<0.050	<0.050
Potassium		1.0	mg/L	127.00	1.60
Rhenium		0.00050	mg/L	<0.00050	<0.00050
Rubidium		0.0050	mg/L	0.04	<0.0050
Selenium		0.00050	mg/L	<0.00050	<0.00050
Silicon		1.0	mg/L	<1.0	<1.0
Silver	**0.0075***	0.00010	mg/L	<0.00010	<0.00010
Sodium		2.5	mg/L	3080.00	5.10
Strontium		0.010	mg/L	2.43	<0.010
Sulphur (Colloidal)		5.0	mg/L	320.00	<5.0
Tellurium		0.00050	mg/L	<0.00050	<0.00050
Thallium		0.000050	mg/L	<0.000050	<0.000050
Thorium-232		0.00050	mg/L	<0.00050	<0.00050
Tin		0.0010	mg/L	<0.0010	<0.0010
Titanium		0.0050	mg/L	<0.0050	<0.0050
Tungsten		0.0010	mg/L	<0.0010	<0.0010
Uranium		0.000050	mg/L	0.00	<0.000050
Vanadium		0.00050	mg/L	<0.00050	<0.00050
Yttrium		0.00050	mg/L	<0.00050	<0.00050
Zinc		0.0010	mg/L	0.00	0.01
Zirconium		0.00050	mg/L	<0.00050	<0.00050
Metals, Total					
Aluminum		0.0050	mg/L	0.03	<0.0050
Antimony		0.0010	mg/L	<0.0010	<0.0010
Arsenic	**0.0125**	0.00040	mg/L	0.00054	<0.00040
Barium		0.0010	mg/L	0.01	<0.0010
Beryllium		0.00050	mg/L	<0.00050	<0.00050
Bismuth		0.00050	mg/L	<0.00050	<0.00050
Boron		0.30	mg/L	1.40	<0.30
Cadmium	**0.00012**	0.000010	mg/L	<0.000010	<0.000010
Calcium		1.0	mg/L	124.00	<1.0
Cesium		0.00050	mg/L	<0.00050	<0.00050
Chromium		0.00050	mg/L	<0.00050	<0.00050
Cobalt		0.000050	mg/L	<0.000050	<0.000050
Copper		0.00050	mg/L	0.00	<0.00050
Gallium		0.00050	mg/L	<0.00050	<0.00050
Iron		0.010	mg/L	0.03	<0.010
Lead		0.000050	mg/L	0.00	<0.000050
Lithium		0.020	mg/L	0.05	<0.020
Magnesium		1.0	mg/L	362.00	6.40
Manganese		0.00020	mg/L	0.00	<0.00020
Mercury	**0.000016**	0.0000050	mg/L	<0.0000050	<0.0000050
Molybdenum		0.00010	mg/L	0.00	0.00
Nickel		0.00050	mg/L	<0.00050	<0.00050
Phosphorus		0.050	mg/L	<0.050	<0.050
Potassium		1.0	mg/L	119.00	1.60
Rubidium		0.00050	mg/L	<0.00050	<0.00050
Rhenium		0.0050	mg/L	0.03	<0.0050
Selenium		0.00050	mg/L	<0.00050	<0.00050
Silicon		1.0	mg/L	<1.0	<1.0
Silver	**0.0075***	0.00010	mg/L	<0.00010	<0.00010
Sodium		2.5	mg/L	3340.00	3.00
Strontium		0.010	mg/L	2.22	<0.010
Sulphur (Colloidal)		5.0	mg/L	289.00	<5.0
Tellurium		0.00050	mg/L	<0.00050	<0.00050
Thallium		0.000050	mg/L	<0.000050	<0.000050
Thorium-232		0.00050	mg/L	<0.00050	<0.00050
Tin		0.0010	mg/L	<0.0010	<0.0010
Titanium		0.0050	mg/L	<0.0050	<0.0050
Tungsten		0.0010	mg/L	<0.0010	<0.0010
Uranium		0.000050	mg/L	0.00	<0.000050
Vanadium		0.00050	mg/L	0.00	<0.00050
Yttrium		0.00050	mg/L	<0.00050	<0.00050
Zinc		0.0030	mg/L	<0.0030	0.01
Zirconium		0.00050	mg/L	<0.00050	<0.00050

CCME = Canadian Council of Ministers for the Environment; mg/L = milligrams per litre; < = below detection limit; - = no data; > = greater than; * = short-term exposure guideline for silver

Bold, outline and blue shaded Exceeds CCME AW-F guidelines for protection of marine aquatic life

1. Canadian Council of Ministers of the Environment (CCME 1999, updated to 2019) water quality guidelines for the protection of marine aquatic life.

Sample ID Date Sampled Time Sampled Laboratory Sample ID QA/QC Parent Sample ID	Lowest Detection Limits	Units	CCME [1] ISQG	CCME [1] PEL	NOAA Sediment Benchmarks T_{20}	NOAA TEL	NOAA ERL	NOAA T_{50}	NOAA PEL	NOAA ERM	NOAA AET	Eco Tox EqP(@1% TOC)	TGT-REF-1 10-Aug-2022 12:30 VA22B8901-005
Physical Parameters													
Moisture	0.25	%	-	-	-	-	-	-	-	-	-	-	19
pH (1:2 soil:water)	0.1	pH units	-	-	-	-	-	-	-	-	-	-	8.89
Particle Size													
clay (<0.004mm)	1	%	-	-	-	-	-	-	-	-	-	-	<1.0
silt (0.063mm - 0.004mm)	1	%	-	-	-	-	-	-	-	-	-	-	7.9
sand (2.0mm - 0.063mm)	1	%	-	-	-	-	-	-	-	-	-	-	91.8
gravel (>2mm)	1	%	-	-	-	-	-	-	-	-	-	-	<1.0
Organic / Inorganic Carbon													
carbon, inorganic	0.05	%	-	-	-	-	-	-	-	-	-	-	3.43
carbon, total	0.05	%	-	-	-	-	-	-	-	-	-	-	4.54
carbon, total organic	0.05	%	-	-	-	-	-	-	-	-	-	-	1.11
carbon, inorganic (as CaCO3 equivalent)	0.4	%	-	-	-	-	-	-	-	-	-	-	28.6
organic matter	0.1	%	-	-	-	-	-	-	-	-	-	-	1.91
Metals													
Aluminum	50	mg/kg	-	-	-	-	-	-	-	-	18000	-	674
Antimony	0.1	mg/kg	-	-	0.63	-	-	2.4	-	-	9.3	-	<0.10
Arsenic	0.1	mg/kg	7.24	41.6	7.4	7.24	8.2	20	41.6	70	35	-	0.68
Barium	0.5	mg/kg	-	-	-	130.1	-	-	-	-	48	-	2.05
Beryllium	0.1	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.10
Bismuth	0.2	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.20
Boron	5	mg/kg	-	-	-	-	-	-	-	-	-	-	16.9
Cadmium	0.02	mg/kg	0.7	4.2	0.38	0.68	1.2	1.4	4.21	9.6	3	-	<0.020
Calcium	50	mg/kg	-	-	-	-	-	-	-	-	-	-	125000
Chromium	0.5	mg/kg	52.3	160	49	52.3	81	141	160	370	62	-	4.19
Cobalt	0.1	mg/kg	-	-	-	-	-	-	-	-	10	-	0.52
Copper	0.5	mg/kg	18.7	108	32	18.7	34	94	108	270	390	-	0.66
Iron	50	mg/kg	-	-	-	-	-	-	-	-	220000	-	4110
Lead	0.5	mg/kg	30.2	112	30	30.24	46.7	94	112	218	400	-	1.12
Lithium	2	mg/kg	-	-	-	-	-	-	-	-	-	-	2.8
Magnesium	20	mg/kg	-	-	-	-	-	-	-	-	-	-	14500
Manganese	1	mg/kg	-	-	-	-	-	-	-	-	260	-	36.9
Mercury	0.005	mg/kg	0.13	0.7	0.14	0.13	0.15	0.48	0.7	0.71	0.41	-	<0.0050
Molybdenum	0.1	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.10
Nickel	0.5	mg/kg	30[(a)]	50[(a)]	15	15.9	20.9	47	42.8	51.6	110	-	1.52
Phosphorus	50	mg/kg	-	-	-	-	-	-	-	-	-	-	200
Potassium	100	mg/kg	-	-	-	-	-	-	-	-	-	-	240
Selenium	0.2	mg/kg	-	-	-	-	-	-	-	-	1	-	<0.20
Silver	0.1	mg/kg	1[(a)]	2.2[(a)]	0.23	0.73	1	1.1	1.77	3.7	3.1	-	<0.10
Sodium	50	mg/kg	-	-	-	-	-	-	-	-	-	-	680
Strontium	0.5	mg/kg	-	-	-	-	-	-	-	-	-	-	72.1
Sulfur	1000	mg/kg	-	-	-	-	-	-	-	-	-	-	<1000
Thallium	0.05	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.050
Tin	2	mg/kg	-	-	-	0.048	-	-	-	-	3.4	-	<2.0
Titanium	1	mg/kg	-	-	-	-	-	-	-	-	-	-	70.9
Tungsten	0.5	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.50
Uranium	0.05	mg/kg	-	-	-	-	-	-	-	-	-	-	0.414
Vanadium	0.2	mg/kg	-	-	-	-	-	-	-	-	57	-	6.61
Zinc	2	mg/kg	124	271	94	124	150	245	271	410	410	-	2.7
Zirconium	1	mg/kg	-	-	-	-	-	-	-	-	-	-	1.1
VOCs													
benzene	0.0050	mg/kg	-	-	-	-	-	-	-	-	-	0.06	-
ethylbenzene	0.015	mg/kg	-	-	-	-	-	-	-	-	0.004	3.6	-
toluene	0.050	mg/kg	-	-	-	-	-	-	-	-	-	0.67	-
xylene, m+p-	0.050	mg/kg	-	-	-	-	-	-	-	-	-	0.025	-
xylene, o-	0.050	mg/kg	-	-	-	-	-	-	-	-	-	-	-
xylenes, total	0.075	mg/kg	-	-	-	-	-	-	-	-	0.004	-	-
Hydrocarbons													
F1 (C6-C10)	5.0	mg/kg	-	-	-	-	-	-	-	-	-	-	-
F1-BTEX	5.0	mg/kg	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	30	mg/kg	-	-	-	-	-	-	-	-	-	-	-
F3 (C16-C34)	50	mg/kg	-	-	-	-	-	-	-	-	-	-	-
F4 (C34-C50)	50	mg/kg	-	-	-	-	-	-	-	-	-	-	-
PAHs													
acenaphthene	0.0050	mg/kg	0.00671	0.0889	0.019	0.007	0.016	0.116	0.089	0.500	0.130	-	<0.0050
acenaphthylene	0.0050	mg/kg											<0.0050
acridine	0.0100	mg/kg											<0.010
anthracene	0.0040	mg/kg	0.0469	0.245	0.034	0.0469	0.0853	0.29	0.245	1.1	0.28	-	<0.0040
benz(a)anthracene	0.010	mg/kg	0.0748	0.693	0.061	0.0748	0.261	0.466	0.693	1.6	0.96	-	<0.010
benzo(a)pyrene	0.010	mg/kg	0.0888	0.763	0.069	0.0888	0.43	0.52	0.763	1.6	1.1	-	<0.010
benzo(b+j)fluoranthene	0.010	mg/kg	-	-	0.13	-	-	1.107	-	-	1.8	-	<0.010
benzo(b+j+k)fluoranthene	0.015	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.015
benzo(g,h,i)perylene	0.010	mg/kg	0.31[(a)]	0.78[(a)]	-	-	-	-	-	-	-	-	<0.010
benzo(k)fluoranthene	0.010	mg/kg	2.3[(a)]	4.5[(a)]	0.07	-	-	0.537	-	-	1.8	-	<0.010
chrysene	0.010	mg/kg	0.108	0.846	0.082	0.108	0.384	0.65	0.846	2.8	0.95	-	<0.010
dibenz(a,h)anthracene	0.0050	mg/kg	0.00622	0.135	0.019	0.00622	0.0634	0.113	0.135	0.26	0.23	-	<0.0050
fluoranthene	0.010	mg/kg	0.113	1.494	0.119	0.113	0.6	1.034	1.494	5.1	1.3	-	<0.010
fluorene	0.010	mg/kg	0.0212	0.144	0.019	0.0212	0.019	0.114	0.144	0.54	0.12	0.54	<0.010
indeno(1,2,3-c,d)pyrene	0.010	mg/kg	0.34[(a)]	0.88[(a)]	0.068	-	-	0.488	-	-	0.6	-	<0.010
methylnaphthalene, 1+2-	0.015	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.015
methylnaphthalene, 1-	0.010	mg/kg	-	-	0.021	-	-	0.094	-	-	-	-	<0.010
methylnaphthalene, 2-	0.010	mg/kg	0.0202	0.201	0.021	0.0202	0.07	0.128	0.201	0.67	0.064	-	<0.010
naphthalene	0.010	mg/kg	0.0346	0.391	0.03	0.0346	0.16	0.217	0.391	2.1	0.23	0.48	<0.010
phenanthrene	0.010	mg/kg	0.0867	0.544	0.068	0.0867	0.24	0.455	0.544	1.5	0.66	-	<0.010
pyrene	0.010	mg/kg	0.153	1.398	0.125	0.153	0.665	0.932	1.398	2.6	2.4	-	<0.010
quinoline	0.010	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.010
B(a)P total potency equivalents [B(a)P TPE]	0.020	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.020
IACR (CCME)	0.150	-	-	-	-	-	-	-	-	-	-	-	<0.150
IACR AB (coarse)	0.10	-	-	-	-	-	-	-	-	-	-	-	<0.10
IACR AB (fine)	0.10	-	-	-	-	-	-	-	-	-	-	-	<0.10
PAHs, total (BC Sched 3.4)	0.040	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.040
PAHs, total (EPA 16 - DAS)	0.140	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.140
PAHs, total (EPA 16)	0.040	mg/kg	-	-	-	-	-	-	-	-	-	-	<0.040

Notes

[1] Canadian Council of Ministers of the Environment (CCME). 1999. Canadian Sediment Quality Guidelines for the Protection of Aquatic Life. In: Canadian Environmental Quality Guidleines, 1999, Canadian Council of Ministers of the Environment, Winnipeg, MB.

[(a)]Guideline value substituted with the BC ENV Working Sediment Guideline in the absence of an applicable CCME Sediment Guideline

BC ENV = British Columbia Ministry of Environment; CCME = Canadian Council of Miniters of the Environment; ISQG = interim sediment quality guidelines; mg/kg = miligram per kilogram; NOAA = National Oceanic and Atmospheric Administration; PEL = probable effects levels; REL = Effect Range Low; SWQG = working sediment quality guidelines; T20 = Concentrations corresponding to 20% probability of observing toxicity; TEL= Threshold Effects Levels; T50 = Concentrations corresponding to 50% probably of observing toxicity; PEL = Probable Effect Levels; pH = scale of acidity; % - percentage; "-" = no value or no result available

Value	Greater than CCME ISQG guideline
Value	Greater than CCME ISQG and PEL guidelines
Value	Greater than BC ENV working lower SWQG
Value	Greater than BC ENV working upper SWQG
Value	Greater than NOAA sediment Benchmarks T_{20} guideline
Value	Greater than NOAA sediment Benchmarks TEL guideline
Value	Greater than NOAA sediment Benchmarks ERLguideline
Value	Greater than NOAA sediment Benchmarks T_{50} guideline
Value	Greater than NOAA sediment Benchmarks PEL guideline

APPENDIX 7B

Fish Health Data

Table 7C-1: Sample Counts for Fish Tissue Chemistry Analyses from the Milne Port Area, 2010 to 2022

Species	Year	Number of Samples	
		Metals	Polycyclic Aromatic Hydrocarbons
Arctic Char	2010	22[(a)]	0
	2013	17	14
	2015	5	0
	2016	13	0
	2017	2	0
	2018	26	0
	2019	47	0
	2020	8	8
	2021	8	8
	2022	8	26
	Total	**156**	**56**
Arctic Staghorn Sculpin	2013	1	0
Fourhorn Sculpin	2013	2	1
	2019	30	0
	2020	8	8
	2021	8	8
	2022	8	8
	Total	**56**	**25**
Hiatella arctica	2018	24	0
	2019	80	0
	2020	8	8
	2021	8	8
	2022	8	4
	Total	**128**	**20**
Unknown Sculpin	2019	30	0
Unknown Fish	2015	10	0
Grand Total	**-**	**381**	**101**

(a) Includes 11 muscle samples and 11 liver samples.

Table 7C-2: Summary of *Hiatella arctica* Samples Sent to Bureau Veritas Laboratory for Tissue Chemistry Analysis, 2022

Composite Sample	Chemistry	Fish Identification Numbers	Number of Individuals
MLN-HTAR-COMP-METALS-1	Metals	BAFF22UMLNHTAR1508	2.00
		BAFF22UMLNHTAR1512	
MLN-HTAR-COMP-METALS-2	Metals	BAFF22UMLNHTAR1522	2.00
		BAFF22UMLNHTAR1525	
MLN-HTAR-COMP-METALS-3	Metals	BAFF22UMLNHTAR1509	2.00
		BAFF22UMLNHTAR1514	
MLN-HTAR-COMP-METALS-4	Metals	BAFF22UMLNHTAR1517	2.00
		BAFF22UMLNHTAR1521	
MLN-HTAR-COMP-METALS-5	Metals	BAFF22UMLNHTAR1504	2.00
		BAFF22UMLNHTAR1530	
MLN-HTAR-COMP-METALS-6	Metals	BAFF22UMLNHTAR1523	3.00
		BAFF22UMLNHTAR1533	
		BAFF22UMLNHTAR1543	
MLN-HTAR-COMP-METALS-7	Metals	BAFF22UMLNHTAR1515	3.00
		BAFF22UMLNHTAR1518	
		BAFF22UMLNHTAR1526	
MLN-HTAR-COMP-METALS-8	Metals	BAFF22UMLNHTAR1520	4.00
		BAFF22UMLNHTAR1529	
		BAFF22UMLNHTAR1538	
		BAFF22UMLNHTAR1544	
MLN-HTAR-COMP-PAH-A	PAH	BAFF22UMLNHTAR1501	6.00
		BAFF22UMLNHTAR1502	
		BAFF22UMLNHTAR1531	
		BAFF22UMLNHTAR1532	
		BAFF22UMLNHTAR1534	
		BAFF22UMLNHTAR1535	
MLN-HTAR-COMP-PAH-B	PAH	BAFF22UMLNHTAR1503	4
		BAFF22UMLNHTAR1510	
		BAFF22UMLNHTAR1505	
		BAFF22UMLNHTAR1542	
MLN-HTAR-COMP-PAH-C	PAH	BAFF22UMLNHTAR1516	6.00
		BAFF22UMLNHTAR1527	
		BAFF22UMLNHTAR1528	
		BAFF22UMLNHTAR1536	
		BAFF22UMLNHTAR1539	
		BAFF22UMLNHTAR1541	
MLN-HTAR-COMP-PAH-D	PAH	BAFF22UMLNHTAR1507	4.00
		BAFF22UMLNHTAR1511	
		BAFF22UMLNHTAR1524	
		BAFF22UMLNHTAR1540	

These were doubled up for PAH analysis due to small sample volumes. Table will need to be revised. See results from BV on which samples to pool.

PAHs = Polycyclic aromatic hydrocarbons.

Table 7C-3: Concentrations of Metals in Arctic Char Muscle Tissue Collected from the Milne Port Area, 2022

Parameter	DL	Fish Identification Number							
		BAFF22UDPFARCH4004	BAFF22UDPFARCH4009	BAFF22UDPFARCH4010	BAFF22UDPFARCH4017	BAFF22UDPFARCH4018	BAFF22UDPFARCH4023	BAFF22UDPFARCH4024	BAFF22UDPFARCH4025
Moisture (%)	0.30	65	73	68	72	74	68	72	66
Total Metals (mg/kg ww)									
Aluminum	0.50	0.77	1.31	<0.50	0.63	<0.50	<0.50	<0.50	<0.50
Antimony	0.0020	0.0030	0.0190	0.0033	0.0031	0.0030	0.0031	<0.0020	<0.0020
Arsenic	0.0050	0.527	0.371	0.373	0.724	0.543	0.635	0.531	0.439
Barium	0.010	0.024	0.024	0.016	<0.010	<0.010	0.041	0.025	<0.010
Beryllium	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Bismuth	0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013
Boron	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cadmium	0.0013	0.0208	0.0032	0.0022	0.0030	<0.0013	0.0035	0.0025	0.0022
Calcium	4.0	86.9	164	267	101	89.1	704	1390	93.1
Chromium	0.025	<0.025	0.033	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Cobalt	0.0013	0.0076	0.0090	0.0498	0.0037	0.0075	0.0067	0.0060	0.0062
Copper	0.013	0.578	0.331	0.273	0.376	0.300	0.391	0.307	0.295
Iron	0.25	7.58	9.95	3.51	3.85	3.46	6.22	4.63	3.66
Lead	0.0013	0.0079	0.0130	0.0045	0.0043	0.0025	0.0032	0.0044	0.0030
Magnesium	0.40	290	363	325	259	311	326	329	313
Manganese	0.010	0.098	0.108	0.146	0.075	0.092	0.239	0.262	0.059
Mercury	0.013	0.041	0.085	0.101	0.074	0.069	0.034	0.054	0.051
Molybdenum	0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080
Nickel	0.010	0.016	0.041	0.013	0.038	0.013	<0.010	0.012	<0.010
Phosphorous	2.0	2810	3480	3050	2570	3170	3190	3520	2800
Potassium	2.5	4180	5170	4470	4070	5060	4400	4340	4240
Selenium	0.010	0.392	0.481	0.386	0.335	0.446	0.367	0.416	0.401
Silver	0.0013	<0.0013	0.0014	0.0014	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013
Sodium	2.5	302	352	299	431	345	292	458	273
Strontium	0.013	0.174	0.260	0.623	0.176	0.167	1.90	2.95	0.168
Thallium	0.00040	0.00172	0.00370	0.00215	0.00160	0.00312	0.00234	0.00157	0.00191
Tin	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Titanium	0.13	0.59	0.73	0.62	0.50	0.62	0.64	0.74	0.57
Uranium	0.00040	0.00061	0.00180	0.00063	<0.00040	<0.00040	0.00164	0.00155	0.00099
Vanadium	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Zinc	0.20	4.85	8.05	5.12	3.85	5.47	5.38	4.51	4.00

% = percent; mg/kg ww = milligram per killigram wet weight; DL = Detection Limit; < = less than.

Table 7C-4: Concentrations of Metals in Fourhorn Sculpin Muscle Tissue Collected from the Milne Port Area, 2022

Parameter	DL	Fish Identification Number							
		BAFF22UDPFFHSC1004	BAFF22UDPFFHSC1012	BAFF22UDPFFHSC1019	BAFF22UDPFFHSC1023	BAFF22UDPFFHSC1024	BAFF22UDPFFHSC1026	BAFF22UDPFFHSC1028	BAFF22UDPFFHSC1038
Moisture (%)	0.30	77	78	78	76	76	75	78	77
Total Metals (mg/kg ww)									
Aluminum	0.50	0.85	0.96	0.65	<0.50	0.96	0.59	1.37	0.62
Antimony	0.0020	0.0027	0.0044	0.0025	0.0029	0.0029	<0.0020	0.0031	0.0023
Arsenic	0.0050	2.56	4.67	3.57	4.21	3.09	1.79	2.06	5.87
Barium	0.010	0.011	0.019	0.013	0.010	0.013	<0.010	0.017	<0.010
Beryllium	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Bismuth	0.0013	0.0018	0.0023	0.0020	0.0016	0.0029	0.0024	0.0025	0.0021
Boron	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cadmium	0.0013	0.0027	0.0063	0.0027	0.0056	0.0061	0.0115	0.0034	0.0074
Calcium	4.0	102	104	108	140	142	122	121	122
Chromium	0.025	<0.025	<0.025	<0.025	<0.025	0.030	0.029	0.027	<0.025
Cobalt	0.0013	0.211	0.0126	0.0124	0.0153	0.0099	0.0094	0.0115	0.0111
Copper	0.013	0.316	0.306	0.364	0.396	0.541	0.367	0.289	0.328
Iron	0.25	7.19	6.81	5.40	3.47	8.08	7.31	5.58	6.27
Lead	0.0013	0.0056	0.0068	0.0055	0.0061	0.0128	0.0054	0.0317	0.0108
Magnesium	0.40	275	246	268	268	264	290	320	297
Manganese	0.010	0.214	0.115	0.138	0.143	0.256	0.213	0.152	0.254
Mercury	0.013	0.198	0.340	0.430	0.272	0.237	0.154	0.195	0.283
Molybdenum	0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080
Nickel	0.010	0.028	0.022	0.020	0.042	0.032	0.019	0.017	0.021
Phosphorous	2.0	2100	1890	2130	2210	2200	2100	2200	2280
Potassium	2.5	3620	3350	3630	3670	3470	3480	3770	3900
Selenium	0.010	0.567	0.529	0.521	0.625	0.496	0.490	0.440	0.605
Silver	0.0013	<0.0013	<0.0013	<0.0013	0.0017	<0.0013	<0.0013	<0.0013	<0.0013
Sodium	2.5	520	662	600	773	501	642	560	505
Strontium	0.013	0.336	0.445	0.545	0.753	0.636	0.493	0.428	0.513
Thallium	0.00040	0.00100	0.00096	0.00114	0.00069	0.00074	0.00076	0.00078	0.00059
Tin	0.020	0.042	0.024	<0.020	<0.020	0.035	0.033	<0.020	0.021
Titanium	0.13	0.42	0.42	0.45	0.46	0.47	0.44	0.49	0.50
Uranium	0.00040	0.00134	0.00271	0.00089	0.00121	0.00075	0.00108	0.00076	0.00084
Vanadium	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Zinc	0.20	10.7	14.4	9.74	18.3	17.6	14.3	11.8	15.0

% = percent; mg/kg ww = milligram per killigram wet weight; DL = Detection Limit; < = less than.

Table 7C-5: Concentrations of Metals in *Hiatella arctica* Tissue Collected from the Milne Port Area, 2022

Parameter	DL	Fish Identification Number							
		MLN-HTAR-COMP-METALS-1	MLN-HTAR-COMP-METALS-2	MLN-HTAR-COMP-METALS-3	MLN-HTAR-COMP-METALS-4	MLN-HTAR-COMP-METALS-5	MLN-HTAR-COMP-METALS-6	MLN-HTAR-COMP-METALS-7	MLN-HTAR-COMP-METALS-8
Moisture (%)	0.30	78	80	75	78	72	80	76	77
Total Metals (mg/kg ww)									
Aluminum	0.50	770	710	414	753	538	715	544	1180
Antimony	0.0020	0.0216	0.0286	0.0146	0.0248	0.0184	0.0302	0.0274	0.0280
Arsenic	0.0050	2.45	3.35	2.42	2.20	3.44	3.35	2.66	3.40
Barium	0.010	4.81	4.23	3.51	4.79	33.2	15.1	13.3	13.3
Beryllium	0.0020	0.0425	0.0395	0.0206	0.0373	0.0316	0.0413	0.0286	0.0648
Bismuth	0.0013	0.0091	0.0117	0.0051	0.0088	0.0089	0.0110	0.0077	0.0169
Boron	0.20	8.44	9.10	4.62	11.4	6.20	7.94	12.7	12.2
Cadmium	0.0013	0.578	0.944	0.727	0.840	0.646	0.839	0.976	1.08
Calcium	4.0	5990	6100	5720	5060	7080	6990	4670	9480
Chromium	0.025	2.00	1.83	1.46	1.87	2.00	2.08	1.50	3.12
Cobalt	0.0013	1.01	1.71	0.559	0.747	1.38	1.98	1.18	1.73
Copper	0.013	2.61	2.32	2.32	2.12	2.58	2.97	2.81	4.64
Iron	0.25	1980	1750	2770	1460	1550	1870	1980	3000
Lead	0.0013	1.16	2.52	0.451	1.13	1.14	1.92	0.886	2.21
Magnesium	0.40	3170	3160	2020	2790	2690	2910	2360	3420
Manganese	0.010	102	181	59.4	69.0	170	282	171	236
Mercury	0.013	0.025	0.030	0.025	0.024	0.061	0.045	0.030	0.034
Molybdenum	0.0080	0.333	0.338	0.274	0.369	0.392	0.400	0.325	0.436
Nickel	0.010	1.78	2.13	1.27	1.56	1.93	2.38	1.55	2.78
Phosphorous	2.0	1860	1200	1480	1240	1780	1140	1790	1500
Potassium	2.5	1840	1650	1610	2060	1220	1450	1630	1700
Selenium	0.010	1.26	1.24	1.51	1.36	1.22	1.44	1.35	1.37
Silver	0.0013	0.0053	0.0057	0.0046	0.0056	0.0132	0.0099	0.0082	0.0083
Sodium	2.5	5590	6070	3930	6310	3400	4970	6070	4880
Strontium	0.013	24.6	25.9	27.1	19.3	37.9	38.8	25.9	49.4
Thallium	0.00040	0.0152	0.0193	0.00782	0.0138	0.0206	0.0218	0.0133	0.0281
Tin	0.020	0.049	0.050	0.038	0.045	0.039	0.050	0.043	0.070
Titanium	0.13	25.3	24.1	18.1	23.7	30.5	23.7	16.5	37.7
Uranium	0.00040	0.156	0.157	0.131	0.148	0.177	0.169	0.129	0.220
Vanadium	0.020	3.25	4.39	1.53	2.72	2.91	3.84	2.49	4.82
Zinc	0.20	14.0	15.5	16.9	13.7	17.2	18.7	18.7	20.0

% = percent; mg/kg ww = milligram per killigram wet weight; DL = Detection Limit; < = less than.

Table 7C-6: Concentrations of Polycyclic Aromatic Hydrocarbons in Arctic Char Muscle Tissue Collected from the Milne Port Area, 2022

Parameter	DL	Fish Identification Number																											
		BAFF22UDPFA RCH4001	BAFF22UDPFA RCH4002	BAFF22UDPFA RCH4003	BAFF22UDPFA RCH4004	BAFF22UDPFA RCH4005	BAFF22UDPFA RCH4006	BAFF22UDPFA RCH4007	BAFF22UDPFA RCH4008	BAFF22UDPFA RCH4009	BAFF22UDPFA RCH4010	BAFF22UDPFA RCH4011[a]	BAFF22UDPFA RCH4012	BAFF22UDPFA RCH4013	BAFF22UDPFA RCH4014	BAFF22UDPFA RCH4015	BAFF22UDPFA RCH4016	BAFF22UDPFA RCH4017	BAFF22UDPFA RCH4018	BAFF22UDPFA RCH4019	BAFF22UDPFA RCH4020	BAFF22UDPFA RCH4021	BAFF22UDPFA RCH4022	BAFF22UDPFA RCH4023	BAFF22UDPFA RCH4024	BAFF22UDPFA RCH4025	BAFF22UDPFA RCH4026	Duplicate[a]
Polycyclic Aromatic Hydrocarbons (µg/kg ww)[b]																												
Perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylnaphthalene	0.50	<0.50	<0.50	<0.50	0.56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Naphthalene	1.00	<1.00	<1.00	<1.00	8.43	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	3.29	<1.00	<1.00	3.06	<1.00	4.98	1.45	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Acenaphthylene	0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Acenaphthene	0.15	<0.15	<0.15	<0.15	0.68	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Fluorene	0.16	<0.16	<0.16	<0.16	0.76	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Phenanthrene	0.20	0.30	<0.20	<0.20	1.87	<0.20	<0.20	<0.20	<0.20	0.70	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.22	<0.20
Anthracene	0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Fluoranthene	0.20	<0.20	<0.20	<0.20	0.27	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pyrene	0.16	<0.16	<0.16	<0.16	0.47	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Benzo(a)anthracene	0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36
Chrysene	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(j)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+j)fluoranthene	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo(k)fluoranthene	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibenz(a,h)anthracene	0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Benzo(g,h,i)perylene	0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Surrogate Recovery (%)																												
$^{13}C_6$-Naphthalene	-	42	46	34	38	44	30	34	40	40	28	28	28	18	28	28	16	24	28	30	42	30	42	46	44	38	46	34
$^{13}C_6$-Acenaphthylene	-	50	54	50	52	50	52	52	52	48	48	48	48	50	46	48	40	52	56	48	52	44	48	50	46	46	52	50
$^{13}C_6$-Acenaphthene	-	52	54	52	54	52	52	52	54	50	48	48	48	50	46	48	38	54	54	48	52	42	50	52	50	46	52	50
$^{13}C_6$-Fluorene	-	44	44	44	40	40	42	40	38	38	40	36	40	40	38	42	36	48	56	48	40	38	42	44	42	40	44	40
$^{13}C_6$-Phenanthrene	-	44	46	46	44	44	46	44	40	40	42	38	42	46	40	44	38	48	56	48	46	42	44	48	46	40	46	40
$^{13}C_6$-Anthracene	-	46	50	48	50	44	50	44	42	42	44	38	50	54	46	50	40	56	66	54	50	46	46	50	48	42	48	42
$^{13}C_6$-Fluoranthene	-	46	50	50	48	46	50	46	44	46	44	40	44	50	42	46	44	50	54	46	48	48	48	52	50	44	48	42
$^{13}C_3$-Pyrene	-	48	52	50	50	50	52	46	44	46	46	42	42	48	44	46	42	50	54	48	48	46	46	52	50	42	48	44
$^{13}C_6$-Benzo(a)anthracene	-	56	62	60	44	60	64	64	62	52	60	56	52	60	52	54	56	64	64	64	56	56	54	64	70	56	66	56
$^{13}C_6$-Chrysene	-	46	54	52	40	54	56	58	56	48	54	50	42	48	44	46	48	54	54	54	48	48	48	56	62	48	56	52
$^{13}C_6$-Benzo(b+j)fluoranthene	-	42	50	46	44	48	48	50	48	50	46	46	52	58	50	52	42	60	58	54	44	48	42	50	50	42	52	46
$^{13}C_6$-Benzo(k)fluoranthene	-	44	52	48	46	50	54	52	48	48	48	50	50	58	50	50	46	58	58	54	46	52	46	56	56	46	56	52
$^{13}C_4$-Benzo(a)pyrene	-	46	52	48	50	50	50	50	50	50	48	46	52	60	52	54	48	60	60	52	48	54	48	52	54	46	54	50
$^{13}C_6$-Indeno(1,2,3-cd)pyrene	-	36	48	40	42	48	48	48	46	34	44	44	54	60	48	46	40	64	54	46	44	50	44	50	54	44	54	46
$^{13}C_6$-Dibenz(a,h)anthracene	-	34	44	36	38	42	44	46	42	30	42	40	56	60	46	46	36	64	50	46	40	46	40	44	50	42	54	42
$^{13}C_{12}$-Benzo(ghi)perylene	-	42	56	48	44	56	58	58	54	44	50	52	50	58	46	46	50	62	54	48	54	54	50	60	66	50	62	52

% = percent; µg/kg ww = microgram per killigram wet weight; DL = Detection Limit; < = less than; - = not analyzed in 2022.

(a) Duplicate sample FIN: BAFF22UDPFARCH4011

(b) Units differ from previous sampling years, where mg/kg ww were used.

Table 7C-7: Concentrations of Polycyclic Aromatic Hydrocarbons in Fourhorn Sculpin Muscle Tissue Collected from the Milne Port Area, 2022

Parameter	DL	Fish Identification Number							
		BAFF22UDPFFHSC1 004	BAFF22UDPFFHSC1 012	BAFF22UDPFFHSC1 019	BAFF22UDPFFHSC1 023	BAFF22UDPFFHSC1 024	BAFF22UDPFFHSC1 026	BAFF22UDPFFHSC1 028	BAFF22UDPFFHSC1 038
Polycyclic Aromatic Hydrocarbons (mg/kg ww)									
Naphthalene	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.09
Acenaphthylene	0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Acenaphthene	0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Fluorene	0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Phenanthrene	0.20	<0.20	<0.20	0.66	0.53	<0.20	<0.20	<0.20	<0.20
Anthracene	0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Fluoranthene	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pyrene	0.16	<0.16	<0.16	0.21	<0.16	<0.16	<0.16	<0.16	<0.16
Benzo(a)anthracene	0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36
Chrysene	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(b)fluoranthene	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo(k)fluoranthene	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibenz(a,h)anthracene	0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Benzo(g,h,i)perylene	0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Surrogate Recovery (%)									
$^{13}C_6$-Naphthalene	-	26	34	34	20	32	26	36	22
$^{13}C_6$-Acenaphthylene	-	46	42	46	36	44	46	54	42
$^{13}C_6$-Acenaphthene	-	50	50	48	38	50	48	60	46
$^{13}C_6$-Fluorene	-	42	40	36	32	40	42	50	46
$^{13}C_6$-Phenanthrene	-	44	38	36	32	38	42	48	42
$^{13}C_6$-Anthracene	-	48	40	40	38	42	44	50	46
$^{13}C_6$-Fluoranthene	-	50	46	46	40	46	52	58	54
$^{13}C_3$-Pyrene	-	54	52	50	42	48	56	64	58
$^{13}C_6$-Benzo(a)anthracene	-	62	60	56	46	60	72	76	70
$^{13}C_6$-Chrysene	-	60	60	54	42	56	70	68	68
$^{13}C_6$-Benzo(b)fluoranthene	-	46	50	42	36	48	58	58	50
$^{13}C_6$-Benzo(k)fluoranthene	-	60	56	50	50	60	68	70	64
$^{13}C_4$-Benzo(a)pyrene	-	54	52	50	44	54	64	66	56
$^{13}C_6$-Indeno(1,2,3-cd)pyrene	-	42	40	38	40	52	60	58	48
$^{13}C_6$-Dibenz(a,h)anthracene	-	36	36	32	34	46	54	50	46
$^{13}C_{12}$-Benzo(ghi)perylene	-	50	46	44	42	52	66	62	58

% = percent; mg/kg ww = milligram per killigram wet weight; DL = Detection Limit; < = less than; - = not analyzed in 2022.

Table 7C-8: Concentrations of Polycyclic Aromatic Hydrocarbons in *Hiatella arctica* Tissues Collected from the Milne Port Area, 2022

Parameter	DL	Fish Identification Number			
		MLN-HTAR-COMP-PAH-A	MLN-HTAR-COMP-PAH-B	MLN-HTAR-COMP-PAH-C	MLN-HTAR-COMP-PAH-D
Polycyclic Aromatic Hydrocarbons (mg/kg ww)					
1-Methylnaphthalene	0.050	<0.050	<0.050	<0.050	<0.050
2-Methylnaphthalene	0.050	<0.050	<0.050	<0.050	<0.050
Benzo(j)fluoranthene	0.050	<0.050	<0.050	<0.050	<0.050
Perylene	0.050	<0.050	<0.050	<0.050	<0.050
Naphthalene	0.050	<0.050	<0.050	<0.050	<0.050
Acenaphthylene	0.050	<0.050	<0.050	<0.050	<0.050
Acenaphthene	0.050	<0.050	<0.050	<0.050	<0.050
Fluorene	0.050	<0.050	<0.050	<0.050	<0.050
Phenanthrene	0.050	<0.050	<0.050	<0.050	<0.050
Anthracene	0.050	<0.050	<0.050	<0.050	<0.050
Fluoranthene	0.050	<0.050	<0.050	<0.050	<0.050
Pyrene	0.050	<0.050	<0.050	<0.050	<0.050
Benzo(a)anthracene	0.050	<0.050	<0.050	<0.050	<0.050
Chrysene	0.050	<0.050	<0.050	<0.050	<0.050
Benzo(b)fluoranthene	0.050	<0.050	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	0.050	<0.050	<0.050	<0.050	<0.050
Benzo(a)pyrene	0.050	<0.050	<0.050	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	0.050	<0.050	<0.050	<0.050	<0.050
Dibenz(a,h)anthracene	0.050	<0.050	<0.050	<0.050	<0.050
Benzo(g,h,i)perylene	0.050	<0.050	<0.050	<0.050	<0.050
Surrogate Recovery (%)					
D10-Anthracene	-	94	92	95	90
D8-Acenaphthylene	-	91	90	91	88
Terphenyl-D14	-	97	96	98	96

% = percent; mg/kg ww = milligram per killigram wet weight; DL = Detection Limit; < = less than.

Table 7C-9: Supporting Information for Inter-annual Comparison of Chemicals of Potential Concern in Arctic Char, Fourhorn Sculpin and *Hiatella*

Species	Parameter	Test	Sample Size 2018	2019	2020	2021	2022	*n* Outliers	Error (MSE)
Arctic Char	Aluminum	$ANOVA_{rank}$	26	47	8	7	8	0	540.816
	Iron	$ANOVA_{rank}$	26	47	8	8	8	0	793.822
	Magnesium	$ANOVA_{rank}$	26	48	8	8	8	0	616.423
	Mercury	$ANCOVA_{log}$ (a)	26	47	7	8	8	1	0.0263
	Selenium	$ANCOVA_{log}$ (a,b)	26	46	8	7	8	1	0.00366
Fourhorn Sculpin	Aluminum	$ANOVA_{log}$	-	30	8	8	8	0	0.0861
	Iron	$ANOVA_{log}$	-	30	8	8	8	0	0.0274
	Magnesium	$ANOVA_{log}$	-	30	8	8	8	0	0.00318
	Mercury	$ANCOVA_{log}$ (a, c)	-	30	8	8	8	0	0.0129
	Selenium	$ANCOVA_{log}$ (a, c)	-	30	8	8	8	0	0.003
Hiatella arctica	Aluminum	$ANOVA_{rank}$	24	80	8	8	8	0	1100.420
	Iron	$ANOVA_{log}$	24	80	8	8	8	1	0.0339
	Magnesium	$ANOVA_{log}$	24	80	8	8	8	0	0.0252
	Mercury	$ANOVA_{rank}$	24	80	8	8	8	0	1323.801
	Selenium	$ANOVA_{rank}$	24	80	8	8	8	0	1236.082

Note: Significant differences indicated in **bold**.

(a) Length was included as a covariate for ANCOVA.

(b) One value was removed due to high leverage (Figure 7 12 in Chapter 7; Appendix 7D, Figure 7D-37). See Appendix 7C, Table 7C-9 for model results including this point.

(c) Parameter concentrations were compared at 217 mm length due to narrow range of covariate overlap.

ANOVA = analysis of variance; ANCOVA = analysis of covariance; log = log10-transformed data; rank = rank-transformed data; - = not calculated, no data available.

Table 7C-10: Statistical Comparisons including High Leverage Points for 2018 to 2022 for Arctic Char Tissue Chemistry, Milne Port

Species	Parameter	Covariate		Test	Sample Size					Number of Outliers	High Leverage Point Included?	Interaction *P*-value	*P*-value	Error (MSE)	LS Mean				
					2018	2019	2020	2021	2022						2018	2019	2020	2021	2022
Arctic Char	Selenium	Length		ANCOVA$_{rank}$	26	47	8	7	8	0	No	0.530	**<0.001**	914.864	31.49	67.63	24.19	85.36	78.77
		Length	328 mm		26	47	8	8	8	0	Yes	**0.016[a]**	**0.044**	932.434	42.5	78.4	34.1	66.1	102.4
			514 mm												20.9	57.3	15.0	97.4	66.8

Covariate		Post-hoc *P*-value									
		2018* 2019	2018* 2020	2018* 2021	2018* 2022	2019* 2020	2019* 2021	2019* 2022	2020* 2021	2020* 2022	2021* 2022
Length		**<0.001**	0.976	**0.001**	**0.002**	**0.003**	0.600	0.878	**0.002**	**0.005**	0.994
Length	328 mm	**0.019**	0.993	0.531	0.129	**0.098**	0.870	0.851	0.518	0.126	0.623
	514 mm	**0.031**	0.996	**0.001**	**0.037**	**0.026**	**0.089**	0.950	**<0.001**	**0.027**	0.474

Covariate		RPD (%)										Power Analysis	
		2018* 2019	2018* 2020	2018* 2021	2018* 2022	2019* 2020	2019* 2021	2019* 2022	2020* 2021	2020* 2022	2021* 2022	Minimum Detectable Difference[b]	Sensitivity[c]
Length		73	-	92	86	95	-	-	112	106	-	19.57	34%
Length	328 mm	59	-	-	-	79	-	-	-	-	-	18.31	28%
	514 mm	93	-	129	104	117	52	-	147	127	-		36%

Note: Significant differences indicated in **bold**.

APPENDIX 7C

Fish Tissue Data

Table 7C-1: Sample Counts for Fish Tissue Chemistry Analyses from the Milne Port Area, 2010 to 2022

Species	Year	Number of Samples	
		Metals	Polycyclic Aromatic Hydrocarbons
Arctic Char	2010	22[(a)]	0
	2013	17	14
	2015	5	0
	2016	13	0
	2017	2	0
	2018	26	0
	2019	47	0
	2020	8	8
	2021	8	8
	2022	8	26
	Total	**156**	**56**
Arctic Staghorn Sculpin	2013	1	0
Fourhorn Sculpin	2013	2	1
	2019	30	0
	2020	8	8
	2021	8	8
	2022	8	8
	Total	**56**	**25**
Hiatella arctica	2018	24	0
	2019	80	0
	2020	8	8
	2021	8	8
	2022	8	4
	Total	**128**	**20**
Unknown Sculpin	2019	30	0
Unknown Fish	2015	10	0
Grand Total	**-**	**381**	**101**

(a) Includes 11 muscle samples and 11 liver samples.

Table 7C-2: Summary of *Hiatella arctica* Samples Sent to Bureau Veritas Laboratory for Tissue Chemistry Analysis, 2022

Composite Sample	Chemistry	Fish Identification Numbers	Number of Individuals
MLN-HTAR-COMP-METALS-1	Metals	BAFF22UMLNHTAR1508	2.00
		BAFF22UMLNHTAR1512	
MLN-HTAR-COMP-METALS-2	Metals	BAFF22UMLNHTAR1522	2.00
		BAFF22UMLNHTAR1525	
MLN-HTAR-COMP-METALS-3	Metals	BAFF22UMLNHTAR1509	2.00
		BAFF22UMLNHTAR1514	
MLN-HTAR-COMP-METALS-4	Metals	BAFF22UMLNHTAR1517	2.00
		BAFF22UMLNHTAR1521	
MLN-HTAR-COMP-METALS-5	Metals	BAFF22UMLNHTAR1504	2.00
		BAFF22UMLNHTAR1530	
MLN-HTAR-COMP-METALS-6	Metals	BAFF22UMLNHTAR1523	3.00
		BAFF22UMLNHTAR1533	
		BAFF22UMLNHTAR1543	
MLN-HTAR-COMP-METALS-7	Metals	BAFF22UMLNHTAR1515	3.00
		BAFF22UMLNHTAR1518	
		BAFF22UMLNHTAR1526	
MLN-HTAR-COMP-METALS-8	Metals	BAFF22UMLNHTAR1520	4.00
		BAFF22UMLNHTAR1529	
		BAFF22UMLNHTAR1538	
		BAFF22UMLNHTAR1544	
MLN-HTAR-COMP-PAH-A	PAH	BAFF22UMLNHTAR1501	6.00
		BAFF22UMLNHTAR1502	
		BAFF22UMLNHTAR1531	
		BAFF22UMLNHTAR1532	
		BAFF22UMLNHTAR1534	
		BAFF22UMLNHTAR1535	
MLN-HTAR-COMP-PAH-B	PAH	BAFF22UMLNHTAR1503	4
		BAFF22UMLNHTAR1510	
		BAFF22UMLNHTAR1505	
		BAFF22UMLNHTAR1542	
MLN-HTAR-COMP-PAH-C	PAH	BAFF22UMLNHTAR1516	6.00
		BAFF22UMLNHTAR1527	
		BAFF22UMLNHTAR1528	
		BAFF22UMLNHTAR1536	
		BAFF22UMLNHTAR1539	
		BAFF22UMLNHTAR1541	
MLN-HTAR-COMP-PAH-D	PAH	BAFF22UMLNHTAR1507	4.00
		BAFF22UMLNHTAR1511	
		BAFF22UMLNHTAR1524	
		BAFF22UMLNHTAR1540	

These were doubled up for PAH analysis due to small sample volumes. Table will need to be revised. See results from BV on which samples to pool.

PAHs = Polycyclic aromatic hydrocarbons.

Table 7C-3: Concentrations of Metals in Arctic Char Muscle Tissue Collected from the Milne Port Area, 2022

Parameter	DL	Fish Identification Number							
		BAFF22UDPFARCH4004	BAFF22UDPFARCH4009	BAFF22UDPFARCH4010	BAFF22UDPFARCH4017	BAFF22UDPFARCH4018	BAFF22UDPFARCH4023	BAFF22UDPFARCH4024	BAFF22UDPFARCH4025
Moisture (%)	0.30	65	73	68	72	74	68	72	66
Total Metals (mg/kg ww)									
Aluminum	0.50	0.77	1.31	<0.50	0.63	<0.50	<0.50	<0.50	<0.50
Antimony	0.0020	0.0030	0.0190	0.0033	0.0031	0.0030	0.0031	<0.0020	<0.0020
Arsenic	0.0050	0.527	0.371	0.373	0.724	0.543	0.635	0.531	0.439
Barium	0.010	0.024	0.024	0.016	<0.010	<0.010	0.041	0.025	<0.010
Beryllium	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Bismuth	0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013
Boron	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cadmium	0.0013	0.0208	0.0032	0.0022	0.0030	<0.0013	0.0035	0.0025	0.0022
Calcium	4.0	86.9	164	267	101	89.1	704	1390	93.1
Chromium	0.025	<0.025	0.033	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Cobalt	0.0013	0.0076	0.0090	0.0498	0.0037	0.0075	0.0067	0.0060	0.0062
Copper	0.013	0.578	0.331	0.273	0.376	0.300	0.391	0.307	0.295
Iron	0.25	7.58	9.95	3.51	3.85	3.46	6.22	4.63	3.66
Lead	0.0013	0.0079	0.0130	0.0045	0.0043	0.0025	0.0032	0.0044	0.0030
Magnesium	0.40	290	363	325	259	311	326	329	313
Manganese	0.010	0.098	0.108	0.146	0.075	0.092	0.239	0.262	0.059
Mercury	0.013	0.041	0.085	0.101	0.074	0.069	0.034	0.054	0.051
Molybdenum	0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080
Nickel	0.010	0.016	0.041	0.013	0.038	0.013	<0.010	0.012	<0.010
Phosphorous	2.0	2810	3480	3050	2570	3170	3190	3520	2800
Potassium	2.5	4180	5170	4470	4070	5060	4400	4340	4240
Selenium	0.010	0.392	0.481	0.386	0.335	0.446	0.367	0.416	0.401
Silver	0.0013	<0.0013	0.0014	0.0014	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013
Sodium	2.5	302	352	299	431	345	292	458	273
Strontium	0.013	0.174	0.260	0.623	0.176	0.167	1.90	2.95	0.168
Thallium	0.00040	0.00172	0.00370	0.00215	0.00160	0.00312	0.00234	0.00157	0.00191
Tin	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Titanium	0.13	0.59	0.73	0.62	0.50	0.62	0.64	0.74	0.57
Uranium	0.00040	0.00061	0.00180	0.00063	<0.00040	<0.00040	0.00164	0.00155	0.00099
Vanadium	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Zinc	0.20	4.85	8.05	5.12	3.85	5.47	5.38	4.51	4.00

% = percent; mg/kg ww = milligram per killigram wet weight; DL = Detection Limit; < = less than.

Table 7C-4: Concentrations of Metals in Fourhorn Sculpin Muscle Tissue Collected from the Milne Port Area, 2022

Parameter	DL	Fish Identification Number							
		BAFF22UDPFFHSC1004	BAFF22UDPFFHSC1012	BAFF22UDPFFHSC1019	BAFF22UDPFFHSC1023	BAFF22UDPFFHSC1024	BAFF22UDPFFHSC1026	BAFF22UDPFFHSC1028	BAFF22UDPFFHSC1038
Moisture (%)	0.30	77	78	78	76	76	75	78	77
Total Metals (mg/kg ww)									
Aluminum	0.50	0.85	0.96	0.65	<0.50	0.96	0.59	1.37	0.62
Antimony	0.0020	0.0027	0.0044	0.0025	0.0029	0.0029	<0.0020	0.0031	0.0023
Arsenic	0.0050	2.56	4.67	3.57	4.21	3.09	1.79	2.06	5.87
Barium	0.010	0.011	0.019	0.013	0.010	0.013	<0.010	0.017	<0.010
Beryllium	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Bismuth	0.0013	0.0018	0.0023	0.0020	0.0016	0.0029	0.0024	0.0025	0.0021
Boron	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cadmium	0.0013	0.0027	0.0063	0.0027	0.0056	0.0061	0.0115	0.0034	0.0074
Calcium	4.0	102	104	108	140	142	122	121	122
Chromium	0.025	<0.025	<0.025	<0.025	<0.025	0.030	0.029	0.027	<0.025
Cobalt	0.0013	0.211	0.0126	0.0124	0.0153	0.0099	0.0094	0.0115	0.0111
Copper	0.013	0.316	0.306	0.364	0.396	0.541	0.367	0.289	0.328
Iron	0.25	7.19	6.81	5.40	3.47	8.08	7.31	5.58	6.27
Lead	0.0013	0.0056	0.0068	0.0055	0.0061	0.0128	0.0054	0.0317	0.0108
Magnesium	0.40	275	246	268	268	264	290	320	297
Manganese	0.010	0.214	0.115	0.138	0.143	0.256	0.213	0.152	0.254
Mercury	0.013	0.198	0.340	0.430	0.272	0.237	0.154	0.195	0.283
Molybdenum	0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080
Nickel	0.010	0.028	0.022	0.020	0.042	0.032	0.019	0.017	0.021
Phosphorous	2.0	2100	1890	2130	2210	2200	2100	2200	2280
Potassium	2.5	3620	3350	3630	3670	3470	3480	3770	3900
Selenium	0.010	0.567	0.529	0.521	0.625	0.496	0.490	0.440	0.605
Silver	0.0013	<0.0013	<0.0013	<0.0013	0.0017	<0.0013	<0.0013	<0.0013	<0.0013
Sodium	2.5	520	662	600	773	501	642	560	505
Strontium	0.013	0.336	0.445	0.545	0.753	0.636	0.493	0.428	0.513
Thallium	0.00040	0.00100	0.00096	0.00114	0.00069	0.00074	0.00076	0.00078	0.00059
Tin	0.020	0.042	0.024	<0.020	<0.020	0.035	0.033	<0.020	0.021
Titanium	0.13	0.42	0.42	0.45	0.46	0.47	0.44	0.49	0.50
Uranium	0.00040	0.00134	0.00271	0.00089	0.00121	0.00075	0.00108	0.00076	0.00084
Vanadium	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Zinc	0.20	10.7	14.4	9.74	18.3	17.6	14.3	11.8	15.0

% = percent; mg/kg ww = milligram per killigram wet weight; DL = Detection Limit; < = less than.

Table 7C-5: Concentrations of Metals in *Hiatella arctica* Tissue Collected from the Milne Port Area, 2022

Parameter	DL	Fish Identification Number							
		MLN-HTAR-COMP-METALS-1	MLN-HTAR-COMP-METALS-2	MLN-HTAR-COMP-METALS-3	MLN-HTAR-COMP-METALS-4	MLN-HTAR-COMP-METALS-5	MLN-HTAR-COMP-METALS-6	MLN-HTAR-COMP-METALS-7	MLN-HTAR-COMP-METALS-8
Moisture (%)	0.30	78	80	75	78	72	80	76	77
Total Metals (mg/kg ww)									
Aluminum	0.50	770	710	414	753	538	715	544	1180
Antimony	0.0020	0.0216	0.0286	0.0146	0.0248	0.0184	0.0302	0.0274	0.0280
Arsenic	0.0050	2.45	3.35	2.42	2.20	3.44	3.35	2.66	3.40
Barium	0.010	4.81	4.23	3.51	4.79	33.2	15.1	13.3	13.3
Beryllium	0.0020	0.0425	0.0395	0.0206	0.0373	0.0316	0.0413	0.0286	0.0648
Bismuth	0.0013	0.0091	0.0117	0.0051	0.0088	0.0089	0.0110	0.0077	0.0169
Boron	0.20	8.44	9.10	4.62	11.4	6.20	7.94	12.7	12.2
Cadmium	0.0013	0.578	0.944	0.727	0.840	0.646	0.839	0.976	1.08
Calcium	4.0	5990	6100	5720	5060	7080	6990	4670	9480
Chromium	0.025	2.00	1.83	1.46	1.87	2.00	2.08	1.50	3.12
Cobalt	0.0013	1.01	1.71	0.559	0.747	1.38	1.98	1.18	1.73
Copper	0.013	2.61	2.32	2.32	2.12	2.58	2.97	2.81	4.64
Iron	0.25	1980	1750	2770	1460	1550	1870	1980	3000
Lead	0.0013	1.16	2.52	0.451	1.13	1.14	1.92	0.886	2.21
Magnesium	0.40	3170	3160	2020	2790	2690	2910	2360	3420
Manganese	0.010	102	181	59.4	69.0	170	282	171	236
Mercury	0.013	0.025	0.030	0.025	0.024	0.061	0.045	0.030	0.034
Molybdenum	0.0080	0.333	0.338	0.274	0.369	0.392	0.400	0.325	0.436
Nickel	0.010	1.78	2.13	1.27	1.56	1.93	2.38	1.55	2.78
Phosphorous	2.0	1860	1200	1480	1240	1780	1140	1790	1500
Potassium	2.5	1840	1650	1610	2060	1220	1450	1630	1700
Selenium	0.010	1.26	1.24	1.51	1.36	1.22	1.44	1.35	1.37
Silver	0.0013	0.0053	0.0057	0.0046	0.0056	0.0132	0.0099	0.0082	0.0083
Sodium	2.5	5590	6070	3930	6310	3400	4970	6070	4880
Strontium	0.013	24.6	25.9	27.1	19.3	37.9	38.8	25.9	49.4
Thallium	0.00040	0.0152	0.0193	0.00782	0.0138	0.0206	0.0218	0.0133	0.0281
Tin	0.020	0.049	0.050	0.038	0.045	0.039	0.050	0.043	0.070
Titanium	0.13	25.3	24.1	18.1	23.7	30.5	23.7	16.5	37.7
Uranium	0.00040	0.156	0.157	0.131	0.148	0.177	0.169	0.129	0.220
Vanadium	0.020	3.25	4.39	1.53	2.72	2.91	3.84	2.49	4.82
Zinc	0.20	14.0	15.5	16.9	13.7	17.2	18.7	18.7	20.0

% = percent; mg/kg ww = milligram per killigram wet weight; DL = Detection Limit; < = less than.

Table 7C-6: Concentrations of Polycyclic Aromatic Hydrocarbons in Arctic Char Muscle Tissue Collected from the Milne Port Area, 2022

Parameter	DL	Fish Identification Number																									
		BAFF22UDPFA RCH4001	BAFF22UDPFA RCH4002	BAFF22UDPFA RCH4003	BAFF22UDPFA RCH4004	BAFF22UDPFA RCH4005	BAFF22UDPFA RCH4006	BAFF22UDPFA RCH4007	BAFF22UDPFA RCH4008	BAFF22UDPFA RCH4009	BAFF22UDPFA RCH4010	BAFF22UDPFA RCH4011[a]	BAFF22UDPFA RCH4012	BAFF22UDPFA RCH4013	BAFF22UDPFA RCH4014	BAFF22UDPFA RCH4015	BAFF22UDPFA RCH4016	BAFF22UDPFA RCH4017	BAFF22UDPFA RCH4018	BAFF22UDPFA RCH4019	BAFF22UDPFA RCH4020	BAFF22UDPFA RCH4021	BAFF22UDPFA RCH4022	BAFF22UDPFA RCH4023	BAFF22UDPFA RCH4024	BAFF22UDPFA RCH4025	BAFF22UDPFA RCH4026	Duplicate[a]
Polycyclic Aromatic Hydrocarbons (µg/kg ww)[b]																												
Perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylnaphthalene	0.50	<0.50	<0.50	<0.50	0.56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Naphthalene	1.00	<1.00	<1.00	<1.00	8.43	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	3.29	<1.00	<1.00	3.06	<1.00	4.98	1.45	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Acenaphthylene	0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Acenaphthene	0.15	<0.15	<0.15	<0.15	0.68	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Fluorene	0.16	<0.16	<0.16	<0.16	0.76	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Phenanthrene	0.20	0.30	<0.20	<0.20	1.87	<0.20	<0.20	<0.20	<0.20	0.70	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.22	<0.20
Anthracene	0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Fluoranthene	0.20	<0.20	<0.20	<0.20	0.27	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pyrene	0.16	<0.16	<0.16	<0.16	0.47	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Benzo(a)anthracene	0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36
Chrysene	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(j)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b+j)fluoranthene	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo(k)fluoranthene	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibenz(a,h)anthracene	0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Benzo(g,h,i)perylene	0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Surrogate Recovery (%)																												
$^{13}C_6$-Naphthalene	-	42	46	34	38	44	30	34	40	40	28	28	28	18	28	28	16	24	28	30	42	30	42	46	44	38	46	34
$^{13}C_6$-Acenaphthylene	-	50	54	50	52	50	52	52	52	48	48	48	48	50	46	48	40	52	56	48	52	44	48	50	46	46	52	50
$^{13}C_6$-Acenaphthene	-	52	54	52	54	52	52	52	54	50	48	48	48	50	46	48	38	54	54	48	52	42	50	52	50	46	52	50
$^{13}C_6$-Fluorene	-	44	44	44	40	40	42	40	38	38	40	36	40	40	38	42	36	48	56	48	40	38	42	44	42	40	44	40
$^{13}C_6$-Phenanthrene	-	44	46	46	44	44	46	44	40	40	42	38	42	46	40	44	38	48	56	48	46	42	44	48	46	40	46	40
$^{13}C_6$-Anthracene	-	46	50	48	50	44	50	44	42	42	44	38	50	54	46	50	40	56	66	54	50	46	46	50	48	42	48	42
$^{13}C_6$-Fluoranthene	-	46	50	50	48	46	50	46	44	46	44	40	44	50	42	46	44	50	54	46	48	48	48	52	50	44	48	42
$^{13}C_3$-Pyrene	-	48	52	50	50	50	52	46	44	46	46	42	42	48	44	46	42	50	54	48	48	46	46	52	50	42	48	44
$^{13}C_6$-Benzo(a)anthracene	-	56	62	60	44	60	64	64	62	52	60	56	52	60	52	54	56	64	64	64	56	56	54	64	70	56	66	56
$^{13}C_6$-Chrysene	-	46	54	52	40	54	56	58	56	48	54	50	42	48	44	46	48	54	54	54	48	48	48	56	62	48	56	52
$^{13}C_6$-Benzo(b+j)fluoranthene	-	42	50	46	44	48	48	50	48	50	46	46	52	58	50	52	42	60	58	54	44	48	42	50	50	42	52	46
$^{13}C_6$-Benzo(k)fluoranthene	-	44	52	48	46	50	54	52	48	48	48	50	50	58	50	50	46	58	58	54	46	52	46	56	56	46	56	52
$^{13}C_4$-Benzo(a)pyrene	-	46	52	48	50	50	50	50	50	50	48	46	52	60	52	54	48	60	60	52	48	54	48	52	54	46	54	50
$^{13}C_6$-Indeno(1,2,3-cd)pyrene	-	36	48	40	42	48	48	48	46	34	44	44	54	60	48	46	40	64	54	46	44	50	44	50	54	44	54	46
$^{13}C_6$-Dibenz(a,h)anthracene	-	34	44	36	38	42	44	46	42	30	42	40	56	60	46	46	36	64	50	46	40	46	40	44	50	42	54	42
$^{13}C_{12}$-Benzo(ghi)perylene	-	42	56	48	44	56	58	58	54	44	50	52	50	58	46	46	50	62	54	48	54	54	50	60	66	50	62	52

% = percent; µg/kg ww = microgram per killigram wet weight; DL = Detection Limit; < = less than; - = not analyzed in 2022.

(a) Duplicate sample FIN: BAFF22UDPFARCH4011

(b) Units differ from previous sampling years, where mg/kg ww were used.

Table 7C-7: Concentrations of Polycyclic Aromatic Hydrocarbons in Fourhorn Sculpin Muscle Tissue Collected from the Milne Port Area, 2022

Parameter	DL	Fish Identification Number							
		BAFF22UDPFFHSC1 004	BAFF22UDPFFHSC1 012	BAFF22UDPFFHSC1 019	BAFF22UDPFFHSC1 023	BAFF22UDPFFHSC1 024	BAFF22UDPFFHSC1 026	BAFF22UDPFFHSC1 028	BAFF22UDPFFHSC1 038
Polycyclic Aromatic Hydrocarbons (mg/kg ww)									
Naphthalene	1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.09
Acenaphthylene	0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Acenaphthene	0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Fluorene	0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Phenanthrene	0.20	<0.20	<0.20	0.66	0.53	<0.20	<0.20	<0.20	<0.20
Anthracene	0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Fluoranthene	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pyrene	0.16	<0.16	<0.16	0.21	<0.16	<0.16	<0.16	<0.16	<0.16
Benzo(a)anthracene	0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36	<0.36
Chrysene	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(b)fluoranthene	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Benzo(k)fluoranthene	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibenz(a,h)anthracene	0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Benzo(g,h,i)perylene	0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Surrogate Recovery (%)									
$^{13}C_6$-Naphthalene	-	26	34	34	20	32	26	36	22
$^{13}C_6$-Acenaphthylene	-	46	42	46	36	44	46	54	42
$^{13}C_6$-Acenaphthene	-	50	50	48	38	50	48	60	46
$^{13}C_6$-Fluorene	-	42	40	36	32	40	42	50	46
$^{13}C_6$-Phenanthrene	-	44	38	36	32	38	42	48	42
$^{13}C_6$-Anthracene	-	48	40	40	38	42	44	50	46
$^{13}C_6$-Fluoranthene	-	50	46	46	40	46	52	58	54
$^{13}C_3$-Pyrene	-	54	52	50	42	48	56	64	58
$^{13}C_6$-Benzo(a)anthracene	-	62	60	56	46	60	72	76	70
$^{13}C_6$-Chrysene	-	60	60	54	42	56	70	68	68
$^{13}C_6$-Benzo(b)fluoranthene	-	46	50	42	36	48	58	58	50
$^{13}C_6$-Benzo(k)fluoranthene	-	60	56	50	50	60	68	70	64
$^{13}C_4$-Benzo(a)pyrene	-	54	52	50	44	54	64	66	56
$^{13}C_6$-Indeno(1,2,3-cd)pyrene	-	42	40	38	40	52	60	58	48
$^{13}C_6$-Dibenz(a,h)anthracene	-	36	36	32	34	46	54	50	46
$^{13}C_{12}$-Benzo(ghi)perylene	-	50	46	44	42	52	66	62	58

% = percent; mg/kg ww = milligram per killigram wet weight; DL = Detection Limit; < = less than; - = not analyzed in 2022.

Table 7C-8: Concentrations of Polycyclic Aromatic Hydrocarbons in *Hiatella arctica* Tissues Collected from the Milne Port Area, 2022

Parameter	DL	Fish Identification Number			
		MLN-HTAR-COMP-PAH-A	MLN-HTAR-COMP-PAH-B	MLN-HTAR-COMP-PAH-C	MLN-HTAR-COMP-PAH-D
Polycyclic Aromatic Hydrocarbons (mg/kg ww)					
1-Methylnaphthalene	0.050	<0.050	<0.050	<0.050	<0.050
2-Methylnaphthalene	0.050	<0.050	<0.050	<0.050	<0.050
Benzo(j)fluoranthene	0.050	<0.050	<0.050	<0.050	<0.050
Perylene	0.050	<0.050	<0.050	<0.050	<0.050
Naphthalene	0.050	<0.050	<0.050	<0.050	<0.050
Acenaphthylene	0.050	<0.050	<0.050	<0.050	<0.050
Acenaphthene	0.050	<0.050	<0.050	<0.050	<0.050
Fluorene	0.050	<0.050	<0.050	<0.050	<0.050
Phenanthrene	0.050	<0.050	<0.050	<0.050	<0.050
Anthracene	0.050	<0.050	<0.050	<0.050	<0.050
Fluoranthene	0.050	<0.050	<0.050	<0.050	<0.050
Pyrene	0.050	<0.050	<0.050	<0.050	<0.050
Benzo(a)anthracene	0.050	<0.050	<0.050	<0.050	<0.050
Chrysene	0.050	<0.050	<0.050	<0.050	<0.050
Benzo(b)fluoranthene	0.050	<0.050	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	0.050	<0.050	<0.050	<0.050	<0.050
Benzo(a)pyrene	0.050	<0.050	<0.050	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	0.050	<0.050	<0.050	<0.050	<0.050
Dibenz(a,h)anthracene	0.050	<0.050	<0.050	<0.050	<0.050
Benzo(g,h,i)perylene	0.050	<0.050	<0.050	<0.050	<0.050
Surrogate Recovery (%)					
D10-Anthracene	-	94	92	95	90
D8-Acenaphthylene	-	91	90	91	88
Terphenyl-D14	-	97	96	98	96

% = percent; mg/kg ww = milligram per killigram wet weight; DL = Detection Limit; < = less than.

Table 7C-9: Supporting Information for Inter-annual Comparison of Chemicals of Potential Concern in Arctic Char, Fourhorn Sculpin and *Hiatella*

Species	Parameter	Test	Sample Size					*n*	Error
			2018	2019	2020	2021	2022	Outliers	(MSE)
Arctic Char	Aluminum	$ANOVA_{rank}$	26	47	8	7	8	0	540.816
	Iron	$ANOVA_{rank}$	26	47	8	8	8	0	793.822
	Magnesium	$ANOVA_{rank}$	26	48	8	8	8	0	616.423
	Mercury	$ANCOVA_{log}$ [(a)]	26	47	7	8	8	1	0.0263
	Selenium	$ANCOVA_{log}$ [(a,b)]	26	46	8	7	8	1	0.00366
Fourhorn Sculpin	Aluminum	$ANOVA_{log}$	-	30	8	8	8	0	0.0861
	Iron	$ANOVA_{log}$	-	30	8	8	8	0	0.0274
	Magnesium	$ANOVA_{log}$	-	30	8	8	8	0	0.00318
	Mercury	$ANCOVA_{log}$ [(a, c)]	-	30	8	8	8	0	0.0129
	Selenium	$ANCOVA_{log}$ [(a, c)]	-	30	8	8	8	0	0.003
Hiatella arctica	Aluminum	$ANOVA_{rank}$	24	80	8	8	8	0	1100.420
	Iron	$ANOVA_{log}$	24	80	8	8	8	1	0.0339
	Magnesium	$ANOVA_{log}$	24	80	8	8	8	0	0.0252
	Mercury	$ANOVA_{rank}$	24	80	8	8	8	0	1323.801
	Selenium	$ANOVA_{rank}$	24	80	8	8	8	0	1236.082

Note: Significant differences indicated in **bold**.

(a) Length was included as a covariate for ANCOVA. -

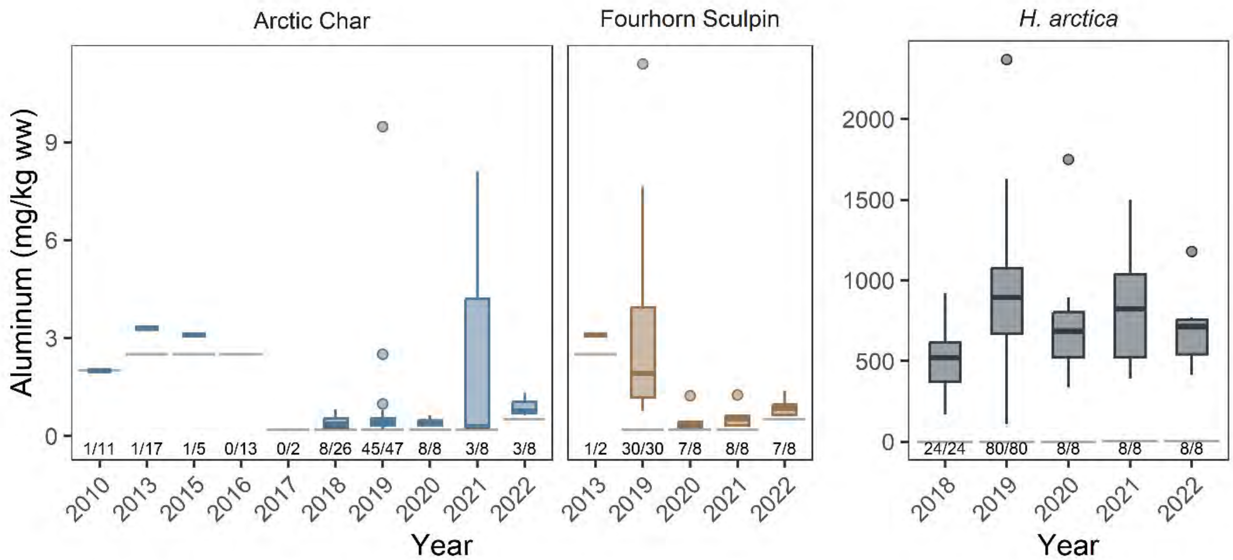
(b) One value was removed due to high leverage (Figure 7 12 in Chapter 7; Appendix 7D, Figure 7D-37). See Appendix 7C, Table 7C-9 for model results including this point.

(c) Parameter concentrations were compared at 217 mm length due to narrow range of covariate overlap.

ANOVA = analysis of variance; ANCOVA = analysis of covariance; log = log10-transformed data; rank = rank-transformed data; - = not calculated, no data available.

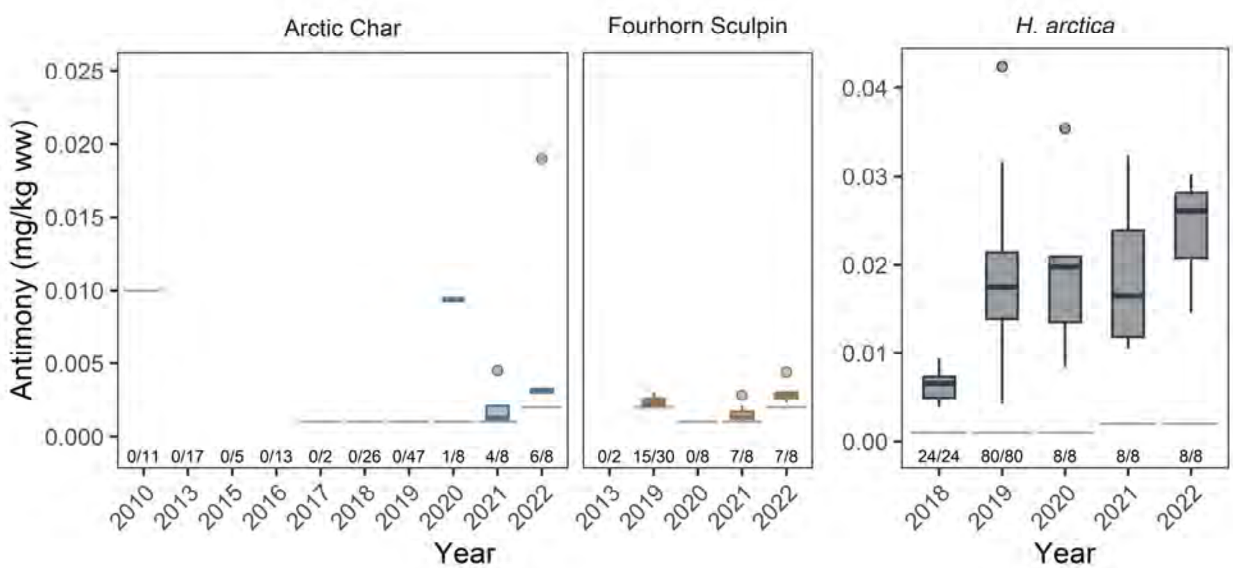
APPENDIX 7D

Fish Tissue Boxplots



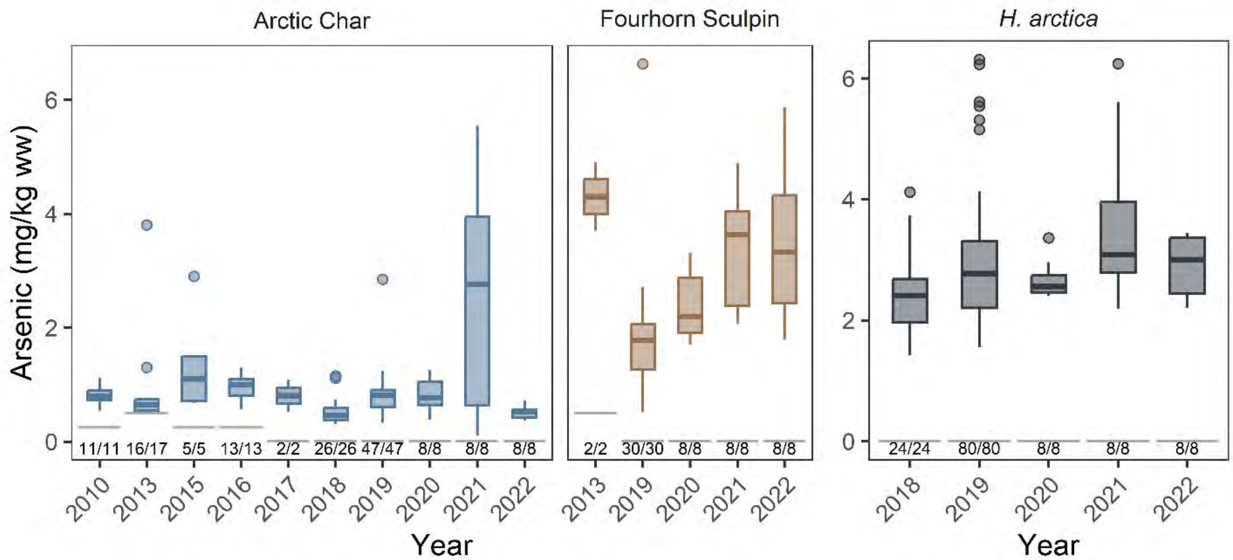
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-1: Concentrations of Aluminum for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



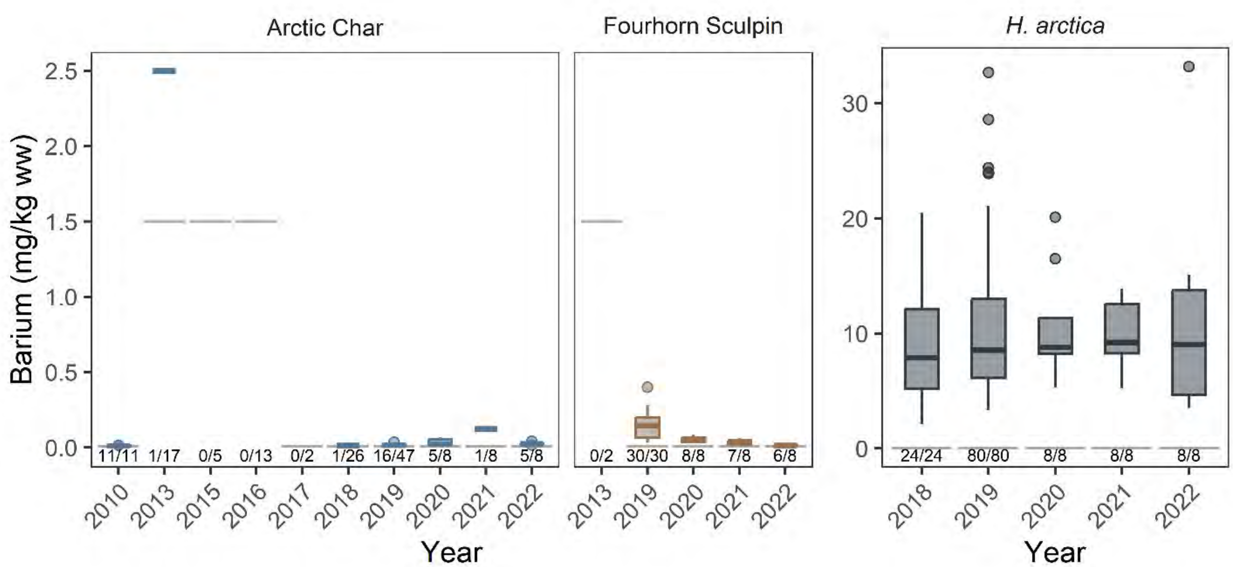
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits. Detection limit of 0.5 mg/kg ww for Arctic Char (2013, 2015, 2016) and Fourhorn Sculpin (2013) not shown to allow for clearer visualization of the data.

Figure 7D-2: Concentrations of Antimony for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



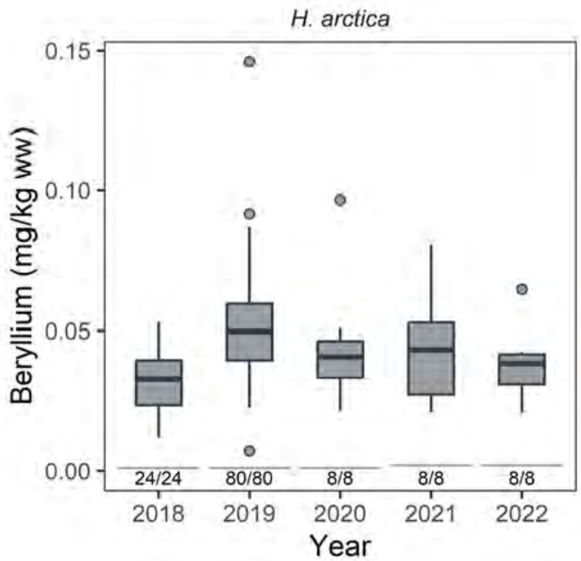
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits. One Arctic Char sample removed from 2020 (BAFF20UMLNGN18ARCH003, 33.2 mg/kg ww) to improve plotting.

Figure 7D-3: Concentrations of Arsenic for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



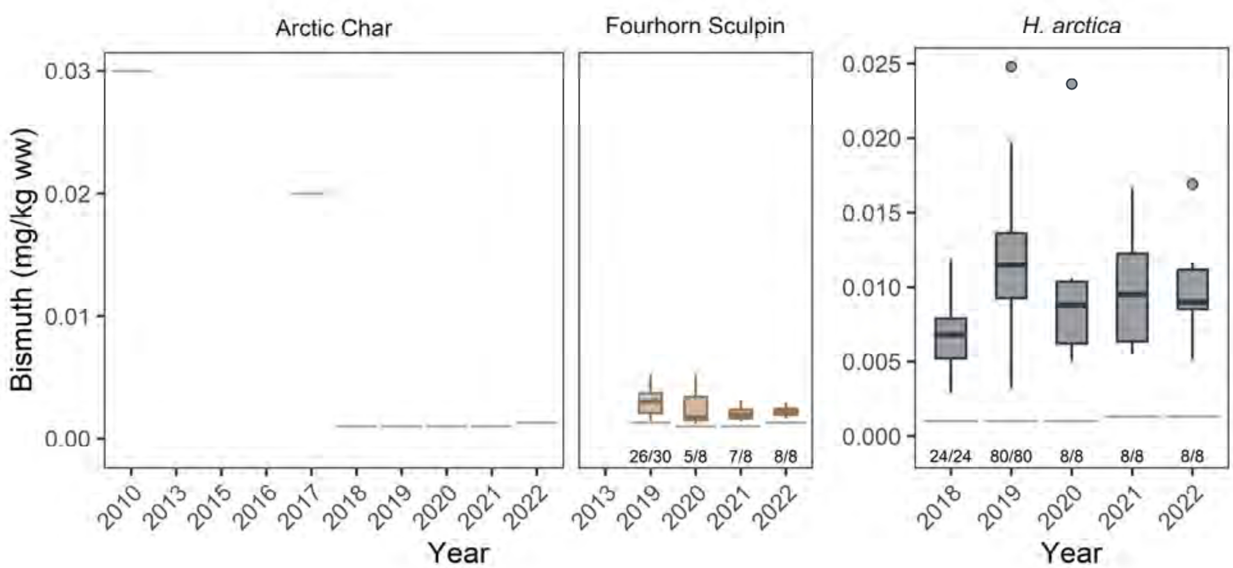
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-4: Concentrations of Barium for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



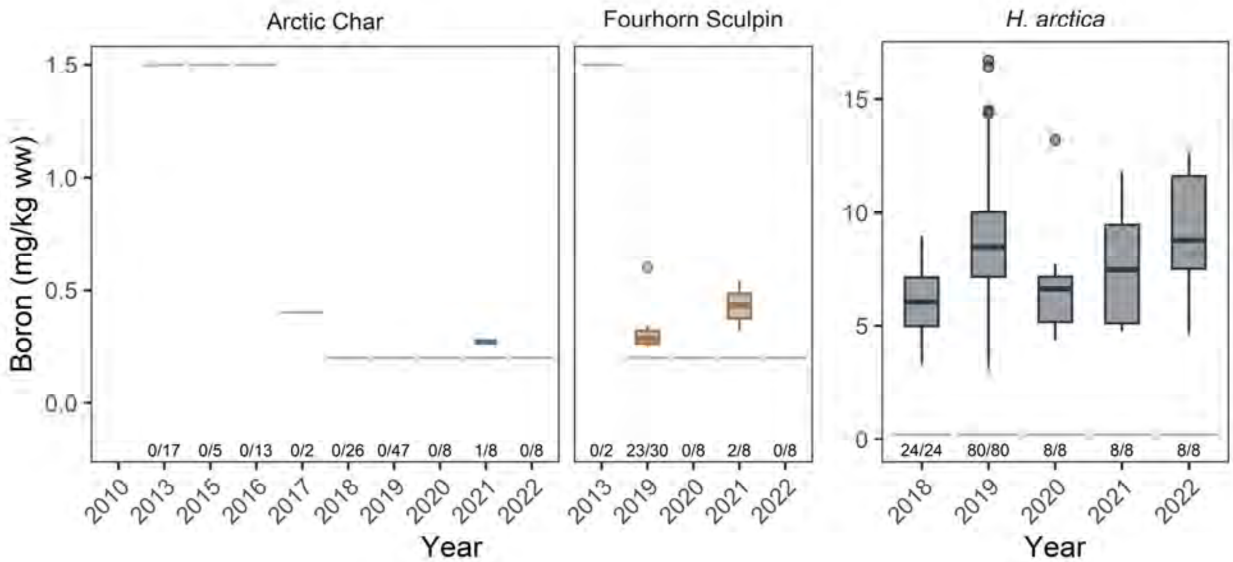
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-5: Concentrations of Beryllium for *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



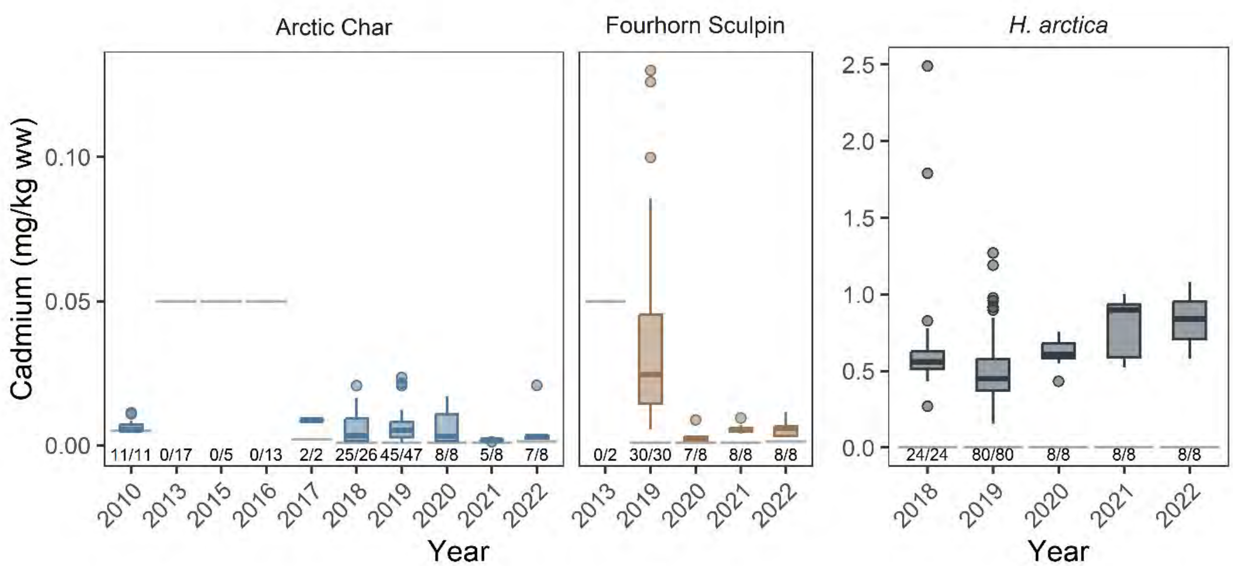
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-6: Concentrations of Bismuth for Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



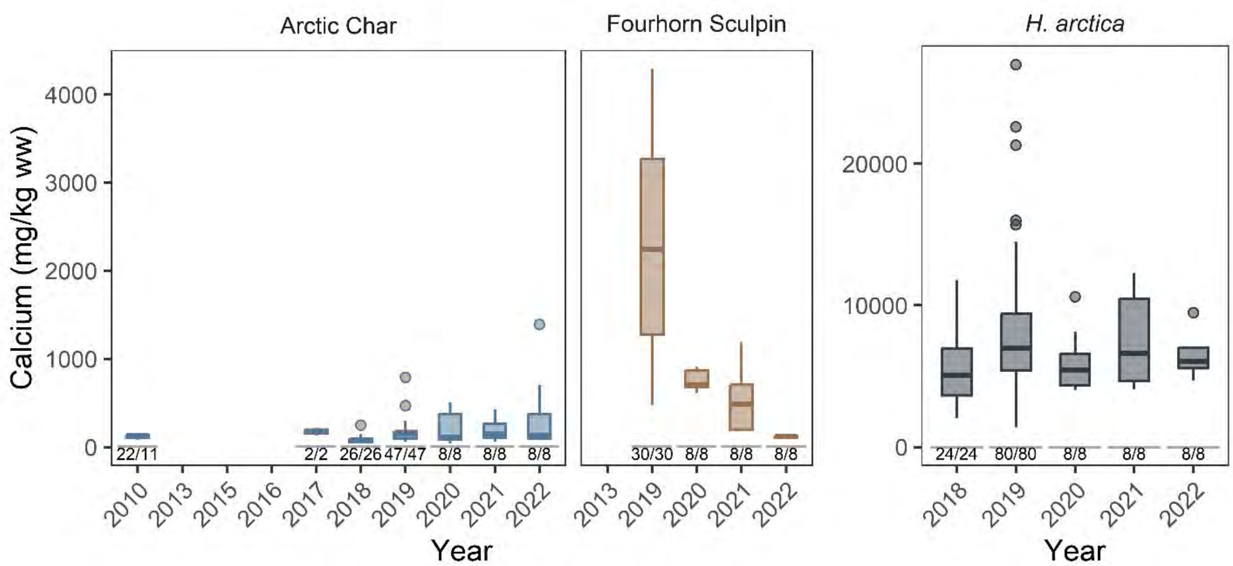
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-7: Concentrations of Boron for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



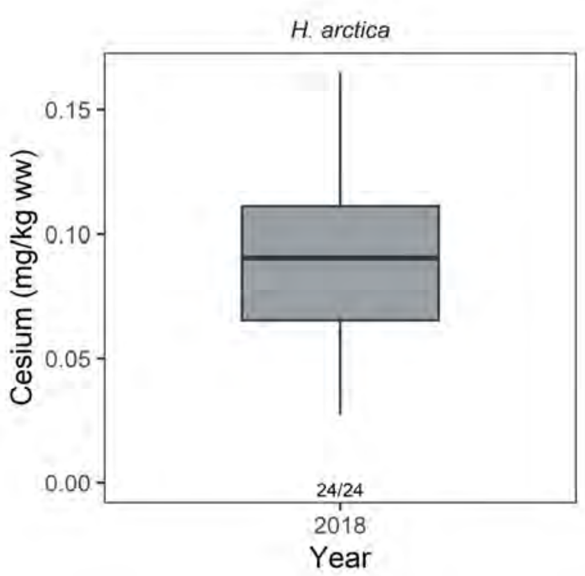
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-8: Concentrations of Cadmium for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



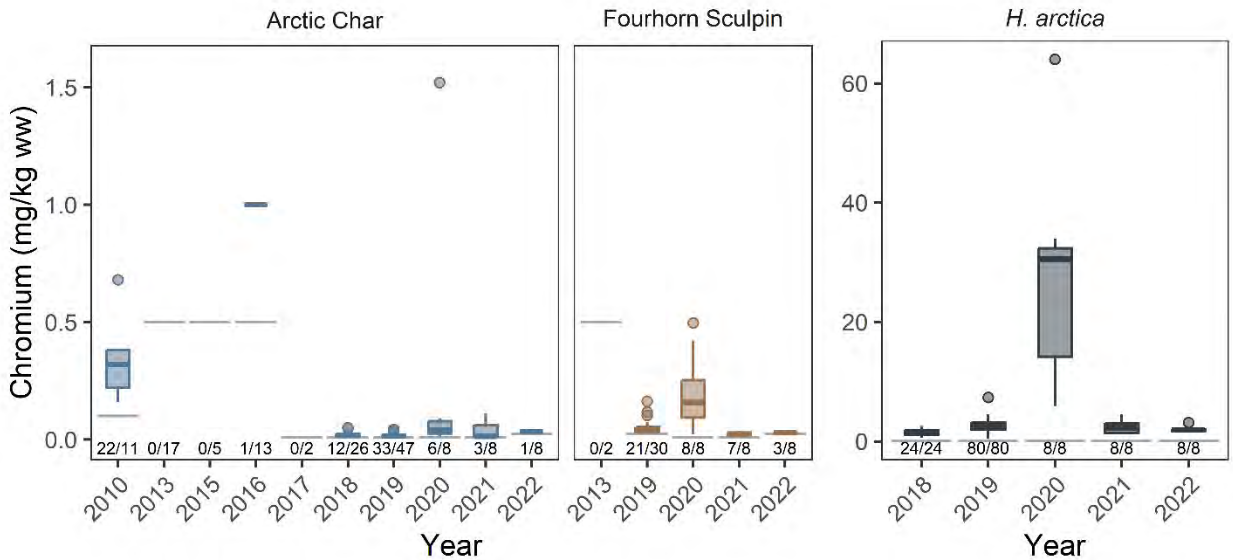
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-9: Concentrations of Calcium for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



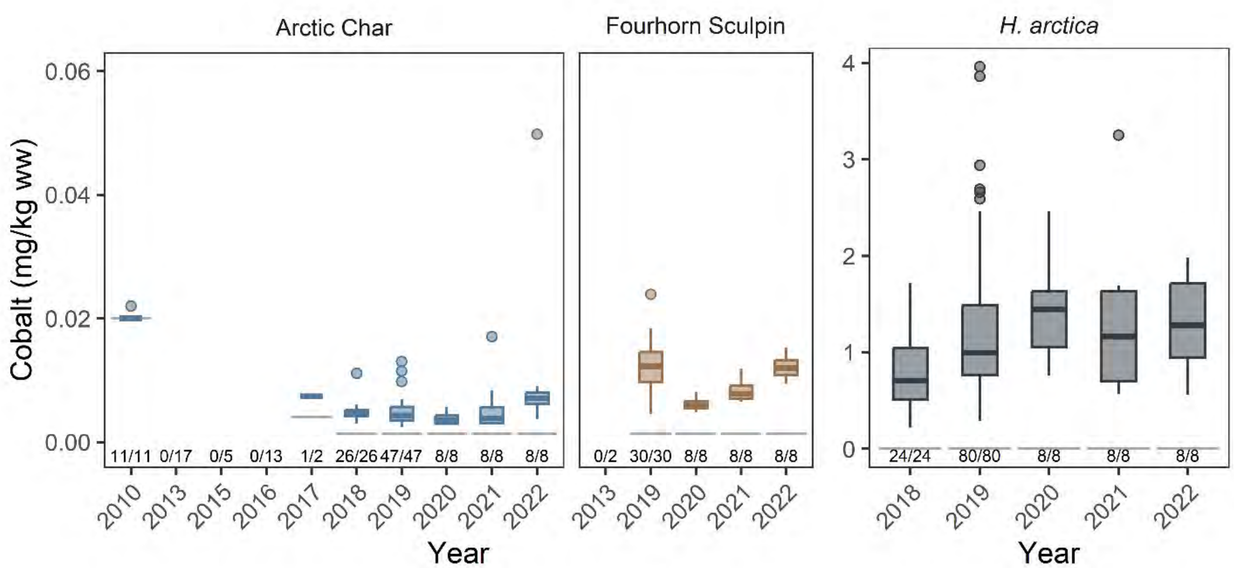
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits. Cesium was not analyzed during other sampling years.

Figure 7D-10: Concentrations of Cesium for *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2018



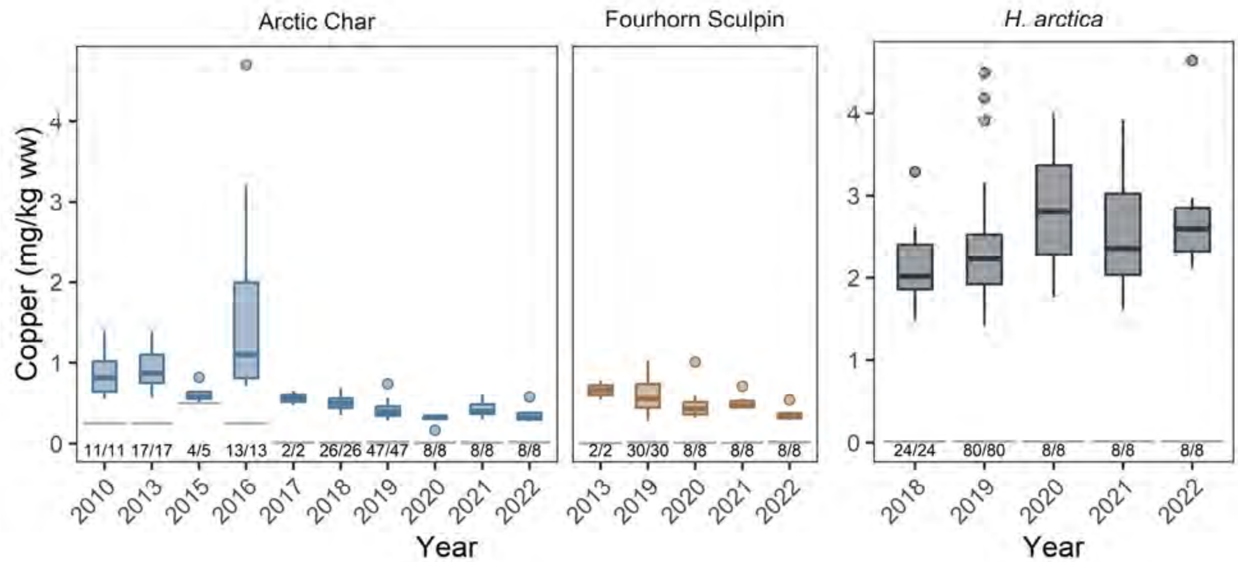
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits. One value for Arctic Char (2010) not shown to allow for clearer visualization of the data.

Figure 7D-11: Concentrations of Chromium for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



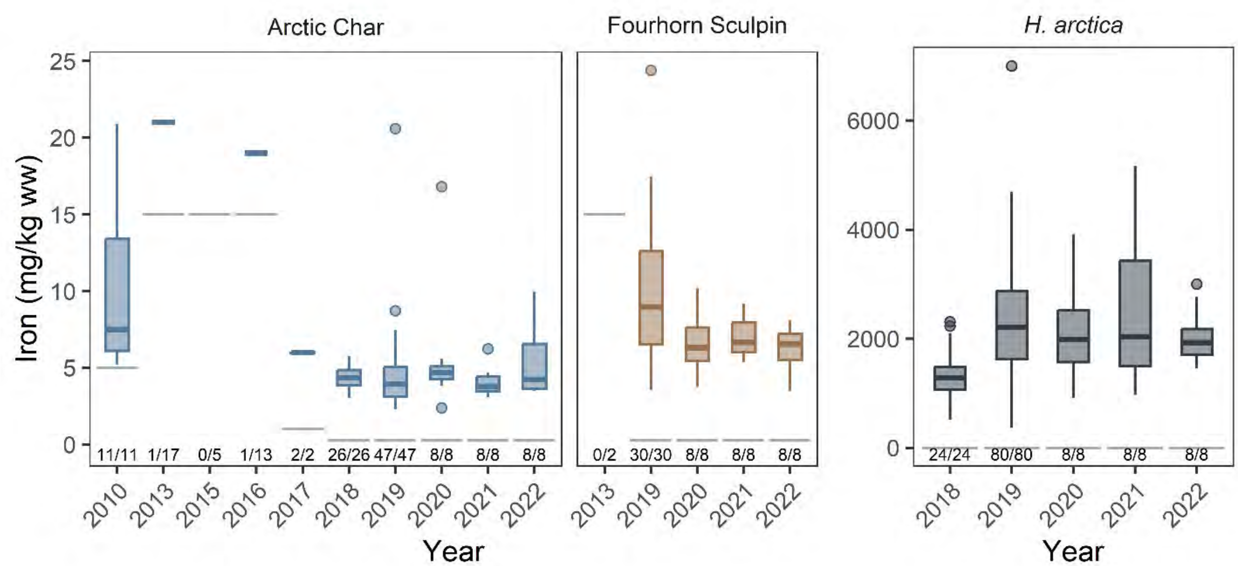
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits. Detection limit of 0.2 mg/kg for Arctic Char (2013, 2015, 2016) and Fourhorn Sculpin (2013), and one point for Fourhorn Sculpin (2022) not shown to allow for clearer visualization of the data.

Figure 7D-12: Concentrations of Cobalt for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



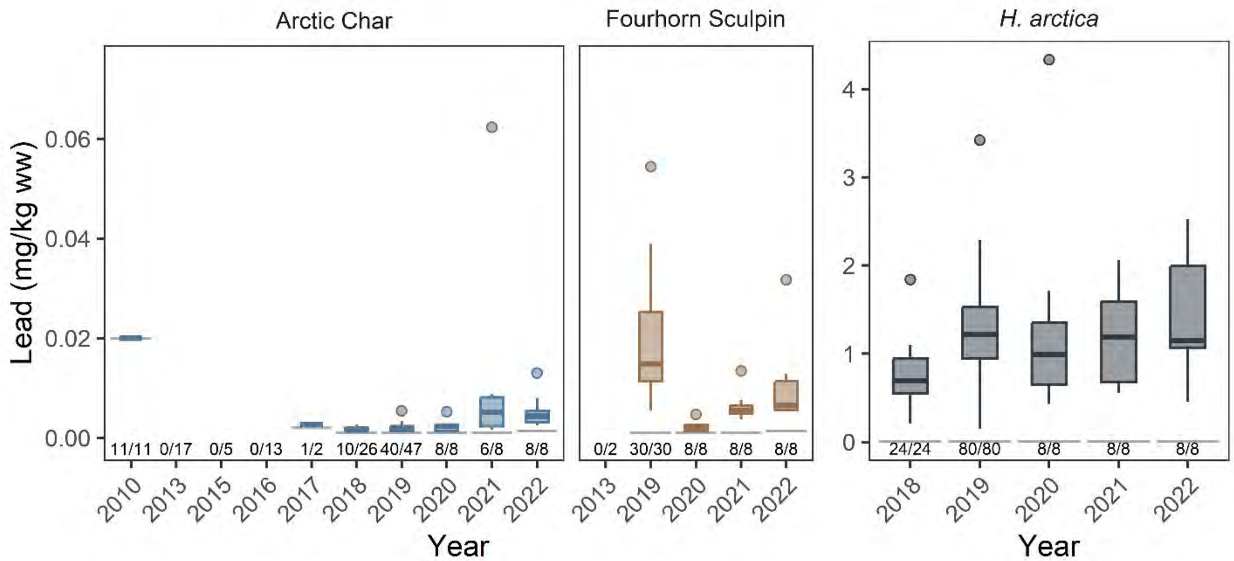
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-13: Concentrations of Copper for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



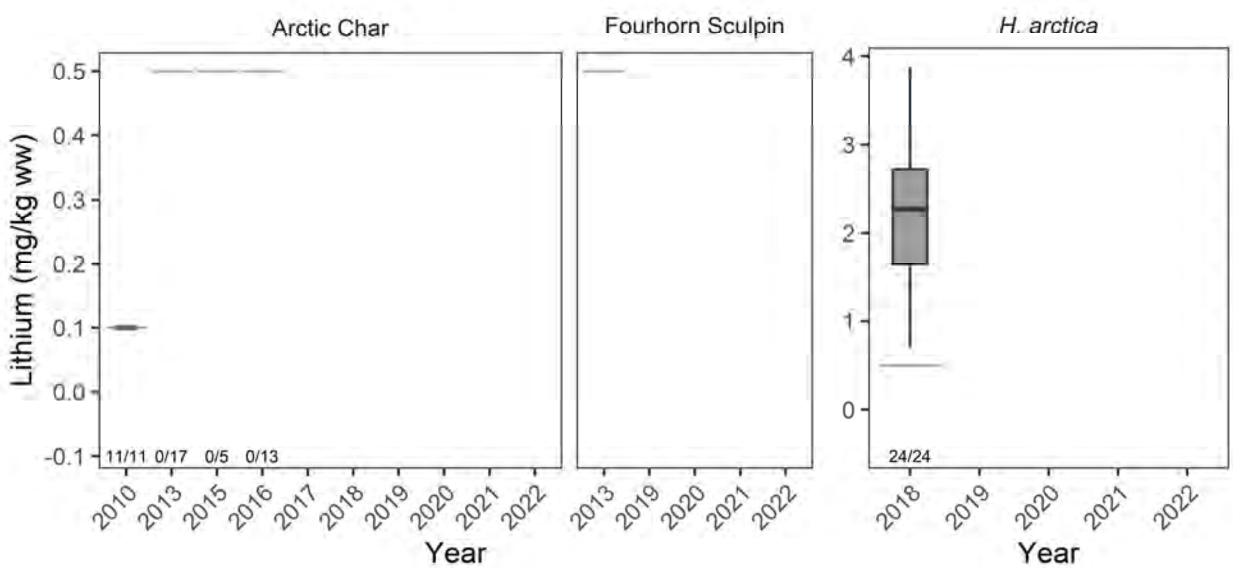
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits. One Arctic Char sample removed from 2022 (BAFF21UMLNGN06ARCH09, 87.15 mg/kg ww) to improve plotting.

Figure 7D-14: Concentrations of Iron for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



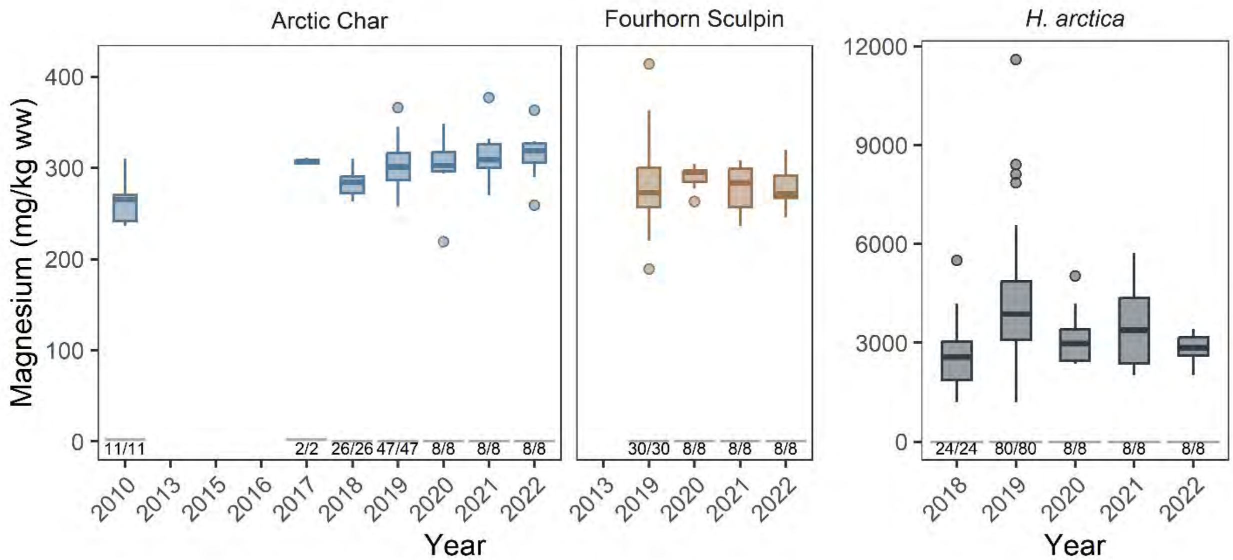
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits. Detection limit of 0.2 mg/kg ww for Arctic Char (2013, 2015, 2016) and Fourhorn Sculpin (2013) not shown to allow for clearer visualization of the data.

Figure 7D-15: Concentrations of Lead for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



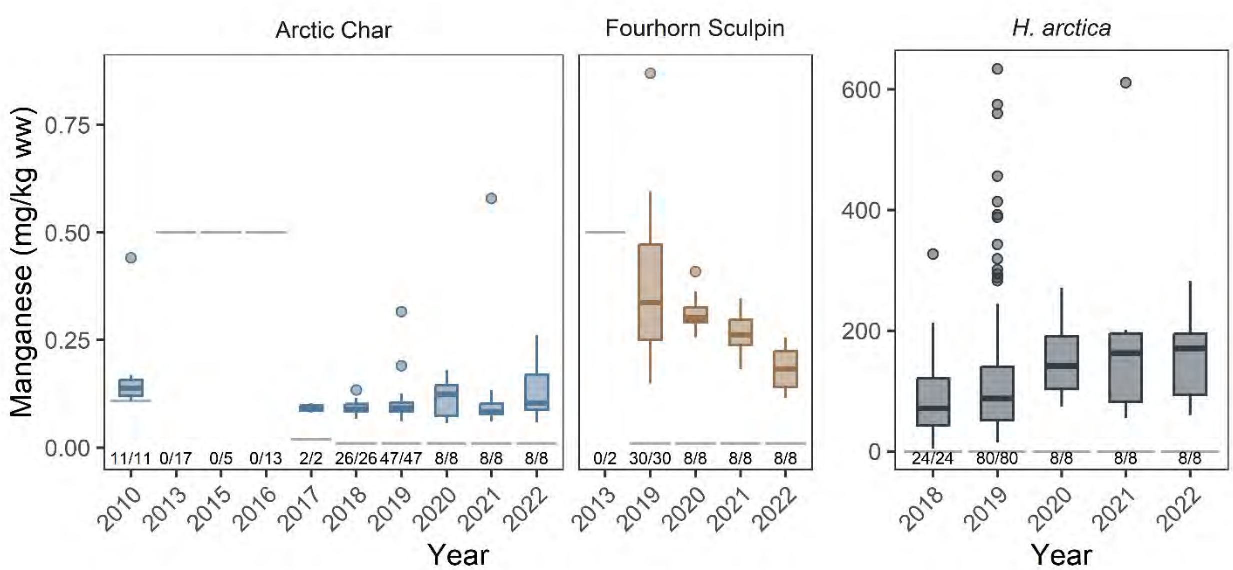
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-16: Concentrations of Lithium for *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



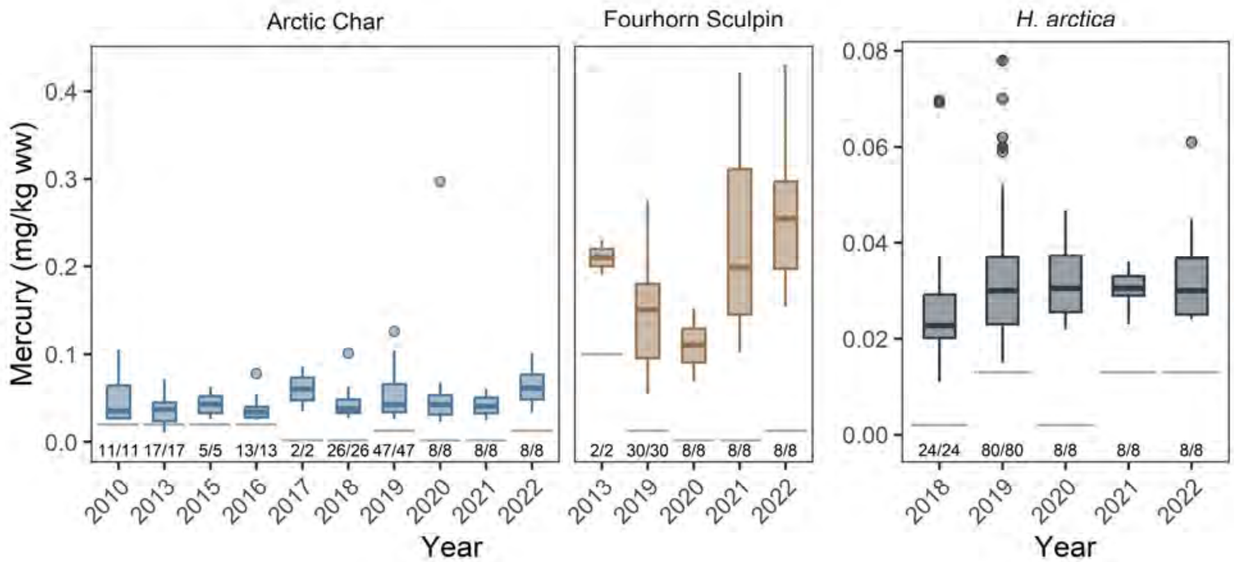
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-17: Concentrations of Magnesium for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



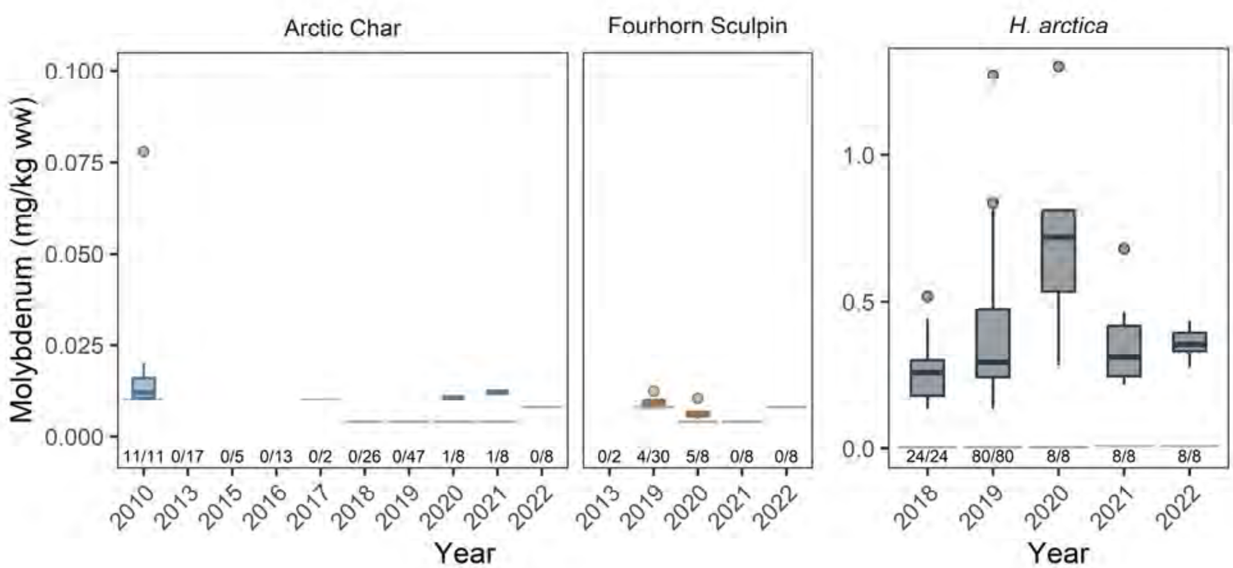
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-18: Concentrations of Manganese for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



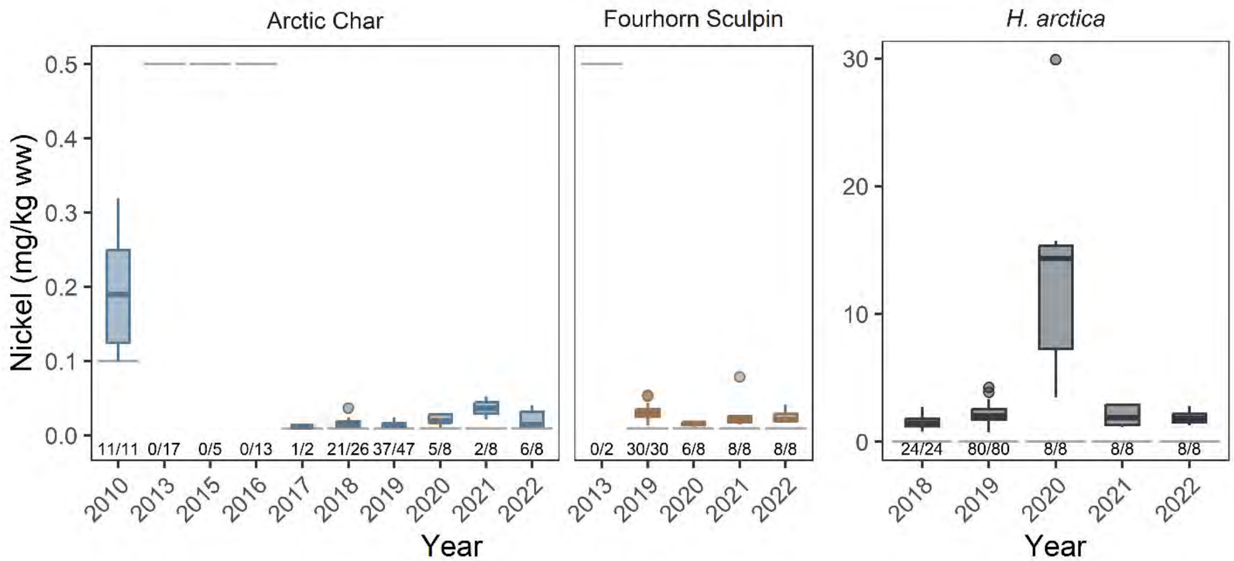
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-19: Concentrations of Mercury for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



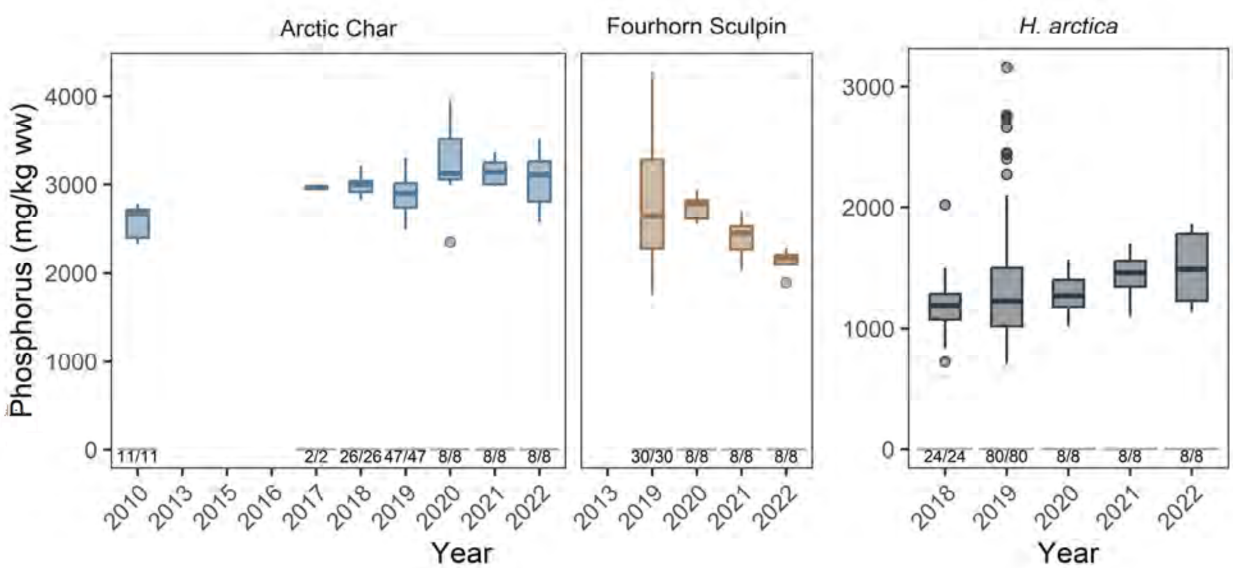
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits. Detection limit of 0.5 mg/kg ww for Arctic Char (2013, 2015, 2016) and Fourhorn Sculpin (2013) not shown to allow for clearer visualization of the data.

Figure 7D-20: Concentrations of Molybdenum for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



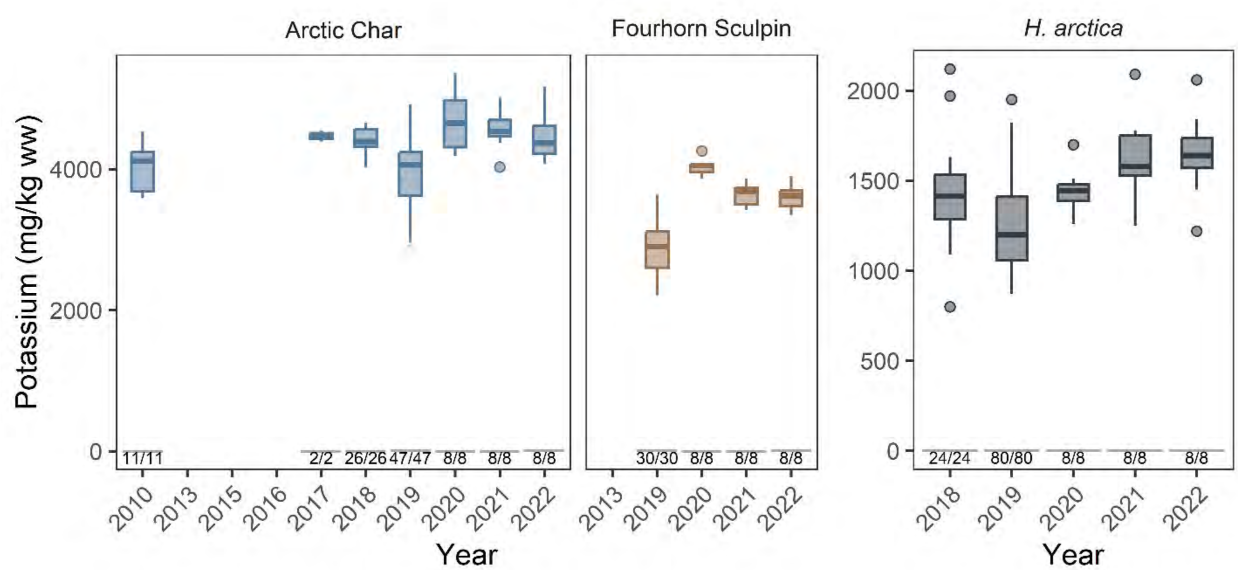
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits. One point for Arctic Char (2010) not shown to allow for clearer visualization of the data.

Figure 7D-21: Concentrations of Nickel for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



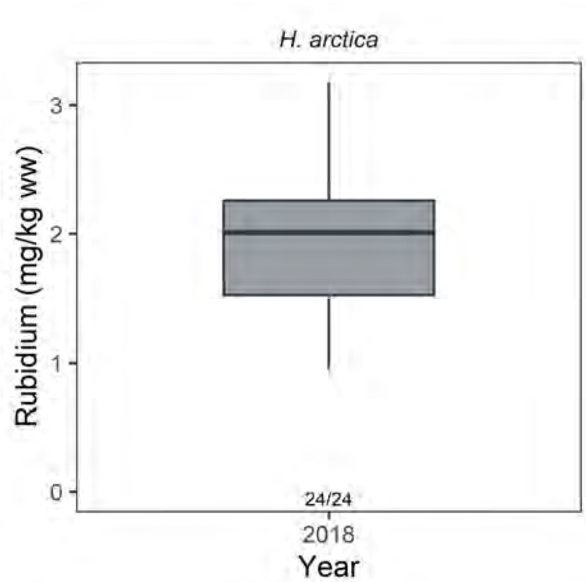
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-22: Concentrations of Phosphorus for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



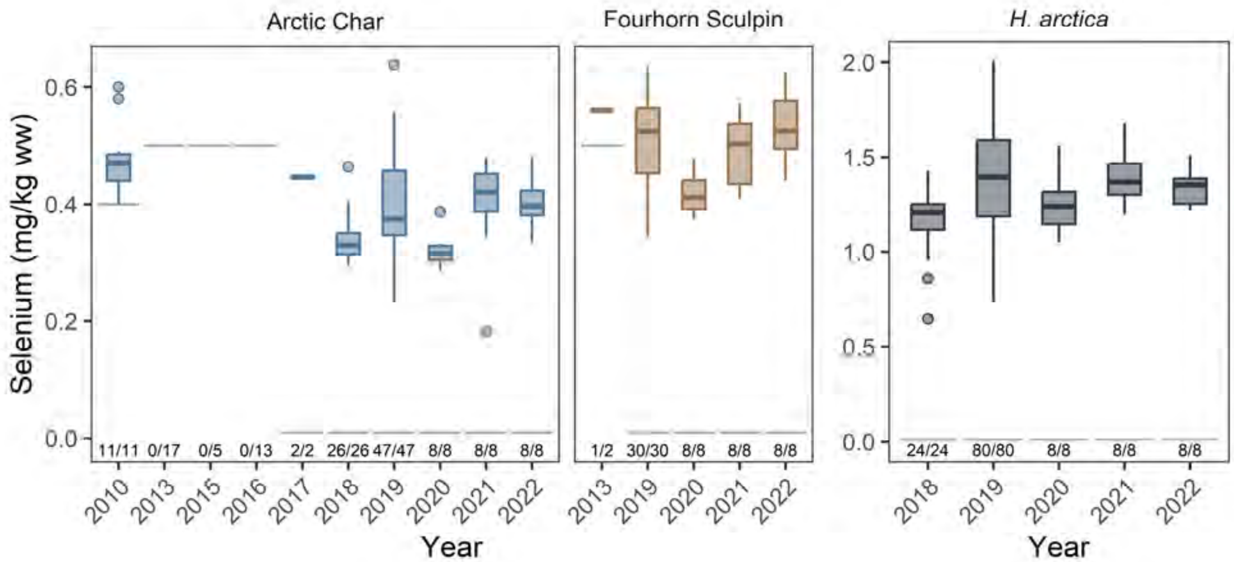
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-23: Concentrations of Potassium for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



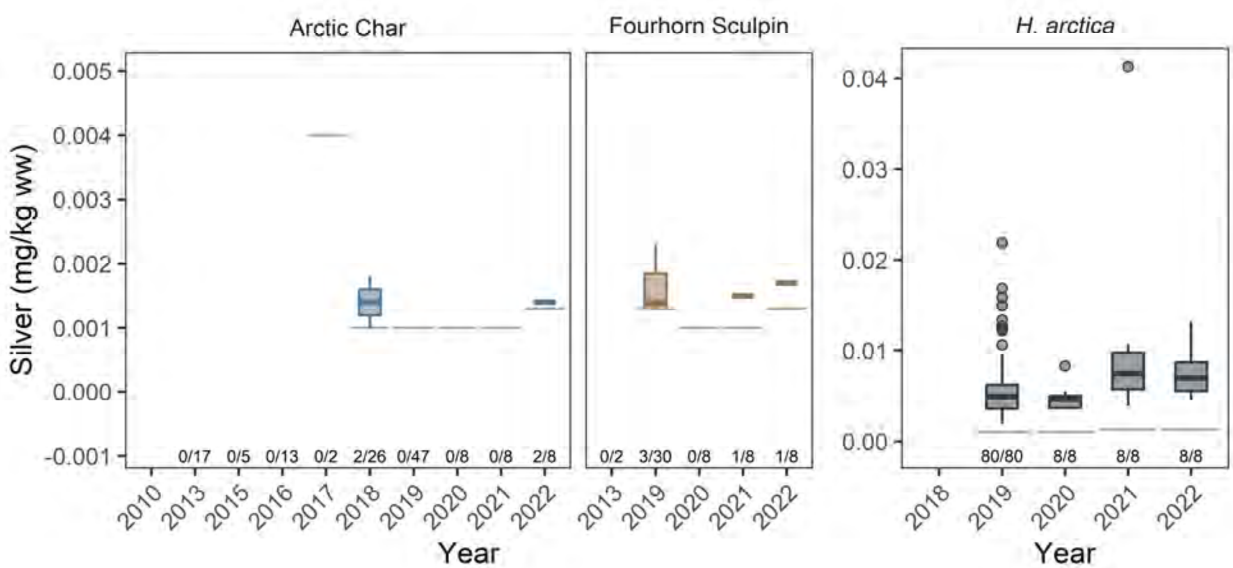
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits. Rubidium was not analyzed during other sampling years.

Figure 7D-24: Concentrations of Rubidium for *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2018



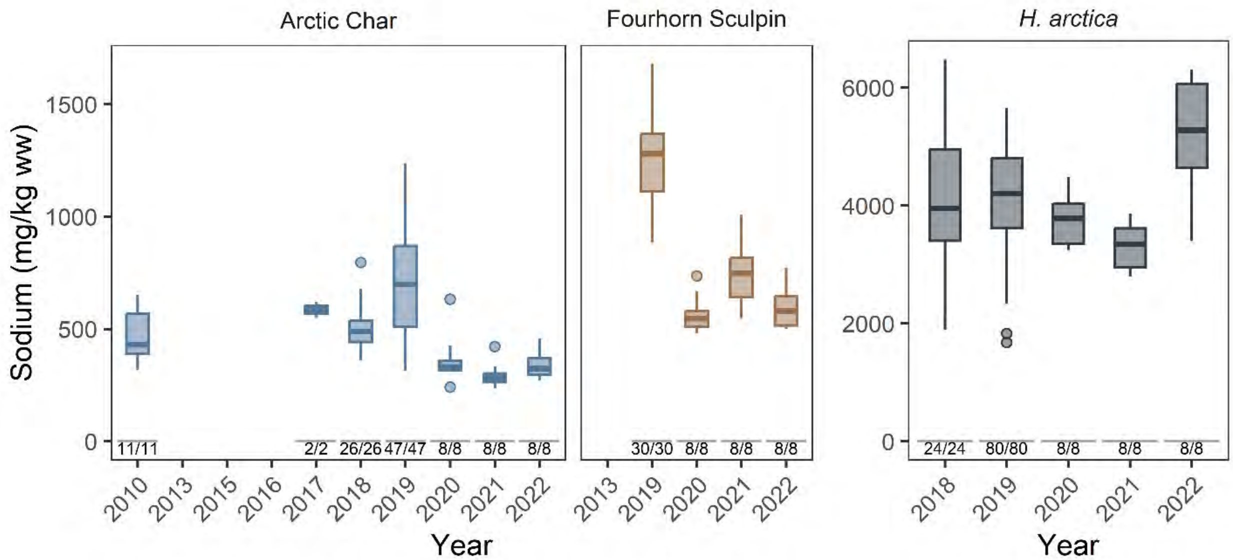
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-25: Concentrations of Selenium for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



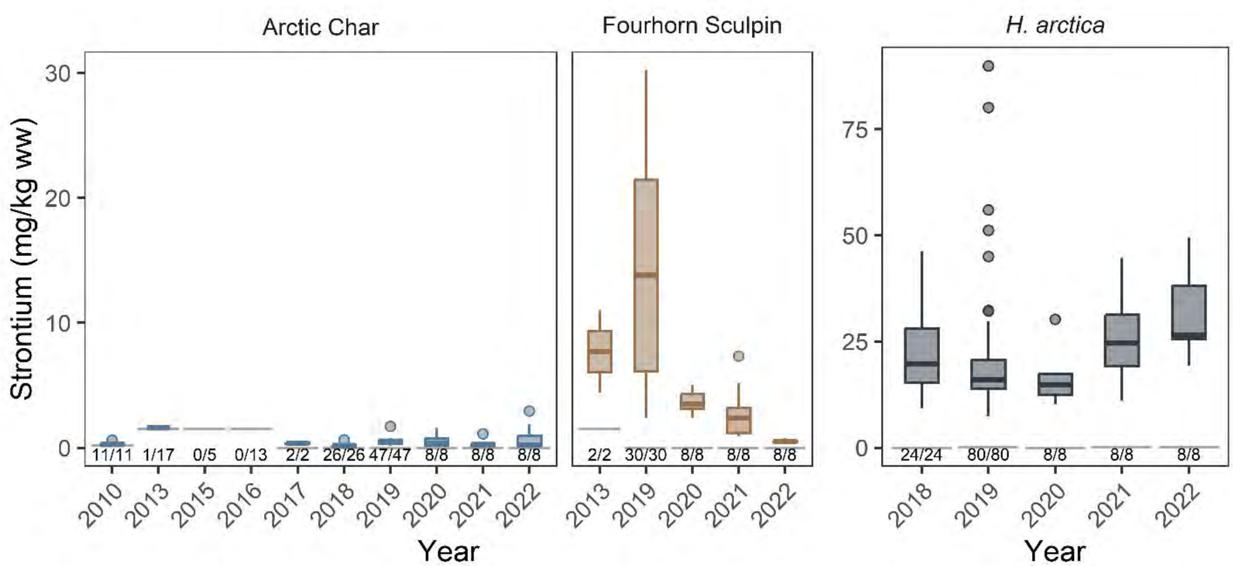
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits. Detection limit of 0.12 mg/kg ww for Arctic Char (2013, 2015, 2016) and Fourhorn Sculpin (2013) not shown to allow for clearer visualization of the data.

Figure 7D-26: Concentrations of Silver for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



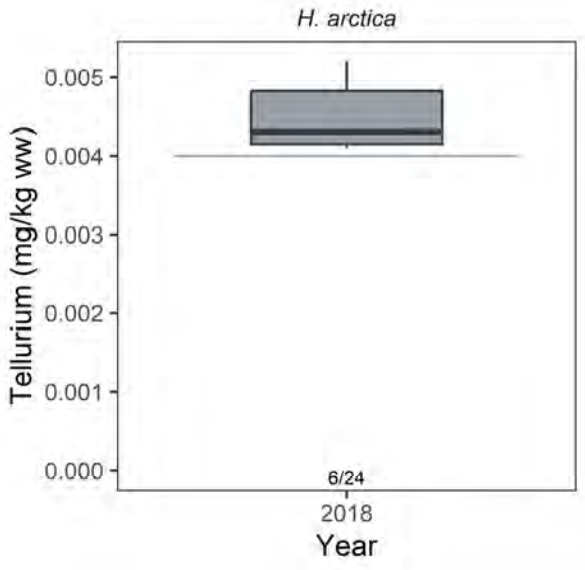
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-27: Concentrations of Sodium for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



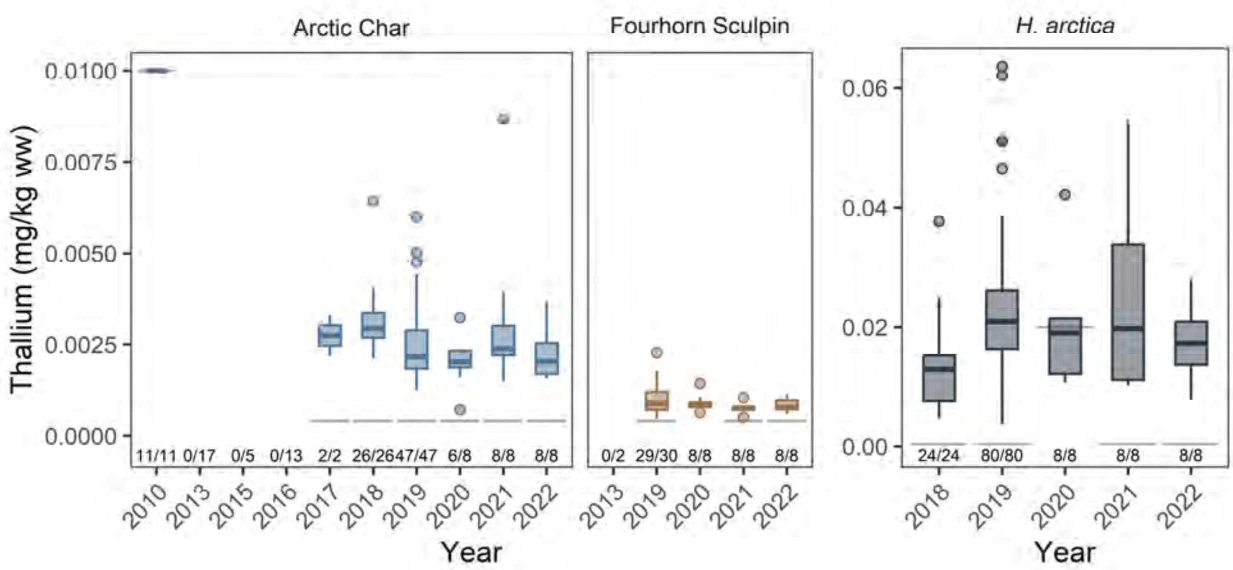
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-28: Concentrations of Strontium for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



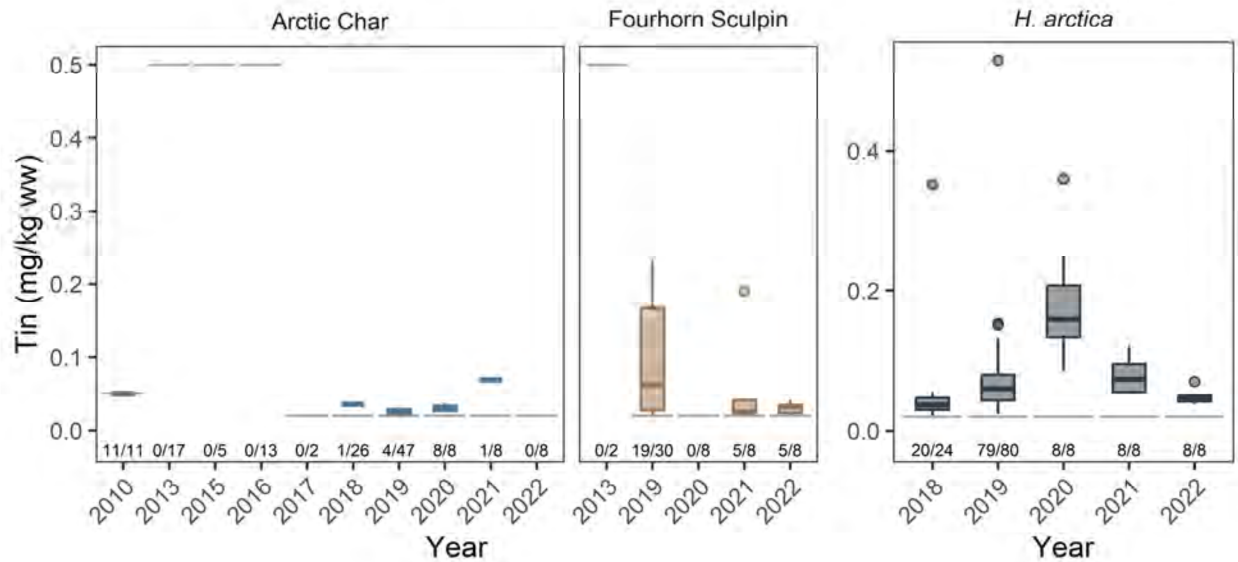
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits. Tellurium was not analyzed during other sampling years.

Figure 7D-29: Concentrations of Tellurium for *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2018



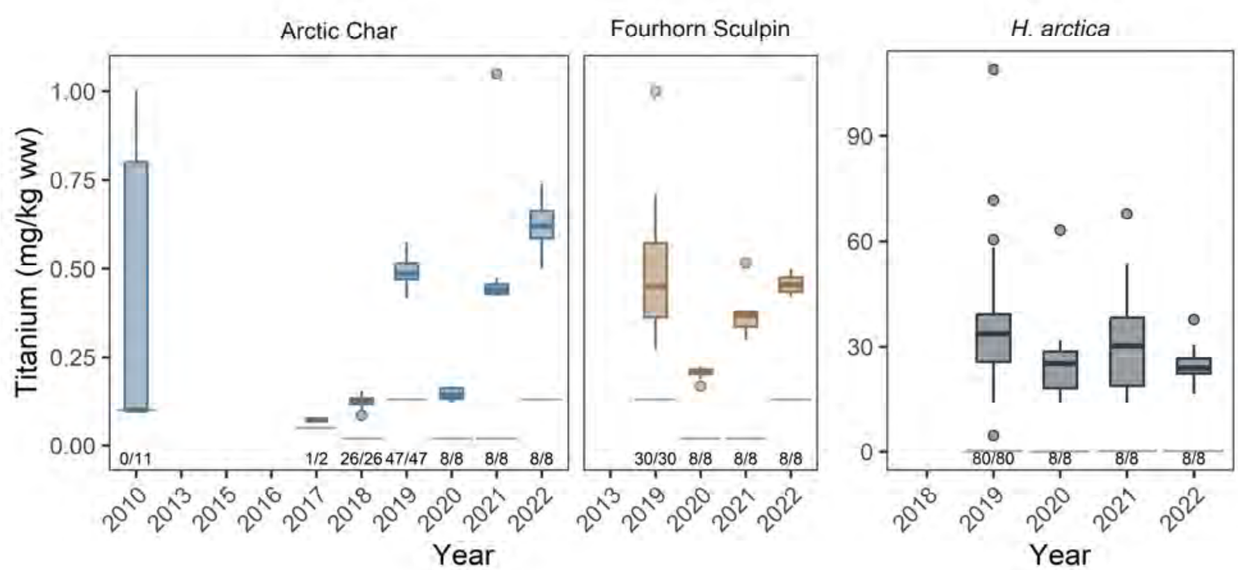
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits. Detection limit of 0.02 mg/kg ww for Arctic Char (2013, 2015, 2016) and Fourhorn Sculpin (2013, 2020) not shown to allow for clearer visualization of the data.

Figure 7D-30: Concentrations of Thallium for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



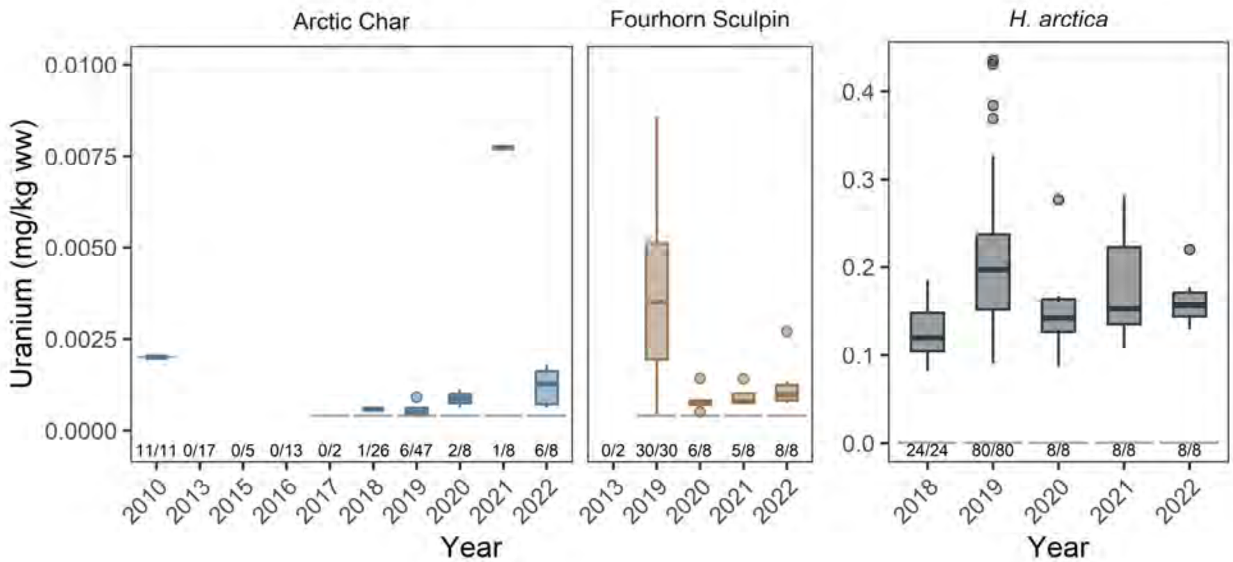
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits. One point for Fourhorn Sculpin (2019) not shown to allow for clearer visualization of the data.

Figure 7D-31: Concentrations of Tin for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



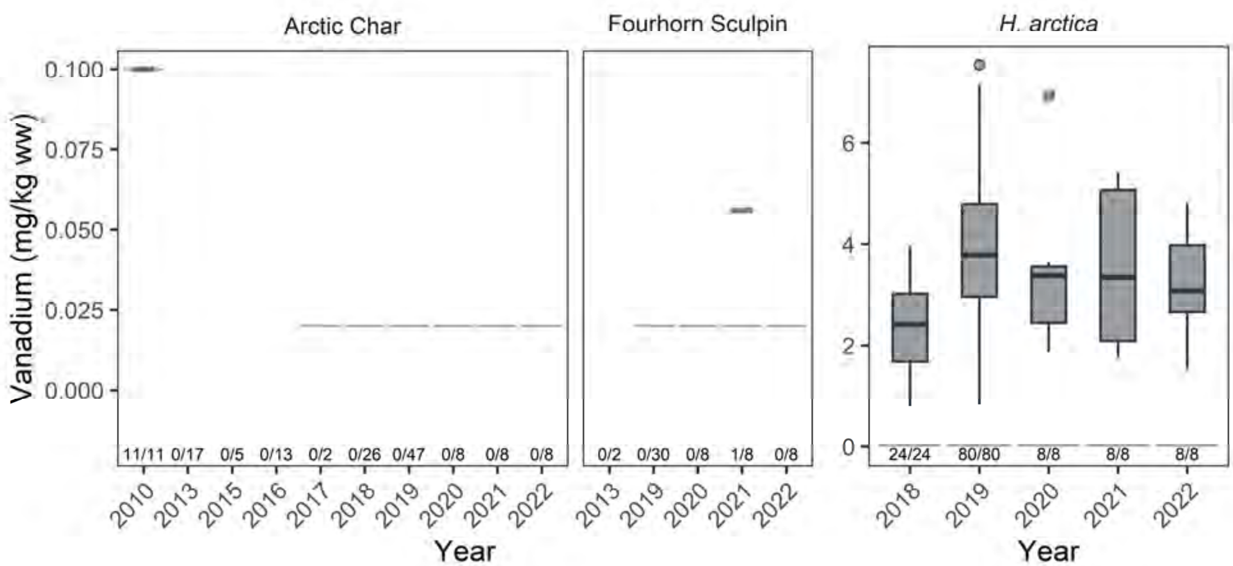
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits.

Figure 7D-32: Concentrations of Titanium for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



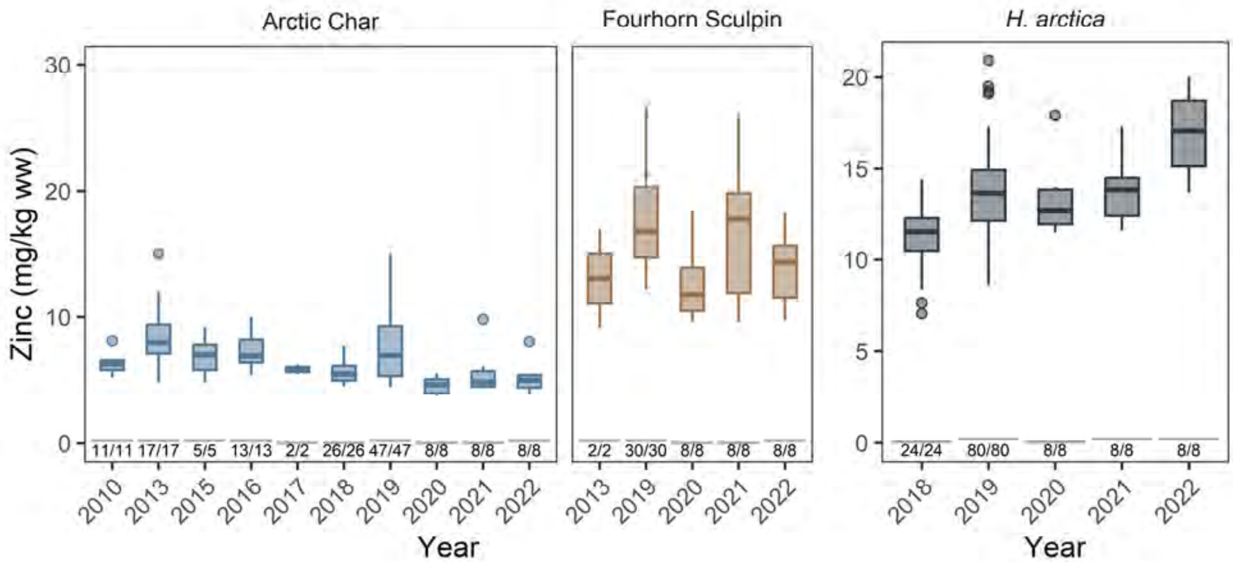
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits. Detection limit of 0.02 mg/kg ww for Arctic Char (2013, 2015, 2016) and Fourhorn Sculpin (2013), and two points for Fourhorn Sculpin (2019) not shown to allow for clearer visualization of the data.

Figure 7D-33: Concentrations of Uranium for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



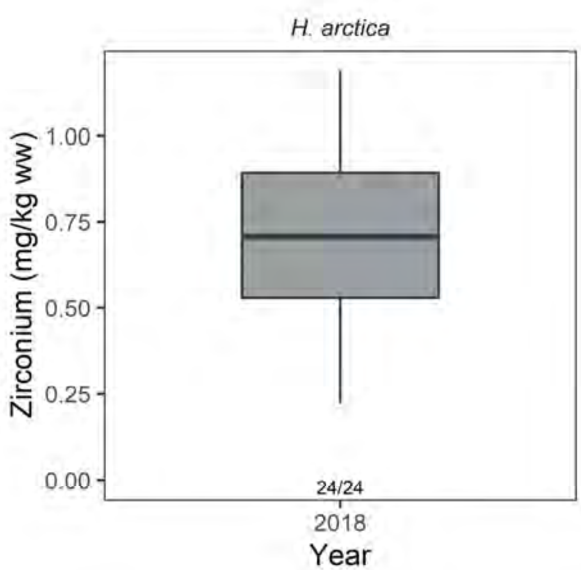
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as "n>DL/n". Values below DL are not shown in the plots. Grey lines indicate detection limits. Detection limit of 0.5 mg/kg ww for Arctic Char (2013, 2015, 2016) and Fourhorn Sculpin (2013) not shown to allow for clearer visualization of the data.

Figure 7D-34: Concentrations of Vanadium for *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



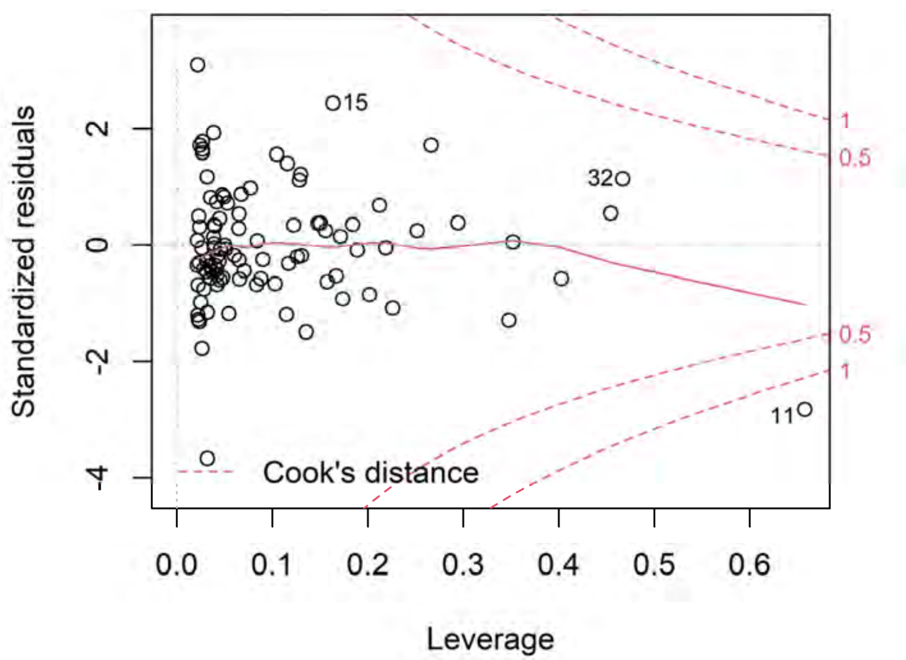
Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits. One point for Arctic Char (2010) not shown to allow for clearer visualization of the data.

Figure 7D-35: Concentrations of Zinc for Arctic Char, Fourhorn Sculpin and *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2010 to 2022



Total sample size (n) and number of samples above detection limits (n>DL) are shown above the x-axis as “n>DL/n”. Values below DL are not shown in the plots. Grey lines indicate detection limits. Zirconium was not analyzed during other sampling years.

Figure 7D-36: Concentrations of Zirconium for *Hiatella arctica* Tissue Sampled from the Milne Port Area, 2018



Point 11 represents Fish Identification Number BAFF21UMLNGN06ARCH09.

Figure 7D-37: Leverage Plot for Arctic Char Selenium ANCOVA, Indicating Point 11 as Having Excessive Leverage.

APPENDIX 7E

Certificates of Analysis

Your Project #: 166372401/64000/03
Site#: MILNE PORT/REFERENCE SITE
Site Location: BAFFINLAND IRON MINE
Your C.O.C. #: 08511529, 08511535, 08511536

Attention: Collin Arens

GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2022/10/29
Report #: R3256208
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C263561
Received: 2022/08/23, 11:25

Sample Matrix: Tissue
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by ICPMS - Tissue Plug Wet Wt	3	2022/10/22	2022/10/28	BBY WI-00033	Auto Calc
Elements by ICPMS - Tissue Plug Wet Wt	5	2022/10/25	2022/10/28	BBY WI-00033	Auto Calc
Moisture in Tissue - Freeze Drying	8	2022/10/20	2022/10/27	BBY7SOP-00021	BCMOE BCLM Aug 2014

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Your Project #: 166372401/64000/03
Site#: MILNE PORT/REFERENCE SITE
Site Location: BAFFINLAND IRON MINE
Your C.O.C. #: 08511529, 08511535, 08511536

Attention: Collin Arens

GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2022/10/29
Report #: R3256208
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C263561
Received: 2022/08/23, 11:25

Encryption Key AUTHORIZED REPORT RAPPORT AUTORISÉ Bureau Veritas 29 Oct 2022 11:51:41

Please direct all questions regarding this Certificate of Analysis to:
Cynny Hagen, Key Account Soecialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273
==
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Raphael Kwan, Senior Manager, BC and Yukon Regions responsible for British Columbia Environmental laboratory operations.

Bureau Veritas Job #: C263561
Report Date: 2022/10/29

GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND IRON MINE
Sampler Initials: MR

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Bureau Veritas ID		BAI028	BAI033	BAI034		
Sampling Date		2022/08/01 14:41	2022/08/01 15:55	2022/08/01 14:30		
COC Number		08511529	08511529	08511529		
	UNITS	**BAFF22UDPFARCH4004**	**BAFF22UDPFARCH4009**	**BAFF22UDPFARCH4010**	**RDL**	**QC Batch**
Total Metals by ICPMS						
Total (Wet Wt) Aluminum (Al)	mg/kg	0.77	1.31	<0.50	0.50	A771339
Total (Wet Wt) Antimony (Sb)	mg/kg	0.0030	0.0190	0.0033	0.0020	A771339
Total (Wet Wt) Arsenic (As)	mg/kg	0.527	0.371	0.373	0.0050	A771339
Total (Wet Wt) Barium (Ba)	mg/kg	0.024	0.024	0.016	0.010	A771339
Total (Wet Wt) Beryllium (Be)	mg/kg	<0.0020	<0.0020	<0.0020	0.0020	A771339
Total (Wet Wt) Bismuth (Bi)	mg/kg	<0.0013	<0.0013	<0.0013	0.0013	A771339
Total (Wet Wt) Boron (B)	mg/kg	<0.20	<0.20	<0.20	0.20	A771339
Total (Wet Wt) Cadmium (Cd)	mg/kg	0.0208	0.0032	0.0022	0.0013	A771339
Total (Wet Wt) Calcium (Ca)	mg/kg	86.9	164	267	4.0	A771339
Total (Wet Wt) Chromium (Cr)	mg/kg	<0.025	0.033	<0.025	0.025	A771339
Total (Wet Wt) Cobalt (Co)	mg/kg	0.0076	0.0090	0.0498	0.0013	A771339
Total (Wet Wt) Copper (Cu)	mg/kg	0.578	0.331	0.273	0.013	A771339
Total (Wet Wt) Iron (Fe)	mg/kg	7.58	9.95	3.51	0.25	A771339
Total (Wet Wt) Lead (Pb)	mg/kg	0.0079	0.0130	0.0045	0.0013	A771339
Total (Wet Wt) Magnesium (Mg)	mg/kg	290	363	325	0.40	A771339
Total (Wet Wt) Manganese (Mn)	mg/kg	0.098	0.108	0.146	0.010	A771339
Total (Wet Wt) Mercury (Hg)	mg/kg	0.041	0.085	0.101	0.013	A771339
Total (Wet Wt) Molybdenum (Mo)	mg/kg	<0.0080	<0.0080	<0.0080	0.0080	A771339
Total (Wet Wt) Nickel (Ni)	mg/kg	0.016	0.041	0.013	0.010	A771339
Total (Wet Wt) Phosphorus (P)	mg/kg	2810	3480	3050	2.0	A771339
Total (Wet Wt) Potassium (K)	mg/kg	4180	5170	4470	2.5	A771339
Total (Wet Wt) Selenium (Se)	mg/kg	0.392	0.481	0.386	0.010	A771339
Total (Wet Wt) Silver (Ag)	mg/kg	<0.0013	0.0014	0.0014	0.0013	A771339
Total (Wet Wt) Sodium (Na)	mg/kg	302	352	299	2.5	A771339
Total (Wet Wt) Strontium (Sr)	mg/kg	0.174	0.260	0.623	0.013	A771339
Total (Wet Wt) Thallium (Tl)	mg/kg	0.00172	0.00370	0.00215	0.00040	A771339
Total (Wet Wt) Tin (Sn)	mg/kg	<0.020	<0.020	<0.020	0.020	A771339
Total (Wet Wt) Titanium (Ti)	mg/kg	0.59	0.73	0.62	0.13	A771339
Total (Wet Wt) Uranium (U)	mg/kg	0.00061	0.00180	0.00063	0.00040	A771339
Total (Wet Wt) Vanadium (V)	mg/kg	<0.020	<0.020	<0.020	0.020	A771339
Total (Wet Wt) Zinc (Zn)	mg/kg	4.85	8.05	5.12	0.20	A771339
RDL = Reportable Detection Limit						

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C263561
Report Date: 2022/10/29

GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND IRON MINE
Sampler Initials: MR

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Bureau Veritas ID		BAI042	BAI043		BAI048		
Sampling Date		2022/08/14 16:45	2022/08/14 16:55		2022/08/14 17:45		
COC Number		08511535	08511535		08511536		
	UNITS	BAFF22UDPFARCH4017	BAFF22UDPFARCH4018	QC Batch	BAFF22UDPFARCH4023	RDL	QC Batch
Total Metals by ICPMS							
Total (Wet Wt) Aluminum (Al)	mg/kg	0.63	<0.50	A771339	<0.50	0.50	A767645
Total (Wet Wt) Antimony (Sb)	mg/kg	0.0031	0.0030	A771339	0.0031	0.0020	A767645
Total (Wet Wt) Arsenic (As)	mg/kg	0.724	0.543	A771339	0.635	0.0050	A767645
Total (Wet Wt) Barium (Ba)	mg/kg	<0.010	<0.010	A771339	0.041	0.010	A767645
Total (Wet Wt) Beryllium (Be)	mg/kg	<0.0020	<0.0020	A771339	<0.0020	0.0020	A767645
Total (Wet Wt) Bismuth (Bi)	mg/kg	<0.0013	<0.0013	A771339	<0.0013	0.0013	A767645
Total (Wet Wt) Boron (B)	mg/kg	<0.20	<0.20	A771339	<0.20	0.20	A767645
Total (Wet Wt) Cadmium (Cd)	mg/kg	0.0030	<0.0013	A771339	0.0035	0.0013	A767645
Total (Wet Wt) Calcium (Ca)	mg/kg	101	89.1	A771339	704	4.0	A767645
Total (Wet Wt) Chromium (Cr)	mg/kg	<0.025	<0.025	A771339	<0.025	0.025	A767645
Total (Wet Wt) Cobalt (Co)	mg/kg	0.0037	0.0075	A771339	0.0067	0.0013	A767645
Total (Wet Wt) Copper (Cu)	mg/kg	0.376	0.300	A771339	0.391	0.013	A767645
Total (Wet Wt) Iron (Fe)	mg/kg	3.85	3.46	A771339	6.22	0.25	A767645
Total (Wet Wt) Lead (Pb)	mg/kg	0.0043	0.0025	A771339	0.0032	0.0013	A767645
Total (Wet Wt) Magnesium (Mg)	mg/kg	259	311	A771339	326	0.40	A767645
Total (Wet Wt) Manganese (Mn)	mg/kg	0.075	0.092	A771339	0.239	0.010	A767645
Total (Wet Wt) Mercury (Hg)	mg/kg	0.074	0.069	A771339	0.034	0.013	A767645
Total (Wet Wt) Molybdenum (Mo)	mg/kg	<0.0080	<0.0080	A771339	<0.0080	0.0080	A767645
Total (Wet Wt) Nickel (Ni)	mg/kg	0.038	0.013	A771339	<0.010	0.010	A767645
Total (Wet Wt) Phosphorus (P)	mg/kg	2570	3170	A771339	3190	2.0	A767645
Total (Wet Wt) Potassium (K)	mg/kg	4070	5060	A771339	4400	2.5	A767645
Total (Wet Wt) Selenium (Se)	mg/kg	0.335	0.446	A771339	0.367	0.010	A767645
Total (Wet Wt) Silver (Ag)	mg/kg	<0.0013	<0.0013	A771339	<0.0013	0.0013	A767645
Total (Wet Wt) Sodium (Na)	mg/kg	431	345	A771339	292	2.5	A767645
Total (Wet Wt) Strontium (Sr)	mg/kg	0.176	0.167	A771339	1.90	0.013	A767645
Total (Wet Wt) Thallium (Tl)	mg/kg	0.00160	0.00312	A771339	0.00234	0.00040	A767645
Total (Wet Wt) Tin (Sn)	mg/kg	<0.020	<0.020	A771339	<0.020	0.020	A767645
Total (Wet Wt) Titanium (Ti)	mg/kg	0.50	0.62	A771339	0.64	0.13	A767645
Total (Wet Wt) Uranium (U)	mg/kg	<0.00040	<0.00040	A771339	0.00164	0.00040	A767645
Total (Wet Wt) Vanadium (V)	mg/kg	<0.020	<0.020	A771339	<0.020	0.020	A767645
Total (Wet Wt) Zinc (Zn)	mg/kg	3.85	5.47	A771339	5.38	0.20	A767645
RDL = Reportable Detection Limit							

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Bureau Veritas ID		BAI049	BAI050		
Sampling Date		2022/08/14 17:55	2022/08/14 18:05		
COC Number		08511536	08511536		
	UNITS	**BAFF22UDPFARCH4024**	**BAFF22UDPFARCH4025**	**RDL**	**QC Batch**
Total Metals by ICPMS					
Total (Wet Wt) Aluminum (Al)	mg/kg	<0.50	<0.50	0.50	A767645
Total (Wet Wt) Antimony (Sb)	mg/kg	<0.0020	<0.0020	0.0020	A767645
Total (Wet Wt) Arsenic (As)	mg/kg	0.531	0.439	0.0050	A767645
Total (Wet Wt) Barium (Ba)	mg/kg	0.025	<0.010	0.010	A767645
Total (Wet Wt) Beryllium (Be)	mg/kg	<0.0020	<0.0020	0.0020	A767645
Total (Wet Wt) Bismuth (Bi)	mg/kg	<0.0013	<0.0013	0.0013	A767645
Total (Wet Wt) Boron (B)	mg/kg	<0.20	<0.20	0.20	A767645
Total (Wet Wt) Cadmium (Cd)	mg/kg	0.0025	0.0022	0.0013	A767645
Total (Wet Wt) Calcium (Ca)	mg/kg	1390	93.1	4.0	A767645
Total (Wet Wt) Chromium (Cr)	mg/kg	<0.025	<0.025	0.025	A767645
Total (Wet Wt) Cobalt (Co)	mg/kg	0.0060	0.0062	0.0013	A767645
Total (Wet Wt) Copper (Cu)	mg/kg	0.307	0.295 (1)	0.013	A767645
Total (Wet Wt) Iron (Fe)	mg/kg	4.63	3.66	0.25	A767645
Total (Wet Wt) Lead (Pb)	mg/kg	0.0044	0.0030	0.0013	A767645
Total (Wet Wt) Magnesium (Mg)	mg/kg	329	313	0.40	A767645
Total (Wet Wt) Manganese (Mn)	mg/kg	0.262	0.059	0.010	A767645
Total (Wet Wt) Mercury (Hg)	mg/kg	0.054	0.051	0.013	A767645
Total (Wet Wt) Molybdenum (Mo)	mg/kg	<0.0080	<0.0080	0.0080	A767645
Total (Wet Wt) Nickel (Ni)	mg/kg	0.012	<0.010	0.010	A767645
Total (Wet Wt) Phosphorus (P)	mg/kg	3520	2800	2.0	A767645
Total (Wet Wt) Potassium (K)	mg/kg	4340	4240	2.5	A767645
Total (Wet Wt) Selenium (Se)	mg/kg	0.416	0.401	0.010	A767645
Total (Wet Wt) Silver (Ag)	mg/kg	<0.0013	<0.0013	0.0013	A767645
Total (Wet Wt) Sodium (Na)	mg/kg	458	273	2.5	A767645
Total (Wet Wt) Strontium (Sr)	mg/kg	2.95	0.168	0.013	A767645
Total (Wet Wt) Thallium (Tl)	mg/kg	0.00157	0.00191	0.00040	A767645
Total (Wet Wt) Tin (Sn)	mg/kg	<0.020	<0.020	0.020	A767645
Total (Wet Wt) Titanium (Ti)	mg/kg	0.74	0.57	0.13	A767645
Total (Wet Wt) Uranium (U)	mg/kg	0.00155	0.00099	0.00040	A767645
Total (Wet Wt) Vanadium (V)	mg/kg	<0.020	<0.020	0.020	A767645

RDL = Reportable Detection Limit
(1) Duplicate exceeds acceptance criteria due to sample non homogeneity. Reanalysis yields similar results.

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ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Bureau Veritas ID		BAI049	BAI050		
Sampling Date		2022/08/14 17:55	2022/08/14 18:05		
COC Number		08511536	08511536		
	UNITS	**BAFF22UDPFARCH4024**	**BAFF22UDPFARCH4025**	**RDL**	**QC Batch**
Total (Wet Wt) Zinc (Zn)	mg/kg	4.51	4.00	0.20	A767645
RDL = Reportable Detection Limit					

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PHYSICAL TESTING (TISSUE)

Bureau Veritas ID		BAI028	BAI033	BAI034		
Sampling Date		2022/08/01 14:41	2022/08/01 15:55	2022/08/01 14:30		
COC Number		08511529	08511529	08511529		
	UNITS	BAFF22UDPFARCH4004	BAFF22UDPFARCH4009	BAFF22UDPFARCH4010	RDL	QC Batch
Physical Properties						
Moisture	%	65	73	68	0.30	A765314
RDL = Reportable Detection Limit						

Bureau Veritas ID		BAI042	BAI043	BAI048		
Sampling Date		2022/08/14 16:45	2022/08/14 16:55	2022/08/14 17:45		
COC Number		08511535	08511535	08511536		
	UNITS	BAFF22UDPFARCH4017	BAFF22UDPFARCH4018	BAFF22UDPFARCH4023	RDL	QC Batch
Physical Properties						
Moisture	%	72	74	68	0.30	A765314
RDL = Reportable Detection Limit						

Bureau Veritas ID		BAI049	BAI050		
Sampling Date		2022/08/14 17:55	2022/08/14 18:05		
COC Number		08511536	08511536		
	UNITS	BAFF22UDPFARCH4024	BAFF22UDPFARCH4025	RDL	QC Batch
Physical Properties					
Moisture	%	72	66	0.30	A765314
RDL = Reportable Detection Limit					

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GENERAL COMMENTS

Results relate only to the items tested.

BUREAU VERITAS

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GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND IRON MINE
Sampler Initials: MR

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A765314	ERE	RPD [BAI050-01]	Moisture	2022/10/27	1.2		%	20
A767645	MYO	QC Standard	Total (Wet Wt) Antimony (Sb)	2022/10/25		110	%	75 - 125
			Total (Wet Wt) Arsenic (As)	2022/10/25		92	%	75 - 125
			Total (Wet Wt) Cadmium (Cd)	2022/10/25		90	%	75 - 125
			Total (Wet Wt) Calcium (Ca)	2022/10/25		93	%	75 - 125
			Total (Wet Wt) Cobalt (Co)	2022/10/25		82	%	75 - 125
			Total (Wet Wt) Copper (Cu)	2022/10/25		89	%	75 - 125
			Total (Wet Wt) Iron (Fe)	2022/10/25		92	%	75 - 125
			Total (Wet Wt) Lead (Pb)	2022/10/25		104	%	75 - 125
			Total (Wet Wt) Manganese (Mn)	2022/10/25		90	%	75 - 125
			Total (Wet Wt) Mercury (Hg)	2022/10/25		83	%	75 - 125
			Total (Wet Wt) Molybdenum (Mo)	2022/10/25		93	%	75 - 125
			Total (Wet Wt) Phosphorus (P)	2022/10/25		96	%	75 - 125
			Total (Wet Wt) Potassium (K)	2022/10/25		97	%	75 - 125
			Total (Wet Wt) Selenium (Se)	2022/10/25		88	%	75 - 125
			Total (Wet Wt) Silver (Ag)	2022/10/25		90	%	75 - 125
			Total (Wet Wt) Sodium (Na)	2022/10/25		101	%	75 - 125
			Total (Wet Wt) Strontium (Sr)	2022/10/25		94	%	75 - 125
			Total (Wet Wt) Thallium (Tl)	2022/10/25		88	%	75 - 125
			Total (Wet Wt) Tin (Sn)	2022/10/25		80	%	75 - 125
			Total (Wet Wt) Uranium (U)	2022/10/25		107	%	75 - 125
			Total (Wet Wt) Vanadium (V)	2022/10/25		83	%	75 - 125
			Total (Wet Wt) Zinc (Zn)	2022/10/25		92	%	75 - 125
A767645	MYO	Spiked Blank	Total (Wet Wt) Aluminum (Al)	2022/10/25		105	%	80 - 120
			Total (Wet Wt) Antimony (Sb)	2022/10/25		101	%	80 - 120
			Total (Wet Wt) Arsenic (As)	2022/10/25		101	%	80 - 120
			Total (Wet Wt) Barium (Ba)	2022/10/25		99	%	80 - 120
			Total (Wet Wt) Beryllium (Be)	2022/10/25		99	%	80 - 120
			Total (Wet Wt) Bismuth (Bi)	2022/10/25		96	%	80 - 120
			Total (Wet Wt) Boron (B)	2022/10/25		106	%	80 - 120
			Total (Wet Wt) Cadmium (Cd)	2022/10/25		97	%	80 - 120
			Total (Wet Wt) Calcium (Ca)	2022/10/25		100	%	80 - 120
			Total (Wet Wt) Chromium (Cr)	2022/10/25		95	%	80 - 120
			Total (Wet Wt) Cobalt (Co)	2022/10/25		92	%	80 - 120
			Total (Wet Wt) Copper (Cu)	2022/10/25		94	%	80 - 120
			Total (Wet Wt) Iron (Fe)	2022/10/25		103	%	80 - 120
			Total (Wet Wt) Lead (Pb)	2022/10/25		95	%	80 - 120
			Total (Wet Wt) Magnesium (Mg)	2022/10/25		103	%	80 - 120
			Total (Wet Wt) Manganese (Mn)	2022/10/25		96	%	80 - 120
			Total (Wet Wt) Mercury (Hg)	2022/10/25		97	%	80 - 120
			Total (Wet Wt) Molybdenum (Mo)	2022/10/25		104	%	80 - 120
			Total (Wet Wt) Nickel (Ni)	2022/10/25		94	%	80 - 120
			Total (Wet Wt) Phosphorus (P)	2022/10/25		100	%	80 - 120
			Total (Wet Wt) Potassium (K)	2022/10/25		99	%	80 - 120
			Total (Wet Wt) Selenium (Se)	2022/10/25		97	%	80 - 120
			Total (Wet Wt) Silver (Ag)	2022/10/25		99	%	80 - 120
			Total (Wet Wt) Sodium (Na)	2022/10/25		99	%	80 - 120
			Total (Wet Wt) Strontium (Sr)	2022/10/25		103	%	80 - 120
			Total (Wet Wt) Thallium (Tl)	2022/10/25		97	%	80 - 120
			Total (Wet Wt) Tin (Sn)	2022/10/25		100	%	80 - 120
			Total (Wet Wt) Titanium (Ti)	2022/10/25		103	%	80 - 120
			Total (Wet Wt) Uranium (U)	2022/10/25		96	%	80 - 120
			Total (Wet Wt) Vanadium (V)	2022/10/25		95	%	80 - 120

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Client Project #: 166372401/64000/03
Site Location: BAFFINLAND IRON MINE
Sampler Initials: MR

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total (Wet Wt) Zinc (Zn)	2022/10/25		98	%	80 - 120
A767645	MYO	Method Blank	Total (Wet Wt) Aluminum (Al)	2022/10/28	<0.50		mg/kg	
			Total (Wet Wt) Antimony (Sb)	2022/10/28	<0.0020		mg/kg	
			Total (Wet Wt) Arsenic (As)	2022/10/28	<0.0050		mg/kg	
			Total (Wet Wt) Barium (Ba)	2022/10/28	<0.010		mg/kg	
			Total (Wet Wt) Beryllium (Be)	2022/10/28	<0.0020		mg/kg	
			Total (Wet Wt) Bismuth (Bi)	2022/10/28	<0.0013		mg/kg	
			Total (Wet Wt) Boron (B)	2022/10/28	<0.20		mg/kg	
			Total (Wet Wt) Cadmium (Cd)	2022/10/28	<0.0013		mg/kg	
			Total (Wet Wt) Calcium (Ca)	2022/10/28	<4.0		mg/kg	
			Total (Wet Wt) Chromium (Cr)	2022/10/28	<0.025		mg/kg	
			Total (Wet Wt) Cobalt (Co)	2022/10/28	<0.0013		mg/kg	
			Total (Wet Wt) Copper (Cu)	2022/10/28	<0.013		mg/kg	
			Total (Wet Wt) Iron (Fe)	2022/10/28	<0.25		mg/kg	
			Total (Wet Wt) Lead (Pb)	2022/10/28	<0.0013		mg/kg	
			Total (Wet Wt) Magnesium (Mg)	2022/10/28	<0.40		mg/kg	
			Total (Wet Wt) Manganese (Mn)	2022/10/28	<0.010		mg/kg	
			Total (Wet Wt) Mercury (Hg)	2022/10/28	<0.013		mg/kg	
			Total (Wet Wt) Molybdenum (Mo)	2022/10/28	<0.0080		mg/kg	
			Total (Wet Wt) Nickel (Ni)	2022/10/28	<0.010		mg/kg	
			Total (Wet Wt) Phosphorus (P)	2022/10/28	<2.0		mg/kg	
			Total (Wet Wt) Potassium (K)	2022/10/28	<2.5		mg/kg	
			Total (Wet Wt) Selenium (Se)	2022/10/28	<0.010		mg/kg	
			Total (Wet Wt) Silver (Ag)	2022/10/28	<0.0013		mg/kg	
			Total (Wet Wt) Sodium (Na)	2022/10/28	<2.5		mg/kg	
			Total (Wet Wt) Strontium (Sr)	2022/10/28	<0.013		mg/kg	
			Total (Wet Wt) Thallium (Tl)	2022/10/28	<0.00040		mg/kg	
			Total (Wet Wt) Tin (Sn)	2022/10/28	<0.020		mg/kg	
			Total (Wet Wt) Titanium (Ti)	2022/10/28	<0.13		mg/kg	
			Total (Wet Wt) Uranium (U)	2022/10/28	<0.00040		mg/kg	
			Total (Wet Wt) Vanadium (V)	2022/10/28	<0.020		mg/kg	
			Total (Wet Wt) Zinc (Zn)	2022/10/28	<0.20		mg/kg	
A767645	MYO	RPD [BAI050-01]	Total (Wet Wt) Aluminum (Al)	2022/10/28	NC		%	40
			Total (Wet Wt) Antimony (Sb)	2022/10/28	NC		%	40
			Total (Wet Wt) Arsenic (As)	2022/10/28	11		%	40
			Total (Wet Wt) Barium (Ba)	2022/10/28	NC		%	40
			Total (Wet Wt) Beryllium (Be)	2022/10/28	NC		%	40
			Total (Wet Wt) Bismuth (Bi)	2022/10/28	NC		%	40
			Total (Wet Wt) Boron (B)	2022/10/28	NC		%	40
			Total (Wet Wt) Cadmium (Cd)	2022/10/28	29		%	40
			Total (Wet Wt) Calcium (Ca)	2022/10/28	6.9		%	60
			Total (Wet Wt) Chromium (Cr)	2022/10/28	NC		%	40
			Total (Wet Wt) Cobalt (Co)	2022/10/28	11		%	40
			Total (Wet Wt) Copper (Cu)	2022/10/28	45 (1)		%	40
			Total (Wet Wt) Iron (Fe)	2022/10/28	31		%	40
			Total (Wet Wt) Lead (Pb)	2022/10/28	29		%	40
			Total (Wet Wt) Magnesium (Mg)	2022/10/28	3.5		%	40
			Total (Wet Wt) Manganese (Mn)	2022/10/28	20		%	40
			Total (Wet Wt) Mercury (Hg)	2022/10/28	6.0		%	40
			Total (Wet Wt) Molybdenum (Mo)	2022/10/28	NC		%	40
			Total (Wet Wt) Nickel (Ni)	2022/10/28	25		%	40
			Total (Wet Wt) Phosphorus (P)	2022/10/28	7.7		%	40
			Total (Wet Wt) Potassium (K)	2022/10/28	4.6		%	40

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total (Wet Wt) Selenium (Se)	2022/10/28	8.9		%	40
			Total (Wet Wt) Silver (Ag)	2022/10/28	NC		%	40
			Total (Wet Wt) Sodium (Na)	2022/10/28	2.8		%	40
			Total (Wet Wt) Strontium (Sr)	2022/10/28	1.1		%	60
			Total (Wet Wt) Thallium (Tl)	2022/10/28	0.52		%	40
			Total (Wet Wt) Tin (Sn)	2022/10/28	NC		%	40
			Total (Wet Wt) Titanium (Ti)	2022/10/28	4.6		%	40
			Total (Wet Wt) Uranium (U)	2022/10/28	3.1		%	40
			Total (Wet Wt) Vanadium (V)	2022/10/28	NC		%	40
			Total (Wet Wt) Zinc (Zn)	2022/10/28	9.8		%	40
A771339	JLP	QC Standard	Total (Wet Wt) Antimony (Sb)	2022/10/28		125	%	N/A
			Total (Wet Wt) Arsenic (As)	2022/10/28		94	%	N/A
			Total (Wet Wt) Cadmium (Cd)	2022/10/28		87	%	N/A
			Total (Wet Wt) Calcium (Ca)	2022/10/28		89	%	N/A
			Total (Wet Wt) Cobalt (Co)	2022/10/28		90	%	N/A
			Total (Wet Wt) Copper (Cu)	2022/10/28		87	%	N/A
			Total (Wet Wt) Iron (Fe)	2022/10/28		89	%	N/A
			Total (Wet Wt) Lead (Pb)	2022/10/28		108	%	N/A
			Total (Wet Wt) Manganese (Mn)	2022/10/28		88	%	N/A
			Total (Wet Wt) Mercury (Hg)	2022/10/28		81	%	N/A
			Total (Wet Wt) Molybdenum (Mo)	2022/10/28		91	%	N/A
			Total (Wet Wt) Phosphorus (P)	2022/10/28		90	%	N/A
			Total (Wet Wt) Potassium (K)	2022/10/28		93	%	N/A
			Total (Wet Wt) Selenium (Se)	2022/10/28		89	%	N/A
			Total (Wet Wt) Silver (Ag)	2022/10/28		89	%	N/A
			Total (Wet Wt) Sodium (Na)	2022/10/28		96	%	N/A
			Total (Wet Wt) Strontium (Sr)	2022/10/28		92	%	N/A
			Total (Wet Wt) Thallium (Tl)	2022/10/28		88	%	N/A
			Total (Wet Wt) Tin (Sn)	2022/10/28		82	%	N/A
			Total (Wet Wt) Uranium (U)	2022/10/28		97	%	N/A
			Total (Wet Wt) Vanadium (V)	2022/10/28		89	%	N/A
			Total (Wet Wt) Zinc (Zn)	2022/10/28		86	%	N/A
A771339	JLP	Spiked Blank	Total (Wet Wt) Aluminum (Al)	2022/10/28		104	%	80 - 120
			Total (Wet Wt) Antimony (Sb)	2022/10/28		103	%	80 - 120
			Total (Wet Wt) Arsenic (As)	2022/10/28		110	%	80 - 120
			Total (Wet Wt) Barium (Ba)	2022/10/28		103	%	80 - 120
			Total (Wet Wt) Beryllium (Be)	2022/10/28		97	%	80 - 120
			Total (Wet Wt) Bismuth (Bi)	2022/10/28		105	%	80 - 120
			Total (Wet Wt) Boron (B)	2022/10/28		103	%	80 - 120
			Total (Wet Wt) Cadmium (Cd)	2022/10/28		99	%	80 - 120
			Total (Wet Wt) Calcium (Ca)	2022/10/28		103	%	80 - 120
			Total (Wet Wt) Chromium (Cr)	2022/10/28		104	%	80 - 120
			Total (Wet Wt) Cobalt (Co)	2022/10/28		96	%	80 - 120
			Total (Wet Wt) Copper (Cu)	2022/10/28		103	%	80 - 120
			Total (Wet Wt) Iron (Fe)	2022/10/28		106	%	80 - 120
			Total (Wet Wt) Lead (Pb)	2022/10/28		103	%	80 - 120
			Total (Wet Wt) Magnesium (Mg)	2022/10/28		107	%	80 - 120
			Total (Wet Wt) Manganese (Mn)	2022/10/28		103	%	80 - 120
			Total (Wet Wt) Mercury (Hg)	2022/10/28		118	%	80 - 120
			Total (Wet Wt) Molybdenum (Mo)	2022/10/28		113	%	80 - 120
			Total (Wet Wt) Nickel (Ni)	2022/10/28		103	%	80 - 120
			Total (Wet Wt) Phosphorus (P)	2022/10/28		105	%	80 - 120
			Total (Wet Wt) Potassium (K)	2022/10/28		105	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total (Wet Wt) Selenium (Se)	2022/10/28		106	%	80 - 120
			Total (Wet Wt) Silver (Ag)	2022/10/28		103	%	80 - 120
			Total (Wet Wt) Sodium (Na)	2022/10/28		108	%	80 - 120
			Total (Wet Wt) Strontium (Sr)	2022/10/28		107	%	80 - 120
			Total (Wet Wt) Thallium (Tl)	2022/10/28		103	%	80 - 120
			Total (Wet Wt) Tin (Sn)	2022/10/28		105	%	80 - 120
			Total (Wet Wt) Titanium (Ti)	2022/10/28		110	%	80 - 120
			Total (Wet Wt) Uranium (U)	2022/10/28		106	%	80 - 120
			Total (Wet Wt) Vanadium (V)	2022/10/28		104	%	80 - 120
			Total (Wet Wt) Zinc (Zn)	2022/10/28		104	%	80 - 120
A771339	JLP	Method Blank	Total (Wet Wt) Aluminum (Al)	2022/10/28	<0.50		mg/kg	
			Total (Wet Wt) Antimony (Sb)	2022/10/28	<0.0020		mg/kg	
			Total (Wet Wt) Arsenic (As)	2022/10/28	<0.0050		mg/kg	
			Total (Wet Wt) Barium (Ba)	2022/10/28	<0.010		mg/kg	
			Total (Wet Wt) Beryllium (Be)	2022/10/28	<0.0020		mg/kg	
			Total (Wet Wt) Bismuth (Bi)	2022/10/28	<0.0013		mg/kg	
			Total (Wet Wt) Boron (B)	2022/10/28	<0.20		mg/kg	
			Total (Wet Wt) Cadmium (Cd)	2022/10/28	<0.0013		mg/kg	
			Total (Wet Wt) Calcium (Ca)	2022/10/28	<4.0		mg/kg	
			Total (Wet Wt) Chromium (Cr)	2022/10/28	<0.025		mg/kg	
			Total (Wet Wt) Cobalt (Co)	2022/10/28	<0.0013		mg/kg	
			Total (Wet Wt) Copper (Cu)	2022/10/28	<0.013		mg/kg	
			Total (Wet Wt) Iron (Fe)	2022/10/28	<0.25		mg/kg	
			Total (Wet Wt) Lead (Pb)	2022/10/28	<0.0013		mg/kg	
			Total (Wet Wt) Magnesium (Mg)	2022/10/28	<0.40		mg/kg	
			Total (Wet Wt) Manganese (Mn)	2022/10/28	<0.010		mg/kg	
			Total (Wet Wt) Mercury (Hg)	2022/10/28	<0.013		mg/kg	
			Total (Wet Wt) Molybdenum (Mo)	2022/10/28	<0.0080		mg/kg	
			Total (Wet Wt) Nickel (Ni)	2022/10/28	<0.010		mg/kg	
			Total (Wet Wt) Phosphorus (P)	2022/10/28	<2.0		mg/kg	
			Total (Wet Wt) Potassium (K)	2022/10/28	<2.5		mg/kg	
			Total (Wet Wt) Selenium (Se)	2022/10/28	<0.010		mg/kg	
			Total (Wet Wt) Silver (Ag)	2022/10/28	<0.0013		mg/kg	
			Total (Wet Wt) Sodium (Na)	2022/10/28	<2.5		mg/kg	
			Total (Wet Wt) Strontium (Sr)	2022/10/28	<0.013		mg/kg	
			Total (Wet Wt) Thallium (Tl)	2022/10/28	<0.00040		mg/kg	
			Total (Wet Wt) Tin (Sn)	2022/10/28	<0.020		mg/kg	
			Total (Wet Wt) Titanium (Ti)	2022/10/28	<0.13		mg/kg	
			Total (Wet Wt) Uranium (U)	2022/10/28	<0.00040		mg/kg	
			Total (Wet Wt) Vanadium (V)	2022/10/28	<0.020		mg/kg	
			Total (Wet Wt) Zinc (Zn)	2022/10/28	<0.20		mg/kg	
A771339	JLP	RPD	Total (Wet Wt) Aluminum (Al)	2022/10/28	3.1		%	40
			Total (Wet Wt) Antimony (Sb)	2022/10/28	NC		%	40
			Total (Wet Wt) Arsenic (As)	2022/10/28	9.3		%	40
			Total (Wet Wt) Barium (Ba)	2022/10/28	39		%	40
			Total (Wet Wt) Beryllium (Be)	2022/10/28	NC		%	40
			Total (Wet Wt) Bismuth (Bi)	2022/10/28	NC		%	40
			Total (Wet Wt) Boron (B)	2022/10/28	NC		%	40
			Total (Wet Wt) Cadmium (Cd)	2022/10/28	16		%	40
			Total (Wet Wt) Calcium (Ca)	2022/10/28	46		%	60
			Total (Wet Wt) Chromium (Cr)	2022/10/28	8.8		%	40
			Total (Wet Wt) Cobalt (Co)	2022/10/28	35		%	40
			Total (Wet Wt) Copper (Cu)	2022/10/28	0.22		%	40

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C263561
Report Date: 2022/10/29

GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND IRON MINE
Sampler Initials: MR

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total (Wet Wt) Iron (Fe)	2022/10/28	1.1		%	40
			Total (Wet Wt) Lead (Pb)	2022/10/28	19		%	40
			Total (Wet Wt) Magnesium (Mg)	2022/10/28	29		%	40
			Total (Wet Wt) Manganese (Mn)	2022/10/28	46 (1)		%	40
			Total (Wet Wt) Mercury (Hg)	2022/10/28	1.7		%	40
			Total (Wet Wt) Molybdenum (Mo)	2022/10/28	0.60		%	40
			Total (Wet Wt) Nickel (Ni)	2022/10/28	15		%	40
			Total (Wet Wt) Phosphorus (P)	2022/10/28	44 (1)		%	40
			Total (Wet Wt) Potassium (K)	2022/10/28	2.7		%	40
			Total (Wet Wt) Selenium (Se)	2022/10/28	4.9		%	40
			Total (Wet Wt) Silver (Ag)	2022/10/28	6.6		%	40
			Total (Wet Wt) Sodium (Na)	2022/10/28	6.0		%	40
			Total (Wet Wt) Strontium (Sr)	2022/10/28	59		%	60
			Total (Wet Wt) Thallium (Tl)	2022/10/28	20		%	40
			Total (Wet Wt) Tin (Sn)	2022/10/28	NC		%	40
			Total (Wet Wt) Titanium (Ti)	2022/10/28	28		%	40
			Total (Wet Wt) Uranium (U)	2022/10/28	NC		%	40
			Total (Wet Wt) Vanadium (V)	2022/10/28	2.0		%	40
			Total (Wet Wt) Zinc (Zn)	2022/10/28	22		%	40

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C263561
Report Date: 2022/10/29

GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND IRON MINE
Sampler Initials: MR

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

David Huang, M.Sc., P.Chem., QP, Scientific Services Manager

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

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Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

08511535

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Toll Free (800) 665 8566
Victoria: 460 Tennyson Place, Unit 1, Victoria, BC V8Z 6S8 Toll Free (866) 385-6112
bvlabs.com

CHAIN OF CUSTODY RECORD

Page 2 of 3

Invoice Information		Report Information (if differs from invoice)		Project Information	
Company:	Golder Associates Ltd.	Company:		Quotation	C00599
Contact Name:	Collin Arens	Contact Name:		P.O. #/AFE#:	
Address:	16820 107 Ave.	Address:			
	Edmonton, AB PC: T5P 4C3		PC:	Project #:	166372401/64000/03
Phone/Fax:	(780) 237-9638	Phone/Fax:		Site Location:	Baffinland Iron Mine
Email:	carens@golder.com	Email:		Site #:	Milne Port/Reference Site
Copies:	rsharpe@golder.com	Copies:		Sampled By:	Monica Redmond, Daniel Vicente

Turnaround Time (TAT) Required

☐ 5 - 7 Days Regular (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)

☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3-4 Days

Date Required:

Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present			Temp	1	0	-1
Seal Intact						
Cooling Media						

	YES	NO	Cooler ID			
Seal Present		X	Temp	5	6	6
Seal Intact		X				
Cooling Media	X					

	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

☐ MTBE; ☐ VOC / BTEXS / VPH; ☐ BTEXS / VPH; ☐ VOC / BTEX / F1; ☐ BTEX F1; ☐ LEPH / HEPH / PAH; ☐ PAH; ☐ F2 - F4; ☐ TEH; ☐ EPH; ☐ Preserved?; ☐ Filtered?; ☐ Dissolved Metals; ☐ Preserved?; ☐ Filtered?; ☐ Dissolved Mercury; ☐ Field Preserved?; ☐ Total Metals; ☐ Field Preserved?; ☐ Total Mercury; ☐ Sulphate; ☐ Fluoride; ☐ Chloride; ☐ COD; ☐ BOD; ☐ TDS; ☐ TSS; ☐ Alkalinity; ☐ Conductivity; ☐ pH; ☐ Ammonia; ☐ Nitrate; ☐ Nitrite; ☐ Alkylated PAHs

Regulatory Criteria

☐ BC CSR
☐ YK CSR
☐ CCME
☐ Drinking Water
☐ BC Water Quality
☐ Other

#	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	Total Metals	number of containers	HOLD - DO NOT ANALYZE	Special Instructions
1	BAFF22UDPFARCH4011	2022-08-11	14:30	Tissue	X	1		
2	BAFF22UIPFARCH4012	2022-08-11	14:45	Tissue	X	1		
3	BAFF22UDPFARCH4013	2022-08-11	14:50	Tissue	X	1		
4	BAFF22UIPFARCH4014	2022-08-13	~~12:30~~ 16:00	~~Tissue~~	X	1		
5	BAFF22UIPFARCH4015	2022-08-13	~~12:40~~ 16:10	~~Tissue~~	X	1		
6	BAFF22UIPFARCH4016	2022-08-13	~~12:40~~ 16:15	~~Tissue~~	X	1		
7	BAFF22UIPFARCH4017	2022-08-14	16:45	Tissue	X	1		
8	BAFF22UIPFARCH4018	2022-08-14	16:55	Tissue	X	1		
9	BAFF22UIPFARCH4019	2022-08-14	17:05	Tissue	X	1		
10	BAFF22UIPFARCH4020	2022-08-14	17:15	Tissue	X	1		

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	BV Job #
M. Redmond	2022/08/23	11:20	DNeudorf	2022/08/23	1125	

Suzitta TAYLOR 2022/08/24 09:30
WHITEHORSE

C263561_COC

08511536

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Toll Free (800) 665 8566
Victoria: 460 Tennyson Place, Unit 1, Victoria, BC V8Z 6S8 Toll Free (866) 385-6112
bvlabs.com

CHAIN OF CUSTODY RECORD

Page 3 of 3

Invoice Information		Report Information (if differs from invoice)		Project Information	
Company:	Golder Associates Ltd.	Company:		Quotation	C00599
Contact Name:	Collin Arens	Contact Name:		P.O. #/AFE#:	
Address:	16820 107 Ave. Edmonton, AB PC: T5P 4C3	Address: PC:		Project #:	166372401/64000/03
Phone/Fax:	(780) 237-9638	Phone/Fax:		Site Location:	Baffinland Iron Mine
Email:	carens@golder.com	Email:		Site #:	Milne Port/Reference Site
Copies:	rsharpe@golder.com	Copies:		Sampled By:	Monica Redmond, Daniel Vicente

Turnaround Time (TAT) Required

☒ 5 - 7 Days Regular (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)

☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days

Date Required:

Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present			Temp	1	0	-1
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present		X	Temp	5	6	6
Seal Intact		X				
Cooling Media	X					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested: MTBE; VOC / BTEXS / VPH; BTEXS / VPH; VOC / BTEX / F1; BTEX F1; LEPH / HEPH / PAH; PAH; F2 - F4; TEH; EPH; Preserved?; Filtered?; Dissolved Metals; Preserved?; Filtered?; Dissolved Mercury; Field Preserved?; Total Metals; Field Preserved?; Total Mercury; Sulphate; Fluoride; Chloride; COD; BOD; TDS; TSS; Alkalinity; Conductivity; pH; Ammonia; Nitrate; Nitrite; Alkylated PAHs; # of containers; HOLD - DO NOT ANALYZE

Regulatory Criteria: ☐ BC CSR ☐ YK CSR ☐ CCME ☐ Drinking Water ☐ BC Water Quality ☐ Other

#	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	Total Metals	# of containers	HOLD - DO NOT ANALYZE	Special Instructions
1	BAFF22UIPFARCH4021	2022-08-14	17:25	Tissue	X	1		
2	BAFF22UIPFARCH4022	2022-08-14	17:35	Tissue	X	1		
3	BAFF22UDPFARCH4023	2022-08-14	17:45	Tissue	X	1		
4	BAFF22UDPFARCH4024	2022-08-14	17:55	Tissue	X	1		
5	BAFF22UDPFARCH4025	2022-08-14	18:05	Tissue	X	1		
6	BAFF22UDPFARCH4026	2022-08-14	18:15	Tissue	X	1		
7				Tissue				
8				Tissue				
9				Tissue				
10				Tissue				

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):
M. Redmond	2022/08/23	11:20	[signature]	2022/08/23	1:25
			Sanjita TAYLOR WHITEHOUSE	2022/08/24	09:30

BV Job #

C263561_COC

08511529

BUREAU VERITAS

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Toll Free (800) 665 8566
Victoria: 460 Tennyson Place, Unit 1, Victoria, BC V8Z 6S8 Toll Free (866) 385-6112
bvlabs.com

CHAIN OF CUSTODY RECORD

Page 1 of 3

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Company:	Golder Associates Ltd.	Company:		Quotation	C00599
Contact Name:	Collin Arens	Contact Name:		P.O. #/AFE#:	
Address:	16820 107 Ave.	Address:			
	Edmonton, AB PC: T5P 4C3		PC:	Project #:	166372401/64000/03
Phone/Fax:	(780) 237-9638	Phone/Fax:		Site Location:	Baffinland Iron Mine
Email:	carens@golder.com	Email:		Site #:	Milne Port/Reference Site
Copies:	rsharpe@golder.com	Copies:		Sampled By:	Monica Redmond, Daniel Vicente

Turnaround Time (TAT) Required

☑ 5 - 7 Days Regular (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)

☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3-4 Days

Date Required:

Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp	1	0	-1
Cooling Media						

	YES	NO	Cooler ID			
Seal Present		X				
Seal Intact		X	Temp	5	6	6
Cooling Media	X					

	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						

Depot Reception

Analysis Requested

☐ MTBE; ☐ VOC / BTEXS / VPH; ☐ BTEXS / VPH; ☐ VOC / BTEX / F1; ☐ BTEX F1; ☐ LEPH / HEPH / PAH; ☐ PAH; ☐ F2 - F4; ☐ TEH; ☐ EPH; ☐ Preserved?; ☐ Filtered?; ☐ Dissolved Metals; ☐ Preserved?; ☐ Filtered?; ☐ Dissolved Mercury; ☐ Field Preserved?; ☐ Total Metals; ☐ Field Preserved?; ☐ Total Mercury; ☐ Sulphate; ☐ Fluoride; ☐ Chloride; ☐ COD; ☐ BOD; ☐ TDS; ☐ TSS; ☐ Alkalinity; ☐ Conductivity; ☐ pH; ☐ Ammonia; ☐ Nitrate; ☐ Nitrite; ☐ Alkylated PAHs; ☐; HOLD - DO NOT ANALYZE

Regulatory Criteria

☐ BC CSR
☐ YK CSR
☐ CCME
☐ Drinking Water
☐ BC Water Quality
☐ Other

	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	# of Containers	Total Metals	HOLD - DO NOT ANALYZE	Special Instructions
1	BAFF22UDPFARCH4001	2022-08-01	14:00	Tissue	1	X		
2	BAFF22UDPFARCH4002	2022-08-01	14:15	Tissue	1	X		
3	BAFF22UDPFARCH4003	2022-08-01	14:30	Tissue	1	X		
4	BAFF22UDPFARCH4004	2022-08-01	14:41	Tissue	1	X		
5	BAFF22UDPFARCH4005	2022-08-01	14:55	Tissue	1	X		
6	BAFF22UDPFARCH4006	2022-08-01	15:10	Tissue	1	X		
7	BAFF22UDPFARCH4007	2022-08-01	15:25	Tissue	1	X		
8	BAFF22UDPFARCH4008	2022-08-01	15:40	Tissue	1	X		
9	BAFF22UDPFARCH4009	2022-08-01	15:55	Tissue	1	X		
10	BAFF22UDPFARCH4010	2022-08-01	14:30	Tissue	1	X		

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	BV Job #
M. Redmond	2022/08/23	11:20	Nordbrugge /	2022/08/23	1125	

TAYLOR 2022/08/24 · 09:30
WHITEHOUSE

C263561_COC

Cynny Hagen

From: Arens, Collin <Collin_Arens@golder.com>
Sent: Thursday, September 29, 2022 5:41 PM
To: Cynny Hagen
Cc: Sharpe, Rainie; Redmond, Monica; Rouget, Philippe; Horgan, Julia
Subject: RE: Concerns re: Baffinland Samples - Job#: C263569,

Hello Cynny,

A list of samples for analysis are provided below. Note that only 8 samples should be included for each job. For C263590, please ensure that only parent PAHs are analyzed – do not include alkylated PAHs.

C263590 – Parent PAHs ONLY
BAFF22UDPFFHSC1004
BAFF22UDPFFHSC1012
BAFF22UDPFFHSC1019
BAFF22UDPFFHSC1023
BAFF22UDPFFHSC1024
BAFF22UDPFFHSC1026
BAFF22UDPFFHSC1028
BAFF22UDPFFHSC1038

C263576 – Metals and Moisture
BAFF22UDPFFHSC1004
BAFF22UDPFFHSC1012
BAFF22UDPFFHSC1019
BAFF22UDPFFHSC1023
BAFF22UDPFFHSC1024
BAFF22UDPFFHSC1026
BAFF22UDPFFHSC1028
BAFF22UDPFFHSC1038

C263561- Metals and Moisture
BAFF22UDPFARCH4004
BAFF22UIPFARCH4009
BAFF22UIPFARCH4010
BAFF22UIPFARCH4017
BAFF22UIPFARCH4018
BAFF22UDPFARCH4023
BAFF22UDPFARCH4024
BAFF22UDPFARCH4025

Also, please forward me your supervisors contact information to discuss C263569. In the meantime, I’ve requested payment for this invoice be held.

Let me know if you have any questions or concerns.

Sincerely,

Your Project #: 166372401/64000/03
Site#: MILNE PORT/REFERENCE SITE
Site Location: BAFFINLAND IRON MINE
Your C.O.C. #: 08511538, 08511539, 08511540

Attention: Collin Arens

GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2022/09/19
Report #: R3234683
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C263569
Received: 2022/08/23, 11:25

Sample Matrix: Tissue
Samples Received: 26

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Parent & Alkylated PAHs in Tissue SubC (1)	1	N/A	2022/09/14		
Parent & Alkylated PAHs in Tissue SubC (1)	25	N/A	2022/09/19		

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Pacific Rim Laboratories Inc., #103, 19575 - 55A Avenue , Surrey, BC, V3S 8P8

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Your Project #: 166372401/64000/03
Site#: MILNE PORT/REFERENCE SITE
Site Location: BAFFINLAND IRON MINE
Your C.O.C. #: 08511538, 08511539, 08511540

Attention: Collin Arens

GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2022/09/19
Report #: R3234683
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C263569
Received: 2022/08/23, 11:25

Encryption Key

Bureau Veritas
19 Sep 2022 17:14:47

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cynny Hagen, Key Account Specialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273
==
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Job #: C263569
Report Date: 2022/09/19

GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND IRON MINE
Sampler Initials: MR

RESULTS OF CHEMICAL ANALYSES OF TISSUE

Bureau Veritas ID		BAI078	BAI079	BAI080	BAI081	
Sampling Date		2022/08/01 14:00	2022/08/01 14:15	2022/08/01 14:30	2022/08/01 14:41	
COC Number		08511538	08511538	08511538	08511538	
	UNITS	**BAFF22UDPFARCH4001**	**BAFF22UDPFARCH4002**	**BAFF22UDPFARCH4003**	**BAFF22UDPFARCH4004**	**QC Batch**
Parameter						
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	A721850

Bureau Veritas ID		BAI082	BAI083	BAI084	BAI085	
Sampling Date		2022/08/01 14:55	2022/08/01 15:10	2022/08/01 15:25	2022/08/01 15:40	
COC Number		08511538	08511538	08511538	08511538	
	UNITS	**BAFF22UDPFARCH4005**	**BAFF22UDPFARCH4006**	**BAFF22UDPFARCH4007**	**BAFF22UDPFARCH4008**	**QC Batch**
Parameter						
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	A721850

Bureau Veritas ID		BAI086	BAI087	BAI096	BAI097	
Sampling Date		2022/08/01 15:55	2022/08/01 14:30	2022/08/11 14:30	2022/08/11 14:45	
COC Number		08511538	08511538	08511539	08511539	
	UNITS	**BAFF22UDPFARCH4009**	**BAFF22UDPFARCH4010**	**BAFF22UDPFARCH4011**	**BAFF22UDPFARCH4012**	**QC Batch**
Parameter						
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	A721850

Bureau Veritas ID		BAI098	BAI099	BAI100	BAI101	
Sampling Date		2022/08/11 14:50	2022/08/13 16:00	2022/08/13 16:10	2022/08/13 16:15	
COC Number		08511539	08511539	08511539	08511539	
	UNITS	**BAFF22UDPFARCH4013**	**BAFF22UDPFARCH4014**	**BAFF22UDPFARCH4015**	**BAFF22UDPFARCH4016**	**QC Batch**
Parameter						
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	A721850

Bureau Veritas ID		BAI102	BAI103	BAI104	BAI105	
Sampling Date		2022/08/14 16:45	2022/08/14 16:55	2022/08/14 17:05	2022/08/14 17:15	
COC Number		08511539	08511539	08511539	08511539	
	UNITS	**BAFF22UDPFARCH4017**	**BAFF22UDPFARCH4018**	**BAFF22UDPFARCH4019**	**BAFF22UDPFARCH4020**	**QC Batch**
Parameter						
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	A721850

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C263569
Report Date: 2022/09/19

GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND IRON MINE
Sampler Initials: MR

RESULTS OF CHEMICAL ANALYSES OF TISSUE

Bureau Veritas ID		BAI106	BAI107	BAI108	BAI109	
Sampling Date		2022/08/14 17:25	2022/08/14 17:35	2022/08/14 17:45	2022/08/14 17:55	
COC Number		08511540	08511540	08511540	08511540	
	UNITS	**BAFF22UDPFARCH4021**	**BAFF22UDPFARCH4022**	**BAFF22UDPFARCH4023**	**BAFF22UDPFARCH4024**	**QC Batch**
Parameter						
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	A721850

Bureau Veritas ID		BAI110	BAI111	
Sampling Date		2022/08/14 18:05	2022/08/14 18:15	
COC Number		08511540	08511540	
	UNITS	**BAFF22UDPFARCH4025**	**BAFF22UDPFARCH4026**	**QC Batch**
Parameter				
Subcontract Parameter	N/A	ATTACHED	ATTACHED	A721850

GENERAL COMMENTS

Results relate only to the items tested.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

08511539

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Toll Free (800) 665 8566
Victoria: 460 Tennyson Place, Unit 1, Victoria, BC V8Z 6S8 Toll Free (866) 385-6112
bvlabs.com

CHAIN OF CUSTODY RECORD

Page 2 of 3

Invoice Information		Report Information (if differs from invoice)		Project Information	
Company:	Golder Associates Ltd.	Company:		Quotation	C00599
Contact Name:	Collin Arens	Contact Name:		P.O. #/AFE#:	
Address:	16820 107 Ave. Edmonton, AB PC: T5P 4C3	Address:	PC:	Project #:	1663724a/64000/03 ~~1663724/44000/03~~
Phone/Fax:	(780) 237-9638	Phone/Fax:		Site Location:	Baffinland Iron Mine
Email:	carens@golder.com	Email:		Site #:	Milne Port/Reference Site
Copies:	rsharpe@golder.com	Copies:		Sampled By:	Monica Redmond ~~Bradley Gee~~ Daniel Vicente

Turnaround Time (TAT) Required

- ☑ 5 - 7 Days Regular (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)

- ☐ Same Day ☐ 2 Days
- ☐ 1 Day ☐ 3-4 Days

Date Required:

Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present			Temp	1	0	-1
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present		X	Temp	5	6	6
Seal Intact		X				
Cooling Media	X					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested: ☐ MTBE; ☐ VOC / BTEXS / VPH; ☐ VOC / BTEX / F1; ☐ LEPH / HEPH / PAH; ☐ F2 - F4; ☐ Preserved?; ☐ Preserved?; ☐ Field Preserved?; ☐ Field Preserved?; ☐ Sulphate; ☐ COD; ☐ Alkalinity; ☐ Ammonia; ☐ BOD; ☐ TEH; ☐ Filtered?; ☐ Filtered?; ☐ Fluoride; ☐ TDS; ☐ Conductivity; ☐ Nitrate; ☐ BTEXS / VPH; ☐ BTEX F1; ☑ PAH; ☐ EPH; ☐ Dissolved Metals; ☐ Dissolved Mercury; ☐ Total Metals; ☐ Total Mercury; ☐ Chloride; ☐ TSS; ☐ pH; ☐ Nitrite; ☑ Alkylated PAHs; HOLD - DO NOT ANALYZE

Regulatory Criteria

- ☐ BC CSR
- ☐ YK CSR
- ☐ CCME
- ☐ Drinking Water
- ☐ BC Water Quality
- ☐ Other

#	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	# of Containers	PAH	Alkylated PAHs	HOLD - DO NOT ANALYZE	Special Instructions
1	BAFF22UDPFARCH4011	2022-08-11	14:30	Tissue	1	X	X		
2	BAFF22UIPFARCH4012	2022-08-11	14:45	Tissue	1	X	X		
3	BAFF22UDPFARCH4013	2022-08-11	14:50	Tissue	1	X	X		
4	BAFF22UIPFARCH4014	2022-08-13	16:00	Tissue	1	X	X		
5	BAFF22UIPFARCH4015	2022-08-13	16:10	Tissue	1	X	X		
6	BAFF22UIPFARCH4016	2022-08-13	16:15	Tissue	1	X	X		
7	BAFF22UIPFARCH4017	2022-08-14	16:45	Tissue	1	X	X		
8	BAFF22UIPFARCH4018	2022-08-14	16:55	Tissue	1	X	X		
9	BAFF22UIPFARCH4019	2022-08-14	17:05	Tissue	1	X	X		
10	BAFF22UIPFARCH4020	2022-08-14	17:15	Tissue	1	X	X		

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	BV Job #
M. Redmond	2022/08/23	11:20	[signature]	2022/08/23	1125	

TAYLOR WHITEHOUSE 2022/08/24 09:30

C263569_COC

08511540

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Toll Free (800) 665 8566
Victoria: 460 Tennyson Place, Unit 1, Victoria, BC V8Z 6S8 Toll Free (866) 385-6112
bvlabs.com

CHAIN OF CUSTODY RECORD

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Golder Associates Ltd.	Company:		Quotation	C00599	☑ 5 - 7 Days Regular (Most analyses)
Contact Name:	Collin Arens	Contact Name:		P.O. #/AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	16820 107 Ave.	Address:				Rush TAT (Surcharges will be applied)
	Edmonton, AB PC: T5P 4C3		PC:	Project #:	1663724/01/84000/03 ~~1663724/44000/03~~	☐ Same Day ☐ 2 Days
Phone/Fax:	(780) 237-9638	Phone/Fax:		Site Location:	Baffinland Iron Mine	☐ 1 Day ☐ 3-4 Days
Email:	carens@golder.com	Email:		Site #:	Milne Port/Reference Site	Date Required:
Copies:	rsharpe@golder.com	Copies:		Sampled By:	M. Redmond ~~Daniel Vicente~~	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp	1	0	-1
Cooling Media						
	YES	NO	Cooler ID			
Seal Present		X				
Seal Intact		X	Temp	5	6	6
Cooling Media	X					
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						

Depot Reception

Analysis Requested: MTBE; VOC / BTEXS / VPH; BTEXS / VPH; VOC / BTEX / F1; BTEX F1; LEPH / HEPH / PAH; PAH; F2 - F4; TEH; EPH; Preserved?; Filtered?; Dissolved Metals; Preserved?; Filtered?; Dissolved Mercury; Field Preserved?; Total Metals; Field Preserved?; Total Mercury; Sulphate; Fluoride; Chloride; COD; BOD; TDS; TSS; Alkalinity; Conductivity; pH; Ammonia; Nitrate; Nitrite; Alkylated PAHs; HOLD - DO NOT ANALYZE

Regulatory Criteria: ☐ BC CSR ☐ YK CSR ☐ CCME ☐ Drinking Water ☐ BC Water Quality ☐ Other

	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	# of Containers	PAH	Alkylated PAHs	HOLD - DO NOT ANALYZE	Special Instructions
1	BAFF22UIPFARCH4021	2022-08-14	17:25	Tissue	1	X	X		
2	BAFF22UIPFARCH4022	2022-08-14	17:35	Tissue	1	X	X		
3	BAFF22UDPFARCH4023	2022-08-14	17:45	Tissue	1	X	X		
4	BAFF22UDPFARCH4024	2022-08-14	17:55	Tissue	1	X	X		
5	BAFF22UDPFARCH4025	2022-08-14	18:05	Tissue	1	X	X		
6	BAFF22UDPFARCH4026	2022-08-14	18:15	Tissue	1	X	X		
7									
8									
9									
10									

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	BV Job #
M. Redmond	2022/08/23	11:20	D. Nadburgt	2022/08/23	1125	

BBY FCD-00077/9

Suzette TAYLOR 2022/08/24 09:30
WHITEHORSE

C263569_COC

08511538

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Toll Free (800) 665 8566
Victoria: 460 Tennyson Place, Unit 1, Victoria, BC V8Z 6S8 Toll Free (866) 385-6112
bvlabs.com

CHAIN OF CUSTODY RECORD

Page 1 of 3

Invoice Information		Report Information (if differs from invoice)		Project Information	
Company:	Golder Associates Ltd.	Company:		Quotation	C00599
Contact Name:	Collin Arens	Contact Name:		P.O. #/AFE#:	
Address:	16820 107 Ave.	Address:			
	Edmonton, AB PC: T5P 4C3		PC:	Project #:	166372401/64000/03 ~~1663724/44000/03~~
Phone/Fax:	(780) 237-9638	Phone/Fax:		Site Location:	Baffinland Iron Mine
Email:	carens@golder.com	Email:		Site #:	Milne Port/Reference Site
Copies:	rsharpe@golder.com	Copies:		Sampled By:	Monica Redmond, Daniel Vicente

Turnaround Time (TAT) Required

☒ 5 - 7 Days Regular (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)

☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3-4 Days

Date Required:

Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present			Temp	1	0	-1
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present		X	Temp	5	6	6
Seal Intact		X				
Cooling Media	X					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

☐ BTEXS / VPH ☐ VOC / BTEXS / VPH ☐ MTBE; ☐ BTEX F1 ☐ VOC / BTEX / F1; ☒ PAH ☐ LEPH / HEPH / PAH; ☐ EPH ☐ TEH ☐ F2 - F4; ☐ Dissolved Metals ☐ Filtered? ☐ Preserved?; ☐ Dissolved Mercury ☐ Filtered? ☐ Preserved?; ☐ Total Metals ☐ Field Preserved?; ☐ Total Mercury ☐ Field Preserved?; ☐ Chloride ☐ Fluoride ☐ Sulphate; ☐ TSS ☐ TDS ☐ BOD ☐ COD; ☐ pH ☐ Conductivity ☐ Alkalinity; ☐ Nitrite ☐ Nitrate ☐ Ammonia; ☒ Alkylated PAHs; HOLD - DO NOT ANALYZE

Regulatory Criteria

☐ BC CSR
☐ YK CSR
☐ CCME
☐ Drinking Water
☐ BC Water Quality
☐ Other

#	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	# of Containers	PAH	Alkylated PAHs	HOLD - DO NOT ANALYZE	Special Instructions
1	BAFF22UDPFARCH4001	2022-08-01	14:00	Tissue	1	X	X		
2	BAFF22UDPFARCH4002	2022-08-01	14:15	Tissue	1	X	X		
3	BAFF22UDPFARCH4003	2022-08-01	14:30	Tissue	1	X	X		
4	BAFF22UDPFARCH4004	2022-08-01	14:41	Tissue	1	X	X		
5	BAFF22UDPFARCH4005	2022-08-01	14:55	Tissue	1	X	X		
6	BAFF22UDPFARCH4006	2022-08-01	15:10	Tissue	1	X	X		
7	BAFF22UDPFARCH4007	2022-08-01	15:25	Tissue	1	X	X		
8	BAFF22UDPFARCH4008	2022-08-01	15:40	Tissue	1	X	X		
9	BAFF22UDPFARCH4009	2022-08-01	15:55	Tissue	1	X	X		
10	BAFF22UDPFARCH4010	2022-08-01	14:30	Tissue	1	X	X		

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):
M. Redmond	2022/08/23	11:20		2022/08/23	1125
			D Wachbright	2022/08/24	09:30

SHIVITA TAYLOR WHITEHOUSE

BV Job #

C263569_COC

Your Project #: 166372401/64000/03
Site#: MILNE PORT/REFERENCE SITE
Site Location: BAFFINLAND IRON MINE

Attention: Collin Arens

GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Your C.O.C. #: 08511541, 08511542, 08511543, 08511544, 08511545

Report Date: 2022/10/28
Report #: R3255989
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C263576
Received: 2022/08/23, 11:25

Encryption Key

AUTHORIZED REPORT
RAPPORT AUTORISÉ

Bureau Veritas
28 Oct 2022 16:04:46

Please direct all questions regarding this Certificate of Analysis to:
Cynny Hagen, Key Account Soecialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273
==

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Your Project #: 166372401/64000/03
Site#: MILNE PORT/REFERENCE SITE
Site Location: BAFFINLAND IRON MINE

Attention: Collin Arens

GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Your C.O.C. #: 08511546, 08511547, 08511548, 08511549, 08511550

Report Date: 2022/10/13
Report #: R3247539
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C263590
Received: 2022/08/23, 11:25

Sample Matrix: Tissue
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
PAH IN Tissue Subcontract (1)	8	2022/10/13	2022/10/13		

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Campobello, 6740 Campobello Road , Mississauga, ON, L5N 2L8

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Your Project #: 166372401/64000/03
Site#: MILNE PORT/REFERENCE SITE
Site Location: BAFFINLAND IRON MINE

Attention: Collin Arens

GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Your C.O.C. #: 08511546, 08511547, 08511548, 08511549, 08511550

Report Date: 2022/10/13
Report #: R3247539
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C263590
Received: 2022/08/23, 11:25

Encryption Key AUTHORIZED REPORT RAPPORT AUTORISÉ Bureau Veritas 13 Oct 2022 16:07:50

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cynny Hagen, Key Account Soecialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273
==
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Job #: C263590
Report Date: 2022/10/13

GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND IRON MINE
Sampler Initials: MR

RESULTS OF CHEMICAL ANALYSES OF TISSUE

Bureau Veritas ID		BAI268	BAI280	BAI287	BAI291	
Sampling Date		2022/08/03 15:19	2022/08/03 16:06	2022/08/05 14:12	2022/08/05 14:47	
COC Number		08511546	08511547	08511547	08511548	
	UNITS	**BAFF22UDPFFHSC1004**	**BAFF22UDPFFHSC1012**	**BAFF22UDPFFHSC1019**	**BAFF22UDPFFHSC1023**	**QC Batch**
Parameter						
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	A755450

Bureau Veritas ID		BAI292	BAI294	BAI296	BAI356	
Sampling Date		2022/08/05 15:00	2022/08/05 15:30	2022/08/05 15:59	2022/08/06 15:49	
COC Number		08511548	08511548	08511548	08511549	
	UNITS	**BAFF22UDPFFHSC1024**	**BAFF22UDPFFHSC1026**	**BAFF22UDPFFHSC1028**	**BAFF22UDPFFHSC1038**	**QC Batch**
Parameter						
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	A755450

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

GENERAL COMMENTS

Results relate only to the items tested.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C263590
Report Date: 2022/10/13

GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND IRON MINE
Sampler Initials: MR

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

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Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

08511547

COC-1020

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 ~~Toll Free (800) 665-8566~~
Victoria: 460 Tennyson Place, Unit 1, Victoria, BC V8Z 6S8 Toll Free (866) 385-6112
bvlabs.com

CHAIN OF CUSTODY RECORD

Page 2 of 5

Invoice Information		Report Information (if differs from invoice)		Project Information	
Company:	Golder Associates Ltd.	Company:		Quotation	C00599
Contact Name:	Collin Arens	Contact Name:		P.O. #/AFE#:	
Address:	16820 107 Ave.	Address:			
	Edmonton, AB PC: T5P 4C3		PC:	Project #:	~~1663724/44000/03~~ 1663724 01/64000/03
Phone/Fax:	(780) 237-9638	Phone/Fax:		Site Location:	Baffinland Iron Mine
Email:	carens@golder.com	Email:		Site #:	Milne Port/Reference Site
Copies:	rsharpe@golder.com	Copies:		Sampled By:	Monica Redmond ~~Daniel Vicente~~

Turnaround Time (TAT) Required

- ☒ 5 - 7 Days Regular (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)

- ☐ Same Day ☐ 2 Days
- ☐ 1 Day ☐ 3-4 Days

Date Required:

Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present			Temp	1	0	-1
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present		X	Temp	5	6	6
Seal Intact		X				
Cooling Media	X					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

#	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	# of Containers	VOC / BTEXS / VPH / BTEXS / VPH / MTBE	VOC / BTEX / F1 / BTEX F1	LEPH / HEPH / PAH / PAH	F2 - F4 / TEH / EPH	Preserved? / Filtered? / Dissolved Metals	Preserved? / Filtered? / Dissolved Mercury	Field Preserved? / Total Metals	Field Preserved? / Total Mercury	Sulphate / Fluoride / Chloride	COD / BOD / TDS / TSS	Alkalinity / Conductivity / pH	Ammonia / Nitrate / Nitrite	Alkylated PAHs					HOLD - DO NOT ANALYZE
1	BAFF22UDPFFHSC1011	2022-08-03	15:56	Tissue	1			X										X					
2	BAFF22UDPFFHSC1012	2022-08-03	16:06	Tissue	1			X										X					
3	BAFF22UDPFFHSC1013	2022-08-03	16:20	Tissue	1			X										X					
4	BAFF22UDPFFHSC1014	2022-08-05	16:30	Tissue	1			X										X					
5	BAFF22UDPFFHSC1015	2022-08-04	16:32	Tissue	1			X										X					
6	BAFF22UDPFFHSC1016	2022-08-04	16:44	Tissue	1			X										X					
7	BAFF22UDPFFHSC1017	2022-08-05	13:56	Tissue	1			X										X					
8	BAFF22UDPFFHSC1018	2022-08-05	14:06	Tissue	1			X										X					
9	BAFF22UDPFFHSC1019	2022-08-05	14:12	Tissue	1			X										X					
10	BAFF22UDPFFHSC1020	2022-08-05	14:22	Tissue	1			X										X					

Regulatory Criteria

- ☐ BC CSR
- ☐ YK CSR
- ☐ CCME
- ☐ Drinking Water
- ☐ BC Water Quality
- ☐ Other

Special Instructions

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	BV Job #
M. Redmond	2022/08/23	11:20	D Woodbright	2022/08/23	11:25	
			TAYLOR WHITEHOUSE	2022/08/24	09:30	

C263590_COC

08511548

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Toll Free (800) 665 8566
Victoria: 460 Tennyson Place, Unit 1, Victoria, BC V8Z 6S8 Toll Free (866) 385-6112
bvlabs.com

CHAIN OF CUSTODY RECORD

Page 3 of 5

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Golder Associates Ltd.	Company:		Quotation	C00599	5 - 7 Days Regular (Most analyses)
Contact Name:	Collin Arens	Contact Name:		P.O. #/AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	16820 107 Ave.	Address:				Rush TAT (Surcharges will be applied)
	Edmonton, AB PC: T5P 4C3		PC:	Project #:	1663724-01/64000/03 ~~1663724/44000/03~~	Same Day / 2 Days
Phone/Fax:	(780) 237-9638	Phone/Fax:		Site Location:	Baffinland Iron Mine	1 Day / 3-4 Days
Email:	carens@golder.com	Email:		Site #:	Milne Port/Reference Site	Date Required:
Copies:	rsharpe@golder.com	Copies:		Sampled By:	Monica Redmond ~~Bradley Cox~~, Daniel Vicente	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present			Temp	1	0	-1
Seal Intact						
Cooling Media						

	YES	NO	Cooler ID			
Seal Present		X	Temp	5	6	6
Seal Intact		X				
Cooling Media	X					

	YES	NO	Cooler ID
Seal Present			Temp
Seal Intact			
Cooling Media			

Depot Reception

Analysis Requested: MTBE; VOC / BTEXS / VPH; VOC / BTEX / F1; LEPH / HEPH / PAH; F2 - F4; TEH; Preserved?; Filtered?; Field Preserved?; Sulphate; COD; BOD; Alkalinity; Ammonia; Fluoride; TDS; Conductivity; Nitrate; Dissolved Metals; Dissolved Mercury; Total Metals; Total Mercury; Chloride; TSS; pH; Nitrite; BTEXS / VPH; BTEX F1; PAH; EPH; Alkylated PAHs; HOLD - DO NOT ANALYZE

Regulatory Criteria: BC CSR; YK CSR; CCME; Drinking Water; BC Water Quality; Other

#	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	# of Containers	PAH	Alkylated PAHs	HOLD - DO NOT ANALYZE	Special Instructions
1	BAFF22UDPFFHSC1021	2022-08-05	14:30	Tissue	1	X	X		
2	BAFF22UDPFFHSC1022	2022-08-05	14:38	Tissue	1	X	X		
3	BAFF22UDPFFHSC1023	2022-08-05	14:47	Tissue	1	X	X		
4	BAFF22UDPFFHSC1024	2022-08-05	15:00	Tissue	1	X	X		
5	BAFF22UDPFFHSC1025	2022-08-05	15:15	Tissue	1	X	X		
6	BAFF22UDPFFHSC1026	2022-08-05	15:30	Tissue	1	X	X		
7	BAFF22UDPFFHSC1027	2022-08-05	15:39	Tissue	1	X	X		
8	BAFF22UDPFFHSC1028	2022-08-05	15:59	Tissue	1	X	X		
9	BAFF22UDPFFHSC1029	2022-08-05	16:14	Tissue	1	X	X		
10	BAFF22UDPFFHSC1030	2022-08-05	16:34	Tissue	1	X	X		

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):
M. Redmond	2022/08/23	11:20	D. Vanderberg	2022/08/23	1125
			TAYLOR WHITEHOUSE	2022/08/24	08:30

C263590_COC

08511549

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Toll Free (800) 665 8566
Victoria: 460 Tennyson Place, Unit 1, Victoria, BC V8Z 6S8 Toll Free (866) 385-6112
bvlabs.com

CHAIN OF CUSTODY RECORD

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Golder Associates Ltd.	Company:		Quotation	C00599	☑ 5 - 7 Days Regular (Most analyses)
Contact Name:	Collin Arens	Contact Name:		P.O. #/AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	16820 107 Ave.	Address:				Rush TAT (Surcharges will be applied)
	Edmonton, AB PC: T5P 4C3		PC:	Project #:	1663724-01/64000/03 ~~1663724/44000/03~~	☐ Same Day ☐ 2 Days
Phone/Fax:	(780) 237-9638	Phone/Fax:		Site Location:	Baffinland Iron Mine	☐ 1 Day ☐ 3-4 Days
Email:	carens@golder.com	Email:		Site #:	Milne Port/Reference Site	Date Required:
Copies:	rsharpe@golder.com	Copies:		Sampled By:	Monica Redmond ~~Bradley Cox~~, Daniel Vicente	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp	1	0	-1
Cooling Media						
	YES	NO	Cooler ID			
Seal Present		X				
Seal Intact			Temp	5	6	6
Cooling Media	X					
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						

Depot Reception

Analysis Requested: ☐ BTEXS / VPH; ☐ VOC / BTEXS / VPH; ☐ MTBE; ☐ BTEX F1; ☐ VOC / BTEX / F1; ☑ PAH; ☐ LEPH / HEPH / PAH; ☐ EPH; ☐ TEH; ☐ F2 - F4; ☐ Dissolved Metals; ☐ Filtered?; ☐ Preserved?; ☐ Dissolved Mercury; ☐ Filtered?; ☐ Preserved?; ☐ Total Metals; ☐ Field Preserved?; ☐ Total Mercury; ☐ Field Preserved?; ☐ Chloride; ☐ Fluoride; ☐ Sulphate; ☐ TSS; ☐ TDS; ☐ BOD; ☐ COD; ☐ pH; ☐ Conductivity; ☐ Alkalinity; ☐ Nitrite; ☐ Nitrate; ☐ Ammonia; ☑ Alkylated PAHs; ☐; HOLD - DO NOT ANALYZE

Regulatory Criteria: ☐ BC CSR; ☐ YK CSR; ☐ CCME; ☐ Drinking Water; ☐ BC Water Quality; ☐ Other

	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	# of Containers	PAH	Alkylated PAHs	HOLD - DO NOT ANALYZE	Special Instructions
1	BAFF22UDPFFHSC1031	2022-08-05	16:58	Tissue	1	X	X		
2	BAFF22UDPFFHSC1032	2022-08-06	14:35	Tissue	1	X	X		
3	BAFF22UDPFFHSC1033	2022-08-06	14:45	Tissue	1	X	X		
4	BAFF22UDPFFHSC1034	2022-08-06	15:00	Tissue	1	X	X		
5	BAFF22UDPFFHSC1035	2022-08-06	15:13	Tissue	1	X	X		
6	BAFF22UDPFFHSC1036	2022-08-06	15:25	Tissue	1	X	X		
7	BAFF22UDPFFHSC1037	2022-08-06	15:36	Tissue	1	X	X		
8	BAFF22UDPFFHSC1038	2022-08-06	15:49	Tissue	1	X	X		
9	BAFF22UDPFFHSC1039	2022-08-06	15:59	Tissue	1	X	X		
10	BAFF22UDPFFHSC1040	2022-08-06	16:12	Tissue	1	X	X		

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):
M. Redmond [signature]	2022/08/23	11:20	[signature] D. Woodbury	2022/08/23	11:25
			Zuleita TAYLOR WHITEHOUSE	2022/08/24	09:30

C263590_COC

08511550

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Toll Free (800) 665 8566
Victoria: 460 Tennyson Place, Unit 1, Victoria, BC V8Z 6S8 Toll Free (866) 385-6112
bvlabs.com

CHAIN OF CUSTODY RECORD

Page 5 of 5

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Golder Associates Ltd.	Company:		Quotation	C00599	☑ 5 - 7 Days Regular (Most analyses)
Contact Name:	Collin Arens	Contact Name:		P.O. #/AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	16820 107 Ave.	Address:				Rush TAT (Surcharges will be applied)
	Edmonton, AB PC: T5P 4C3		PC:	Project #:	1663724Y01/64000/03 ~~1663724/44000/03~~	☐ Same Day ☐ 2 Days
Phone/Fax:	(780) 237-9638	Phone/Fax:		Site Location:	Baffinland Iron Mine	☐ 1 Day ☐ 3-4 Days
Email:	carens@golder.com	Email:		Site #:	Milne Port/Reference Site	Date Required:
Copies:	rsharpe@golder.com	Copies:		Sampled By:	Monica Redmond ~~Bradley Cox~~, Daniel Vicente	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present			Temp	1	0	-1
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present		X	Temp	5	6	6
Seal Intact		X				
Cooling Media	X					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested: # of Containers; BTEXS / VPH / VOC / BTEXS / VPH / MTBE; BTEX F1 / VOC / BTEX / F1; PAH / LEPH / HEPH / PAH; EPH / TEH / F2 - F4; Dissolved Metals / Filtered? / Preserved?; Dissolved Mercury / Filtered? / Preserved?; Total Metals / Field Preserved?; Total Mercury / Field Preserved?; Chloride / Fluoride / Sulphate; TSS / TDS / BOD / COD; pH / Conductivity / Alkalinity; Nitrite / Nitrate / Ammonia; Alkylated PAHs; HOLD - DO NOT ANALYZE

Regulatory Criteria: ☐ BC CSR ☐ YK CSR ☐ CCME ☐ Drinking Water ☐ BC Water Quality ☐ Other

#	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	PAH	Alkylated PAHs	Special Instructions
1	BAFF22UTGTFHSC2001	2022-08-10	17:30	Tissue	X	X	
2							
3							
4							
5							
6							
7							
8							
9							
10							

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):
M. Redmond	2022/08/23	11:20	D Nordlught	2022/08/23	1125
			Suzette TAYLOR WHITEHORSE	2022/08/24	09:30

C263590_COC

08511546

COC-1020

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Toll Free (800) 665 8566
Victoria: 460 Tennyson Place, Unit 1, Victoria, BC V8Z 6S8 Toll Free (866) 385-6112
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CHAIN OF CUSTODY RECORD

BBY FCD-00077/9

Page 1 of 5

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Golder Associates Ltd.	Company:		Quotation	C00599	☑ 5 - 7 Days Regular (Most analyses)
Contact Name:	Collin Arens	Contact Name:		P.O. #/AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	16820 107 Ave.	Address:			1663724O1/64000/03	Rush TAT (Surcharges will be applied)
	Edmonton, AB PC: T5P 4C3		PC:	Project #:	~~1663724/44000/03~~	☐ Same Day ☐ 2 Days
Phone/Fax:	(780) 237-9638	Phone/Fax:		Site Location:	Baffinland Iron Mine	☐ 1 Day ☐ 3-4 Days
Email:	carens@golder.com	Email:		Site #:	Milne Port/Reference Site	Date Required:
Copies:	rsharpe@golder.com	Copies:		Sampled By:	Monica Redmond ~~Bradley Cox~~, Daniel Vicente	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp	1	0	-1
Cooling Media						

	YES	NO	Cooler ID			
Seal Present		X				
Seal Intact		X	Temp	5	6	6
Cooling Media	X					

	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						

Depot Reception

Analysis Requested

☐ MTBE; ☐ VOC / BTEXS / VPH; ☐ VOC / BTEX / F1; ☐ LEPH / HEPH / PAH; ☐ F2 - F4; ☐ TEH; ☐ Preserved?; ☐ Filtered?; ☐ Preserved?; ☐ Filtered?; ☐ Field Preserved?; ☐ Field Preserved?; ☐ Sulphate; ☐ Fluoride; ☐ COD; ☐ BOD; ☐ TDS; ☐ Alkalinity; ☐ Conductivity; ☐ Ammonia; ☐ Nitrate

Regulatory Criteria

☐ BC CSR
☐ YK CSR
☐ CCME
☐ Drinking Water
☐ BC Water Quality
☐ Other

	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	# of Containers	☐ BTEXS / VPH	☐ BTEX F1	☑ PAH	☐ EPH	☐ Dissolved Metals	☐ Dissolved Mercury	☐ Total Metals	☐ Total Mercury	☐ Chloride	☐ TSS	☐ pH	☐ Nitrite	☑ Alkylated PAHs	☐						HOLD - DO NOT ANALYZE	Special Instructions
1	BAFF22UDPFFHSC1001	2022-08-03	14:25	Tissue	1			X										X								
2	BAFF22UDPFFHSC1002	2022-08-03	14:50	Tissue	1			X										X								
3	BAFF22UDPFFHSC1003	2022-08-03	15:03	Tissue	1			X										X								
4	BAFF22UDPFFHSC1004	2022-08-03	15:19	Tissue	1			X										X								
5	BAFF22UDPFFHSC1005	2022-08-03	15:37	Tissue	1			X										X								
6	BAFF22UDPFFHSC1006	2022-08-03	16:02	Tissue	1			X										X								
7	BAFF22UDPFFHSC1007	2022-08-03	15:00	Tissue	1			X										X								
8	BAFF22UDPFFHSC1008	2022-08-03	15:15	Tissue	1			X										X								
9	BAFF22UDPFFHSC1009	2022-08-03	15:28	Tissue	1			X										X								
10	BAFF22UDPFFHSC1010	2022-08-03	15:42	Tissue	1			X										X								

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	BV Job #
M. Redmond	2022/08/23	11:20	D. Whitehouse	2022/08/23	1125	
			Suwitz TAYLOR WHITEHOUSE	2022/08/24	09:30	

C263590_COC

Cynny Hagen

From: Arens, Collin <Collin_Arens@golder.com>
Sent: Thursday, September 29, 2022 5:41 PM
To: Cynny Hagen
Cc: Sharpe, Rainie; Redmond, Monica; Rouget, Philippe; Horgan, Julia
Subject: RE: Concerns re: Baffinland Samples - Job#: C263569,

Hello Cynny,

A list of samples for analysis are provided below. Note that only 8 samples should be included for each job. For C263590, please ensure that only parent PAHs are analyzed – do not include alkylated PAHs.

C263590 – Parent PAHs ONLY
BAFF22UDPFFHSC1004
BAFF22UDPFFHSC1012
BAFF22UDPFFHSC1019
BAFF22UDPFFHSC1023
BAFF22UDPFFHSC1024
BAFF22UDPFFHSC1026
BAFF22UDPFFHSC1028
BAFF22UDPFFHSC1038

C263576 – Metals and Moisture
BAFF22UDPFFHSC1004
BAFF22UDPFFHSC1012
BAFF22UDPFFHSC1019
BAFF22UDPFFHSC1023
BAFF22UDPFFHSC1024
BAFF22UDPFFHSC1026
BAFF22UDPFFHSC1028
BAFF22UDPFFHSC1038

C263561- Metals and Moisture
BAFF22UDPFARCH4004
BAFF22UIPFARCH4009
BAFF22UIPFARCH4010
BAFF22UIPFARCH4017
BAFF22UIPFARCH4018
BAFF22UDPFARCH4023
BAFF22UDPFARCH4024
BAFF22UDPFARCH4025

Also, please forward me your supervisors contact information to discuss C263569. In the meantime, I've requested payment for this invoice be held.

Let me know if you have any questions or concerns.

Sincerely,

Your Project #: 166372401/64000/03
Site#: BAFFINLAND
Site Location: BAFFINLAND-MILNE PORT
Your C.O.C. #: 08515782

Attention: Collin Arens

GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2022/12/12
Report #: R3276103
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C287377
Received: 2022/11/04, 08:30

Sample Matrix: Tissue
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by ICPMS - Tissue Plug Wet Wt	8	2022/11/30	2022/12/09	BBY WI-00033	Auto Calc
Moisture in Tissue - Freeze Drying	8	2022/11/30	2022/12/09	BBY7SOP-00021	BCMOE BCLM Aug 2014

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Your Project #: 166372401/64000/03
Site#: BAFFINLAND
Site Location: BAFFINLAND-MILNE PORT
Your C.O.C. #: 08515782

Attention: Collin Arens

GOLDER ASSOCIATES LTD
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2022/12/12
Report #: R3276103
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C287377
Received: 2022/11/04, 08:30

Encryption Key

AUTHORIZED REPORT
RAPPORT AUTORISÉ

Bureau Veritas
12 Dec 2022 10:36:39

Please direct all questions regarding this Certificate of Analysis to:
Cynny Hagen, Key Account Soecialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273
==
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Raphael Kwan, Senior Manager, BC and Yukon Regions responsible for British Columbia Environmental laboratory operations.

Bureau Veritas Job #: C287377
Report Date: 2022/12/12

GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND-MILNE PORT
Sampler Initials: MB

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Bureau Veritas ID		BGH283	BGH284	BGH285		
Sampling Date		2022/08/14 12:00	2022/08/14 12:00	2022/08/14 12:00		
COC Number		08515782	08515782	08515782		
	UNITS	**MLN-HTAR-COMP-METALS-1**	**MLN-HTAR-COMP-METALS-2**	**MLN-HTAR-COMP-METALS-3**	**RDL**	**QC Batch**
Total Metals by ICPMS						
Total (Wet Wt) Aluminum (Al)	mg/kg	770	710	414	0.50	A814983
Total (Wet Wt) Antimony (Sb)	mg/kg	0.0216	0.0286	0.0146	0.0020	A814983
Total (Wet Wt) Arsenic (As)	mg/kg	2.45	3.35	2.42	0.0050	A814983
Total (Wet Wt) Barium (Ba)	mg/kg	4.81	4.23	3.51	0.010	A814983
Total (Wet Wt) Beryllium (Be)	mg/kg	0.0425	0.0395	0.0206	0.0020	A814983
Total (Wet Wt) Bismuth (Bi)	mg/kg	0.0091	0.0117	0.0051	0.0013	A814983
Total (Wet Wt) Boron (B)	mg/kg	8.44	9.10	4.62	0.20	A814983
Total (Wet Wt) Cadmium (Cd)	mg/kg	0.578	0.944	0.727	0.0013	A814983
Total (Wet Wt) Calcium (Ca)	mg/kg	5990	6100	5720	4.0	A814983
Total (Wet Wt) Chromium (Cr)	mg/kg	2.00	1.83	1.46	0.025	A814983
Total (Wet Wt) Cobalt (Co)	mg/kg	1.01	1.71	0.559	0.0013	A814983
Total (Wet Wt) Copper (Cu)	mg/kg	2.61	2.32	2.32	0.013	A814983
Total (Wet Wt) Iron (Fe)	mg/kg	1980	1750	2770	0.25	A814983
Total (Wet Wt) Lead (Pb)	mg/kg	1.16	2.52	0.451	0.0013	A814983
Total (Wet Wt) Magnesium (Mg)	mg/kg	3170	3160	2020	0.40	A814983
Total (Wet Wt) Manganese (Mn)	mg/kg	102	181	59.4	0.010	A814983
Total (Wet Wt) Mercury (Hg)	mg/kg	0.025	0.030	0.025	0.013	A814983
Total (Wet Wt) Molybdenum (Mo)	mg/kg	0.333	0.338	0.274	0.0080	A814983
Total (Wet Wt) Nickel (Ni)	mg/kg	1.78	2.13	1.27	0.010	A814983
Total (Wet Wt) Phosphorus (P)	mg/kg	1860	1200	1480	2.0	A814983
Total (Wet Wt) Potassium (K)	mg/kg	1840	1650	1610	2.5	A814983
Total (Wet Wt) Selenium (Se)	mg/kg	1.26	1.24	1.51	0.010	A814983
Total (Wet Wt) Silver (Ag)	mg/kg	0.0053	0.0057	0.0046	0.0013	A814983
Total (Wet Wt) Sodium (Na)	mg/kg	5590	6070	3930	2.5	A814983
Total (Wet Wt) Strontium (Sr)	mg/kg	24.6	25.9	27.1	0.013	A814983
Total (Wet Wt) Thallium (Tl)	mg/kg	0.0152	0.0193	0.00782	0.00040	A814983
Total (Wet Wt) Tin (Sn)	mg/kg	0.049	0.050	0.038	0.020	A814983
Total (Wet Wt) Titanium (Ti)	mg/kg	25.3	24.1	18.1	0.13	A814983
Total (Wet Wt) Uranium (U)	mg/kg	0.156	0.157	0.131	0.00040	A814983
Total (Wet Wt) Vanadium (V)	mg/kg	3.25	4.39	1.53	0.020	A814983
Total (Wet Wt) Zinc (Zn)	mg/kg	14.0	15.5	16.9	0.20	A814983
RDL = Reportable Detection Limit						

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C287377
Report Date: 2022/12/12

GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND-MILNE PORT
Sampler Initials: MB

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Bureau Veritas ID		BGH286	BGH287	BGH288		
Sampling Date		2022/08/14 12:00	2022/08/14 12:00	2022/08/14 12:00		
COC Number		08515782	08515782	08515782		
	UNITS	**MLN-HTAR-COMP-METALS-4**	**MLN-HTAR-COMP-METALS-5**	**MLN-HTAR-COMP-METALS-6**	**RDL**	**QC Batch**
Total Metals by ICPMS						
Total (Wet Wt) Aluminum (Al)	mg/kg	753	538	715	0.50	A814983
Total (Wet Wt) Antimony (Sb)	mg/kg	0.0248	0.0184	0.0302	0.0020	A814983
Total (Wet Wt) Arsenic (As)	mg/kg	2.20	3.44	3.35	0.0050	A814983
Total (Wet Wt) Barium (Ba)	mg/kg	4.79	33.2	15.1	0.010	A814983
Total (Wet Wt) Beryllium (Be)	mg/kg	0.0373	0.0316	0.0413	0.0020	A814983
Total (Wet Wt) Bismuth (Bi)	mg/kg	0.0088	0.0089	0.0110	0.0013	A814983
Total (Wet Wt) Boron (B)	mg/kg	11.4	6.20	7.94	0.20	A814983
Total (Wet Wt) Cadmium (Cd)	mg/kg	0.840	0.646	0.839	0.0013	A814983
Total (Wet Wt) Calcium (Ca)	mg/kg	5060	7080	6990	4.0	A814983
Total (Wet Wt) Chromium (Cr)	mg/kg	1.87	2.00	2.08	0.025	A814983
Total (Wet Wt) Cobalt (Co)	mg/kg	0.747	1.38	1.98	0.0013	A814983
Total (Wet Wt) Copper (Cu)	mg/kg	2.12	2.58	2.97	0.013	A814983
Total (Wet Wt) Iron (Fe)	mg/kg	1460	1550	1870	0.25	A814983
Total (Wet Wt) Lead (Pb)	mg/kg	1.13	1.14	1.92	0.0013	A814983
Total (Wet Wt) Magnesium (Mg)	mg/kg	2790	2690	2910	0.40	A814983
Total (Wet Wt) Manganese (Mn)	mg/kg	69.0	170	282	0.010	A814983
Total (Wet Wt) Mercury (Hg)	mg/kg	0.024	0.061	0.045	0.013	A814983
Total (Wet Wt) Molybdenum (Mo)	mg/kg	0.369	0.392	0.400	0.0080	A814983
Total (Wet Wt) Nickel (Ni)	mg/kg	1.56	1.93	2.38	0.010	A814983
Total (Wet Wt) Phosphorus (P)	mg/kg	1240	1780	1140	2.0	A814983
Total (Wet Wt) Potassium (K)	mg/kg	2060	1220	1450	2.5	A814983
Total (Wet Wt) Selenium (Se)	mg/kg	1.36	1.22	1.44	0.010	A814983
Total (Wet Wt) Silver (Ag)	mg/kg	0.0056	0.0132	0.0099	0.0013	A814983
Total (Wet Wt) Sodium (Na)	mg/kg	6310	3400	4970	2.5	A814983
Total (Wet Wt) Strontium (Sr)	mg/kg	19.3	37.9	38.8	0.013	A814983
Total (Wet Wt) Thallium (Tl)	mg/kg	0.0138	0.0206	0.0218	0.00040	A814983
Total (Wet Wt) Tin (Sn)	mg/kg	0.045	0.039	0.050	0.020	A814983
Total (Wet Wt) Titanium (Ti)	mg/kg	23.7	30.5	23.7	0.13	A814983
Total (Wet Wt) Uranium (U)	mg/kg	0.148	0.177	0.169	0.00040	A814983
Total (Wet Wt) Vanadium (V)	mg/kg	2.72	2.91	3.84	0.020	A814983
Total (Wet Wt) Zinc (Zn)	mg/kg	13.7	17.2	18.7	0.20	A814983
RDL = Reportable Detection Limit						

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C287377
Report Date: 2022/12/12

GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND-MILNE PORT
Sampler Initials: MB

ELEMENTS BY ATOMIC SPECTROSCOPY - WET WT (TISSUE)

Bureau Veritas ID		BGH289	BGH290		
Sampling Date		2022/08/14 12:00	2022/08/14 12:00		
COC Number		08515782	08515782		
	UNITS	**MLN-HTAR-COMP-METALS-7**	**MLN-HTAR-COMP-METALS-8**	**RDL**	**QC Batch**
Total Metals by ICPMS					
Total (Wet Wt) Aluminum (Al)	mg/kg	544	1180	0.50	A814983
Total (Wet Wt) Antimony (Sb)	mg/kg	0.0274	0.0280	0.0020	A814983
Total (Wet Wt) Arsenic (As)	mg/kg	2.66	3.40	0.0050	A814983
Total (Wet Wt) Barium (Ba)	mg/kg	13.3	13.3	0.010	A814983
Total (Wet Wt) Beryllium (Be)	mg/kg	0.0286	0.0648	0.0020	A814983
Total (Wet Wt) Bismuth (Bi)	mg/kg	0.0077	0.0169	0.0013	A814983
Total (Wet Wt) Boron (B)	mg/kg	12.7	12.2	0.20	A814983
Total (Wet Wt) Cadmium (Cd)	mg/kg	0.976	1.08	0.0013	A814983
Total (Wet Wt) Calcium (Ca)	mg/kg	4670	9480	4.0	A814983
Total (Wet Wt) Chromium (Cr)	mg/kg	1.50	3.12	0.025	A814983
Total (Wet Wt) Cobalt (Co)	mg/kg	1.18	1.73	0.0013	A814983
Total (Wet Wt) Copper (Cu)	mg/kg	2.81	4.64	0.013	A814983
Total (Wet Wt) Iron (Fe)	mg/kg	1980	3000	0.25	A814983
Total (Wet Wt) Lead (Pb)	mg/kg	0.886	2.21	0.0013	A814983
Total (Wet Wt) Magnesium (Mg)	mg/kg	2360	3420	0.40	A814983
Total (Wet Wt) Manganese (Mn)	mg/kg	171	236	0.010	A814983
Total (Wet Wt) Mercury (Hg)	mg/kg	0.030	0.034	0.013	A814983
Total (Wet Wt) Molybdenum (Mo)	mg/kg	0.325	0.436	0.0080	A814983
Total (Wet Wt) Nickel (Ni)	mg/kg	1.55	2.78	0.010	A814983
Total (Wet Wt) Phosphorus (P)	mg/kg	1790	1500	2.0	A814983
Total (Wet Wt) Potassium (K)	mg/kg	1630	1700	2.5	A814983
Total (Wet Wt) Selenium (Se)	mg/kg	1.35	1.37	0.010	A814983
Total (Wet Wt) Silver (Ag)	mg/kg	0.0082	0.0083	0.0013	A814983
Total (Wet Wt) Sodium (Na)	mg/kg	6070	4880	2.5	A814983
Total (Wet Wt) Strontium (Sr)	mg/kg	25.9	49.4	0.013	A814983
Total (Wet Wt) Thallium (Tl)	mg/kg	0.0133	0.0281	0.00040	A814983
Total (Wet Wt) Tin (Sn)	mg/kg	0.043	0.070	0.020	A814983
Total (Wet Wt) Titanium (Ti)	mg/kg	16.5	37.7	0.13	A814983
Total (Wet Wt) Uranium (U)	mg/kg	0.129	0.220	0.00040	A814983
Total (Wet Wt) Vanadium (V)	mg/kg	2.49	4.82	0.020	A814983
Total (Wet Wt) Zinc (Zn)	mg/kg	18.7	20.0	0.20	A814983
RDL = Reportable Detection Limit					

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GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND-MILNE PORT
Sampler Initials: MB

PHYSICAL TESTING (TISSUE)

Bureau Veritas ID		BGH283	BGH284	BGH285	BGH286		
Sampling Date		2022/08/14 12:00	2022/08/14 12:00	2022/08/14 12:00	2022/08/14 12:00		
COC Number		08515782	08515782	08515782	08515782		
	UNITS	**MLN-HTAR-COMP-METALS-1**	**MLN-HTAR-COMP-METALS-2**	**MLN-HTAR-COMP-METALS-3**	**MLN-HTAR-COMP-METALS-4**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	78	80	75	78	0.30	A814946
RDL = Reportable Detection Limit							

Bureau Veritas ID		BGH287	BGH288	BGH289	BGH290		
Sampling Date		2022/08/14 12:00	2022/08/14 12:00	2022/08/14 12:00	2022/08/14 12:00		
COC Number		08515782	08515782	08515782	08515782		
	UNITS	**MLN-HTAR-COMP-METALS-5**	**MLN-HTAR-COMP-METALS-6**	**MLN-HTAR-COMP-METALS-7**	**MLN-HTAR-COMP-METALS-8**	**RDL**	**QC Batch**
Physical Properties							
Moisture	%	72	80	76	77	0.30	A814946
RDL = Reportable Detection Limit							

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GENERAL COMMENTS

Results relate only to the items tested.

Bureau Veritas Job #: C287377
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GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND-MILNE PORT
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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A814946	ERE	RPD	Moisture	2022/12/09	0.65		%	20
A814983	VBA	QC Standard	Total (Wet Wt) Antimony (Sb)	2022/12/09		167	%	N/A
			Total (Wet Wt) Arsenic (As)	2022/12/09		92	%	N/A
			Total (Wet Wt) Cadmium (Cd)	2022/12/09		88	%	N/A
			Total (Wet Wt) Calcium (Ca)	2022/12/09		91	%	N/A
			Total (Wet Wt) Cobalt (Co)	2022/12/09		86	%	N/A
			Total (Wet Wt) Copper (Cu)	2022/12/09		88	%	N/A
			Total (Wet Wt) Iron (Fe)	2022/12/09		92	%	N/A
			Total (Wet Wt) Lead (Pb)	2022/12/09		106	%	N/A
			Total (Wet Wt) Manganese (Mn)	2022/12/09		89	%	N/A
			Total (Wet Wt) Mercury (Hg)	2022/12/09		86	%	N/A
			Total (Wet Wt) Molybdenum (Mo)	2022/12/09		92	%	N/A
			Total (Wet Wt) Phosphorus (P)	2022/12/09		92	%	N/A
			Total (Wet Wt) Potassium (K)	2022/12/09		99	%	N/A
			Total (Wet Wt) Selenium (Se)	2022/12/09		85	%	N/A
			Total (Wet Wt) Silver (Ag)	2022/12/09		90	%	N/A
			Total (Wet Wt) Sodium (Na)	2022/12/09		101	%	N/A
			Total (Wet Wt) Strontium (Sr)	2022/12/09		93	%	N/A
			Total (Wet Wt) Thallium (Tl)	2022/12/09		79	%	N/A
			Total (Wet Wt) Tin (Sn)	2022/12/09		107	%	N/A
			Total (Wet Wt) Uranium (U)	2022/12/09		113	%	N/A
			Total (Wet Wt) Vanadium (V)	2022/12/09		81	%	N/A
			Total (Wet Wt) Zinc (Zn)	2022/12/09		84	%	N/A
A814983	VBA	Spiked Blank	Total (Wet Wt) Aluminum (Al)	2022/12/09		102	%	80 - 120
			Total (Wet Wt) Antimony (Sb)	2022/12/09		104	%	80 - 120
			Total (Wet Wt) Arsenic (As)	2022/12/09		99	%	80 - 120
			Total (Wet Wt) Barium (Ba)	2022/12/09		100	%	80 - 120
			Total (Wet Wt) Beryllium (Be)	2022/12/09		96	%	80 - 120
			Total (Wet Wt) Bismuth (Bi)	2022/12/09		101	%	80 - 120
			Total (Wet Wt) Boron (B)	2022/12/09		99	%	80 - 120
			Total (Wet Wt) Cadmium (Cd)	2022/12/09		95	%	80 - 120
			Total (Wet Wt) Calcium (Ca)	2022/12/09		103	%	80 - 120
			Total (Wet Wt) Chromium (Cr)	2022/12/09		98	%	80 - 120
			Total (Wet Wt) Cobalt (Co)	2022/12/09		98	%	80 - 120
			Total (Wet Wt) Copper (Cu)	2022/12/09		97	%	80 - 120
			Total (Wet Wt) Iron (Fe)	2022/12/09		105	%	80 - 120
			Total (Wet Wt) Lead (Pb)	2022/12/09		105	%	80 - 120
			Total (Wet Wt) Magnesium (Mg)	2022/12/09		107	%	80 - 120
			Total (Wet Wt) Manganese (Mn)	2022/12/09		98	%	80 - 120
			Total (Wet Wt) Mercury (Hg)	2022/12/09		102	%	80 - 120
			Total (Wet Wt) Molybdenum (Mo)	2022/12/09		104	%	80 - 120
			Total (Wet Wt) Nickel (Ni)	2022/12/09		99	%	80 - 120
			Total (Wet Wt) Phosphorus (P)	2022/12/09		96	%	80 - 120
			Total (Wet Wt) Potassium (K)	2022/12/09		106	%	80 - 120
			Total (Wet Wt) Selenium (Se)	2022/12/09		96	%	80 - 120
			Total (Wet Wt) Silver (Ag)	2022/12/09		99	%	80 - 120
			Total (Wet Wt) Sodium (Na)	2022/12/09		105	%	80 - 120
			Total (Wet Wt) Strontium (Sr)	2022/12/09		99	%	80 - 120
			Total (Wet Wt) Thallium (Tl)	2022/12/09		103	%	80 - 120
			Total (Wet Wt) Tin (Sn)	2022/12/09		102	%	80 - 120
			Total (Wet Wt) Titanium (Ti)	2022/12/09		100	%	80 - 120
			Total (Wet Wt) Uranium (U)	2022/12/09		106	%	80 - 120
			Total (Wet Wt) Vanadium (V)	2022/12/09		97	%	80 - 120

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GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND-MILNE PORT
Sampler Initials: MB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total (Wet Wt) Zinc (Zn)	2022/12/09		99	%	80 - 120
A814983	VBA	Method Blank	Total (Wet Wt) Aluminum (Al)	2022/12/09	<0.50		mg/kg	
			Total (Wet Wt) Antimony (Sb)	2022/12/09	<0.0020		mg/kg	
			Total (Wet Wt) Arsenic (As)	2022/12/09	<0.0050		mg/kg	
			Total (Wet Wt) Barium (Ba)	2022/12/09	<0.010		mg/kg	
			Total (Wet Wt) Beryllium (Be)	2022/12/09	<0.0020		mg/kg	
			Total (Wet Wt) Bismuth (Bi)	2022/12/09	<0.0013		mg/kg	
			Total (Wet Wt) Boron (B)	2022/12/09	<0.20		mg/kg	
			Total (Wet Wt) Cadmium (Cd)	2022/12/09	<0.0013		mg/kg	
			Total (Wet Wt) Calcium (Ca)	2022/12/09	<4.0		mg/kg	
			Total (Wet Wt) Chromium (Cr)	2022/12/09	<0.025		mg/kg	
			Total (Wet Wt) Cobalt (Co)	2022/12/09	<0.0013		mg/kg	
			Total (Wet Wt) Copper (Cu)	2022/12/09	<0.013		mg/kg	
			Total (Wet Wt) Iron (Fe)	2022/12/09	<0.25		mg/kg	
			Total (Wet Wt) Lead (Pb)	2022/12/09	<0.0013		mg/kg	
			Total (Wet Wt) Magnesium (Mg)	2022/12/09	<0.40		mg/kg	
			Total (Wet Wt) Manganese (Mn)	2022/12/09	<0.010		mg/kg	
			Total (Wet Wt) Mercury (Hg)	2022/12/09	<0.013		mg/kg	
			Total (Wet Wt) Molybdenum (Mo)	2022/12/09	<0.0080		mg/kg	
			Total (Wet Wt) Nickel (Ni)	2022/12/09	<0.010		mg/kg	
			Total (Wet Wt) Phosphorus (P)	2022/12/09	<2.0		mg/kg	
			Total (Wet Wt) Potassium (K)	2022/12/09	<2.5		mg/kg	
			Total (Wet Wt) Selenium (Se)	2022/12/09	<0.010		mg/kg	
			Total (Wet Wt) Silver (Ag)	2022/12/09	<0.0013		mg/kg	
			Total (Wet Wt) Sodium (Na)	2022/12/09	<2.5		mg/kg	
			Total (Wet Wt) Strontium (Sr)	2022/12/09	<0.013		mg/kg	
			Total (Wet Wt) Thallium (Tl)	2022/12/09	<0.00040		mg/kg	
			Total (Wet Wt) Tin (Sn)	2022/12/09	<0.020		mg/kg	
			Total (Wet Wt) Titanium (Ti)	2022/12/09	<0.13		mg/kg	
			Total (Wet Wt) Uranium (U)	2022/12/09	<0.00040		mg/kg	
			Total (Wet Wt) Vanadium (V)	2022/12/09	<0.020		mg/kg	
			Total (Wet Wt) Zinc (Zn)	2022/12/09	<0.20		mg/kg	
A814983	VBA	RPD	Total (Wet Wt) Aluminum (Al)	2022/12/09	18		%	40
			Total (Wet Wt) Antimony (Sb)	2022/12/09	6.5		%	40
			Total (Wet Wt) Arsenic (As)	2022/12/09	102 (1)		%	40
			Total (Wet Wt) Barium (Ba)	2022/12/09	15		%	40
			Total (Wet Wt) Beryllium (Be)	2022/12/09	NC		%	40
			Total (Wet Wt) Bismuth (Bi)	2022/12/09	NC		%	40
			Total (Wet Wt) Boron (B)	2022/12/09	NC		%	40
			Total (Wet Wt) Cadmium (Cd)	2022/12/09	156 (1)		%	40
			Total (Wet Wt) Calcium (Ca)	2022/12/09	6.2		%	60
			Total (Wet Wt) Chromium (Cr)	2022/12/09	160 (1)		%	40
			Total (Wet Wt) Cobalt (Co)	2022/12/09	15		%	40
			Total (Wet Wt) Copper (Cu)	2022/12/09	9.9		%	40
			Total (Wet Wt) Iron (Fe)	2022/12/09	37		%	40
			Total (Wet Wt) Lead (Pb)	2022/12/09	29		%	40
			Total (Wet Wt) Magnesium (Mg)	2022/12/09	4.0		%	40
			Total (Wet Wt) Manganese (Mn)	2022/12/09	1.5		%	40
			Total (Wet Wt) Mercury (Hg)	2022/12/09	6.8		%	40
			Total (Wet Wt) Molybdenum (Mo)	2022/12/09	39		%	40
			Total (Wet Wt) Nickel (Ni)	2022/12/09	101 (1)		%	40
			Total (Wet Wt) Phosphorus (P)	2022/12/09	3.3		%	40
			Total (Wet Wt) Potassium (K)	2022/12/09	4.8		%	40

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GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND-MILNE PORT
Sampler Initials: MB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total (Wet Wt) Selenium (Se)	2022/12/09	8.2		%	40
			Total (Wet Wt) Silver (Ag)	2022/12/09	NC		%	40
			Total (Wet Wt) Sodium (Na)	2022/12/09	6.7		%	40
			Total (Wet Wt) Strontium (Sr)	2022/12/09	1.3		%	60
			Total (Wet Wt) Thallium (Tl)	2022/12/09	NC		%	40
			Total (Wet Wt) Tin (Sn)	2022/12/09	21		%	40
			Total (Wet Wt) Titanium (Ti)	2022/12/09	6.9		%	40
			Total (Wet Wt) Uranium (U)	2022/12/09	26		%	40
			Total (Wet Wt) Vanadium (V)	2022/12/09	NC		%	40
			Total (Wet Wt) Zinc (Zn)	2022/12/09	17		%	40

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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GOLDER ASSOCIATES LTD
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND-MILNE PORT
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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

David Huang, M.Sc., P.Chem., QP, Scientific Services Manager

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CHAIN OF CUSTODY RECORD

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Invoice Information		Report Information (if differs from Invoice)		Project Information		Turnaround Time (TAT) Required
Company:	WSP Golder	Company:		Quotation	C00599	☑ 5 - 7 Days Regular (Most analyses)
Contact Name:	Collin Arens	Contact Name:		P.O. #/AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	16820 107 Ave.	Address:				Rush TAT (Surcharges will be applied)
	Edmonton, AB PC: T5P 4C3		PC:	Project #:	166372401/64000/03	☐ Same Day ☐ 2 Days
Phone/Fax:	780 237-9638	Phone/Fax:		Site Location:	Baffinland - Milne Port	☐ 1 Day ☐ 3-4 Days
Email:	collin.arens@wsp.com	Email:		Site #:	Baffinland	Date Required:
Copies:		Copies:		Sampled By:	Monica Redmond	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		1	Temp	4	4	4
Seal Intact						
Cooling Media	X					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Regulatory Criteria

- ☐ BC CSR
- ☐ YK CSR
- ☐ CCME
- ☐ Drinking Water
- ☐ BC Water Quality
- ☐ Other

Analysis Requested

#	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	# of Containers	☐ MTBE / ☐ VOC/BTEXS/VPH / ☐ BTEXS/VPH	☐ VOC/BTEX/F1 / ☐ BTEX F1	☐ LEPH/HEPH/PAH / ☐ PAH	☐ F2-F4 / ☐ TEH / ☐ EPH	☐ Preserved? / ☐ Filtered? / ☐ Dissolved Metals	☐ Preserved? / ☐ Filtered? / ☐ Dissolved Mercury	☐ Field Preserved? / ☑ Total Metals	☐ Field Preserved? / ☐ Total Mercury	☐ Sulphate / ☐ Fluoride / ☐ Chloride	☐ COD / ☐ BOD / ☐ TDS / ☐ TSS	☐ Alkalinity / ☐ Conductivity / ☐ pH	☐ Ammonia / ☐ Nitrate / ☐ Nitrite						HOLD - DO NOT ANALYZE	Special Instructions
1	MLN-HTAR-COMP-METALS-1	8/14/2022	12:00	Tissue	1							X												
2	MLN-HTAR-COMP-METALS-2	8/14/2022	12:00	Tissue	1							X												
3	MLN-HTAR-COMP-METALS-3	8/14/2022	12:00	Tissue	1							X												
4	MLN-HTAR-COMP-METALS-4	8/14/2022	12:00	Tissue	1							X												
5	MLN-HTAR-COMP-METALS-5	8/14/2022	12:00	Tissue	1							X												
6	MLN-HTAR-COMP-METALS-6	8/14/2022	12:00	Tissue	1							X												
7	MLN-HTAR-COMP-METALS-7	8/14/2022	12:00	Tissue	1							X												
8	MLN-HTAR-COMP-METALS-8	8/14/2022	12:00	Tissue	1							X												
9																								
10																								
11																								

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	BV Job #
Maddie Beorge	2022/11/3	11:24	VHAH TOKUHO AT	NOV 0 4 2022	0830	

C287377_COC

Your Project #: 166372401/64000/03
Site#: BAFFINLAND
Site Location: BAFFINLAND-MILNE PORT
Your C.O.C. #: 08515795

Attention: Collin Arens

WSP Canada Inc.
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2023/02/07
Report #: R3297173
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C287380
Received: 2022/11/04, 08:30

Sample Matrix: Tissue
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
PAH in Tissue by GC/MS (SIM) (1, 2)	4	2023/02/01	2023/02/06	ATL SOP 00104	EPA 8270E R6 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Bedford, Bureau Veritas Bedford, 200 Bluewater Rd. Suite 105, Bedford, NS, Canada, B4B 1G9
(2) Results are reported on an as received basis unless otherwise indicated.

Your Project #: 166372401/64000/03
Site#: BAFFINLAND
Site Location: BAFFINLAND-MILNE PORT
Your C.O.C. #: 08515795

Attention: Collin Arens

WSP Canada Inc.
16820-107 AVE
EDMONTON, AB
CANADA T5P 4C3

Report Date: 2023/02/07
Report #: R3297173
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C287380
Received: 2022/11/04, 08:30

Encryption Key

AUTHORIZED REPORT
RAPPORT AUTORISÉ

Bureau Veritas
07 Feb 2023 10:09:18

Please direct all questions regarding this Certificate of Analysis to:
Cynny Hagen, Key Account Soecialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273
===
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Raphael Kwan, Senior Manager, BC and Yukon Regions responsible for British Columbia Environmental laboratory operations.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C287380
Report Date: 2023/02/07

WSP Canada Inc.
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND-MILNE PORT
Sampler Initials: MR

RESULTS OF CHEMICAL ANALYSES OF TISSUE

Bureau Veritas ID		BIX665	BIX667	BIX668	BIX669		
Sampling Date		2022/08/14 12:00	2022/08/14 12:00	2022/08/14 12:00	2022/08/14 12:00		
COC Number		08515795	08515795	08515795	08515795		
	UNITS	**MLN-HTAR-COMP-PAH-A (COMP PAH-1 & PAH-8)**	**MLN-HTAR-COMP-PAH-B (COMP PAH-2 & PAH-5)**	**MLN-HTAR-COMP-PAH-C (COMP PAH-6 & PAH-7)**	**MLN-HTAR-COMP-PAH-D (COMP PAH-4 & PAH-3)**	**RDL**	**QC Batch**
Polycyclic Aromatics							
1-Methylnaphthalene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
2-Methylnaphthalene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Benzo(j)fluoranthene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Perylene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Naphthalene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Acenaphthylene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Acenaphthene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Fluorene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Phenanthrene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Anthracene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Fluoranthene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Pyrene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Benzo(a)anthracene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Chrysene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Benzo(b)fluoranthene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Benzo(k)fluoranthene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Benzo(a)pyrene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Indeno(1,2,3-cd)pyrene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Dibenz(a,h)anthracene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Benzo(g,h,i)perylene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.050	A874436
Surrogate Recovery (%)							
D10-ANTHRACENE (sur.)	%	94	92	95	90	N/A	A874436
D8-ACENAPHTHYLENE (sur.)	%	91	90	91	88	N/A	A874436
TERPHENYL-D14 (sur.)	%	97	96	98	96	N/A	A874436

RDL = Reportable Detection Limit
N/A = Not Applicable

GENERAL COMMENTS

Results relate only to the items tested.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C287380
Report Date: 2023/02/07

WSP Canada Inc.
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND-MILNE PORT
Sampler Initials: MR

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A874436	éLS	Reagent Blank	1-Methylnaphthalene	2023/02/06	<0.050		mg/kg	
			2-Methylnaphthalene	2023/02/06	<0.050		mg/kg	
			Benzo(j)fluoranthene	2023/02/06	<0.050		mg/kg	
			D10-ANTHRACENE (sur.)	2023/02/06		95	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2023/02/06		91	%	50 - 130
			Perylene	2023/02/06	<0.050		mg/kg	
			TERPHENYL-D14 (sur.)	2023/02/06		100	%	50 - 130
			Naphthalene	2023/02/06	<0.050		mg/kg	
			Acenaphthylene	2023/02/06	<0.050		mg/kg	
			Acenaphthene	2023/02/06	<0.050		mg/kg	
			Fluorene	2023/02/06	<0.050		mg/kg	
			Phenanthrene	2023/02/06	<0.050		mg/kg	
			Anthracene	2023/02/06	<0.050		mg/kg	
			Fluoranthene	2023/02/06	<0.050		mg/kg	
			Pyrene	2023/02/06	<0.050		mg/kg	
			Benzo(a)anthracene	2023/02/06	<0.050		mg/kg	
			Chrysene	2023/02/06	<0.050		mg/kg	
			Benzo(b)fluoranthene	2023/02/06	<0.050		mg/kg	
			Benzo(k)fluoranthene	2023/02/06	<0.050		mg/kg	
			Benzo(a)pyrene	2023/02/06	<0.050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2023/02/06	<0.050		mg/kg	
			Dibenz(a,h)anthracene	2023/02/06	<0.050		mg/kg	
			Benzo(g,h,i)perylene	2023/02/06	<0.050		mg/kg	
A874436	éLS	Spiked Blank	1-Methylnaphthalene	2023/02/06		88	%	50 - 130
			2-Methylnaphthalene	2023/02/06		89	%	50 - 130
			Benzo(j)fluoranthene	2023/02/06		83	%	50 - 130
			D10-ANTHRACENE (sur.)	2023/02/06		90	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2023/02/06		87	%	50 - 130
			Perylene	2023/02/06		76	%	50 - 130
			TERPHENYL-D14 (sur.)	2023/02/06		93	%	50 - 130
			Naphthalene	2023/02/06		88	%	50 - 130
			Acenaphthylene	2023/02/06		87	%	50 - 130
			Acenaphthene	2023/02/06		89	%	50 - 130
			Fluorene	2023/02/06		90	%	50 - 130
			Phenanthrene	2023/02/06		87	%	50 - 130
			Anthracene	2023/02/06		85	%	50 - 130
			Fluoranthene	2023/02/06		79	%	50 - 130
			Pyrene	2023/02/06		82	%	50 - 130
			Benzo(a)anthracene	2023/02/06		59	%	50 - 130
			Chrysene	2023/02/06		75	%	50 - 130
			Benzo(b)fluoranthene	2023/02/06		83	%	50 - 130
			Benzo(k)fluoranthene	2023/02/06		82	%	50 - 130
			Benzo(a)pyrene	2023/02/06		78	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2023/02/06		65	%	50 - 130
			Dibenz(a,h)anthracene	2023/02/06		61	%	50 - 130
			Benzo(g,h,i)perylene	2023/02/06		76	%	50 - 130
A874436	éLS	Method Blank	1-Methylnaphthalene	2023/02/06	<0.050		mg/kg	
			2-Methylnaphthalene	2023/02/06	<0.050		mg/kg	
			Benzo(j)fluoranthene	2023/02/06	<0.050		mg/kg	
			D10-ANTHRACENE (sur.)	2023/02/06		97	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2023/02/06		93	%	50 - 130
			Perylene	2023/02/06	<0.050		mg/kg	
			TERPHENYL-D14 (sur.)	2023/02/06		102	%	50 - 130

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Naphthalene	2023/02/06	<0.050		mg/kg	
			Acenaphthylene	2023/02/06	<0.050		mg/kg	
			Acenaphthene	2023/02/06	<0.050		mg/kg	
			Fluorene	2023/02/06	<0.050		mg/kg	
			Phenanthrene	2023/02/06	<0.050		mg/kg	
			Anthracene	2023/02/06	<0.050		mg/kg	
			Fluoranthene	2023/02/06	<0.050		mg/kg	
			Pyrene	2023/02/06	<0.050		mg/kg	
			Benzo(a)anthracene	2023/02/06	<0.050		mg/kg	
			Chrysene	2023/02/06	<0.050		mg/kg	
			Benzo(b)fluoranthene	2023/02/06	<0.050		mg/kg	
			Benzo(k)fluoranthene	2023/02/06	<0.050		mg/kg	
			Benzo(a)pyrene	2023/02/06	<0.050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2023/02/06	<0.050		mg/kg	
			Dibenz(a,h)anthracene	2023/02/06	<0.050		mg/kg	
			Benzo(g,h,i)perylene	2023/02/06	<0.050		mg/kg	

Reagent Blank: A blank matrix containing all reagents used in the analytical procedure. Used to determine any analytical contamination.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C287380
Report Date: 2023/02/07

WSP Canada Inc.
Client Project #: 166372401/64000/03
Site Location: BAFFINLAND-MILNE PORT
Sampler Initials: MR

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

RoseMarie MacDonald

Rosemarie MacDonald, Scientific Specialist (Organics)

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Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

08515795

Burnaby: 4606 Canada Way, Burnaby, BC V5G 1K5 Toll Free (800) 665 8566
Victoria: 460 Tennyson Place, Unit 1, Victoria, BC V8Z 6S8 Toll Free (866) 385-6112
bvlabs.com

CHAIN OF CUSTODY RECORD

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Invoice Information
Company: WSP Golder
Contact Name: Collin Arens
Address: 16820 107 Ave.
Edmonton, AB PC: T5P 4C3
Phone/Fax: 780 237-9638
Email: colin.arens@wsp.com
Copies:

Report Information (if differs from invoice)
Company:
Contact Name:
Address:
PC:
Phone/Fax:
Email:
Copies:

Project Information
Quotation: C00599
P.O. #/AFE#:
Project #: 166372401/64000/03
Site Location: Baffinland - Milne Port
Site #: Baffinland
Sampled By: Monica Redmond

Turnaround Time (TAT) Required
[x] 5 - 7 Days Regular (Most analyses)
PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Rush TAT (Surcharges will be applied)
[ ] Same Day [ ] 2 Days
[ ] 1 Day [ ] 3-4 Days
Date Required:
Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		1	Temp	4	4	4
Seal Intact		1				
Cooling Media	X					

	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

MTBE; VOC / BTEXS / VPH; BTEXS / VPH; VOC / BTEX / F1; BTEX F1; LEPH / HEPH / PAH; PAH; F2 - F4; TEH; EPH; Preserved?; Filtered?; Dissolved Metals; Preserved?; Filtered?; Dissolved Mercury; Field Preserved?; Total Metals; Field Preserved?; Total Mercury; Sulphate; Fluoride; Chloride; COD; BOD; TDS; TSS; Alkalinity; Conductivity; pH; Ammonia; Nitrate; Nitrite; Alkylated PAHs; HOLD - DO NOT ANALYZE

Regulatory Criteria
[ ] BC CSR
[ ] YK CSR
[ ] CCME
[ ] Drinking Water
[ ] BC Water Quality
[ ] Other

#	Sample Identification	Date Sampled (yyyy/mm/dd)	Time Sampled (hh:mm)	Matrix	# of Containers	PAH	HOLD - DO NOT ANALYZE	Special Instructions
1	MLN-HTAR-COMP-PAH-1	8/14/2022	12:00	Tissue	1	X		
2	MLN-HTAR-COMP-PAH-2	8/14/2022	12:00	Tissue	1	X		
3	MLN-HTAR-COMP-PAH-3	8/14/2022	12:00	Tissue	1	X		
4	MLN-HTAR-COMP-PAH-4	8/14/2022	12:00	Tissue	1	X		
5	MLN-HTAR-COMP-PAH-5	8/14/2022	12:00	Tissue	1	X		
6	MLN-HTAR-COMP-PAH-6	8/14/2022	12:00	Tissue	1	X		
7	MLN-HTAR-COMP-PAH-7	8/14/2022	12:00	Tissue	1	X		
8	MLN-HTAR-COMP-PAH-8	8/14/2022	12:00	Tissue	1	X		
9								
10								
11								

Relinquished by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):	Received by: (Signature/ Print)	Date (yyyy/mm/dd):	Time (hh:mm):
Maddie Besnge	2022/11/3	11:24	YHAU Tanaka Ali	NOV 0 4 2022	0830

BV Job #

C287380_COC

wsp.com

REPORT

Chapter 8.0 Non-Indigenous Species and Aquatic Invasive Species (NIS/AIS) Monitoring Program

2022 Milne Port Marine Environmental Effects Monitoring Program (MEEMP) and Non-Indigenous Species and Aquatic Invasive Species (NIS/AIS) Monitoring Program

Submitted to:

Baffinland Iron Mines Corporation

2275 Upper Middle Road East, Suite 300
Oakville, ON L6H 0C3

Submitted by:

WSP Canada Inc.

3600 Uptown Blvd, Suite 301, Building 15
Victoria, British Columbia V8Z 0B9, Canada

+1 250 384 5510

1663724-430h-R-Rev0-64000

28 April 2023

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Appendix 8C-3
Settlement Substrate Laboratory Methods

Appendix 8D-1
Zooplankton Taxa Presence/Absence from Survey Years 2010-2022

Appendix 8D-2
Zooplankton Laboratory Data

Appendix 8D-3
Zooplankton Laboratory Methods

Appendix 8E-1
Record of New and Flagged Taxa Risk Status 2022

Appendix 8E-2
Record of Independent Verifications

Appendix 8E-3
Program Watch List

DEFINITIONS, ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Definitions
AIS	Aquatic Invasive Species
ArcOD	Arctic Ocean Diversity
ARMS	Arctic Register of Marine Species
Biologica	Biological Environmental Services Ltd.
BOLD	Barcode of Life Data
CBDD	Convention of Biological Diversity Decision VI/23
CD	Chart Datum
cf.	Compare with (taxonomy)
DFO	Fisheries and Oceans Canada
DNA	Deoxyribonucleic Acid
EEM	Environmental Effects Monitoring
EOL	Encyclopedia of Life
GBIF	Global Biodiversity Information Facility
GISD	Global Invasive Species Database
Indet.	Indeterminate (taxonomy)
ISSG	Invasive Species Specialist Group
IUCN	International Union for Conservation of Nature
Laval	Benthic Ecology Lab at Université Laval
MEEMP	Marine Environmental Effects Monitoring Program
MEWG	Marine Environment Working Group
NCCOS	National Centers for Coastal Ocean Science
NEMESIS	National Exotic Marine and Estuarine Species Information System
NIS	Non-Indigenous Species
OBIS	Ocean Biogeographic Information System
PC	Project Certificate
QA/QC	Quality assurance and quality control
sp.	Species (taxonomy)
sp. nr.	Species near (taxonomy)
WoRMS	World Register of Marine Species
WRIMS	World Register of Introduced Marine Species

8.0 NON-INDIGENOUS SPECIES/AQUATIC INVASIVE SPECIES (NIS/AIS)

8.1 Introduction

This chapter presents the results of the Non-Indigenous Species (NIS) and Aquatic Invasive Species (AIS) monitoring program as a part of the larger Marine Environmental Effects Monitoring Program (MEEMP) conducted at Milne Port and in Milne Inlet during the 2022 open-water season. This component was developed in consideration of the monitoring requirements outlined in the PC Conditions described in Chapter 1.0, Table 1-2. Project Certificate (PC) Conditions related to the monitoring of NIS and AIS included PC Conditions No. 76, 87, 89, 91, 99 (a), and 99 (c).

8.1.1 Objectives

The MEEMP objectives are outlined in Section 1.3 for the overall program. The objectives specific to the NIS/AIS monitoring program are:

- Sample marine environment to screen for potential Project-related introductions of taxa that are invasive or non-indigenous.
- Update taxonomic inventory of marine biota (i.e., list of organisms observed) for Milne Inlet.
- Communicate outcomes for specimens sent for independent verification.

8.1.2 Definitions

Definitions are provided below for technical terms used throughout this chapter. Definitions are written to align with federal and international standards, based on the definition contained in the Convention of Biological Diversity Decision VI/23 (CBDD; Government of Canada 2004).

Non-indigenous species (NIS): species introduced by human action outside their natural past or present distribution (Government of Canada, 2004)

Aquatic invasive species (AIS): harmful non-indigenous species whose introduction or spread threatens the environment, the economy, or society (Government of Canada, 2004)

Cryptogenic: a species that is not demonstrably native or introduced, a species with an obscure or unknown natural range (Carlton 1996).

forma (f.): or form, indicating a secondary rank classification that designates a group with a noticeable morphological deviation.

sp.: “Species”, used to indicate the species name is indeterminate. This is typically used for samples that were damaged, juvenile, or missing features preventing a conclusive identification to species level.

indet.: “indeterminate”, used to indicate the specimen can be identified only to the listed taxonomic level, used for indeterminate taxonomic designations above genus. This is typically used for samples that were damaged, juvenile, or missing features preventing a conclusive identification beyond the indicated taxonomic level.

cf.: “compare with”, in taxonomy refers to a taxonomic designation that indicates an inexact match to the indicated taxon. The specimen may represent a similar related species, an undescribed morph, or the specimen may be lacking characteristics (due to damage, lack of development of the features, or immaturity) that allow for a positive identification.

sp. nr.: “species near”, similar to “cf.”, but representing a species that is similar to the described species, however there are indications that the species is not a correct match. This may occur in poorly or newly described taxonomic groups where a specimen clearly matches the genus description but does not necessarily match the described species within it. May indicate a new to science species without a description on record.

Homotypic synonym: where there is more than one species name on record based on the same type taxon or species description. May occur when the taxon is independently described by separate taxonomists, or when species are moved from one genus to another.

Other terms used throughout the report include:

Flagged taxa: Taxa are flagged where there is low confidence in their identifications, uncertainties in the range on record, or presence on any of the AIS databases.

No Risk: A species is considered “No Risk” if it has a probable range that includes the Canadian Arctic, or the north Atlantic in the vicinity of the Project (i.e., Labrador Sea), and is not present in any AIS databases. For higher taxonomic levels, a taxon is considered “No Risk” if at least one representative species within the taxon has a confirmed range that includes the Canadian Arctic.

Low Risk: Taxa is considered “Low Risk” if the species (or any representative species for higher taxonomic levels) does not have a probable range that includes the Canadian Arctic, and, but it is not considered invasive in any AIS databases.

High Risk: Taxa is considered “High Risk” if the species (or any representative species for higher taxonomic levels) does not have a probable range that includes the Canadian Arctic, and it is considered invasive in any AIS databases.

Watch List: a list of taxa identified in Milne Inlet that are considered to be “Low Risk” or “High Risk” but not directly attributable to the Project, or requiring more data. Taxa on this list are subjected to a heightened level of monitoring, which may include targeted sampling for DNA analysis or population assessment.

Trigger List: a list that contains species confirmed as Project-related introductions of High-Risk taxa. Responsive actions will be species specific and proportional to the risk. There are currently no species on the trigger list and, therefore, no species-specific response or action plans have been developed to date. Should a species be added to the trigger list, a species-specific response plan would be developed in consultation with Fisheries and Oceans Canada (DFO).

8.2 Study Design

NIS/AIS monitoring is recommended to be conducted annually. Annual monitoring not only increases the data available for Milne Port, but is also important from a regional perspective, as this program currently represents the most intensive sampling for NIS/AIS in the Canadian Arctic and has contributed to filling data gaps and advancing the science on benthic invertebrates in particular.

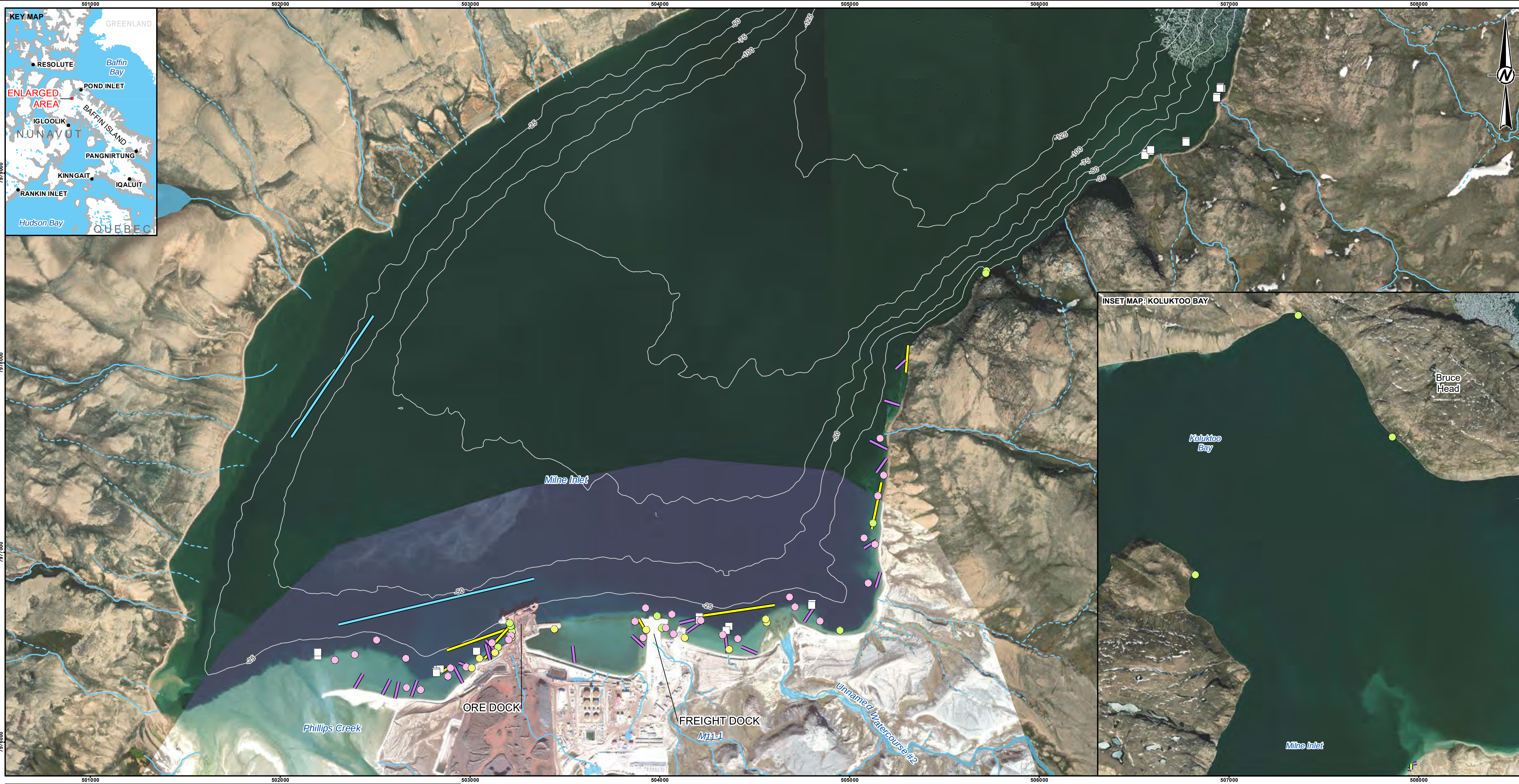
The NIS/AIS monitoring program is designed to detect potential introductions of non-indigenous and/or invasive species from potential Project-related vectors such as ballast water discharges or ship hull biofouling. Since ballast water releases only occur at the anchorages and the Ore Dock in Milne Port, sampling conducted to date has largely focused on southern Milne Inlet as the area with highest likelihood of a potential marine invasion.

NIS/AIS monitoring involves a combination of dedicated surveys as well as screening all specimens caught during surveys for all the various MEEMP components; thus, NIS/AIS monitoring involves data collection across multiple trophic levels – marine vegetation, invertebrates, zooplankton, and fish – to establish a comprehensive inventory of existing marine biota in the Project area that serves as a point of reference for any new species/taxa identified (herein referred to as the “Milne Inlet Taxonomic Inventory”). The Milne Inlet Taxonomic Inventory was initially populated with organisms identified during baseline studies in 2008, 2010 and 2013 and has been updated annually with new records collected during MEEMP surveys; 2022 sampling locations are shown in Figure 8-1.

Dedicated surveys involve:

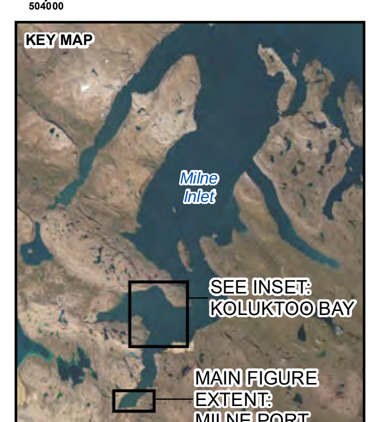
i) NIS/AIS sampling of zooplankton at Milne Port (Zooplankton on Figure 8-2).

ii) Recruitment surveys using settlement substrates deployed in 2020 around Milne Port (Settlement Plate Only and Settlement Basket and Plate on Figure 8-2).



LEGEND

- ANGLING (JIGGING)
- FUKUI TRAP
- HOOP NET
- PERMANANT QUADRAT LOCATION
- ANGLING (JIGGING)
- ANGLING (TROLLING)
- GILL NET
- TRAWLING
- BATHYMETRIC CONTOUR (25 m INTERVAL)
- INTERMITTENT WATERCOURSE
- WATERCOURSE
- WATERBODY



0 500 1,000
1:20,000 METRES

REFERENCE(S)
BATHYMETRY CREATED BY GOLDER FROM MULTIPLE DATA SOURCES. FREIGHT DOCK DATA PROVIDED BY HATCH, MARCH 4, 2020. ADDITIONAL MILNE PORT INFRASTRUCTURE DATA OBTAINED FROM CLIENT, MAY 2, 2020 AND MAY 28, 2018. HYDROGRAPHY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. MILNE PORT IMAGERY CAPTURED AUGUST 2020 © 2020 DIGITAL GLOBE, INC. ADDITIONAL IMAGERY COPYRIGHT © 20190802 ESRI AND ITS LICENSORS. SOURCE: MAXAR VIVID. USED UNDER LICENSE, ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 17 DATUM: NAD 83

CLIENT
BAFFINLAND IRON MINES CORPORATION

PROJECT
MARY RIVER PROJECT

CONSULTANT

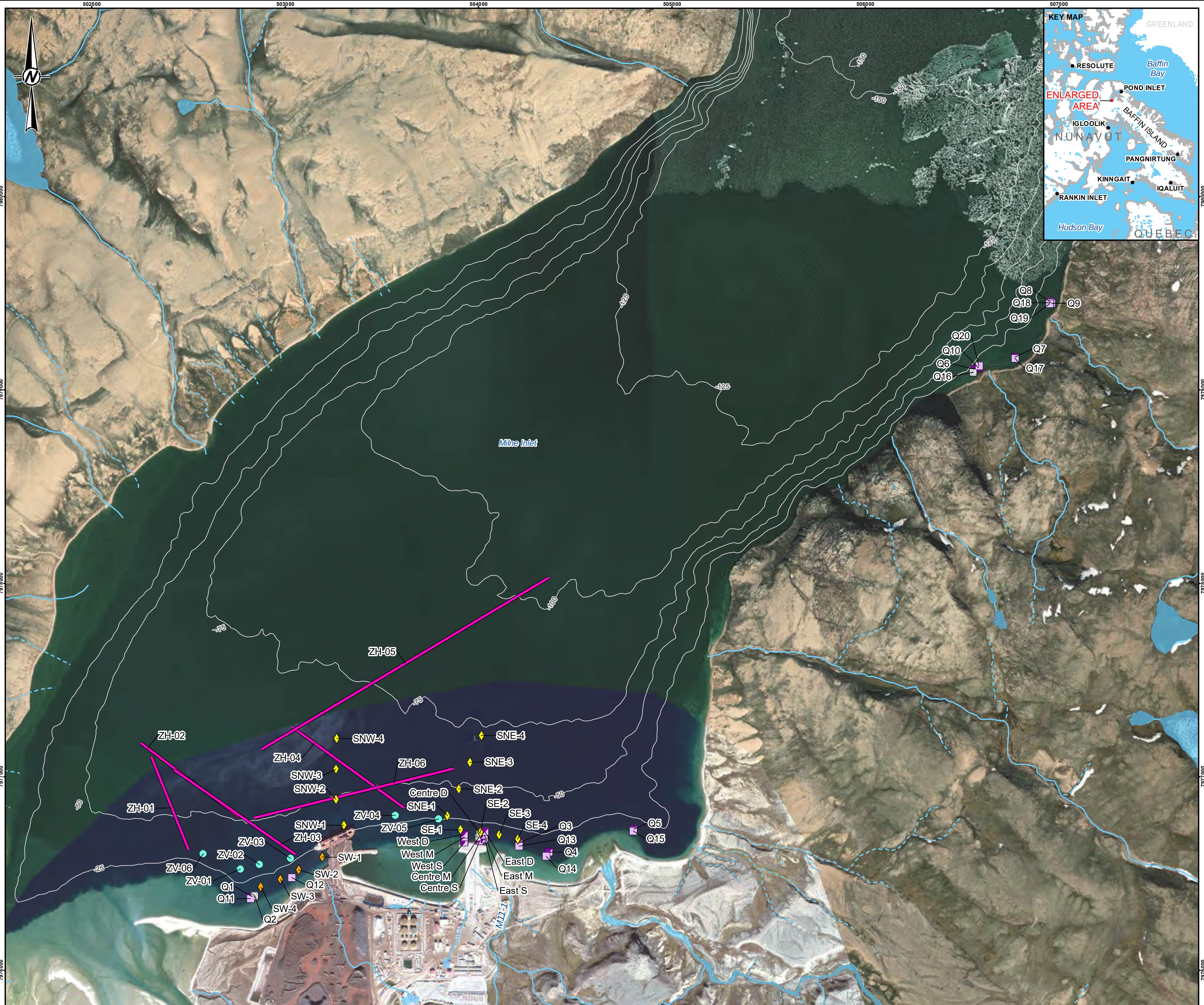
YYYY-MM-DD	2023-04-27
DESIGNED	CB
PREPARED	AA
REVIEWED	AL
APPROVED	AL

TITLE
MEEMP SAMPLING LOCATIONS IN MILNE INLET USED TO INFORM NON-INDIGENOUS SPECIES/AQUATIC INVASIVE SPECIES (NIS/AIS) PROGRAM SPECIES INVENTORIES, 2022

PROJECT NO.	CONTROL	REV.	FIGURE
166372401	64000-04	0	8-1

PATH: I:\2016\1663724\Mapping\MXD\64000_2022_MEEMP\166372401_64000_04_Fig8_1_MEEMP_Sampling_to_Inform_NIS_AIS_Rev0.mxd PRINTED ON: 2023-04-27 AT: 3:26:19 PM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
25mm



LEGEND

BENTHIC INFAUNA

- NON-INDIGENOUS SPECIES/AQUATIC INVASIVE SPECIES (NIS/AIS) SAMPLING ONLY
- SEDIMENT AND BENTHICS

SETTLEMENT SUBSTRATES

- SETTLEMENT BASKET ONLY
- SETTLEMENT BASKET AND PLATE
- SETTLEMENT PLATE ONLY
- NOT RECOVERED

ZOOPLANKTON

- VERTICAL TOW
- HORIZONTAL TOW

- BATHYMETRIC CONTOUR (25 m INTERVAL)
- INTERMITTENT WATERCOURSE
- WATERCOURSE
- WATERBODY

0 500 1,000

1:20,000 METRES

REFERENCE(S)

BATHYMETRY CREATED BY GOLDER FROM MULTIPLE DATA SOURCES. FREIGHT DOCK DATA PROVIDED BY HATCH, MARCH 4, 2020. ADDITIONAL MILNE PORT INFRASTRUCTURE DATA OBTAINED FROM CLIENT, MAY 2, 2020 AND MAY 28, 2018. HYDROGRAPHY DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. MILNE PORT IMAGERY CAPTURED AUGUST 2020 © 2020 DIGITAL GLOBE, INC. ADDITIONAL IMAGERY COPYRIGHT © 20210718, 20210709, AND 20200809 ESRI AND ITS LICENSORS. SOURCE: MAXAR VIVID. USED UNDER LICENSE, ALL RIGHTS RESERVED. PROJECTION: UTM ZONE 17 DATUM: NAD 83

CLIENT

BAFFINLAND IRON MINES CORPORATION

PROJECT

MARY RIVER PROJECT

TITLE

SPECIFIC NON-INDIGENOUS SPECIES/AQUATIC INVASIVE SPECIES (NIS/AIS) SAMPLING LOCATIONS IN MILNE PORT, 2022

CONSULTANT

YYYY-MM-DD	2023-04-27
DESIGNED	CB
PREPARED	AA
REVIEWED	AL
APPROVED	AL

PROJECT NO.	CONTROL	REV.	FIGURE
166372401	64000-04	0	8-2

8.2.1 Modifications to the Program (2022)

Due to multiple years of monitoring data revealing no adverse trends in benthic community indicators related to Project construction and operations, the monitoring frequency of the benthic infauna invertebrates sampling program was adjusted to every 3 years, which is more consistent with routine biological sampling for other mining effects monitoring programs (e.g., the federal Environmental Effects Monitoring Program [EEM]). As a result, benthic sampling collection in 2022 was dedicated to supporting the NIS/AIS program and, accordingly, focused on areas surrounding Project infrastructure with the greatest potential for NIS/AIS detection. Sampling effort consisted of 16 stations, comparable to efforts in 2021. The full-scale benthic community program will occur in 2023. All taxa identified in the full-scale program will continue to be assessed as part of the NIS/AIS monitoring program.

Following targeted sampling in 2020 and 2021 to obtain specimens for genetic analysis, no additional locations were identified for potential flagged taxa. As a result, no targeted sampling for genetic analysis occurred in 2022. Rather, the subfractions remaining following analysis of samples collected for genetic analysis in 2021 will be sorted for targeted organisms.

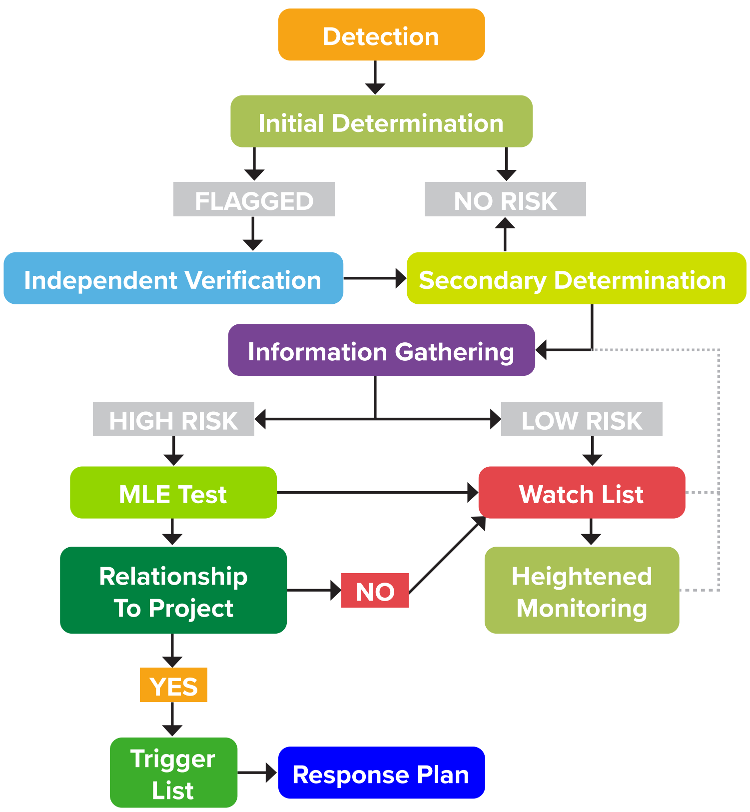
After an off-year of sampling in 2021, zooplankton sampling was reinstated in Milne Port in addition to the established settlement basket and plate program designed to monitor for recruitment (Zooplankton and Settlement Substrates on Figure 8-2). Settlement baskets were added to 10 quadrats that were deployed in 2021, as well as to quadrats Q2 and Q9, which had been lost in 2021. During the 2022 diving operations, a fourth settlement plate and basket was added to each station to complete the sets required for annual and multi-year collections, which is detailed in Chapter 5.0.

In working towards the development of risk assessments for potential NIS/AIS in Milne Port and to better express confidence and uncertainty in range assessments for taxa identified in Milne Port surveys, a distribution category has been added to indicate the known range of taxa in proximity to the Milne Port site.

8.2.2 Indicators and Thresholds

The NIS/AIS monitoring program is designed as a surveillance survey and therefore does not use traditional indicators and thresholds. Detection of a single NIS/AIS will initiate a response protocol aimed to assess the risk and determine the appropriate course of action. Ultimately, species are either determined to be “No Risk” or are determined to be “High Risk” or “Low Risk” and placed on a “Watch List” and subject to heightened monitoring efforts, or placed on a “Trigger List”, where rapid response plans and an evaluation of potential intervention measures would be developed and implemented. The taxa review process framework is depicted in Figure 8-3.

Figure 8-3: Flow Chart Describing Taxa Review Process for Flagging Species as Low or High Risk



Detection

Detection involves screening the taxonomic list received from annual survey efforts against the taxonomic inventory developed for Milne Inlet (which includes all taxa observed across all baseline and monitoring surveys) to identify taxa that have not been observed previously.

Initial Determination

Taxa identified in the detection stage are compared to existing taxonomic resources and available regional species records of occurrence. Resources include, but are not limited to, the World Register of Marine Species (WoRMS), the Global Biodiversity Information Facility (GBIF), and Arctic species inventories published or accessed through the Ocean Biogeographic Information System (OBIS). Taxa are also screened against available global and domestic AIS databases including, but not limited to, the Global invasive species database (Molnar et al. 2008), the National Exotic Marine and Estuarine Species Information System (NEMESIS), the Global Invasive Species Database (GISD) published by the IUCN Invasive Species Specialist Group (ISSG) and the invasive species list within the National Risk Assessment for Introduction of Aquatic Nonindigenous Species to Canada by Ballast Water (Casas-Monroy et al. 2014). Species, or taxa of higher levels with at least one representative species that are found to have a range that includes the Canadian Arctic and do not appear on the AIS databases are considered “No Risk” and added to the inventory. Taxa are **flagged** for independent verification where there is low confidence in their identifications, uncertainties in the range on record, or presence on any of the AIS databases.

Independent Verification

Specimens of flagged taxa are sent for an independent identification or verification of the initial identification. Currently, taxa are verified by the Benthic Ecology Lab at Université Laval. Additional specialists in particular taxonomic groups or species are also being sought to provide clarity on identifications unable to be resolved by Laval. Specimens preserved in ethanol are alternatively sent for DNA verification by the Canadian Centre for DNA Barcoding at the University of Guelph.

Secondary Determination

Results and rationale for the independent verifications are reviewed by Biologica Environmental Services Ltd. for accuracy and confidence in the identification. Results from the independent verifications are compared to the same taxonomic resources and AIS databases as described in the Initial Determination step. Species, or taxa of higher levels with at least one representative species that are found to have a range that includes the Canadian Arctic and do not appear on the AIS databases are considered “No Risk” and added to the Milne Inlet taxonomic inventory. Specimens where the initial identification was confirmed or updated identifications with uncertainties in the range on record, or a presence on any of the AIS databases are flagged for a more detailed review stage.

Information Gathering

All taxa not determined to be “No Risk” following Secondary Determination are subjected to a detailed and focussed literature review. Information Gathering includes examining documented occurrences relative to the range on record, as well as genetic and phylogenetic studies that may help resolve a taxon’s origin. Following the review, taxa will either be classified as “Low Risk” and added to the Watchlist, or classified as “High Risk” and subjected to the MLE Test.

MLE Test

The Multiple Lines of Evidence (MLE) test is applied to all “High Risk” taxa determined through the Information Gathering step. Recognizing the limitations of existing AIS databases, the MLE test informs whether site-specific biogeographic, ecological, and genetic evidence supports the categorization of a particular species/taxon as invasive. Biogeographic evidence may include information from the historical taxonomic record or historical documented occurrences. Ecological evidence considers vectors of introduction as well as whether the species/taxon of concern is displaying invasive behaviour at Milne Port (i.e., increase in relative abundance, geographic spread, change in benthic community indices). Genetic evidence may help resolve trickier taxonomic identifications and may also identify related or source populations of the same species in linked Ports and nearby areas.

Relationship To Project

Following the MLE test, a determination will be made as to whether a potential introduction is Project-related. An introduction is considered Project-related if a species/taxon was not documented in baseline surveys or if there are no documented occurrences in the Canadian Arctic prior to the commencement of shipping operations. Introductions attributable to the Project will be added to the Trigger List while those that are not will be added to the Watchlist.

Watch List

The Watchlist is a list of taxa identified in Milne Port that are considered to be “Low Risk” or “High Risk” but not attributable to the Project. Taxa on this list are subjected to a heightened level of monitoring, which may include increased surveillance through targeted sampling events, and the involvement of taxonomic specialists. Additionally, each year the taxa is reidentified in samples, the Information Gathering step will be performed again to review any updates to the literature and NIS/AIS status of the taxa. The taxa will be reassessed as “No Risk”, “Low Risk” or “High Risk” accordingly.

Heighted monitoring includes annual sampling at the locations where taxa have been previously observed to monitor for changes in metrics such as relative abundance, species diversity and richness, and other indications that the taxa is displaying invasive behaviours. Should invasive behaviours be identified, the taxa will be considered “High Risk” and the MLE Test performed again.

Trigger List

The Trigger List contains species confirmed as Project-related introductions of High-Risk taxa. Responsive actions will be species specific and proportional to the risk.

Response Plan

Species specific response plans will be developed in collaboration with DFO and may include possible interventions such as control or eradication efforts, balancing the environmental impacts of the response.

8.3 Materials and Methods

8.3.1 Sample Collection for Taxonomic Identification

The 2022 MEEMP and NIS/AIS monitoring programs were conducted between 29 July and 15 August by a field team composed of seven Golder biologists including biologist/SCUBA divers, a Golder vessel operator, and a local Inuit field technician from Pond Inlet, NU. Sampling was conducted from a 30-foot aluminum vessel (research vessel) in addition to two inflatable tender vessels (20-foot and 16-foot) based at the Milne Port facility.

8.3.1.1 Benthic Infauna, Macroflora and Benthic Epifauna, Fish and Incidentals

All specimens caught or observed during surveys for all the various MEEMP components were screened for NIS/AIS status, including benthic infaunal and epifaunal invertebrates (Chapter 4.0 and Chapter 5.0, respectively), macroflora (Chapter 5.0), fish species (Chapter 6.0), and taxa found in fish stomachs (Chapter 7.0). Methodologies for these collections are described in the respective chapters of this report.

Chapter 4.0 presents community analysis for stations on the West transect only. Benthic collections specific to the NIS/AIS program were also collected from the first four stations on the Northwest, Northeast, and East transects using the same methods as described in Chapter 4.0. Station coordinates for all benthic infauna collections are presented in Table 8-1 and on Figure 8-2.

Incidental samples were also collected opportunistically during SCUBA surveys for macroflora and epifauna as well as during fishing efforts; the specimens have been sent for taxonomic analysis due to the difficulty of field identification. Specimens of all collected incidental taxa were preserved in 10% formalin and submitted to Biologica Environmental Services Ltd. (henceforth referred to as “Biologica”; a Canadian marine and freshwater taxonomy laboratory) for taxonomic identification. Representative specimens of macroalgae taxa were also preserved in 80% ethanol in the field, and transferred to 95% ethanol upon arrival at Biologica’s laboratory approximately one month later (this has been confirmed by the Canadian Centre for DNA Barcoding as an acceptable protocol for preservation for future DNA analysis; T. Macdonald, 2022, pers.comm.), and dry-pressed to develop a reference collection.

Table 8-1: Station Locations for Benthic Infauna Sampling for NIS/AIS Monitoring in Milne Port, 2022

Station Name	UTM Coordinates (Zone 17W)	
	Easting	Northing
West Transect		
SW-1[1]	503191	7976587
SW-2	503069	7976520
SW-3	502975	7976472
SW-4	502874	7976431
Northwest Transect		
SNW-1	503303	7976751
SNW-2	503263	7976884
SNW-3	503262	7977040
SNW-4	503266	7977199

Station Name	UTM Coordinates (Zone 17W)	
	Easting	Northing
Northeast Transect		
SNE-1	503839	7976800
SNE-2	503897	7976938
SNE-3	503955	7977076
SNE-4	504014	7977214
East Transect		
SE-1	503907	7976727
SE-2	504009	7976714
SE-3	504106	7976700
SE-4	504202	7976677

Notes:

m = metre; UTM = Universal Transverse Mercator

1. Station SW-1 was sampled approximately 44 m NE of the target station location due to difficulties obtaining an acceptable grab with the coarse substrate in the area (14 grab attempts).

8.3.1.2 Settlement Substrates

In 2020 and 2021, settlement substrates were deployed in various locations throughout Milne Port to monitor for recruitment of encrusting taxa. Three stations situated at the Ragged Island anchorage were not sampled in 2022 due to time constraints. Each station was configured as three to five settlement baskets filled with locally sourced cobble and three to five settlement plates (comprised of a 5-gallon bucket lid stacked horizontally) attached to a line with a subtidal buoy (Figure 8-4). Stations were located at -3 m, -8 m, and -15 m water depth, along the East, North, and West faces of the Freight Dock as well as various depths co-located with the quadrats (Figure 8-2, Table 8-2, Chapter 5.0).

Each station contains a set of rotational settlement baskets and plates. Each monitoring year, one settlement basket and plate are retrieved from the set, and then redeployed for retrieval in future monitoring programs three years following deployment. In subsequent years, the next settlement basket and plate in the series will be collected, which will have been deployed for three years to represent short to medium term colonization. An additional plate and basket are collected annually and redeployed to represent immediate term colonization. The first settlement substrates were deployed in 2020, and therefore 2022 represented only the second year of collections for deployments on the freight dock and quadrats Q1-Q10. Due to supply chain limitations associated with COVID-19 in 2020, the addition of new stations in 2021, and the loss of some sampling locations in 2021 and 2022, full sets of annual and multi-year plates and baskets are not available for all stations. Deployment year and soak time at recovery for all settlement substrates recovered in 2022 are described in Table 8-2.

Baskets were brought to the surface and placed in clean 4-gallon buckets with in-situ water. Plates were cut underwater to unwrap from the center line and placed within a collection bag and brought to the surface where they were placed in a clean plastic tote with in-situ water. The cobbles were removed from the basket and photographed prior to being placed into an 8-gallon sample bucket. The plates were photographed prior to being cut into quarters using a knife and then placed in a 4-gallon sample bucket. Samples were preserved with 10% formalin. The buckets were sealed and inverted several times to promote homogenization with the formalin. The buckets were labeled internally and externally with water-resistant labels and sent to Biologica for taxonomic analysis of attached and motile invertebrates, and marine vegetation.

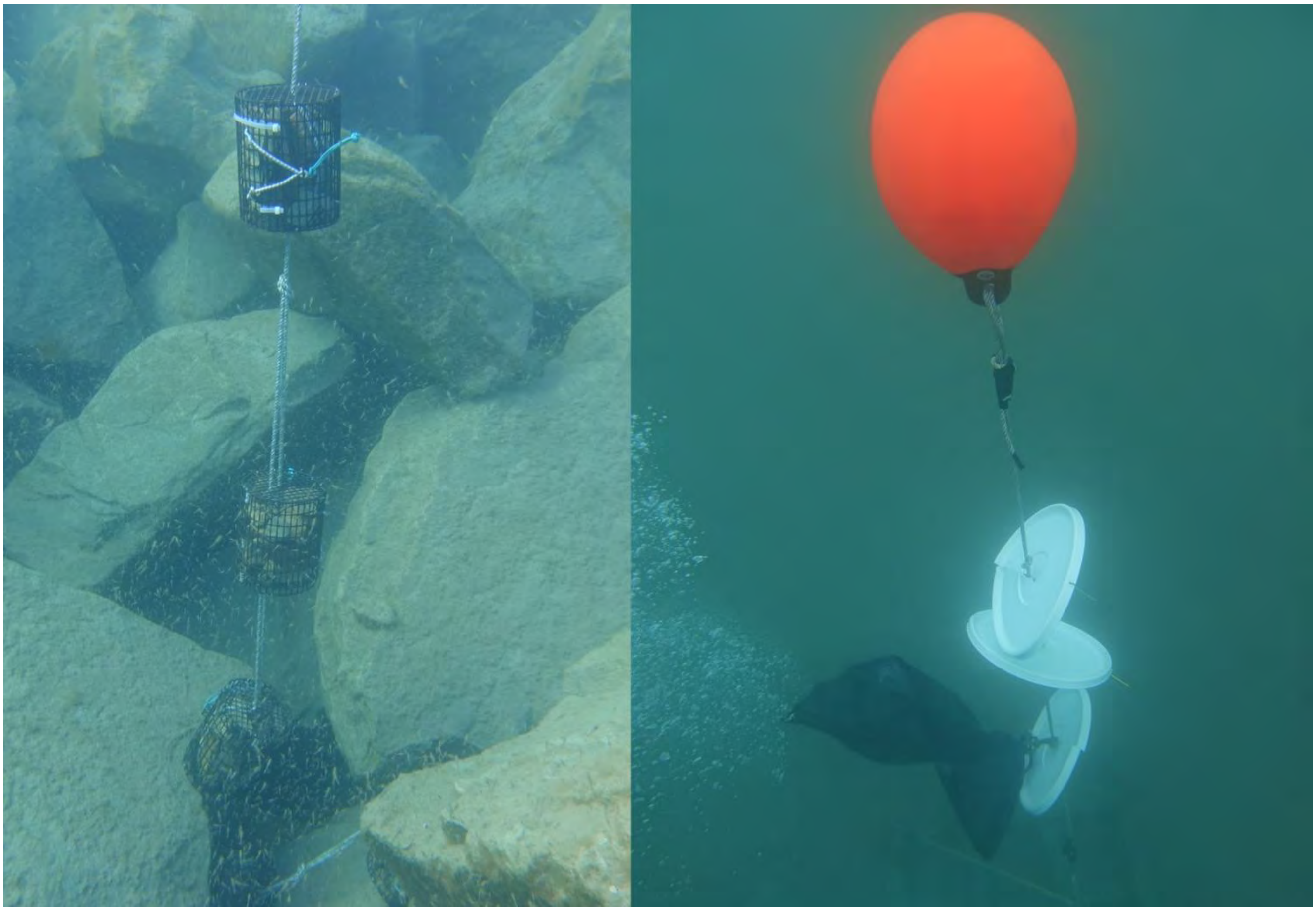


Figure 8-4: Settlement baskets deployed along the face of the freight dock and settlement plates from the quadrats.

Table 8-2: Summary of Settlement Basket and Plate Stations

Station	Location (NAD 83 UTM 17W)		Depth (m below CD)	Substrate Sample Collected	Date Deployed	Date Recovered
	Easting (m)	Northing (m)				
West S	503927	7976662	-4.4	Annual Basket and Plate	August 2021	7 August 2022
				Multi-year Basket and Plate	August 2020	
West M	503926	7976690	-7.8	Annual Basket and Plate	August 2021	7 August 2022
				Multi-year Basket and Plate	August 2020	
West D	503926	7976703	-10.0	Annual Basket and Plate	August 2021	7 August 2022
				Multi-year Basket and Plate	August 2020	
Centre S	504005	7976670	-9.11	Annual Basket and Plate	August 2021	9 August 2022
				Multi-year Basket and Plate	August 2020	
Centre M	504003	7976689	-8.7	Not Recovered[1]	N/A	N/A
Centre D	504008	7976708	-15.2	Not Recovered[2]	N/A	N/A
East S	504031	7976679	-8.7	Annual Basket and Plate	August 2021	9 August 2022
				Multi-year Basket and Plate	August 2020	
East M	504029	7976700	-12.3	Annual Basket and Plate	August 2021	9 August 2022
				Multi-year Basket and Plate	August 2020	
East D	504033	7976717	-19	Annual Basket and Plate	August 2021	9 August 2022
				Multi-year Plate[3]	August 2020	
Q1	502828	7976382	-10.0	Basket and Plate	August 2020	6 August 2022
Q2	502843	7976385	-12.3	Not Recovered[4]	N/A	N/A
Q3	504208	7976659	-11.7	Basket and Plate	August 2020	3 August 2022
Q4	504363	7976611	-14.0	Basket and Plate	August 2020	6 August 2022
Q5	504802	7976731	-12.9	Basket and Plate	August 2020	2 August 2022
Q6	506563	7979107	-18.3	Basket and Plate	August 2020	10 August 2022
Q7	506774	7979170	-11.1	Basket and Plate	August 2020	4 August 2022
Q8	506957	7979457	-11.3	Basket and Plate	August 2020	4 August 2022
Q9	506962	7979448	-9.7	Plate only[5]	August 2020	8 August 2022
Q10	506584	7979115	-8.8	Basket only[6]	August 2020	4 August 2022
Q11	502820	7976371	-8.4	Plate only	August 2021	6 August 2022
Q12	503034[7]	7976479[7]	-11.5	Plate only	August 2021	7 August 2022
Q13	504210	7976643	-9.8	Plate only	August 2021	3 August 2022
Q14	504350	7976589	-9.4	Plate only	August 2021	6 August 2022
Q15	504800	7976721	-10.5	Plate only	August 2021	2 August 2022
Q16	506558[8]	7979093[8]	-11.8	Not Recovered[9]	August 2021	10 August 2022
Q17	506774	7979163	-10.2	Plate only	August 2021	4 August 2022

Station	Location (NAD 83 UTM 17W)		Depth (m below CD)	Substrate Sample Collected	Date Deployed	Date Recovered
	Easting (m)	Northing (m)				
Q18	506956	7979452	-11.1	Plate only	August 2021	4 August 2022
Q19	506953	7979447	-11.5	Plate only	August 2021	8 August 2022
Q20	506588	7979125	-13.6	Plate only	August 2021	4 August 2022

[1]Centre M Station deployment was unable to be located by divers. Divers conducted an extensive search along the depth contour while the visibility was 10 m.

[2]Centre D Station was not recovered due to insufficient field time remaining

[3]East D Station deployment had moved from its original location into deeper water. While the bulk of the deployment was recoverable, two baskets were too deep to be recovered.

[4]Q2 was not able to be located by divers in 2021. A new quadrat and settlement substrates were deployed at a new location in 2022.

[5]Q9 was relocated in 2021, due to equipment availability, no baskets were deployed at that time.

[6]Equipment issues prevented recovery of settlement plate safely at Q10

[7] Q12 was relocated to deeper depths in 2022 to revise for data outliers related to Chapter 5.0.

[8] Q16 had moved to deeper depths in 2022 due to vessel anchor dragging (described in Chapter 5.0)

[9]Dive time limits precluded recovery of settlement plate safely at Q16

8.3.1.3 Zooplankton

Zooplankton samples were collected using a combination of vertical and horizontal oblique tows (Figure 8-2, Table 8-3). Vertical hauls were conducted at six sampling stations in the Milne Port area by lowering a 0.3 m diameter (64 µm mesh size) plankton net to 3 m above the bottom and then raising the net by hand to the surface at a rate of approximately 1 m/s (visually estimated). Three replicate hauls were conducted at each station and combined into a single composite sample following methodology from previous years (SEM 2017; Golder 2018, 2019, 2020a).

Horizontal oblique tows were conducted along six transects in Milne Port established in 2018. Horizontal oblique tows were conducted by towing a 0.5 m diameter net (250 µm mesh size) at a speed of approximately 2.5 knots for a period of at least fifteen minutes per tow. The larger net size in the oblique tows reduces drag during towing, preventing loss of sampling equipment and allowing for a faster tow speed, and typically collects a different set of zooplankton taxa (e.g. the larger mesh and mouth size combined with higher speed captures larger zooplankton taxa including larval fish, whereas the smaller mesh size retains smaller zooplankton taxa including larval forms of planktonic invertebrates). Tows were conducted near the surface in a sinusoidal fashion by means of regular transitions in tow speed (1-minute towing, 1-minute idling), which allowed the weighted net to periodically sink and rise during active sampling. This helped to avoid sampling only in the upper few metres of the water column. The sinusoidal oblique tow approach was used to help catch a more representative sample of zooplankton in the water column and as noted above may catch faster moving larvae (e.g., fish larvae, larger crustaceans). Transects were towed in sections to allow for clearing of the plankton net, and samples were carefully flushed into a sample container as a single composite sample for each transect.

Once the sample was transferred to the sample container, water was splashed or sprayed on the outside of the net to rinse any remaining sample into the container. Between each tow, the nets and bottles were rinsed (either flushed with sea water or by using a spray bottle filled with sea water through the net mesh to exclude organisms). All zooplankton samples were preserved in 5% formalin and submitted to Biologica for taxonomic identification. Laboratory methodologies are detailed in Appendix 8D-3.

Table 8-3: Zooplankton Sampling Locations 2022

Station Name	Sampling Date	UTM Coordinates			
		Start		End	
		Easting	Northing	Easting	Northing
Horizontal Tows					
ZH-01	11 August 2022	502500	7976624	502307	7977105
ZH-02	11 August 2022	502253	7977175	502756	7976797
ZH-03	14 August 2022	502427	7977036	503052	7976600
ZH-04	11 August 2022	503615	7976841	503035	7977258
ZH-05	14 August 2022	504364	7978031	502879	7977144
ZH-06	9 August 2022	503873	7977044	502838	7976788
Vertical Tows					
ZV-01	7 August 2022	502768	7976524	-	-
ZV-02	7 August 2022	502866	7976548	-	-
ZV-03	7 August 2022	503028	7976580	-	-
ZV-04	6 August 2022	503570	7976801	-	-
ZV-05	6 August 2022	503793	7976782	-	-
ZV-06	6 August 2022	502576	7976603	-	-

8.3.2 Samples Collected for Genetic Analysis

Following targeted sampling in 2020 and 2021 to obtain specimens for genetic analysis, no additional locations were identified for potential flagged taxa. As a result, no targeted sampling for genetic analysis occurred in 2022. Rather, the subfractions remaining following analysis of samples collected for genetic analysis in 2021 were set aside to be sorted for targeted organisms. Biologica is currently processing these samples and results remain pending.

8.3.3 Data Analysis

8.3.3.1 Taxonomic Identification and Literature Review

Data presented in this chapter focuses on taxa presence, rather than enumeration, since relative abundance and other species metrics are generally presented in other chapters of the report. Should a potential NIS/AIS be detected, these metrics will be examined as part of heightened monitoring.

Benthic infauna, fish stomachs, and other samples collected incidentally were sent to Biologica for taxonomic identification, with specimens identified to the lowest possible taxonomic level. The process for reviewing and assessing the status of the identified taxa is described in Figure 8-3. All specimens were compared to the Milne Inlet Taxonomic Inventory, and those not on the Inventory (i.e., not found in previous surveys) were assessed further through literature review to determine if their known distributions and ranges included North Atlantic, Arctic and/or Canadian Arctic waters. The inventory was also updated to include any new or updated accepted species names for any previously identified species.

Information on general species biology and distributions for the literature review was sourced from:

- World Register of Marine Species (WoRMS 2023)
- Global Biodiversity Information Facility (GBIF 2023)
- Encyclopedia of Life (EOL 2023)
- SeaLifeBase (Palomares and Pauly 2022)
- Marine Species Identification Portal (ETI 2023)
- National Centers for Coastal Ocean Science (NCCOS 2017)
- Arctic Register of Marine Species (ARMS) compiled by the Arctic Ocean Diversity (ArcOD 2023, Sirenko et al. 2023)
- Arctic species inventories published or accessed through the Ocean Biogeographic Information System (UNESCO 2023)

In addition, specimens were also compared against the following global and domestic AIS databases and resources:

- Global invasive species database (Molnar et al. 2008)
- National Exotic Marine and Estuarine Species Information System (NEMESIS; Fofonoff et al. 2022)
- Global Invasive Species Database (GISD) published by the IUCN Invasive Species Specialist Group (ISSG 2023)
- Known invasive species list within the National Risk Assessment for Introduction of Aquatic Nonindigenous Species to Canada by Ballast Water (Casas-Monroy et al. 2014)
- High-risk AIS in the Hudson Bay Region and Canadian Arctic identified using the Canadian Marine Invasive Screening Tool (CMIST, Goldsmit et al. 2021)
- World Register of Introduced Marine Species (WRIMS; Rius et al. 2023)
- Invasive Species Compendium published by CABI (Centre for Agriculture and Bioscience International; CABI 2023).
- AquaNIS information system on aquatic non-indigenous and cryptogenic species (CRPI 2023)
- The Arctic Invasive Alien Species: Strategy and Action Plan developed by CAFF (Conservation of Arctic Flora and Fauna) and PAME (Protection of the Arctic Marine Environment) (CAFF and PAME 2017)
- Regional specific invasive species Watch List informational brochure (Government of Nunavut 2016)

8.3.3.1.1 Distribution Categories

Based on the range on record for each taxon, a value was assigned to each new observation to express the distance to the closest record as a descriptor of distribution. Methods for describing the distribution categories followed those of Goldsmit et al. 2014, adjusted for the Project location (Figure 8-5). Each taxon was assigned a value of 1 to 5 based on the locations of the closest records to the project area, where:

- A value of 1 indicates there are previous records “Within the Region”. The region is defined as Milne Inlet between the Milne Port Site and Ragged Island[1].
- A value of 2 indicates that there is no record within the immediate region, however there is a record from the “Surrounding Region”. Boundaries for the surrounding region include the eastern Canadian Arctic and Davis Strait.
- A value of 3 indicates that records exist for the taxon in other regions of the Canadian Arctic, or “Arctic, Outside Region”. Boundaries included the western Canadian Arctic and Hudson Bay.
- A value of 4 indicates the taxon has a “Circumpolar/Circumboreal Distribution” on record, indicating the taxon has been recorded in other locations within the Arctic, or has a generally described Arctic distribution, with no georeferenced collections in the Arctic Outside Region.
- A value of 5 indicates the taxon has a “Wider Distribution” on record that does not clearly include records within circumpolar or circumboreal regions.

An uncertainty value was also provided to indicate the confidence in the available data used to place the specific taxon within the appropriate distribution category.

- Low uncertainty indicates that the available data are robust and well reviewed. It is assumed that the range on record is an accurate description for the taxon.
- Moderate uncertainty indicates that there is some uncertainty in the range on record or limited collection records, and that there is a reasonable probability that range may be broader or narrower than described in the available literature.
- High uncertainty indicates that the range on record is likely incomplete and not representative of the probable range. High uncertainty will be more likely for newly described species, or rarer species that are underrepresented in collections.

Taxa with distribution categories of 1 and 2 are generally assumed to be “No Risk” and are not subjected to further review. Further review of taxa with a value of 3 may occur where there is moderate to high uncertainty in the range on record. Any taxon with a distribution category value of 4 is flagged for further literature review, and potential independent external review. Any taxon with a distribution category value of 5 is automatically flagged for independent external review. Moderate to High uncertainty scores will be applied to taxonomic designations that are not able to be resolved to species level, including for “cf.” taxa.

[1] Due to the limited number of species surveys that have occurred in this region in comparison to MEEMP survey efforts, it is anticipated that most new observations in the program will not fall into this category.

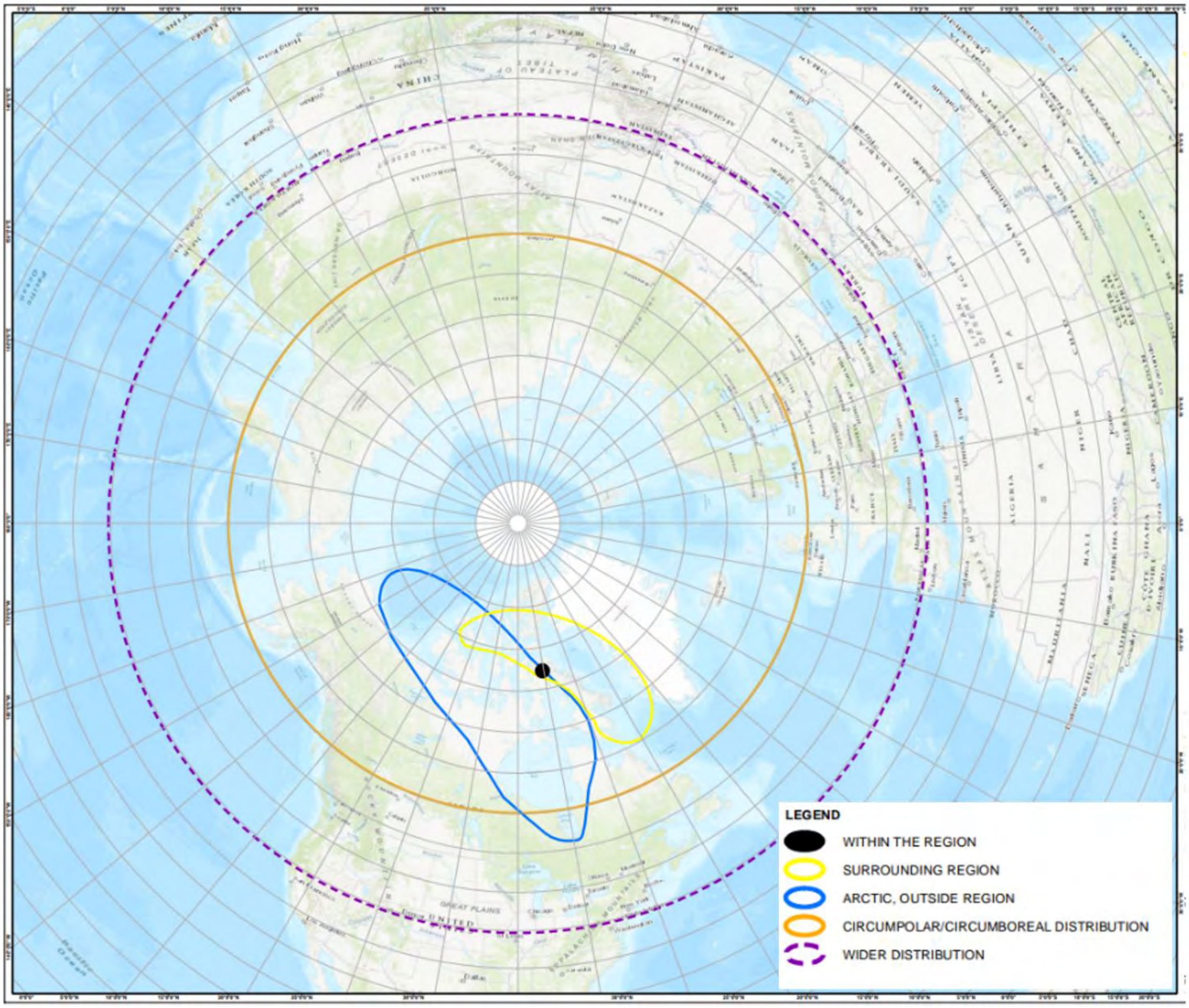


Figure 8-5: Approximate regions for taxonomic distribution categories used to define closest records. Adapted from Goldsmit et al. 2014.

8.3.3.1.2 Limitations

Specimens were not always identified to the species level due to a variety of limitations such as incomplete or disputed morphological descriptions available for some taxonomic groups, missing or undeveloped (juvenile) features, or damage to specimens. These specimens were recorded to the lowest practical taxonomic level as indet. (indeterminate) or sp. (species) when identifiable to the genus level. When an inexact match to a species was made, the designations cf. (compare with) and sp. nr. (species near) were used to indicate the specimen was similar to or represented an unknown species near to the indicated taxon, respectively (see Section 8.1.2 Definitions). For literature review, where taxa were not identifiable to the species level, an attempt was made to confirm the higher taxon includes members that have a distribution or range that included north Atlantic, Arctic and/or Canadian Arctic waters. The higher taxonomic levels were also compared to the invasive species databases; for example, if a specimen from Milne Inlet could only be identified to genus, and the database revealed that no species within that genus have ranges that include the Canadian Arctic, the specimen was flagged for further review.

The Canadian Arctic is not well studied, particularly in comparison to the Eurasian Arctic (Sirenko et al. 2023, Figure 8-6). Surveys and species inventories in the Canadian Arctic are not exhaustive, and species descriptions may not include a comprehensive description of range. Rarer and more recently described taxa may not have a report of occurrence or range on record within Canadian Arctic waters despite having the potential to be present. Species where the native range is unknown, disputed, or uncertain are considered cryptogenic, being unable to be classified as native or introduced where they are found to be present.

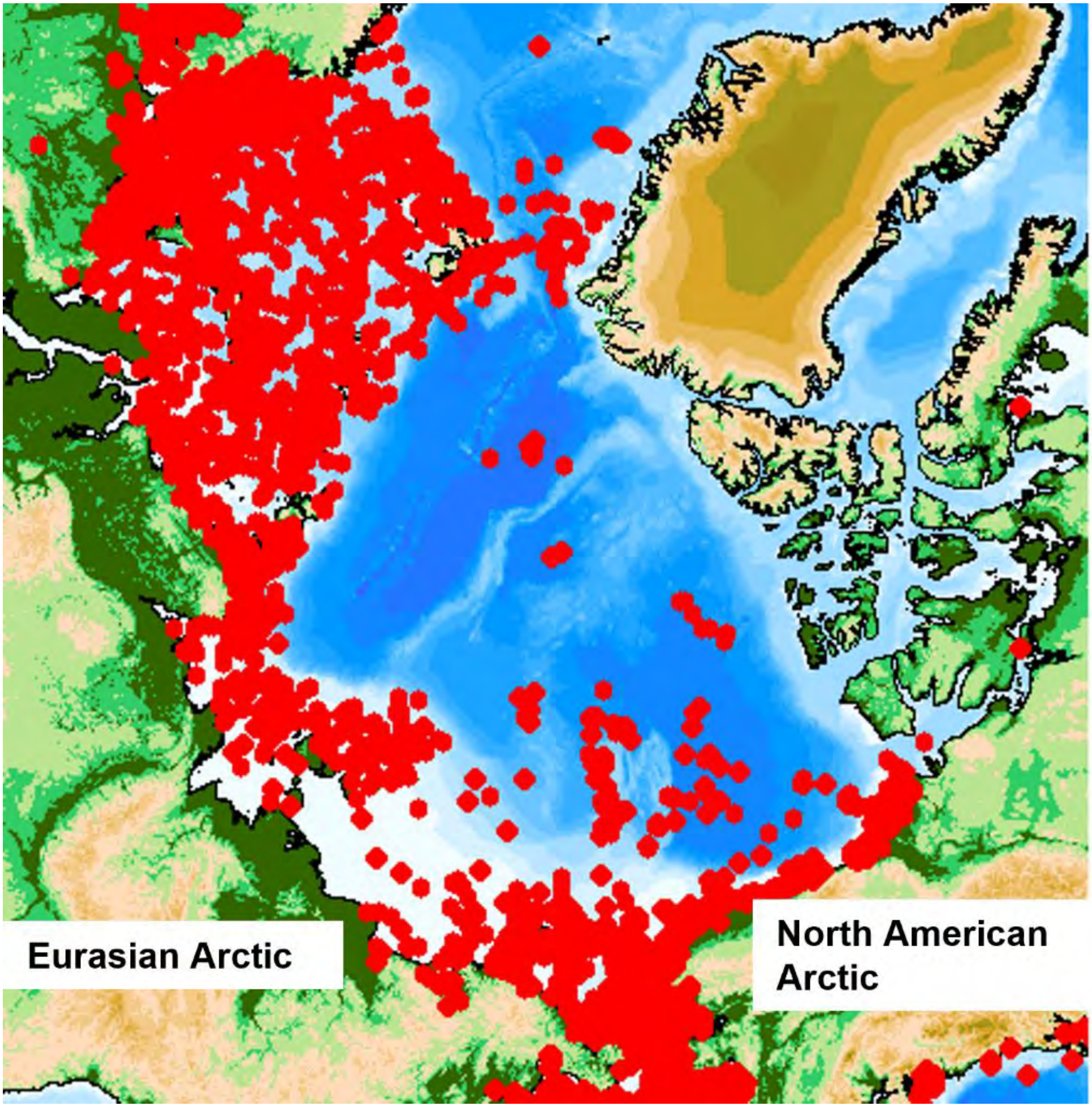


Figure 8-6: Datasets on Arctic species available through ArcOD, indicating the discrepancy between studies in Canadian waters (right side) compared to other areas of the Arctic Ocean (left side). Image from ArcOD 2023.

8.3.3.2 Independent Verification

Following literature review, specimens that were flagged as requiring closer examination underwent secondary taxonomic review by Biologica and were sent for independent verification to the Benthic Ecology Lab at Université Laval (Laval). Following review by Laval, specimens were also sent to specialists in specific taxonomic groups if further clarification was required, or taxa were reviewed by Laval in previous survey years. Samples were sent for independent verification for a number of reasons, including possible NIS/AIS status, existence of a new species description, limited information on the distribution, or uncertainty on the identification; in other words, not all species sent for independent verification were flagged as being of concern as potential non-indigenous or invasive species.

Specimens sent to specialists in 2022 also included taxa identified during the 2021 MEEMP and NIS/AIS program that were reviewed by Laval but required further clarification.

8.4 Results

8.4.1 Taxonomic Identification

8.4.1.1 Benthic Infauna

Benthic infaunal sampling in 2022 was conducted at 16 stations in Milne Port, yielding a total abundance of 65,982 infaunal organisms representing 244 taxa (Appendix 8A-1, 8A-2). Of these, only one taxon (*Myrianida* sp). was considered a "new record", meaning it was not found in previous surveys in Milne Inlet; the new record is presented in Table 8-4, along with a description of the distribution on record.

Myrianida is a genus of annelid worms from the class Phyllodocida. Arctic records of *Myrianida* are largely not identified to species, however, collections indicate that the genus has a circumpolar presence. This includes *M. prolifera*, the only taxon identified to the species level in the Canadian Arctic, recorded in Churchill, Ungava Bay, and Iqaluit (Miller et al. 2014, Goldsmit 2016, Gagnon and Torgersen 2021). Based on collection records from the eastern Canadian Arctic, including Baffin Island, *Myrianida* sp. was given a Distribution Category rating of 2, matching closest records in the surrounding region. Based on limited collections and the lack of taxonomic resolution to species level, the distribution record was considered to be moderately uncertain.

Myrianida contains one species recorded as NIS. *M. pachycera* is native to Australia and the Indo-Pacific, non-indigenous populations have been identified in Hawai'i, California, and Florida (Fofonoff et al. 2023). Methods of introduction are presumed to be through biofouling and ballast water and no ecological or economic impacts associated with the introductions have been reported. This species is temperature limited, restricted to warm-temperate and tropical waters and is unlikely to be an invasion risk at Milne Port.

Two taxa from benthic infauna samples were sent for verification. This included one taxon from the Program Watch List (*Hesperonoe* sp.) and one taxon flagged for further review due to it containing taxa flagged for review in previous survey years (Buguloidea indet.). Independent verification results are detailed in Section 8.4.2.

Additionally, two specimens of *Marenzelleria* sp. were identified in benthic samples. *Marenzelleria* is a spionid polychaete genus with a representative species (i.e., *M. viridis*) on the Watch List. *Marenzelleria* sp. were first recorded in Milne Port in 2016 but were not flagged for review until the tentative identification of *M. viridis* in 2018. Specimens from 2018 through 2021 were subsequently corrected to the Arctic species *M. wireni* (via genetic analysis) and potentially *M. arctia* (via morphological examination) by a specialist in the taxonomic group. Assessment of the 2022 specimens by Biologica suggested they were likely *M. wireni*, an Arctic species known to occur in Milne Port, however the features required to make a confident identification of species were damaged or missing. The identification was left at the genus level as a precaution. Due to the missing features, the specimens were not sent for independent review as it is unlikely to be further resolved.

Table 8-4: List of Newly Recorded Benthic Infauna Taxa Identified at Milne Inlet in 2022, with Description of Distribution on Record

Phylum Class/Order	Family	Taxon	Description	Distribution References	Distribution Category[(a)]	Uncertainty[(b)]
Annelida						
Polychaeta / Phyllodocida	Syllidae	*Myrianida* sp.	Globally distributed genus of phyllodocid worms that contains representative species with ranges that include the Canadian Arctic and representative collections from Baffin Island.	1, 2, 3, 4, 5	2 Surrounding Region	Moderate

Notes: Taxa identified to the lowest practical taxonomic level; *indicates non-unique taxa; indet.= indeterminate (taxa which could not be identified beyond the taxonomic level listed); sp.=species.
[(a)] Distribution categories indicate the proximity to the Project of the closest georeferenced collection of the taxon, where category 1: Within the Region, 2: Surrounding Region, 3: Arctic, Outside Region, 4: Circumpolar/Circumboreal Distribution, 5: Wider Distribution. Distribution categories are defined in Section 8.3.2.1.1
[(b)] Uncertainty indicates confidence in the data available for the range on record. Uncertainty categories (Low, Moderate, and High) are described in Section 8.3.2.1.1
Taxa distribution references: 1: WoRMS 2023, 2: GBIF 2023, 3: Miller et al. 2014, 4. Goldsmit 2016, 5. Gagnon and Torgersen 2021.
All taxa cross-referenced with NIS/AIS resources: Fofonoff et al. 2023, ISSG 2023, Rius et al. 2023, Molnar et al. 2008, Casas-Monroy et al. 2014.

8.4.1.2 Macroflora and Benthic Epifauna

A total of 40 distinct macroflora and epifauna taxa were recorded during quadrat surveys in Milne Inlet in 2022, 29 of which were identifiable to the species level. The complete list of identified taxa is presented along with the fish and incidental taxa in Appendix 8B-1. All macroflora, epifauna and fish taxa observed in quadrat surveys had been observed previously in Milne Inlet, had natural distributions that included the Canadian Arctic, and were not listed on any AIS Watch Lists or databases.

In addition to the macroflora and invertebrate taxa identified during quadrat surveys, a specimen was collected that was determined to be from phylum Bryophyta (Table 8-5). As bryophytes are generally terrestrial and freshwater, and Biologica specializes in marine species taxonomy, Biologica did not have the resources available to make an identification beyond the phylum level. While there are hundreds of potential species with ranges that include the eastern Canadian Arctic, the specimen was sent to Terry MacIntosh, a consulting bryophyte expert with the UBC Herbarium, Beaty Biodiversity Museum to resolve the identification further. Based on collection records from terrestrial locations within the region near Ragged Island and Milne Port, Bryophyta indet. was given a temporary Distribution Category rating of 1, pending independent review. Based on the lack of resolution on the specimen identification, the uncertainty was considered High.

No taxa from the Program Watch List were detected during permanent quadrat surveys and no taxa were flagged for review.

Table 8-5: List of Newly Recorded Taxa Identified during Quadrat Surveys at Milne Inlet in 2022, with Description of Distribution on Record

Phylum Class/Order	Family	Taxon	Description	Distribution References	Distribution Category(a)	Uncertainty(b)
Bryophyta						
-/-	-	Bryophyta indet.	Global phylum of mosses, records include specimens collected from the Eastern Canadian Arctic, including Baffin Island.	1	1 Within the Region	High

Notes: Taxa identified to the lowest practical taxonomic level; *indicates non-unique taxa; indet.= indeterminate (taxa which could not be identified beyond the taxonomic level listed); sp.=species.
[(a)] Distribution categories indicate the proximity to the Project of the closest georeferenced collection of the taxon, where category 1: Within the Region, 2: Surrounding Region, 3: Arctic, Outside Region, 4: Circumpolar/Circumboreal Distribution, 5: Wider Distribution. Distribution categories are defined in Section 8.3.2.1.1
[(b)] Uncertainty indicates confidence in the data available for the range on record. Uncertainty categories (Low, Moderate, and High) are described in Section 8.3.2.1.1
Taxa distribution references: 1: GBIF 2023.
All taxa cross-referenced with NIS/AIS resources: Fofonoff et al. 2023, ISSG 2023, Rius et al. 2023, Molnar et al. 2008, Casas-Monroy et al. 2014.

8.4.1.3 Settlement Substrates

A total of sixteen plates and seven baskets were recovered following one year of deployment and an additional fifteen plates and fourteen baskets were recovered following a two-year soak period. At stations where annual and multi-year substrates were recovered, multi-year substrates appeared to have greater recruitment and percent cover (Appendix 8C-2), and generally had higher taxonomic richness compared to annual plates based on qualitative observations (Figure 8-7).

A total of 158 taxa, including 110 unique taxa were identified on settlement substrates (Appendix 8C-1). Of these, only one invertebrate taxon was considered a “new record” (*Musculus glacialis*), meaning it was not found in previous surveys in Milne Inlet; the new record is presented in Table 8-6, along with a description of the distribution on record.

Musculus glacialis is a species of mussel with a broad distribution, largely restricted to the northern hemisphere. Collection records indicate that the species has a well-established circumpolar presence, including georeferenced specimens collected from the eastern Canadian Arctic, including Baffin Island. *M. glacialis*. was given a Distribution Category rating of 2, matching closest records in the surrounding region. Based on the well-established records of the species presence in the Canadian Arctic, the distribution record was considered to have low uncertainty.

Eighteen new records for algae, as well as one vascular plant taxon, were also identified on settlement substrates. Many of the new identifications were uncertain or inexact matches to described taxa (indicated by cf. in the taxonomic designation). Among the new observations, only four confident matches to species were made (*Pylaiella littoralis, Stictyosiphon tortilis, Battersia arctica,* and *Arcticophycus glacialis*). The new records are presented in Table 8-6, along with a description of the distribution on record. The majority of new observations had range records that included the Eastern Canadian Arctic, within the surrounding region of Milne Port.

Specimens identified as cf. *Punctaria latifolia* and cf. *Stictyosiphon soriferus* were flagged for further review due to no or limited records in the Canadian Arctic and it being listed as cryptogenic or introduced in Australia (Hewitt et al. 2004, AquaNIS 2023, WRIMS 2023).

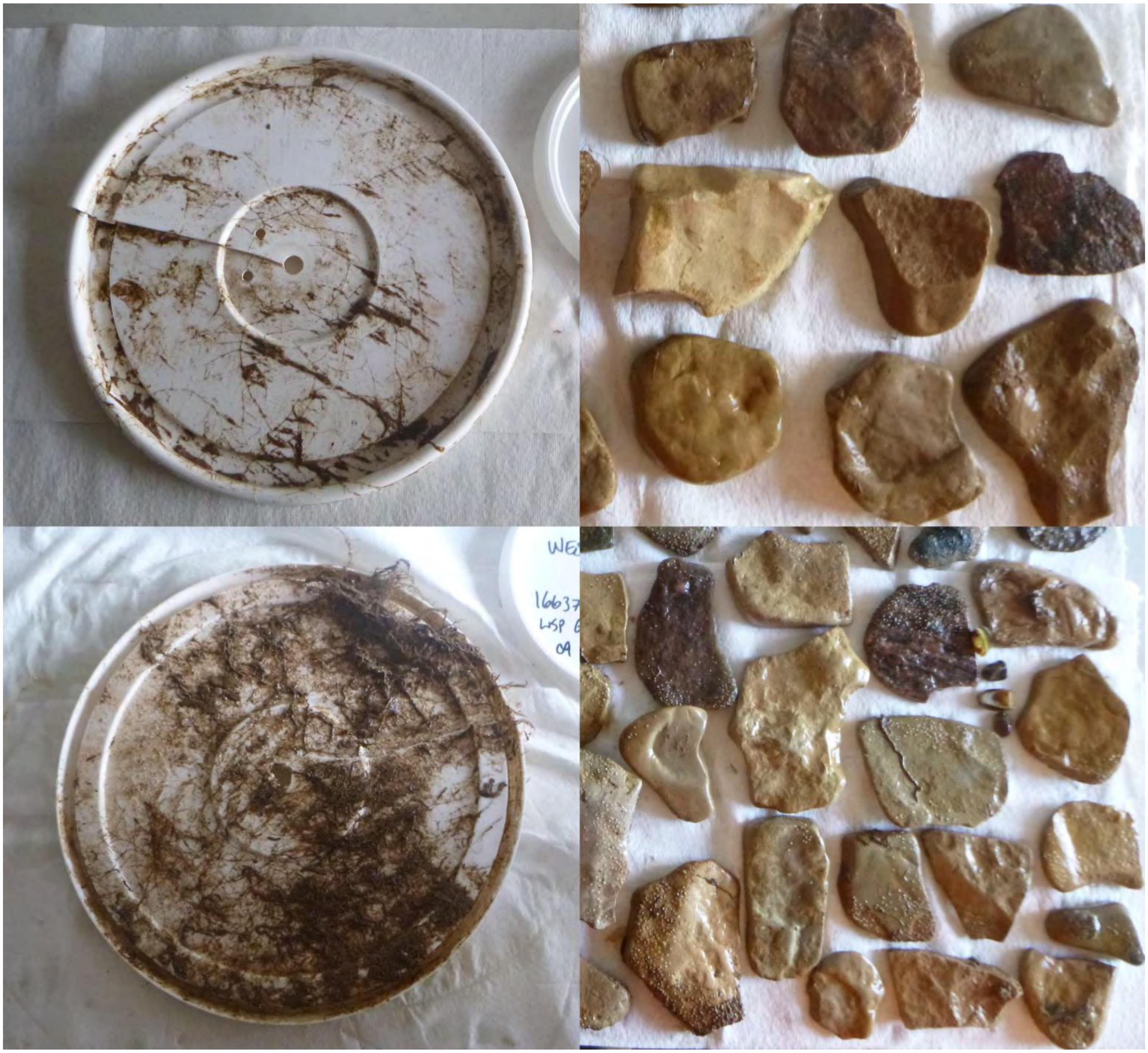


Figure 8-7: Example of differences in growth on settlement plates (left) and rocks from settlement baskets (right) collected from a single mid-depth station (Station West-M) located on the Freight Dock following one-year (top) and two-year (bottom) deployment times.

Table 8-6: List of Newly Recorded Taxa Identified on Settlement Substrates at Milne Inlet in 2022, with Description of Distribution on Record

Phylum Class/Order	Family	Taxon	Description	Distribution References	Distribution Category[(a)]	Uncertainty[(b)]
Mollusca						
Bivalvia/Mytilida	Mytilidae	*Musculus glacialis*	Broadly distributed species of mussel with a natural range that includes the Canadian Arctic and representative collections from Baffin Island.	1, 2, 3	2 Surrounding Region	Low
Chlorophyta						
Chlorophyceae/ Chlamydomonadales	Chlorochytriaceae	*Chlorochytrium* sp.	Despite few georeferenced species, occurrence records indicate there are multiple epiphytic species ubiquitous to the Canadian Arctic. Collection records include two species collected from Ragged Island before 2010.	2, 4, 5, 6, 7, 12	1 Within Region	Moderate
Ulvophyceae/ Acrosiphoniales	Acrosiphoniaceae	*Acrosiphonia* sp.	Patchy global distribution that includes Arctic region. Collection records indicate that at least one species occurs in the Eastern Canadian Arctic, including at Ragged Island before 2010.	2, 6, 7, 12, 13	1 Within Region	Moderate
Ulvophyceae/ Ulotrichales	Monostromataceae	*Monostroma* sp.	Broad global distribution, including two species recorded in the Eastern Canadian Arctic, including Baffin and Ellesmere Islands.	1, 2, 6, 12	2 Surrounding Region	Moderate
Ulvophyceae/ Ulvales	Kornmanniaceae	*Blidingia* cf. *marginata* cf. *Blidingia marginata*	Described as a North Atlantic and Greenland Sea species, records include collections from South Baffin Island and Hudson Strait (Victoria Island). Recorded as Alien in Argentinian waters.	2, 6, 8, 12	2 Surrounding Region	Moderate

Phylum Class/Order	Family	Taxon	Description	Distribution References	Distribution Category[a]	Uncertainty[b]
Ulvophyceae/ Ulvales	Kornmanniaceae	cf. *Blidingia ramifera*	Uncertain taxonomic designation for alternative species name *B. minima* var. *ramifera*. Records for both designations indicate a potentially broad Eastern Canadian Arctic and Atlantic range.	4, 6, 12	2 Surrounding Region	High
Ulvophyceae/ Ulvales	Kornmanniaceae	*Blidingia* sp.*	Genus with at least two species known to occur in the Eastern Canadian Arctic, including records from Ragged Island before 2010.	2, 4, 5, 6, 7, 12, 13	1 Within Region	Moderate
Ulvophyceae/ Ulvales	Ulvellaceae	cf. *Ulvella* sp.	Poorly described range on record, with patchy global distribution. Records place at least three species in the North American Arctic, including one species recorded in the Canadian Arctic Archipelago.	2, 4, 9	2 Surrounding Region	High
Ochrophyta						
Phaeophyceae/ Chordales	Chordaceae	cf. *Chorda filum*	Circumboreal species with collection records from the Canadian Arctic, including at Ragged Island before 2010 and Pond Inlet. Described as Alien to Mediterranean and Marmara seas.	1, 2, 6, 7, 8, 10, 12, 13	1 Within Region	Moderate
Phaeophyceae/ Ectocarpales	Acinetosporaceae	cf. *Hincksia* sp.	Broadly distributed, with range records from the Eastern Canadian Arctic, including at Ragged Island before 2010. Multiple species described as Alien in Australia.	4, 6, 7, 8, 10	1 Within Region	Moderate

Phylum Class/Order	Family	Taxon	Description	Distribution References	Distribution Category[a]	Uncertainty[b]
Phaeophyceae/ Ectocarpales	Acinetosporaceae	cf. *Pogotrichum filiforme*	Poorly described range on record largely limited to North Atlantic and Greenland Sea. However, there are records of observations in the North American Arctic, including Alaska (Boulder Patch) and Ellesmere-Baffin Region.	6, 11, 12	2 Surrounding Region	High
Phaeophyceae/ Ectocarpales	Acinetosporaceae	*Pylaiella littoralis*	Common summer annual algae taxon in the Canadian Arctic, documented range includes Ragged Island before 2010, and the Project area. Barcoding indicates that the Canadian populations may include multiple distinct genetic groups. Introduced to Australia and potentially other locations.	1, 2, 4, 5, 6, 7, 8, 9, 10, 13	1 Within Region	Low
Phaeophyceae/ Ectocarpales	Chordariaceae	cf. *Asperococcus fistulosus*[c]	Often synonymized with *Scytosiphon lomentara* f. *fistulosis* and other species. Due to confusion with multiple species, range on record is difficult to determine. Records for *A. fistulosus* include Ellesmere-Baffin Region.	1, 6, 11	2 Surrounding Region	High
		cf. *Scytosiphon lomentaria*[c]	Often synonymized with or misidentified as other species. Range on record accepted to include the Eastern Canadian Arctic, with records from Ragged Island before 2010. Introduced to Australia.	1, 6, 7, 9, 10, 12, 13	1 Within Region	Moderate

Phylum Class/Order	Family	Taxon	Description	Distribution References	Distribution Category[(a)]	Uncertainty[(b)]
Phaeophyceae/ Ectocarpales	Chordariaceae	cf. *Delamarea attenuata*	Poorly described taxon, however range on record includes Western Greenland and the North Atlantic. Collection records include observations at Ragged Island before 2010.	2, 7	1 Within Region	Moderate
Phaeophyceae/ Ectocarpales	Chordariaceae	cf. *Punctaria latifolia*	Broadly distributed species, however Arctic range only described for European Arctic (Greenland Sea). Possibly cryptogenic to Australia	1, 2, 10, 16	4 Circumpolar/ Circumboreal	Moderate
Phaeophyceae/ Ectocarpales	Chordariaceae	cf. *Punctaria* sp.*	Genus contains multiple species with natural ranges that include the Canadian Arctic, including collections at Ragged Island. DNA barcoding indicates potentially undescribed species present in the Canadian Arctic	1, 2, 6, 7, 9, 12, 13	1 Within Region	Moderate
Phaeophyceae/ Ectocarpales	Chordariaceae	*Stictyosiphon tortilis* cf. *Stictyosiphon tortilis* cf. *Stictyosiphon* cf. *tortilis*	Arctic species with a well documented presence in the Eastern Canadian Arctic, including Ragged Island before 2010.	1, 2, 4, 5, 6, 7, 9, 11, 12, 13	1 Within Region	Low
Phaeophyceae/ Ectocarpales	Chordariaceae	cf. *Stictyosiphon soriferus*	Broad range that includes the Greenland Sea, North Atlantic, and the Mediterranean Seas. Single record in Churchill.	1, 2, 13	3 Arctic, Outside Region	High
Phaeophyceae/ Ectocarpales	Chordariaceae	*Stictyosiphon* sp.* cf. *Stictyosiphon* sp.	Genus that contains at least one Arctic species with a well documented presence in the Eastern Canadian Arctic, including Ragged Island before 2010.	1, 2, 4, 5, 6, 7, 9, 11, 12, 13	1 Within Region	Moderate

Phylum Class/Order	Family	Taxon	Description	Distribution References	Distribution Category[(a)]	Uncertainty[(b)]
Phaeophyceae/ Sphacelariales	Sphacelariaceae	*Battersia arctica* cf. *Battersia arctica*	Species with a well-documented presence in the Canadian Arctic. Records include observations in Ellesmere-Baffin region and Ragged Island before 2010.	1, 2, 4, 7, 9	1 Within Region	Low
Phaeophyceae/ Stschapoviales	Platysiphonaceae	*Arcticophycus glacialis* cf. *Arcticophycus glacialis*	Relatively newly described species and genus. Species described from specimen collections from Ragged Island before 2010..	14	1 Within Region	Moderate
Phaeophyceae/ Tilopteridales	Tilopteridaceae	cf. *Haplospora globosa*	Wide Arctic distribution, including Eurasian Arctic, Alaska, and Ellesmere-Baffin Region. Presence in Churchill confirmed through DNA barcoding.	1, 2, 6, 12, 13	2 Surrounding Region	Moderate
Rhodophyta						
Compsopogonophyceae/ Erythropeltales	Erythrotrichiaceae	cf. *Erythrotrichia* sp.	Patchy global distribution, with at least one species recorded in the Canadian Arctic, including Ellesmere-Baffin Region and James Bay. Multiple species potentially alien to Mediterranean and Australia.	6, 8, 10, 12	2 Surrounding Region	Moderate
Florideophyceae/ Acrochaetiales	Audouinellaceae	Audouinellaceae indet.	Only one described genus (*Audouinella*) in the family, with multiple taxonomic revisions. Multiple species recorded in the Canadian Arctic, including records from Pond Inlet.	12, 15	2 Surrounding Region	High
Florideophyceae/ Ceramiales	Ceramiaceae	Ceramioideae indet.[(d)]	Subfamily with multiple species with ranges in the Eastern Canadian Arctic (Ellesmere-Baffin Region), including records from Ragged Island before 2010.	6, 7, 9, 13, 15	1 Within Region	Moderate

Phylum Class/Order	Family	Taxon	Description	Distribution References	Distribution Category[a]	Uncertainty[b]
Florideophyceae/ Ceramiales	Rhodomelaceae	cf. *Polysiphonia* sp.	Species *Savoiea arctica* (synonymized to *Polysiphonia arctica*) previously observed in Milne Port surveys. Multiple records in the Eastern Canadian Arctic, including Ragged Island before 2010 (as *P. arctica*). Multiple species described as alien to Mediterranean.	2, 5, 6, 7, 8, 10, 12, 13, 14	1 Within Region	Moderate
Florideophyceae/ Ceramiales	Rhodomelaceae	cf. *Rhodomela confervoides*[e]	Well documented species in the Eastern Canadian Arctic, including observations at Ragged Island before 2010.	1, 2, 5, 6, 7, 12, 13	1 Within Region	Moderate
Florideophyceae/ Ceramiales	-	Ceramiales indet.* (cf. *Callithamnion / Pleonosporium*)[f]	Order containing multiple species with ranges that include the Canadian Arctic, including records from previous Milne Port surveys. *Callithamnion* species recorded in the Canadian Arctic under synonymized names. No records of *Pleonosporium* species.	2, 12	1 Within Region	High
Tracheophyta						
-/-	-	Tracheophyta indet.	Vascular plant phylum with representative species in all oceans.	1, 2	1 Within Region	High

Notes: Taxa identified to the lowest practical taxonomic level; *indicates non-unique taxa; indet.= indeterminate (taxa which could not be identified beyond the taxonomic level listed); sp.=species; cf.: "compare with", in taxonomy refers to a taxonomic designation that indicates an inexact match to the indicated taxon.
[a] Distribution categories indicate the proximity to the Project of the closest georeferenced collection of the taxon, where category 1: Within the Region, 2: Surrounding Region, 3: Arctic, Outside Region, 4: Circumpolar/Circumboreal Distribution, 5: Wider Distribution. Distribution categories are defined in Section 8.3.2.1.1
[b] Uncertainty indicates confidence in the data available for the range on record. Uncertainty categories (Low, Moderate, and High) are described in Section 8.3.2.1.1
[c] cf. *Asperococcus fistulosus* and *cf. Scytosiphon lomentaria* are alternative identifications for the same specimen and therefore are presented as a single new observation, while considered separately as part of the NIS/AIS monitoring program.
[d] Specimens were likely either *Scagelia pylaisaei* or *Scagelothamnion pusillum*, both of species have been recorded in the Eastern Canadian Arctic (Ellesmere-Baffin Region), *S. pylaisaei* recorded at Ragged Island
[e] Specimens were identified as cf. *Rhodomela* sp., which has been observed previously in Milne Port surveys, however the lab indicated that they were possibly *R. confervoides*. Therefore, the specimens were not considered a new observation for Milne Port surveys, but *R. confervoides* was considered as part of the NIS/AIS monitoring program.
[e] Specimens were identified as Ceramiales indet., which includes representative species observed previously in Milne Port surveys, however the lab indicated that the specimens had features similar to two genera (*Callithamnion* and *Pleonosporium*), both of which have not been observed previously. Therefore, the specimens were not considered a new observation for Milne Port surveys, but both genera were considered as part of the NIS/AIS monitoring program
Taxa distribution references: 1: WoRMS 2023, 2: GBIF 2023, 3: Miller et al. 2014, 4. Charette et al. 2020, 5. Ellis and Wilce 1961, 6. Mathieson et al. 2010, 7. Küpper et al. 2016, 8. Ruis et al. 2023, 9. Wilce and Dunton 2014, 10. AquaNIS 2023, 11. Algaebase 2023, 12. Lee 1980, 13, Saunders and McDevit 2013, 14. Wilce and Bradley 2019, 15. Brown et al. 2011, 16. Hewitt et al. 2004
All taxa cross-referenced with NIS/AIS resources: Fofonoff et al. 2023, ISSG 2023, Rius et al. 2023, AquaNIS 2023, Molnar et al. 2008, Casas-Monroy et al. 2014.

8.4.1.4 Zooplankton

Taxonomic data of zooplankton collected from twelve stations in Milne Port are presented in Appendix 8D-2. Zooplankton taxa presence/absence from 2014 to 2020 is presented below in Table 8-7, with a complete list provided in Appendix 8D-1.

A total of 49 zooplankton taxa were observed in 2022 samples, and all taxa had been detected previously in Project monitoring and were known to have natural ranges that include the Project area. Several taxa (Ascidiacea indet., Hyperiidea indet., Ophiuroidea indet., Scyphozoa indet., and *Mertensia ovum*) were observed for the first time in zooplankton samples in 2022, but these taxa, or representative lower taxonomic levels, have been observed previously in other survey methods in Milne Port. No taxa from the Program Watch List were detected and no taxa were flagged for review.

Table 8-7: Zooplankton Taxa Presence in Milne Inlet During NIS/AIS Monitoring in 2022 Compared to Previous Survey Years (2014-2020, 2022)

Taxa	2014	2015	2016	2017	2018	2019	2020	2022
Acartia hudsonica			X					X
Acartia longiremis	X	X	X	X		X	X	X
Aeginopsis laurentii				X	X	X		X
Aglantha digitale	X			X	X	X	X	X
Ammodytes sp.					X		X	X
Ascidiacea indet.*								X
Balanomorpha indet.*				X	X	X	X	X
Beroe sp.					X			X
Bivalvia indet.*	X	X	X	X	X	X	X	X
Bosminidae indet.**				X			X	X
Calanoida indet.*	X	X		X	X	X	X	X
Calanus finmarchicus	X	X	X	X	X	X	X	X
Calanus glacialis	X	X	X	X	X	X	X	X
Calanus hyperboreus	X	X	X	X	X	X	X	X
Calanus sp.*				X	X	X	X	X
Clione limacina	X	X		X	X	X	X	X
Copepoda indet.*	X	X	X		X	X	X	X
Crustacea indet.				X	X	X		X
Ctenophora indet.		X				X		X
Cyclopoida indet.*				X	X	X	X	X
*Cyclops scutifer***							X	X
Daphnia sp.***		X					X	X
Euphysa sp.		X			X	X		X
Gadidae indet.				X	X	X		X

Taxa	2014	2015	2016	2017	2018	2019	2020	2022
Gastropoda indet.*				X	X	X	X	X
Harpacticoida indet.*			X		X	X	X	X
Hyperiidae indet.*					X	X		X
Hyperiidea indet.*								X
Isopoda indet.*				X	X	X	X	X
Limacina helicina	X	X		X	X	X	X	X
Limacina sp.*	X		X	X			X	X
Limnocalanus macrurus							X	X
Lysianassoidea indet.					X			X
*Mertensia ovum**								X
Microcalanus sp.				X	X	X	X	X
Microsetella norvegica	X	X	X	X	X	X	X	X
Mysis sp.*					X		X	X
Oikopleura sp.*		X		X	X	X	X	X
Oithona sp.*	X	X	X	X	X	X	X	X
Onisimus sp.					X			X
Ophiuroidea indet.*								X
Pandeidae indet.*							X	X
Parasagitta elegans	X			X	X	X	X	X
Polychaeta indet.*	X	X	X	X	X	X	X	X
Pseudocalanus sp. *	X	X	X	X	X	X	X	X
Sabinea septemcarinata				X	X			X
Scyphozoa indet.*								X
Themisto libellula				X	X	X	X	X
Themisto sp.	X			X	X			X

Notes: Taxa in bold indicate the first observation of the taxa during MEEMP and NIS/AIS surveys. Taxa identified to the lowest practical taxonomic level; presence/absence for previous years taken from SEM 2015, 2016, 2017a, Golder 2018, Golder 2019a, Golder 2020a, Golder 2021a. *=Species or taxa from lower taxonomic levels identified in other survey years and/or in other survey methods; **=Freshwater taxon; ***= Incidental (benthic or terrestrial taxa or life stages); indet.= indeterminate (taxa could not be identified beyond the taxonomic level listed); sp.=species.

8.4.1.5 Fish and Incidentals

Throughout surveys at Milne Inlet, some species are targeted and caught intentionally (such as fish as part of fish health and population chapters; collected for and reported in Chapters 6.0 and 7.0) while others are collected or observed incidentally. In 2022 MEEMP surveys, 83 taxa were collected, captured, or observed incidentally and of these, seven taxa were newly recorded in MEEMP surveys (Table 8-8). The full list of incidental taxa is available in Appendix 8B-1; laboratory results are in Appendices 8B-2, 8B-3, and 8B-4.

All taxa observed or caught incidentally in MEEMP and NIS/AIS surveys were cross-checked against a global database of marine invasive species and none of the taxa were identified as a globally-recognized invasive species (Molnar et al. 2008) or an invasive species in Canada according to the National Risk Assessment for Introduction of Aquatic Nonindigenous Species to Canada by Ballast Water (Casas-Monroy et al. 2014). In addition to these databases, each taxon was researched independently in the literature for their known habitats and distributions for signs of taxa that may be considered non-native to the Arctic region. For taxa that were not identified to the species level, it was confirmed that the identified higher-level taxa had at least one representative species with a distribution that included Arctic waters.

No taxa from the Program Watch List were identified and no taxa were flagged for review. The majority of distribution category assignments ranged from category 1 to category 2 with low to moderate uncertainty. One exception was *Gymnelus hemifasciatus*, which had a distribution category of 3 due to a lack of records in the Eastern Canadian Arctic, however, there are indications that physical similarities with other *Gymnelus* species may have confused the range on record (Coad and Reist 2018). Additionally, there are no barriers interrupting habitat connectivity between the range on record and the Eastern Canadian Arctic, such that it is considered likely that the native range includes the Project area (Fishbase 2023).

Table 8-8: Newly Recorded Fish and Incidental Taxa Identified in Milne Inlet in 2022

Phylum Class/Order	Family	Taxa	Capture Method	Description	Distribution Reference	Distribution Category[(a)]	Uncertainty[(b)]
Arthropoda							
Thecostraca / Balanomorpha	Balanidae	*Balanus crenatus*	Incidentals (Trawl)	Wrinkled barnacle, broadly distributed with collections in the Canadian Arctic, including Baffin Island.	1,2,5,6,7,11	2	Low
Chordata							
Actinopterygii / Perciformes	Zoarcidae	*Gymnelus hemifasciatus*	Fish Catch (Fukui Trap)	Halfbarred Pout has a circumpolar distribution with records in the Canadian Arctic.	1,2	3	Moderate
Actinopterygii / Scorpaeniformes	Cottidae	*Icelus spatula*	Fish Catch (Trawl)	Spatulate Sculpin, broad Arctic distribution with well-established presence in the Eastern Canadian Arctic.	1,2,3,4	2	Low
Ascidiacea / Stolidobranchia	Pyuridae	*Halocynthia pyriformis*	Incidentals (Trawl)	Atlantic Arctic / North Atlantic species of tunicate. Records include specimens collected at Baffin Island.	1,2,3,7	2	Low
Cnidaria							
Anthozoa / Actiniaria	Actinostolidae	*Stomphia* sp.	Incidentals (Trawl)	Anemone genus generally restricted to higher latitudes. Collection records include representative species from Baffin Island.	1,2,4	2	Moderate
Mollusca							
Gastropoda / Trochida	Margaritidae	*Margartites groenlandicus umbilicalis*	Incidentals (Trawl)	Subspecies of Margarite snail species previously recorded in Milne Port. Subspecies is specific to the Canadian Arctic with records from Koluktoo Bay.	1,2,3,5	1	Low
Platyhelminthes							
Cestoda/-	-	Cestoda indet.	Incidentals (Fish Stomachs)	Large class of parasitic tapeworms. Distributed globally, with representative collections in the Canadian Arctic, including Baffin Island.	1,2,9,10,11	2	Moderate

Notes: Taxa identified to the lowest practical taxonomic level; indet.= indeterminate (taxa could not be identified beyond the taxonomic level listed); sp.=species; cf.=compare with (taxa is an inexact match to the designated taxa).
[(a)] Distribution categories indicate the proximity to the Project of the closest georeferenced collection of the taxon, where category 1: Within the Region, 2: Surrounding Region, 3: Arctic, Outside Region, 4: Circumpolar/Circumboreal Distribution, 5: Wider Distribution. Distribution categories are defined in Section 8.3.2.1.1
[(b)] Uncertainty indicates confidence in the data available for the range on record. Uncertainty categories (Low, Moderate, and High) are described in Section 8.3.2.1.1
Taxa distribution references: 1: WoRMS 2023, 2: GBIF 2023, 3: Miller et al. 2014, 4: DFO 2019, 5: Goldsmit 2016, 6: OBIS 2011, 7: Cusson 2018, 8. Ellis and Wilce 1961, 9: Stewart 2013, 10: Stewart and Bernier 1999, 11: Chain et al. 2016.
All taxa cross-referenced with NIS/AIS resources: Fofonoff et al. 2023, ISSG 2023, Rius et al. 2023, CABI 2023, CAFF 2017, Molnar et al. 2008, Casas-Monroy et al. 2014.

8.4.2 Independent Verification and Identifications

A total of four taxa were flagged for further review by independent specialists (Table 8-9). This included *Hesperonoe* sp. and Buguloidea indet., collected from benthic infauna samples, Bryophyta indet., collected during quadrat sampling, as well as cf. *Punctaria latifolia,* collected on settlement subtrates. Reviewers for *Hesperonoe* sp. and cf. *Punctaria latifolia* are currently being identified. The bryophyte specimen has been sent to Dr. Terry MacIntosh, a consulting bryophyte expert with the UBC Herbarium, Beaty Biodiversity Museum. Buguloidea indet. specimens will be sent to Laval.

In addition to specimens from 2022, *Ampharete petersenae* and *Paramphitrite birulai* were collected in 2021, and following independent verification by Laval were sent for further review by Dr. Julio Parapar (Departamento de Bioloxía, Facultade de Ciencias at Universidade da Coruña), a specialist in terebellid polychaetes. As of April 14, results of independent verifications are pending for *Hesperonoe* sp., Bryophyta indet., Buguloidea indet., and cf. *Punctaria latifolia*.

Table 8-9: Record of Results of Independent Review of Taxa Collected in Milne Port 2021 and 2022

Biologica's Identification	Reviewer (Year)	Result of Verification	Description	Reference
Annelida				
Ampharete petersenae	Dr. Julio Parapar - Universidade da Coruña (2021)	*Ampharete petersenae*	Independent morphological assessment results indicated the specimens were morphologically similar to *A. petersenae* collected from Iceland, however features required for conclusive identification were missing or damaged. Based on the limited records indicating the natural range extends into Arctic, potentially including Western Greenland, the species was removed from the Watch List in 2021	3,4
Paramphitrite birulai	Dr. Julio Parapar - Universidade da Coruña (2021)	*Paramphitrite birulai*	Independent morphological assessment indicated that the specimens match the description for *P. birulai*. Taxon remains on the Watch List with a risk status of "Low" due to records of potential introductions in the Adriatic Sea. The designated risk status may be updated based on the results of review. New research suggests that the taxonomic record is incomplete and the records may represent more than one species.	3,5,6, 7
Hesperonoe sp.	TBD (2022)	TBD	TBD	TBD
Bryophyta				
Bryophyta indet.	Dr. Terry MacIntosh – UBC Herbarium, Beaty Biodiversity Museum (2022)	TBD	TBD	TBD
Bryozoa				
Buguloidea indet.	Benthic Ecology Lab at Université Laval (2022)	TBD	TBD	TBD

Biologica's Identification	Reviewer (Year)	Result of Verification	Description	Reference
Ochrophyta				
cf. *Punctaria latifolia*	TBD (2022)	TBD	TBD	TBD
cf. *Stictyosiphon soriferus*	TBD (2022)	TBD	TBD	TBD

Taxa distribution references: 1: WoRMS 2023, 2: GBIF 2023, 3: Parapar 2023, pers. comm, 4. Parapar et al. 2012, 5. Parapar et al. 1991, 6. Loia et al. 2017, 7. LaVesque et al. 2021.

8.5 Discussion

8.5.1 Limitations

It is important to note that it is not always possible to identify specimens to the species level due to a variety of limitations. Species descriptions are often based on adult samples, and immature specimens may lack the features present in the adult that are required for specific identification (Steinerstauch 2019, pers. comm.). Fragmented samples, or samples damaged during collection, may also be missing identifying features that would be used to determine species. Incomplete species records and descriptions also lead to limitations in species identification (Steinerstauch 2019, pers. comm.). Where taxa were not identifiable to the species level, it was confirmed that the higher taxonomic designation included at least one species with a probable native range that included the Project area.

Identification resolution may be dependent also on the number of individual specimens of the same type that are collected. This is for two general reasons: first, higher incidence of a type of specimen often translates to a higher incidence of specimens with diagnostic characters, and thus higher identification resolution; and second, the increase in incidence of identifiable taxa allows for more distinctions to be made about like and unlike taxa. For example, with bryozoans, a single incidence of a small colony or fragment observed in a sample is less likely to be identified to genus than it would be in a sample with a high incidence, in which opportunities to compare and contrast morphologies are greater (T. Macdonald 2022, pers. comm.)

Ranges on record are not complete for all taxa; recently described or uncommon taxa may have a limited range description based on where specimens have been found, with a broader range inferred based on biological characteristics and tolerances. However, with some taxa it can be difficult to determine if a species is originally from the area in which it is found, or if it was introduced from another location. In cases where the original native range cannot be conclusively determined, a species is considered cryptogenic.

Flora and fauna of the Canadian Arctic are not thoroughly described and surveys of species in the Canadian Arctic are severely lacking relative to surveys in other Arctic and sub-Arctic regions, particularly in comparison to surveys in Northern Europe. Surveys in the Canadian Arctic are also frequently limited by methodology, focusing on methods such as benthic grabs and zooplankton tows that exclude larger hard substrates. Encrusting taxa such as bryozoans and some tunicate species may be underrepresented in the datasets. This lowers the confidence in the ranges on record, particularly for less common or recently described species that may be cryptogenic to a broader area, but due to their rarity and the relative survey effort, have not yet been described outside the range on record.

Difficulties in determining the historic range of a species may also be related to changes or inconsistencies in a species description. The range on record may be linked to a previous name or description and databases are not always updated as new descriptions are accepted. Alternatively, multiple conflicting descriptions or names for the same taxa may further confound records. New species descriptions occur when an update to the taxonomic record is accepted. This may be due to a variety of reasons including acceptance of a more senior description, DNA analysis combining (two species merging under one species name) or separating species descriptions (one species being divided into two distinct species or subspecies), or reclassification due to the identification of features that match a different taxonomic group (such as reclassification to a new genus or being considered a subspecies). These limitations may be more pronounced in certain taxonomic groups such as bryozoans and marine algae (i.e., macroflora) where there are fewer experts focused on refining the taxonomy or more variation in reporting relative to other more well-defined groups.

The accurate identification of macroalgae by genetic means requires reliable, accurate reference sequences in an accessible database. Currently, there are some barriers slowing the process of populating reference databases such as the Barcode of Life Database (BOLD). First, obtaining quality DNA sequences reliably can be difficult. Macroalgae are a diverse taxonomic group, and many taxa require specialized extraction protocols and primer design. Thus, an industrial-scale approach to DNA sequencing (e.g., DNA barcoding as per the Canadian Centre for DNA Barcoding) may not always be successful. The second barrier to progress is that once the sequences are obtained, like with any other taxonomic group, the rigour of the original identification for reference specimens must be considered, as can often be misleading due to the limitations of morphological identifications, as discussed earlier. Therefore, improvement is an iterative process, with understanding of algal molecular and morphological diversity developing hand in hand (MacDonald 2022, Pers. Comm.).

Availability of publications may further impact descriptions, more recently published works may not be readily available or accepted by the larger taxonomic community, and updates may not be reflected in the identification keys used by the taxonomy labs.

8.5.2 Taxonomic Identification

8.5.2.1 Benthic Infauna

Benthic infauna community analysis is performed every three years, with 2022 constituting a year of lower collection levels. The full program is scheduled to occur in 2023. Nonetheless, a subset of benthic infauna stations was sampled in support of NIS/AIS monitoring in 2022, focusing on stations surrounding Project infrastructure or where flagged taxa had previously been detected. A total of 244 taxa were identified in 16 benthic samples in Milne Inlet, including one taxon which had not previously been recorded in the Project area. An analysis of the available literature indicated the new record had a clearly described range and collection records that included Arctic waters.

Results for the taxa sent for independent verification are discussed in Section 8.5.3.

- Arctic records of *Myrianida* are largely not identified to species, however, collections indicate that the genus has a circumpolar presence. This includes *M. prolifera*, the only taxon identified to the species level in the Canadian Arctic, recorded in Churchill, Ungava Bay, and Iqaluit (Miller et al. 2014, Goldsmit 2016, Gagnon and Torgersen 2021). While *Myrianida* includes one species recorded as NIS, the invasion history indicates the species is limited to warmer waters and would not represent an invasion risk at Milne Port.
  - ***Myrianida* sp. is not considered a taxon of concern in Milne Port.**

8.5.2.2 Macroflora and Benthic Epifauna

Dive surveys of the permanent quadrats were performed to assess for presence of macroflora and epifauna species. Dive surveys included collection of algae and invertebrate specimens for taxonomic assessment. 40 distinct macroflora and epifauna taxa were recorded during quadrat surveys in Milne Inlet in 2022, all of which had been previously identified in Milne Port surveys.

In addition to the macroflora and invertebrate taxa, a bryophyte specimen was collected from quadrats located at the mouth of Phillips Creek. Bryophytes are generally terrestrial and freshwater limited, and the taxonomic lab lacked the resources to make a confident identification of species. The bryophyte specimens will be sent for independent review by a specialist. Results of the independent review will be discussed in Section 8.5.3 when they become available.

8.5.2.3 Settlement Substrates

Previous experience with settlement substrates in Milne Port indicated that deployment time is a large factor in the ability to detect organisms (SEM 2016a, 2016b; Golder 2018, 2019b, 2020b). Most years were unsuccessful in identifying organisms when deployed for a single year. The program was adjusted to focus on longer term deployments, with plates and baskets soaking for three years prior to recovery. Due to the start time of the program, plates and baskets collected in 2022 had only been soaking for a maximum of two years. Sampling in 2023 will represent the first year of the planned three-year soak time. Additional plates and baskets are collected annually to aid in early detection of recruitment of NIS/AIS in Milne Port.

A total of sixteen plates and seven baskets were recovered following one year of deployment and an additional fifteen plates and fourteen baskets were recovered following a two-year soak period. Generally, multi-year substrates had greater recruitment, percent cover, and taxonomic richness compared to annual substrates. A total of 158 taxa were identified on settlement substrates, 27 of which were new observations in Milne Port surveys. An analysis of the available literature indicated the new record had a clearly described range and collection records that included Arctic waters.

- *Musculus glacialis* is a species of mussel with a broad distribution, largely restricted to the northern hemisphere. Collection records indicate that the species has a well-established circumpolar presence, including georeferenced specimens collected from the eastern Canadian Arctic, including Baffin Island (WoRMS 2023, GBIF 2023, Miller et al. 2014).
  - ***Musculus glacialis* is not considered a taxon of concern for Milne Port**
- *Chlorochytrium* is a genus of green algae with a poor record of distribution. Only five specimens have been georeferenced globally from the four representative species. As an epiphytic genus, *Chlorochytrium* species are underrepresented in algal collections. However, observational records indicate there are multiple species with ranges that include the Eastern Canadian Arctic, including *C. dermatocolax*, described as a ubiquitous taxon in the Eastern Canadian Arctic (Mathieson et al. 2010). Two species have been recorded near the Project area at Cape Hatt, Ragged Island (*C. dermatocolax* and *C. schmitzii*; Küpper et al. 2016). No records of potential NIS species in the genus *Chlorochytrium* occur in comparable environments to Milne Port.
  - ***Chlorochytrium* sp. is not considered a taxon of concern for Milne Port**

- *Acrosiphonia* is a genus of green algae with a broad record of distribution. Arctic records include species in the Eurasian Arctic, Western Greenland, and the Eastern Canadian Arctic (GBIF 2023). Two species are recorded within the Eastern Canadian Arctic (*A. arcta* and *hystrix*; Mathieson et al. 2010, Küpper et al. 2016), including collections from Ragged Island. However, DNA barcoding of specimens collected in Churchill indicate that the taxonomic record for the Canadian Arctic is incomplete and there are at least four distinct species present in the area (Saunders and McDevit 2013). No records of potential NIS species in the genus *Acrosiphonia* occur in comparable environments to Milne Port.
  - ***Acrosiphonia* sp. is not considered a taxon of concern for Milne Port**
- *Monostroma* is a genus of green algae with a broad record of distribution. Arctic records include species in the Eastern Canadian Arctic, including South Baffin Island and the general Ellesmere-Baffin Region (WoRMS 2023, GBIF 2023, Mathieson et al. 2010). No accepted species are listed on any AIS databases, however, *M. obscurum*, an unaccepted name for *Ulvaria obscura* is listed on an AIS database as alien to European and Mediterranean waters (WRIMS 2023). No records of potential NIS species in the genus *Monostroma* occur in comparable environments to Milne Port.
  - ***Monostroma* sp. is not considered a taxon of concern for Milne Port**
- Specimens tentatively classified as *Blidingia* cf. *marginata* and cf. *Blidingia marginata* were identified on settlement substrates. *Blidingia marginata* is a species of green algae formerly identified as *Enteromorpha marginata* with a well documented distribution in the North Atlantic and Greenland Sea (WoRMS 2023, GBIF 2023). Arctic records include observations in the Eastern Canadian Arctic, including South Baffin Island and Victoria Island (Mathieson et al. 2010). *B. marginata* is listed on an AIS database as alien to Argentina (WRIMS 2023). No records of potential NIS occurrence for this species occur in comparable environments to Milne Port.
  - ***Blidingia* cf. *marginata*/cf. *Blidingia marginata* is not considered a taxon of concern for Milne Port**
- Specimens tentatively classified as cf. *Blidingia ramifera* were identified on settlement substrates. *Blidingia ramifera* is a species of green algae also identified as *Blidingia minima* var. *ramifera*, with a poor range on record (WoRMS 2023, GBIF 2023). Canadian Arctic records include observations in the Ellesmere-Baffin Region (Mathieson et al. 2010, Charette et al. 2020, Lee 1980). There are no records of this species in available NIS/AIS databases.
  - **cf. *Blidingia ramifera* is not considered a taxon of concern for Milne Port**
- *Blidingia* is a genus of green algae with a range that includes the North Atlantic and Greenland Sea. In addition to the two species discussed above, the genus also contains *B. minima*, identified in the Eastern Canadian Arctic, including at Ragged Island (Küpper et al. 2016). DNA barcoding of specimens collected in Churchill indicate the genus requires further taxonomic review (Saunders and McDevit 2013). No records of potential NIS occurrence for this genus occur in comparable environments to Milne Port.
  - ***Blidingia* sp. is not considered a taxon of concern for Milne Port**
- Specimens tentatively classified as cf. *Ulvella* sp were identified on settlement substrates. *Ulvella* is a genus of green algae with a global distribution (WoRMS 2023, GBIF 2023). Arctic records include observations in Alaska (multiple species in the Boulder Patch; Wilce and Dunton 2014), as well as the Canadian Arctic Archipelago (Wilkins and Kellet straits; Charette et al. 2020). *U. leptochaete* and *U. viridis* are listed on an AIS

database as of uncertain origin in the Mediterranean Sea (WRIMS 2023). No records of potential NIS occurrence for this genus occur in comparable environments to Milne Port.

  - **cf. *Ulvella* sp. is not considered a taxon of concern for Milne Port**

- Specimens tentatively classified as cf. *Chorda filum* were identified on settlement substrates. *Chorda filum* is a species of brown algae with a circumboreal distribution (WoRMS 2023, GBIF 2023). Arctic records include observations in Churchill, James Bay and Hudson Strait (Lee 1980, Saunders and McDevit 2013, Mathieson et al. 2010), as well as closer to the Project area (Ragged Island and Pond Inlet; GBIF 2023, Küpper et al. 2016). *C. filum* is listed on an AIS databases as alien to the Mediterranean Sea, Marmara Sea, and to European waters (WRIMS 2023, AquaNIS 2023). No records of potential NIS occurrence for this species occur in comparable environments to Milne Port.

  - **cf. *Chorda filum* is not considered a taxon of concern for Milne Port**

- Specimens tentatively classified as cf. *Hincksia* sp. were identified on settlement substrates. *Hincksia* is a genus of brown algae with a broad global distribution (WoRMS 2023, GBIF 2023). Arctic records include observations in Wilkins Strait and the Ellesmere-Baffin Region (Charette et al. 2020, Mathieson et al. 2010), as well as closer to the Project area (Ragged Island; Küpper et al. 2016). *Hincksia* includes several species documented as potentially non-indigenous or alien to Australia and the Mediterranean (WRIMS 2023, AquaNIS 2023). No records of potential NIS occurrence for this genus occur in comparable environments to Milne Port.

  - **cf. *Hincksia* sp. is not considered a taxon of concern for Milne Port**

- Specimens tentatively classified as cf. *Pogotrichum filiforme* were identified on settlement substrates. *Pogotrichum filiforme* is a species of brown algae with collections throughout the North Atlantic and Greenland Sea (WoRMS 2023, GBIF 2023). No georeferenced collections of this species exist in the Canadian Arctic, however, the range description includes the Canadian Arctic under synonymised names (AlgaeBase 2023, Lee 1980). Eastern Canadian Arctic records include observations in the Ellesmere-Baffin Region (Mathieson et al. 2010). There are no records of this species in available NIS/AIS databases.

  - **cf. *Pogotrichum filiforme* is not considered a taxon of concern for Milne Port**

- *Pylaiella littoralis* is a species of epiphytic brown algae with a complicated taxonomic record, being synonymised with over 60 different species, subspecies, variants, and forms from six separate genera (WoRMS 2023). Due to the complicated taxonomic record, the documented range on record is somewhat uncertain, however there are multiple records of occurrence throughout the Canadian Arctic for this species designation, where it frequently described as a common or dominant taxon. Records include observations along the Arctic Archipelago, Ellesmere-Baffin Region, as well as observations at Ragged Island and Pond Inlet (Charette et al. 2020, Mathieson et al. 2010, Küpper et al. 2016). DNA barcoding of specimens collected at Ragged Island confirm the presence of this species near the project area (Küpper et al. 2016).

  - ***Pylaiella littoralis* is not considered a taxon of concern for Milne Port**

- A specimen of filamentous brown algae was tentatively identified as either cf. *Asperococcus fistulosus* or cf. *Scytosiphon lomentaria,* which are homotypic synonyms (separate accepted species names for specimens of the same description; AlgaeBase 2023). Due to the complicated taxonomic record, the documented ranges for both designations are somewhat uncertain. *Asperococcus fistulosus* is described as having a range that includes the North Atlantic and Greenland Sea (WoRMS 2023, GBIF 2023). *A. fistulosus* has also been identified in the Canadian Arctic in the Ellesmere-Baffin Region, as well as under the synonym *A. echinatus* (AlgaeBase 2023). *Scytosiphon lomentaria* has a broader range on record that includes the Canadian Arctic (WoRMS 2023, GBIF 2023). *S. lomentaria* has been identified in the Ellesmere-Baffin Region, including at Ragged Island (Mathieson et al. 2010, Küpper et al. 2016). DNA barcoding suggests that the genus *Scytosiphon* is in need of revision and that records of *S. lomentaria* in the Canadian Arctic may include misidentified *S. canaliculatus* (Saunders and McDevit 2013). *S. lomentaria* has been recorded as potentially introduced to Australia (AquaNIS 2023).

  - **cf. *Asperococcus fistulosus* and cf. *Scytosiphon lomentaria* are not considered taxa of concern for Milne Port**

- Specimens tentatively classified as cf. *Delamarea attenuata* were identified on settlement substrates. *Delamarea attenuata* is a species of brown algae with collections throughout the North Atlantic and Greenland Sea (WoRMS 2023, GBIF 2023). No georeferenced collections of this species exist in the Canadian Arctic, however, collections have been made along the western coast of Greenland (GBIF 2023). Eastern Canadian Arctic records include observations at Ragged Island (Küpper et al. 2016). There are no records of this species in available NIS/AIS databases.

  - **cf. *Delamarea attenuata* is not considered a taxon of concern for Milne Port**

- Specimens tentatively classified as cf. *Punctaria latifolia* were identified on settlement substrates. *Punctaria latifolia* is a species of brown algae with a broad range on record throughout the North Atlantic and Greenland Sea (WoRMS 2023, GBIF 2023, AlgaeBase 2023). No records of this species exist in the Canadian Arctic and it is present on at least one AIS database as cryptogenic in Australia. Therefore, this specimen has been flagged for further review as a precaution and will be sent for verification.

  - **cf. *Punctaria latifolia* is flagged for independent review (8.5.3.7).**

- Specimens tentatively classified as cf. *Punctaria* sp. were identified on settlement substrates. *Punctaria* is a genus of brown algae with a broad global range. The genus includes multiple species known to occur in the Canadian Arctic, including *P. glacialis* (see note under *Arcticophycus glacialis*), *P. plantaginea,* and *P. tenuissima. P. glacialis* and *P. tenuissima* have been identified at Ragged Island (Küpper et al. 2016). DNA barcoding of specimens collected in Churchill indicate the genus requires further taxonomic review (Saunders and McDevit 2013). No records of potential NIS occurrence for this genus occur in comparable environments to Milne Port.

  - **cf. *Punctaria* sp. is not considered a taxon of concern for Milne Port**

- Specimens of *Stictyosiphon tortilis,* in addition to specimens tentatively identified as cf. *Stictyosiphon tortilis* and cf. *Stictyosiphon* cf. *tortilis* were observed on settlement substrates. *S. tortilis* is a species of brown algae with well documented presence in the Canadian Arctic (GBIF 2023, WoRMS 2023). Records include observations along the Arctic Archipelago, Ellesmere-Baffin Region, as well as observations at Ragged Island (Charette et al. 2020, Mathieson et al. 2010, Küpper et al. 2016). There are no records of this species in available NIS/AIS databases.

  - ***Stictyosiphon tortilis* (cf. *Stictyosiphon tortilis* and cf. *Stictyosiphon* cf. *tortilis*) is not considered a taxon of concern for Milne Port**

- Specimens identified as cf. *Stictyosiphon soriferus* were observed on settlement substrates. *Stictyosiphon soriferus* is a species of brown algae with a broad range on record throughout the North Atlantic and Greenland Sea (WoRMS 2023, GBIF 2023, AlgaeBase 2023). No records exist for this species in the Eastern Canadian Arctic, aside from collections in Churchill, confirmed through DNA barcoding (Saunders and McDevit 2013). Recorded as introduced via hull fouling to Australia (Hewitt et al. 2004).
  - **cf. *Stictyosiphon soriferus* is flagged for independent review (8.5.3.8).**
- Specimens classified as *Stictyosiphon* sp. and cf. *Stictyosiphon* sp. were identified on settlement substrates. *Stictyosiphon* is a genus of brown algae with a broad global range. The genus includes multiple species known to occur in the Canadian Arctic, including *S. tortilis* (described above) and *S. arcticus* (WoRMS 2023, GBIF 2023, AlgaeBase 2023), including observations at Ragged Island (Küpper et al. 2016). No records of potential NIS occurrence for this genus occur in comparable environments to Milne Port.
  - ***Stictyosiphon* sp./cf. *Stictyosiphon* sp. is not considered a taxon of concern for Milne Port**
- Specimens of *Battersia arctica,* in addition to specimens tentatively identified as cf. *Battersia arctica* were observed on settlement substrates. *B. arctica* is a species of brown algae with well documented presence in the Canadian Arctic (GBIF 2023, WoRMS 2023). Records include observations along the Arctic Archipelago, as well as observations at Ragged Island (Charette et al. 2020, Küpper et al. 2016). There are no records of this species in available NIS/AIS databases.
  - ***Battersia arctica* (cf. *Battersia arctica*) is not considered a taxon of concern for Milne Port**
- Specimens of *Arcticophycus glacialis,* in addition to specimens tentatively identified as cf. *Arcticophycus glacialis* were observed on settlement substrates. *A. glacialis* is a recently re-described species of brown algae with well documented presence in the Canadian Arctic under homotypic synonyms (*Punctaria glacialis, Platysiphon glacialis,* and *Platyarcticus glacialis*; Küpper et al. 2016, AlgaeBase 2023). The specimens used to describe *A. glacialis* were collected from Ragged Island (Wilce and Bradley 2019). There are no records of this species in available NIS/AIS databases.
  - ***Arcticophycus glacialis* (cf. *Arcticophycus glacialis*) is not considered a taxon of concern for Milne Port**
- Specimens tentatively classified as cf. *Haplospora globosa* were identified on settlement substrates. *Haplospora globosa* is a species of brown algae with a patchy global distribution (WoRMS 2023, GBIF 2023). Records indicate there is at least one species that occurs in the Eastern Canadian Arctic, including observations in the Ellesmere-Baffin Region (Mathieson et al. 2010, Lee 1980). There are no records of this species in available NIS/AIS databases.
  - **cf. *Haplospora globosa* is not considered a taxon of concern for Milne Port**
- Specimens tentatively classified as cf. *Erythrotrichia* sp. were identified on settlement substrates. *Erythrotrichia* is a genus of red algae with a wide Arctic distribution (WoRMS 2023, GBIF 2023). Eastern Canadian Arctic records include one species (*E. carnea*) in the Ellesmere-Baffin Region, Eclipse Sound, and Churchill (Mathieson et al. 2010, Lee 1980, Saunders and McDevit 2013). NIS/AIS databases indicate multiple species potentially introduced to Australia and the Mediterranean (including *E. carnea*; AquaNIS 2023, Ruis et al. 2023).
  - **cf. *Erythrotrichia* is not considered a taxon of concern for Milne Port**

- Specimens keyed to the family Audouinellaceae were identified on settlement substrates. The specimens were similar to, but did not match descriptions for any species in the only described genus for this family (*Audouinella,* sometimes listed as part of the family Acrochaetiaceae; Lee 1980, AlgaeBase 2023). Multiple species of *Audouinella* have been identified in the Eastern Canadian Arctic (Brown et al. 2011, Lee 1980). There are no records of any members of the Audouinellaceae in available NIS/AIS databases.
  - **Audouinellaceae indet. is not considered a taxon of concern for Milne Port**
- Specimens keyed to the subfamily Ceramioideae were identified on settlement substrates. The specimens had features that indicated they might be either *Scagelia pylasaei* or *Scagelothamnion pusillum*. Both potential species have well documented presence in Arctic waters, including the Eastern Canadian Arctic (AlgaeBase 2023, Matheison et al. 2010, Lee 1980). *Scagelia pylasaei* has been recorded at Ragged Island (Küpper et al. 2016). There are records of Ceremioideae species in available NIS/AIS databases, however, none of the listed taxa include either *Scagelia* or *Scagelothamnion* species (Ruis et al. 2023).
  - **Ceramioideae indet. is not considered a taxon of concern for Milne Port**
- Specimens tentatively classified as cf. *Polysiphonia* sp. were identified on settlement substrates. Most Canadian Arctic records for this genus are of *P. arctica,* which is a homotypic synonym for *Savoiea arctica,* a taxon that has been observed in previous surveys in Milne Port (AlgaeBase 2023, Golder 2022). *Polysiphonia* species are generally described among ubiquitous taxa in the Eastern Canadian Arctic, with records of at least two distinct species in the Ellesmere-Baffin Region, including at Ragged Island (Mathieson et al. 2010, Küpper et al. 2016, Saunders and McDevit 2013). NIS/AIS databases indicate multiple species potentially introduced to temperate and sub-tropical waters, including *P. morrowii*, a Pacific species, listed on the National Risk Assessment as a potential taxon of concern in Arctic waters (AquaNIS 2023, Ruis et al. 2023, Casas-Monroy et al. 2014). No records of potential NIS occurrence for this genus occur in comparable environments to Milne Port.
  - **cf. *Polysiphona* sp. is not considered a taxon of concern for Milne Port**
- Specimens tentatively classified as cf. *Rhodomela* sp. were identified on settlement substrates. Unidentified *Rhodomela* specimens have been observed previously in Milne Port, however Biologica indicated that the specimens had features to suggest they may be *Rhodomela confervoides,* which, if confirmed would be a new observation. *R. confervoides* has a wide range that includes the Canadian Arctic (WoRMS 2023, GBIF 2023). Eastern Canadian Arctic records include the Ellesmere-Baffin Region, including observations at Ragged Island (Mathieson et al. 2010, Küpper et al. 2016, Ellis and Wilce 1961). There are no records of this species in available NIS/AIS databases.
  - **cf. *Rhodomela* sp. (*Rhodomela confervoides*) is not considered a taxon of concern for Milne Port**
- Specimens keyed to the order Ceramiales were identified on settlement substrates. Species of Ceramiales have been observed previously in Milne Port, however Biologica indicated the specimens had features similar to species in the genera *Callithamnion* or *Pleonosporium*, both which would be new observations for Milne Port surveys. While there are multiple occurrences of Ceramiales species in the Eastern Canadian Arctic, there are no Canadian Arctic records for *Pleonosporium*. Canadian Arctic records for *Callithamnion* are limited to observations under unaccepted synonyms from other genera (Lee 1980). As the specimens were not exact matches to either genera. There are records of Ceremiales species in available NIS/AIS databases,

including members of *Callithamnion*, however none of the listed taxa occur in comparable environments to Milne Port (Ruis et al. 2023).

- **Ceramiales indet. is not considered a taxon of concern for Milne Port**

- A single unidentified vascular plant (phylum Tracheophyta) was found on settlement substrates. Due to the high taxonomic level of the specimen identification, it is difficult to determine the risk status of the specimen, however, there are many freshwater and riparian vascular plant species with ranges that include the Project area and would have potential to be found in samples collected in the marine environment near freshwater inputs such as Phillips Creek (GBIF 2023).
  - **Tracheophyta indet. is not considered a taxon of concern for Milne Port**

8.5.2.4 Zooplankton

A total of 49 zooplankton taxa were observed in 2022 samples. All taxa had been observed in previous surveys in Milne Port and were known to have natural ranges that include the Project area. No taxa from the Program Watch List were detected and no taxa were flagged for review.

8.5.2.5 Fish and Incidentals

All taxa observed during marine surveys at Milne Port are considered under the NIS/AIS program. This includes non-targeted captures such as invertebrate species during fishing efforts. 83 taxa were collected, captured, or observed incidentally and of these, seven taxa were newly recorded in MEEMP surveys (i.e., not on the Milne Inlet Taxonomic Inventory), including duplicate observations through other methodologies. Notably, new observations included a parasitic worm taxon (Cestoda indet.), collected from the stomachs of three Arctic Char incidental mortalities.

All taxa observed incidentally in MEEMP and NIS/AIS surveys were cross-checked against marine invasive species databases. None of the taxa observed were identified as globally recognized invasive species (Molnar et al. 2008) or as domestically recognized invasive species according to the National Risk Assessment for Introduction of Aquatic Nonindigenous Species to Canada by Ballast Water (Casas-Monroy et al. 2014). In addition to these databases, the distribution and habitat preferences of each taxon was researched independently in the literature for signs of NIS status in the Arctic region. For specimens that could not be resolved to species, review efforts focused on confirming that the higher-level classification (e.g., genus) had at least one species with a distribution that included Arctic waters.

- *Balanus crenatus*, the wrinkled barnacle, has a broad distribution with collection records from the Canadian Arctic, including Baffin Island (GBIF 2023, WoRMS 2023, Chain et al. 2016).
  - ***Balanus crenatus* is not considered a taxon of concern for Milne Port**

- *Gymnelus hemifasciatus*, the Halfbarred Pout, is an Arctic fish species with a broad circumpolar distribution. Although records are largely confined to the Western Canadian Arctic, there are indications the range on record is incomplete and would likely include the Project area (GBIF 2023, WoRMS 2023, Coad and Reist 2018).

  - ***Gymnelus hemifasciatus* is not considered a taxon of concern for Milne Port**

- *Icelus spatula*, the Spatulate Sculpin, has a broad Arctic distribution with a well-established presence in the eastern Canadian Arctic, including Baffin Island (GBIF 2023, WoRMS 2023, Miller et al. 2014, DFO 2019).

  - ***Icelus spatula* is not considered a taxon of concern for Milne Port**

- *Halocynthia pyriformis* is a tunicate species with a well described range on record in the Atlantic region of the Arctic and the North Atlantic. Collection records include specimens from Baffin Island (GBIF 2023, WoRMS 2023, Miller et al. 2014, Cusson 2018).

  - ***Halocynthia pyriformis* is not considered a taxon of concern for Milne Port**

- *Stomphia* is a genus of anemones that are largely restricted to higher latitudes, including a well-established presence in the Canadian Arctic. Records include specimens collected from Baffin Island (GBIF 2023, WoRMS 2023, DFO 2019).

  - ***Stomphia* sp. is not considered a taxon of concern for Milne Port**

- *Margarites groenlandicus umbilicalis* is a subspecies of margarite snails that is found almost specifically in the Canadian Arctic. Previously *M. groenlandicus* have been identified in Milne Port surveys, and this identification may represent a clarification of the species. Collection records include specimens from Milne Inlet, collected in Koluktoo Bay (GBIF 2023, WoRMS 2023, Miller et al. 2014, Goldsmit 2016).

  - ***Margarites groenlandicus umbilicalis* is not considered a taxon of concern for Milne Port**

- Cestoda is a class of parasitic worms with a broad global distribution (WoRMS 2023, Stewart and Bernier 1999, Stewart 2013). At least 19 representative species are recorded in the eastern Canadian Arctic, and these include natural parasites of marine mammal and fish species (GBIF 2023).

  - **Cestoda indet. is not considered a taxon of concern for Milne Port**

8.5.3 Independent Verifications and Program Watch List

Results of independent verification through morphological assessment are pending and will be updated as reviews become available. Updated results will be presented in revisions to the 2023 report and, in the event that updated information alters the NIS/AIS status of a taxon found at Milne Port such that it could be added or removed from the Watch List or Trigger List, will be presented to MEWG.. The NIS/AIS program is conducted at a surveillance level and designed to flag potential invasive or non-indigenous species; the independent verification process is a crucial element of the program, ensuring third party review by global specialists in particular taxa. A summary of specimens flagged for review is provided in Table 8-10 and results of verifications will be updated as they become available. A summary of all newly recorded taxa in 2022 and their risk statuses is presented in Appendix 8E-1 and the record of verifications is available in Appendix 8E-2. A complete list of the Project Watch List for taxa of concern in Milne Port is included in Appendix 8E-3.

Table 8-10: Summary of External Taxa Verifications in 2022

Initial ID	Year(s) Present	Verification Method	Independent ID (Reviewer)	Risk[1]	Action	Rationale
Annelida						
Ampharete petersenae	2020 – 2021	Morphological assessment	*Ampharete petersenae* (Parapar)	No Risk	Removed from Watch List in 2021	Independent morphological assessment results Watch Listindicated the specimens were morphologically similar to *A. petersenae* collected from Iceland, however features required for conclusive identification were missing or damaged. Based on the limited records indicating the natural range extends into Arctic, potentially including Western Greenland, the species was designated "No Risk" and removed from the Watch List in 2021. Specimens were sent for verification as part of QA/QC procedures.
Paramphitrite birulai	2020 – 2021	Morphological assessment	*Paramphitrite birulai* (Parapar)	Low Risk	Watch List	Independent morphological assessment indicated that the specimens match the description for *P. birulai*. Taxon remains on the Watch List with a risk status of "Low" due to records of potential introductions in the Adriatic Sea. New research suggests that the taxonomic record is incomplete and the records may represent more than one species. The designated risk status may be updated based on further review.
Hesperonoe sp.	2020, 2022	Morphological assessment	TBD	Low Risk	Watch List	Unidentified species from the genus *Hesperonoe* were flagged in 2020 due to *Hesperonoe* being a poorly described genus with limited georeferenced collection records. Specimens were collected again in 2022 and sent for independent review. Currently the identification is considered unresolved and the taxon remains on the Watch List as Low Risk.
Bryophyta						
Bryophyta indet.	2022	Morphological assessment	TBD	No Risk	None	Global phylum of mosses, collection records include specimens from the Eastern Canadian Arctic, including Baffin Island in close proximity to Milne Port and at Ragged Island. Sent for independent review with a specialist at University of British Columbia to further resolve the identification.
Bryozoa						
Buguloidea indet.[2]	2017, 2018, 2021, 2022	Morphological assessment	TBD (Laval)	No Risk	None	Bryozoans of the superfamily Buguloidea include multiple species with natural ranges that include the Canadian Arctic and have previously been observed in Milne Port surveys. It is considered probable that the Buguloidea indet. specimens represent a Canadian Arctic species, however, the specimens were sent for independent review as a precaution.

Initial ID	Year(s) Present	Verification Method	Independent ID (Reviewer)	Risk[1]	Action	Rationale
Ochrophyta						
cf. *Punctaria latifolia*	2022	Morphological assessment	TBD	Low Risk	Watch List	Specimen was an inexact match to *Punctaria latifolia*, a filamentous brown alga that has no records of occurrence in the Canadian Arctic. Listed on an AIS database as cryptogenic in Australia. Currently the identification is considered unresolved, and the taxon has been precautionarily placed on the Watch List as Low Risk.
cf. *Stictyosiphon soriferus*	2022	Morphological assessment	TBD	Low Risk	Watch List	Specimen was an inexact match to *Stictyosiphon soriferus*, a brown alga that has a single record of occurrence in the Canadian Sub-Arctic (Churchill). Listed on an AIS database as Introduced in Australia. Currently the identification is considered unresolved, and the taxon has been precautionarily placed on the Watch List as Low Risk.

[1] Risk category refers to the taxonomic description following independent verification

[2] Previously identified to lower taxonomic levels (*Synnotum* sp. in 2017, *Scrupocelleria* sp. in 2018, *Tricelleria* sp. and Candidae indet. in 2021).

8.5.3.1 *Ampharete petersenae*

The terebellid polychaete worm, *Ampharete petersenae* is a relatively recently-described species. Specimens were first identified in Milne Port in 2020 and again in 2021. Due to a poor description of its range on record, specimens were sent for independent review. Laval University confirmed the identification of *A. petersenae* in 2020.

Further review of the records in 2021 found specimen collection records indicated the range may include the North Atlantic as well as Arctic waters around Iceland, where the species was first described (Jirkov 1997; WoRMS 2022; Parapar et al. 2012), as well as an anecdotal report indicating that this species may have been present in western Greenland (Parapar et al. 2012). It was considered unlikely that these specimens represented an introduction in Canadian Arctic waters. *A. petersenae* was designated No Risk and was removed from the program Watch List in 2021.

Watch ListPrior to being removed from the Watch List, two specimens were sent to Dr. Julio Parapar for verification. Dr. Parapar confirmed that the specimens were likely *A. petersenae*, closely matching specimens collected from Iceland, however a positive identification was not possible due to the specimens being incomplete (Parapar 2023, pers. comm.).

- ***A. petersenae* was designated as No Risk in 2021 and is not considered a species of concern in Milne Inlet.**

8.5.3.2 *Paramphitrite birulai*

The terebellid polychaete *Paramphitrite birulai* is poorly described with a limited taxonomic record. No range description exists for this species, but collection records indicate the range may be wide and include the European North Atlantic and high Arctic oceans (WoRMS 2022; Jirkov 2020). There are also potential indications of introductions in the Adriatic Sea, where it is described as non-indigenous, but not invasive (Rius et al. 2023, Loia 2017). Uncertainty in the range of this taxa is compounded by disagreement in the accepted name, with some sources indicating the species is *Amphitrite birulai*, which has a narrower range on record, with type localities in Scandinavian waters (WoRMS 2022). Collection records for this species in North America are limited to a single specimen collected off the coast of Labrador in 1987 (Gagnon and Torgersen 2021) and Yukon/Alaska under the junior synonym *P. tetrabranchiata* (GBIF 2022). There are also indications that the taxonomic record for *Paramphitrite* species is incomplete and requires further review (LaVesque et al. 2021).

The specimen was flagged for independent verification as a precaution due to uncertainty in the described range on record; however, the wide high-Arctic range derived from a few collection events indicates this is unlikely to be a species of concern. In 2020, Laval confirmed the identification under the alternative name *Amphitrite birulai*. *Amphitrite birulai* is considered Low Risk because, although it is not listed in AIS databases, it has potentially been flagged as alien in the Adriatic and does not have a documented distribution in the Canadian Arctic; therefore, it has been placed on the Watch List.

The specimens were subsequently forwarded to Dr. Julio Parapar, a specialist in terebellid polychaetes who originally described *P. tetrabranchiata,* for further review. The specimen closely matched the most recent descriptions for *P. birulai*, however, features required for positive identification were missing. Additionally, Dr. Parapar noted features on the third segment that are not described for any of the known species in this genus, highlighting the requirement for further review of *Paramphitrite*. *P. biruali* will remain on the Watch List pending further review of the genus.

- ***Paramphitrite/Amphitrite birulai* is designated Low Risk and will remain on the Watch List.**

8.5.3.3 *Hesperonoe* sp.

Unidentified species from the genus *Hesperonoe* were flagged in benthic infauna samples in 2020 due to a limited range on record. Generally, the genus is considered Arctic-Boreal; however, collections are limited to Arctic waters near Alaska and Russia (GBIF 2023, WoRMS 2023, Degan and Faultwetter 2021).

The specimen was sent for independent verification as a precaution due to uncertainty in the taxonomic record and Laval indicated that the specimens could instead be from the genus *Bylgides*, which had been observed previously in the Milne Port baseline and MEEMP surveys (WoRMS 2023, GBIF 2023, Golder 2020a). However, Biologica disagreed with the corrected identification, believing the specimens to have visible characteristics that differentiated them from the genus *Bylgides* and indicated *Hesperonoe* (MacDonald 2021, Pers. Comm.). The identification was considered unresolved.

No species of *Hesperonoe* are listed in AIS databases. However, *Hesperonoe* was placed on the Watch List as a Low Risk taxon due to uncertainties in the range on record and because it does not have a documented distribution in the Canadian Arctic.

Hesperonoe specimens were not identified in 2021 surveys, however, in 2022, specimens were once again found in benthic infauna samples. 2022 specimens will be sent for independent review with a specialist in the group. Results of independent review remain pending.

- ***Hesperonoe* sp. was designated Low Risk and was placed on the Watch List in 2020, the status remains unchanged.**

8.5.3.4 Bryophyta indet.

An unidentified bryophyte specimen was collected from quadrats located at the mouth of Phillips Creek. Bryophytes are generally terrestrial and freshwater limited, and the Biologica (marine taxonomic specialists) lacked the required resources to make a confident identification of species. The bryophyte specimens was set aside to be sent for independent review by a specialist. Results of the independent review remain pending.

There are hundreds of potential species of bryophyte with well-documented natural ranges that include the eastern Canadian Arctic, including records from terrestrial locations within the region near Ragged Island and Milne Port. Therefore, Bryophyta indet. is tentatively considered to not be a taxon of concern, pending independent review.

- **Bryophyta indet. is designated No Risk and is not considered a taxon of concern in Milne Port.**

8.5.3.5 Buguloidea indet.

An unidentified bryozoan species from the genus *Tricelleria* collected in 2021 was flagged for review due to the genus having representative species listed on databases as alien (Rius et al. 2023, Fofonoff et al. 2023, Molnar et al. 2008), including *T. inopinata*, listed on the National Risk Assessment as a potential invader to Canadian waters, including the Arctic region (Casas-Monroy et al. 2014). Independent review was unable to resolve the identification. The taxon was designated No Risk and not placed on the Watch List due to the presence of multiple species with natural ranges that include the Project area, however, as a precaution, the genus remained flagged for review.

In 2022, unidentified specimens from the superfamily Buguloidea were collected in benthic infauna samples. This superfamily includes multiple species with documented ranges that include the project area, however, it also contains the genus *Tricellaria*. Due to previous concerns, the specimens were flagged for independent review to determine if the identification could be clarified. Results of independent review remain pending.

Detecting invasive species of bryozoans, like any other faunal group, requires reliable and comprehensive information about species identities and ranges (T. Macdonald 2022, pers. comm.). This is particularly pronounced for bryozoan taxa in the Arctic, as the baseline communities have not been well-studied in the region. The majority of Canadian Arctic bryozoan community information heavily relies on a single survey performed by Powell (1968) for taxonomic and ecological information in which records representing 93 species were compiled from previous sampling missions that took place throughout Hudson Bay, the Labrador Sea, the Northwestern Passages, Queen Elizabeth Islands, and Beaufort Sea. A recent review of European Arctic bryozoan fauna (Denisenko, 2020) compiled 518 European records, which represented a 26.4% increase in registered taxa. Using rarefaction (as described by Clarke and Warwick, 1994), Denisenko demonstrated that bryozoan fauna are still underexplored, estimating species richness would increase by 10–30% with additional sampling effort, depending on the region, and that the Canadian Archipelago stood out as being particularly poorly studied. Additionally, this author indicated that bryozoans are possibly one of the most species-rich groups in the Arctic.

- **Based on the presence multiple Bugoloidea species in the Eastern Canadian Arctic and poor range descriptions for bryozoans in general, it is considered highly probable Buguloidea indet. would be one of the Canadian Arctic species rather than represent an NIS. Buguloidea indet. is designated No Risk and is not considered a taxon of concern in Milne Port**

8.5.3.6 *Marenzelleria* sp.

Two specimens of *Marenzelleria* sp. were identified in benthic samples in 2022. *Marenzelleria* is a spionid polychaete genus with a representative species (i.e., *M. viridis*) on the Watch List. *Marenzelleria* sp. were first recorded in Milne Port in 2016 but were not flagged for review until the tentative identification of *M. viridis* in 2018. Specimens from 2018 through 2021 were subsequently corrected to the Arctic species *M. wireni* and potentially *M. arctia* and *M. neglecta* by a specialist in the taxonomic group, with the identification of *M. wireni* further confirmed through DNA analysis. The correction was further supported by environmental conditions at Milne Port matching habitat preferences for *M. wireni, M. neglecta*, and *M. arctia.*

Biologica indicated that the specimens from 2022 closely matched the description for *M. wireni*, an Arctic species known to occur in Milne Port, however the features required to make a confident identification of species were damaged or missing. The identification was left at the genus level as a precaution. Due to the missing features, the specimens were not sent for independent review as it was unlikely to be further resolved.

Similar to 2021, benthic sampling in 2022 included targeted collections where *Marenzelleria* specimens were previously collected. Only two of the four targeted stations had *Marenzelleria* present, with no records at adjacent stations reinforcing the observation that invasive behaviour is not apparent in *Marenzelleria* in Milne Port. No meaningful change in abundance or distribution has been observed in Milne Port since the genus was first recorded in 2016.

Marenzelleria species are known successful invaders to European waters, mediated by ballast water, and thus this genus is listed in AIS databases. Accordingly, this genus is designated as High Risk. However, biogeographic evidence suggests multiple species are indigenous to the Canadian Arctic or may be cryptogenic, while ecological evidence indicates the genus is not showing invasive behaviour in Milne Port. Further, documented occurrences of the genus in waters around Baffin Island prior to the commencement of shipping operations confirm this is not a Project-related introduction (if it is to be considered an introduction at all). For these reasons, *Marenzelleria wireni* and *Marenzelleria arctia* are designated No Risk and will not be placed on the Program Watch List, however, other members of the genus *Marenzelleria*, and *M. viridis* in particular, will remain on the Watch List where it is subject to heightened monitoring efforts, as a precaution.

- ***Marenzelleria wireni* and *Marenzelleria arctia* are designated No Risk and are not considered taxa of concern in Milne Port.**

8.5.3.7 cf. *Punctaria latifolia*

In 2022, specimens tentatively classified as cf. *Punctaria latifolia* were identified on settlement substrates. While the specimens were an inexact match to the species, for the purposes of NIS/AIS monitoring, the specimens were considered as *Punctaria latifolia. P. latifolia* is a species of bladed brown algae with a broad global range that includes records from the North Atlantic and Greenland Sea (WoRMS 2023, GBIF 2023, AlgaeBase 2023). No records of this species exist in the Canadian Arctic, and it is present on at least one AIS database as cryptogenic in Australia. Due to the limitations in algal taxonomy and Canadian Arctic surveys described in Section 8.3.3.1.2, there is uncertainty in whether this species can be considered alien to the Canadian Arctic, however, the specimens were flagged for further review as a precaution.

As the specimens were similar, but not an exact match to *P. latifolia*, it may be that these specimens are of a morphologically related species that is not yet described. Notably, DNA barcoding of algae collected in Churchill identified the presence of a *Punctaria* species that was not able to be matched to any currently described species, resulting in the authors suggesting that it may be a new species (Saunders and McDevit 2013).

- ***Punctaria latifolia* is designated Low Risk and has been placed on the Watch List.**

8.5.3.8 cf. *Stictyosiphon soriferus*

In 2022, cf. *Stictyosiphon soriferus* was tentatively identified on the settlement substrates. While the specimens were an inexact match to the species, for the purposes of NIS/AIS monitoring, the specimens were considered as *Stictyosiphon soriferus*, a species of brown algae with a broad range on record throughout the North Atlantic and Greenland Sea (WoRMS 2023, GBIF 2023, AlgaeBase 2023). However, although there is a single record of occurrence record in the surrounding region (Churchill), no records exist for this species in the Eastern Canadian Arctic (Saunders and McDevit 2013). Additionally, this species has been recorded as introduced to Australia, likely through the vector of hull fouling (Hewitt et al. 2004).

As the specimens were similar, but not an exact match to *S. soriferus*, it may be that these specimens are of a morphologically related species that is not yet described. Due to the limitations in algal taxonomy and Canadian Arctic surveys described in Section 8.3.3.1.2, there is uncertainty in whether this species can be considered alien to the Canadian Arctic, however, the specimens were flagged for further review as a precaution.

- ***Stictyosiphon soriferus* is designated Low Risk and has been placed on the Watch List.**

8.6 Conclusions and Recommendations

The NIS/AIS program satisfies PC Nos. 87, 89, and 91. Detection is conducted at a surveillance level and designed to flag potential invasive or non-indigenous species introduced through Project-related vectors. Approximately 880 taxa (including 396 identifiable to species) have been observed in Milne Inlet through monitoring surveys to date. The vast majority of these taxa have been designated as “No Risk” and are not considered to be of concern. Taxonomic sampling at Milne Port remains one of the most comprehensive multi-trophic level species inventory programs in the Canadian Arctic, a region historically under-sampled in comparison to Eurasian Arctic and Sub-Arctic regions.

Directed literature review of flagged taxa in 2022 has resulted in two taxa being added to the Project Watch List for increased monitoring effort, such as review by specialists or DNA analysis. However, independent taxonomic verifications for 2022 specimens remain pending for some specimens.

The complete program Watch List is presented in Appendix 8E-3. As yet, there has not been confirmation of Project-related introduction of an NIS/AIS species documented at Milne Port and no species have been placed on the Trigger List to initiate rapid response. Based on the number of specimens flagged and sent for independent verification, monitoring is considered to be effective and is functioning as intended.

It is recommended that:

- **Sampling across multiple trophic levels continues in 2023;**
- **That the Milne Inlet Taxonomic Inventory continue to be expanded upon;**
- **And, that all flagged specimens continue to be screened for known geographic ranges and NIS/AIS status.**
- **It is further recommended that efforts are continued to collect and review genetic evidence for *Marenzelleria* sp. and *Monocorophium* sp., in addition to bryozoan taxa in general, including targeted sampling to obtain specimens for DNA barcoding to further resolve these taxonomic groups in Milne Port.**

8.7 Closure

We trust this information is sufficient for your needs at this time. Should you have any questions or concerns, please do not hesitate to contact Phil Rouget, on behalf of the undersigned, at +1 250 419 4945.

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https://golderassociates.sharepoint.com/sites/11206g/deliverables (do not use)/issued to client_for wp/400-499/1663724-430h-r-rev0-64000/1663724-430h-r-rev0-64000 2022 meemp_8.0 nis ais_28apr_23.docx

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APPENDIX 8A-1

Benthic Infauna Presence/Absence from Survey Years 2010-2022

Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2010	2013	2015	2016	2017	2018	2019	2020	2021	2022
Annelida	-	Clitellata	Hirudinea	-	-	-	Hirudinea indet.	-	-	-	-	-	-	Y	-	-	X
Annelida	-	Clitellata	Hirudinea	Rhynchobdellida	Piscicolidae	Platybdellinae	*Mysidobdella* sp.	-	-	-	-	X	-	-	X	-	-
Annelida	-	Clitellata	Oligochaeta	-	-	-	Oligochaete indet.	-	X	-	-	-	-	-	-	-	-
Annelida	-	Clitellata	Oligochaeta	Enchytraeida	Enchytraeidae	-	Enchytraeidae indet.	X	-	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	-	-	-	-	Polychaeta indet.	-	X	X	X	Y	-	-	-	-	-
Annelida	-	Polychaeta	-	Phyllodocida	Syllidae	Autolytinae	*Myrianida* sp.*	-	-	-	-	-	-	-	-	-	X
Annelida	-	Polychaeta	Echiura	Echiuroidea	Echiuridae	-	*Echiurus echiurus*	-	X	X	-	X	X	-	X	-	-
Annelida	-	Polychaeta	Errantia	-	-	-	Errantia indet.	-	-	-	-	Y	-	-	-	-	-
Annelida	-	Polychaeta	Errantia	Eunicida	Dorvilleidae	-	*Ophryotrocha* sp.	-	-	-	-	-	-	-	X	-	X
Annelida	-	Polychaeta	Errantia	Eunicida	Dorvilleidae	-	*Parougia caeca*	-	-	-	-	-	X	X	X	-	X
Annelida	-	Polychaeta	Errantia	Eunicida	Lumbrineridae	-	*Lumbrineris* sp.	X	X	X	X	-	X	-	-	-	-
Annelida	-	Polychaeta	Errantia	Eunicida	Lumbrineridae	-	Lumbrineridae indet.	-	-	-	-	-	-	Y	X	Y	X
Annelida	-	Polychaeta	Errantia	Eunicida	Lumbrineridae	-	*Lumbrineris fauchaldi*	-	-	-	-	-	-	-	-	X	-
Annelida	-	Polychaeta	Errantia	Eunicida	Lumbrineridae	-	*Scoletoma fragilis*	X	-	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Errantia	Eunicida	Lumbrineridae	-	*Scoletoma impatiens*	-	-	-	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Errantia	Eunicida	Lumbrineridae	-	*Scoletoma* sp.	-	-	-	-	-	X	Y	Y	Y	X
Annelida	-	Polychaeta	Errantia	Eunicida	Lumbrineridae	-	*Scoletoma tenuis*	-	X	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Errantia	Eunicida	Onuphidae	Hyalinoeciinae	*Nothria conchylega*	X	-	-	-	-	X	X	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Aphroditidae	-	Aphroditidae indet.	-	X	-	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Glyceridae	-	*Glycera capitata*	-	-	-	-	X	X	X	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Glyceridae	-	*Glycera* sp.	-	-	-	-	Y	X	Y	X	Y	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Hesionidae	-	Hesionidae indet.	-	-	-	-	Y	-	Y	-	Y	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Hesionidae	Ophiodrominae	*Gyptis* sp.	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Hesionidae	Psamathinae	*Nereimyra aphroditoides*	-	-	-	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Microphthalmidae	-	*Microphthalmus* sp.	-	-	-	-	-	X	-	X	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Nephtyidae	-	*Aglaophamus malmgreni*	-	-	-	-	-	-	X	X	-	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Nephtyidae	-	*Aglaophamus* sp.	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Nephtyidae	-	*Micronephthys cornuta*	-	-	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Nephtyidae	-	*Nephtys bucera*	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Nephtyidae	-	*Nephtys ciliata*	X	-	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Nephtyidae	-	*Nephtys paradoxa*	-	-	-	-	-	-	X	X	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Nephtyidae	-	*Nephtys* sp.	X	X	X	X	-	X	Y	Y	Y	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Nereididae	-	Nereididae indet.	X	-	-	-	Y	X	Y	X	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Nereididae	Nereidinae	*Nereis* sp.	-	-	-	X	Y	-	Y	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Nereididae	Nereidinae	*Nereis zonata*	-	X	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Pholoidae	-	*Pholoe longa*	X	X	-	-	-	-	X	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Pholoidae	-	*Pholoe minuta*	-	-	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Pholoidae	-	*Pholoe* sp.	X	X	X	X	Y	X	Y	Y	Y	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Pholoidae	-	*Pholoe tecta*	X	X	X	X	X	X	X	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	-	Phyllodocidae indet.	-	-	X	X	Y	-	-	-	Y	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	Eteoninae	*Eteone barbata*	X	-	-	-	X	X	X	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	Eteoninae	*Eteone flava*	-	-	-	-	X	X	X	X	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	Eteoninae	*Eteone longa* complex	-	X	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	Eteoninae	*Eteone* sp.	X	X	X	X	Y	X	Y	X	Y	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	Eteoninae	*Eteone spilotus*	-	-	-	-	-	X		-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	Eteoninae	*Eulalia bilineata*	-	-	-	-	-	-	-	X	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	Eteoninae	*Eulalia* sp.	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	Eteoninae	*Eumida* sp.	-	-	-	-	-	-	X	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	Eteoninae	*Hypereteone* sp.	-	-	-	-	X	X	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	Phyllodocinae	*Phyllodoce groenlandica*	X	-	X	X	X	X	X	X	X	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	Phyllodocinae	*Phyllodoce mucosa*	-	-	X	X	X	-	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Phyllodocidae	Phyllodocinae	*Phyllodoce* sp.	-	-	-	-	Y	X	Y	-	Y	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	-	Polynoidae indet.	X	X	X	X	Y	X	-	X	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Bylgides groenlandicus*	X	-	-	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Bylgides promamme*	-	-	-	-	-	-	-	X	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Bylgides sarsi*	-	X	X	X	X	X	-	X	X	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Bylgides* sp.	-	-	-	-	-	Y	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Bylgides* sp. A	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Gattyana cirrhosa*	X	X	X	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Harmothoe extenuata*	-	X	X	X	X	X	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Harmothoe fragilis*	-	X	-	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Harmothoe imbricata*	X	X	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Harmothoe propinqua*	-	-	-	-	-	-	-	X	-	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Harmothoe rarispina*	-	-	-	-	-	-	X	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Harmothoe* sp.	X	X	X	X	Y	X	Y	X	Y	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Hartmania moorei*	-	-	-	-	X	X	-	-	-	-

Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2010	2013	2015	2016	2017	2018	2019	2020	2021	2022
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Hartmania* sp.	-	X	-	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Hesperonoe* sp.	-	-	-	-	-	-	-	X	-	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Melaenis loveni*	-	-	-	-	-	X	-	X	-	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	*Neobylgides* sp.	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Polynoidae	Polynoinae	Polynoinae indet.	-	-	-	-	Y	-	Y	Y	Y	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Sphaerodoridae	-	*Ephesiella* sp.	-	-	-	-	-	-	-	X	-	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Sphaerodoridae	-	*Sphaerodoropsis biserialis*	-	-	-	-	-	-	X	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Sphaerodoridae	-	*Sphaerodoropsis minuta*	X	-	-	-	X	X	-	X	X	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Sphaerodoridae	-	*Sphaerodoropsis minutum*	-	-	-	-	-	-	X	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Syllidae	-	Syllidae indet.	X	X	X	X	Y	-	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Syllidae	Anoplosyllinae	*Streptospinigera niuqtuut*	-	-	-	-	-	X	X	X	-	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Syllidae	Anoplosyllinae	*Syllides* sp.	-	-	-	-	X	X	-	X	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Syllidae	Eusyllinae	*Eusyllis* sp.	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Syllidae	Eusyllinae	*Pionosyllis compacta*	-	-	-	-	-	-	X	X	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Syllidae	Eusyllinae	*Pionosyllis* sp.	-	-	-	-	-	X	-	Y	Y	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Syllidae	Exogoninae	*Exogone naidina*	-	-	-	-	-	-	X	X	X	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Syllidae	Exogoninae	*Exogone* sp.	-	X	-	-	X	X	-	-	-	X
Annelida	-	Polychaeta	Errantia	Phyllodocida	Syllidae	Exogoninae	*Exogone verugera*	X	X	-	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Errantia	Phyllodocida	Syllidae	Exogoninae	*Parexogone hebes*	-	X	-	-	-	X	X	-	-	-
Annelida	-	Polychaeta	Polychaeta incertae sedis	-	Oweniidae	-	*Galathowenia oculata*	-	-	X	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Polychaeta incertae sedis	-	Oweniidae	-	*Myriochele danielsseni*	-	-	-	-	X	-	-	-	-	-
Annelida	-	Polychaeta	Polychaeta incertae sedis	-	Oweniidae	-	*Myriochele heeri*	-	-	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Polychaeta incertae sedis	-	Oweniidae	-	*Myriochele* sp.	-	-	-	-	Y	-	-	-	Y	X
Annelida	-	Polychaeta	Polychaeta incertae sedis	-	Oweniidae	-	*Owenia fusiformis*	X	X	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Polychaeta incertae sedis	-	Oweniidae	-	Oweniidae indet.	-	-	X	X	-	X	Y	-	Y	X
Annelida	-	Polychaeta	Polychaeta incertae sedis	-	Protodrilidae	-	*Protodrilus* sp.	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Capitellidae	-	*Capitella capitata* complex	X	X	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	-	Capitellidae	-	Capitellidae indet.	-	-	-	X	Y	-	Y	X	-	-
Annelida	-	Polychaeta	Sedentaria	-	Capitellidae	-	*Mediomastus ambiseta*	-	X	-	X	X	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Capitellidae	-	*Mediomastus* sp.	X	-	-	-	Y	X	Y	X	Y	X
Annelida	-	Polychaeta	Sedentaria	-	Capitellidae	-	*Notomastus latericeus*	-	-	-	-	X	X	X	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Capitellidae	-	*Notomastus* sp.	-	-	-	-	-	-	-	Y	Y	X
Annelida	-	Polychaeta	Sedentaria	-	Cossuridae	-	*Cossura longocirrata*	-	X	-	-	-	-	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	-	Cossuridae	-	*Cossura* sp.	X	-	X	X	X	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	-	Maldanidae indet.	X	X	X	X	Y	X	Y	Y	Y	X
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	-	Maldanidae sp. A	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	-	Maldanidae sp. B	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	-	Maldanidae sp. C	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Euclymeninae	*Axiothella* sp.	-	-	-	-	-	-	-	X	-	X
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Euclymeninae	*Clymenura polaris*	-	-	-	-	-	-	X	X	-	X
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Euclymeninae	*Clymenura* sp.	-	-	-	-	X	X	Y	X	Y	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Euclymeninae	*Euclymene* sp.	-	-	-	-	X	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Euclymeninae	Euclymeninae indet.	-	-	-	-	Y	X	Y	X	Y	X
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Euclymeninae	*Heteroclymene robusta*	-	-	X	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Euclymeninae	*Microclymene* sp.	-	-	-	-	X	X	X	X	X	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Euclymeninae	*Praxillella gracilis*	-	-	-	-	-	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Euclymeninae	*Praxillella praetermissa*	-	-	-	-	X	X	X	X	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Euclymeninae	*Praxillella* sp.	-	-	-	X	Y	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Maldaninae	*Maldane sarsi*	X	X	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Nicomachinae	*Nicomache lumbricalis*	-	-	X	X	X	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Nicomachinae	*Nicomache* sp.	-	-	-	-	-	X	Y	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Nicomachinae	Nicomachinae indet.	-	-	-	-	-	-	Y	X	-	X
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Nicomachinae	*Petaloproctus* sp.	-	-	-	-	-	-	Y	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Nicomachinae	*Petaloproctus tenuis*	-	-	-	-	-	-	X	X	-	X
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Rhodininae	*Rhodine bitorquata*	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Rhodininae	*Rhodine gracilior*	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Rhodininae	*Rhodine loveni*	-	-	-	-	X	-	X	X	-	X
Annelida	-	Polychaeta	Sedentaria	-	Maldanidae	Rhodininae	*Rhodine sp. **	-	-	-	-	-	-	-	-	-	X
Annelida	-	Polychaeta	Sedentaria	-	Opheliidae	-	Opheliidae indet.	X	-	-	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Opheliidae	Opheliinae	*Ophelia limacina*	X	X	X	X	X	-	X	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Opheliidae	Opheliinae	*Ophelia* sp.	-	-	-	-	-	-	-	-	Y	X
Annelida	-	Polychaeta	Sedentaria	-	Opheliidae	Ophelininae	*Ophelina acuminata*	X	-	X	X	X	X	X	X	-	-
Annelida	-	Polychaeta	Sedentaria	-	Opheliidae	Ophelininae	*Ophelina cylindricaudata*	-	-	-	-	-	X	X	X	-	X
Annelida	-	Polychaeta	Sedentaria	-	Opheliidae	Ophelininae	*Ophelina* sp.	-	-	-	-	Y	X	Y	Y	Y	-
Annelida	-	Polychaeta	Sedentaria	-	Orbiniidae	-	Orbiniidae indet.	-	-	-	-	Y	X	Y	X	-	X
Annelida	-	Polychaeta	Sedentaria	-	Orbiniidae	Orbiniinae	*Leitoscoloplos acutus*	-	X	X	X	X	X	X	-	-	-

Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2010	2013	2015	2016	2017	2018	2019	2020	2021	2022
Annelida	-	Polychaeta	Sedentaria	-	Orbiniidae	Orbiniinae	*Leitoscoloplos* sp.	X	-	-	-	X	X	-	X	Y	X
Annelida	-	Polychaeta	Sedentaria	-	Orbiniidae	Orbiniinae	*Scoloplos armiger*	X	-	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	-	Orbiniidae	Orbiniinae	*Scoloplos* sp.	-	X	X	-	Y	X	Y	Y	Y	X
Annelida	-	Polychaeta	Sedentaria	-	Paraonidae	-	*Aricidea (Acmira) catherinae*	-	-	-	-	-	-	X	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Paraonidae	-	*Aricidea (Strelzovia) antennata*	-	-	-	-	-	-	X	X	-	-
Annelida	-	Polychaeta	Sedentaria	-	Paraonidae	-	*Aricidea catherinae*	-	X	-	-	X	-	-	X	-	-
Annelida	-	Polychaeta	Sedentaria	-	Paraonidae	-	*Aricidea hartmanae*	-	-	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	-	Paraonidae	-	*Aricidea minuta*	-	-	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	-	Paraonidae	-	*Aricidea nolani*	-	X	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	-	Paraonidae	-	*Aricidea* sp.	X	X	-	X	Y	X	Y	X	Y	X
Annelida	-	Polychaeta	Sedentaria	-	Paraonidae	-	*Aricidea* sp. A	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Paraonidae	-	Paraonidae indet.	-	X	X	X	Y	X	Y	Y	-	X
Annelida	-	Polychaeta	Sedentaria	-	Paraonidae	-	*Paraonides* sp.	-	-	-	-	-	-	-	X	-	-
Annelida	-	Polychaeta	Sedentaria	-	Paraonidae	-	*Paraonis* sp.	X	-	-	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Scalibregmatidae	-	*Polyphysia baffinensis*	X	-	-	-	-	-	-	X	X	-
Annelida	-	Polychaeta	Sedentaria	-	Scalibregmatidae	-	*Polyphysia crassa*	-	-	-	-	X	X	-	X	-	-
Annelida	-	Polychaeta	Sedentaria	-	Scalibregmatidae	-	*Polyphysia* sp.	-	-	-	-	-	-	Y	-	-	-
Annelida	-	Polychaeta	Sedentaria	-	Scalibregmatidae	-	*Scalibregma inflatum*	X	X	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	-	Scalibregmatidae	-	Scalibregmatidae indet.	-	-	-	-	Y	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Fabriciidae	-	Fabriciidae indet.	-	-	-	-	X	-	Y	X	Y	X
Annelida	-	Polychaeta	Sedentaria	Sabellida	Fabriciidae	-	*Manayunkia aesturiana*	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Fabriciidae	-	*Pseudofabricia* sp.*	-	-	-	-	-	-	-	-	-	X
Annelida	-	Polychaeta	Sedentaria	Sabellida	Fabriciidae	-	*Pseudofabricia* sp. nr. *aberrans*	-	-	-	-	-	-	X	X	X	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	-	Sabellid sp. A	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	-	Sabellid sp. B	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	-	Sabellid sp. F	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	-	Sabellid sp. G	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	-	Sabellidae indet.	-	X	X	X	Y	X	Y	Y	Y	X
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	-	Sabellidae sp. 3	-	-	-	-	-	-	Y	Y	X	X
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	-	Sabellidae sp. 4	-	-	-	-	-	-	Y	Y	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	-	Sabellidae sp. H	-	-	-	-	X	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	-	Sabellidae sp. I	-	-	-	-	X	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	-	Sabellidae sp. J	-	-	-	-	X	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Myxicolinae	*Chone duneri*	-	-	-	-	X	X	-	X	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Myxicolinae	*Chone* sp.	X	-	-	-	-	-	-	-	X	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Bispira* sp.	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Branchiomma* sp.	-	-	-	-	X	X	-	X	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Dialychone* sp.	-	-	-	-	X	X	X	X	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Dialychone* sp. 1	-	-	-	-	-	-	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Dialychone* sp. 3	-	-	-	-	-	-	-	Y	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Dialychone* sp. A	-	-	-	-	Y	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Dialychone* sp. B	-	-	-	-	X	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Euchone analis*	-	-	-	-	-	-	X	X	-	X
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Euchone incolor*	-	X	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Euchone papillosa*	X	-	-	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Euchone rubrocincta*	-	-	-	-	X	X	X	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Euchone* sp.	-	-	X	X	-	X	Y	X	Y	X
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Euchone* sp. 1	-	-	-	-	-	-	-	Y	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Hypsicomus* sp.	-	-	-	-	X	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Paradialychone harrisae*	-	-	-	-	X	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Potamilla neglecta*	-	-	X	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Sabellidae	Sabellinae	*Pseudopotamilla reniformis*	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Serpulidae	-	Serpulidae indet.	X	X	X	X	-	-	Y	-	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Serpulidae	Spirorbinae	*Bushiella (Jugaria) quadrangularis*	-	-	-	-	X	-	-	X	-	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Serpulidae	Spirorbinae	*Bushiella* sp.	-	-	-	-	-	-	-	-	Y	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Serpulidae	Spirorbinae	*Pileolaria* sp.	-	-	-	-	X	X	-	-	X	-
Annelida	-	Polychaeta	Sedentaria	Sabellida	Serpulidae	Spirorbinae	Spirorbinae indet.	-	-	-	-	X	X	-	X	-	-
Annelida	-	Polychaeta	Sedentaria	Spionida	Apistobranchidae	-	*Apistobranchus* sp.	-	-	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Dipolydora caulleryi*	-	-	-	-	X	X	X	X	-	-
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Dipolydora concharum*	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Dipolydora quadrilobata*	-	-	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Dipolydora socialis*	-	-	-	-	-	X	X	-	-	-
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Dipolydora* sp.	-	-	-	-	Y	X	-	X	-	X
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Laonice cirrata*	-	-	-	-	-	X	X	X	-	-
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Marenzelleria* sp.	-	-	-	X	X	X	-	-	Y	X
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Marenzelleria viridis*	-	-	-	-	-	-	X	X	-	-

Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2010	2013	2015	2016	2017	2018	2019	2020	2021	2022
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Polydora* sp. complex	X	X	-	-	X	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Prionospio (Prionospio)* sp.	-	-	-	-	-	-	-	Y	-	-
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Prionospio cirrifera*	-	-	-	-	X	X	-	X	-	-
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Prionospio* sp.	-	-	-	-	Y	X	Y	Y	Y	X
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Prionospio steenstrupi*	-	X	X	X	X	X	X	-	-	-
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Pygospio elegans*	-	-	-	-	-	-	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Pygospio* sp.	-	X	-	-	X	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Scolelepis* sp.	-	-	-	-	-	X	-	X	X	X
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Spio filicornis*	X	X	X	X	X	X	X	X	X	-
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	*Spio* sp.	-	-	-	-	-	-	-	Y	Y	X
Annelida	-	Polychaeta	Sedentaria	Spionida	Spionidae	-	Spionidae indet.	X	X	X	X	Y	X	Y	Y	Y	X
Annelida	-	Polychaeta	Sedentaria	Spionida	Trochochaetidae	-	*Trochochaeta watsoni*	-	-	-	-	X	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	-	Ampharetidae indet.	X	X	X	X	Y	-	Y	X	Y	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	*Ampharete borealis*	-	-	-	-	-	-	X	X	-	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	*Ampharete finmarchica*	-	-	-	-	-	-	-	X	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	*Ampharete oculata*	-	-	X	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	*Ampharete petersenae*	-	-	-	-	-	-	-	X	X	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	*Ampharete* sp.	-	X	-	X	Y	X	Y	X	Y	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	*Ampharete vega*	-	-	-	-	X	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	Ampharetid sp. B	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	Ampharetid sp. E	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	*Amphicteis gunneri*	-	X	X	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	*Amphicteis sundevalli*	X	-	-	-	X	X	X	X	X	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	*Anobothrus gracilis*	-	-	-	X	-	-	-	X	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	*Lysippe labiata*	-	-	X	X	X	X	X	X	-	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	*Samytha* sp.	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Ampharetidae	Ampharetinae	*Sosane* sp. nr. *wireni*	-	-	-	-	-	-	X	X	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Cirratulidae	-	*Aphelochaeta marioni*	-	X	-	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Cirratulidae	-	*Aphelochaeta* sp.	-	-	-	-	X	X	Y	X	Y	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Cirratulidae	-	*Chaetozone bathyala*	-	-	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Cirratulidae	-	*Chaetozone careyi*	-	-	-	-	X	X	-	X	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Cirratulidae	-	*Chaetozone pigmentata*	-	-	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Cirratulidae	-	*Chaetozone setosa* complex	-	X	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Cirratulidae	-	*Chaetozone* sp.	-	-	-	-	Y	X	Y	X	Y	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Cirratulidae	-	Cirratulidae indet.	X	X	X	X	Y	X	Y	X	Y	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Cirratulidae	-	Cirratulidae sp. A	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Cirratulidae	-	*Kirkegaardia* sp.	-	-	-	-	-	X	-	X	X	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Cirratulidae	-	*Tharyx* sp.	-	-	-	-	X	X	X	X	-	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Flabelligeridae	-	*Brada villosa*	-	X	-	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Flabelligeridae	-	*Diplocirrus hirsutus*	-	-	X	X	-	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Flabelligeridae	-	*Flabelligera affinis*	-	-	-	X	-	-	X	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Flabelligeridae	-	Flabelligeridae indet.	-	-	X	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Melinnidae	-	*Melinna elisabethae*	X	X	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Melinnidae	-	*Melinna* sp.	X	-	-	-	-	X	-	-	-	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Pectinariidae	-	*Cistenides granulata*	X	X	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Pectinariidae	-	*Cistenides hyperborea*	X	-	-	-	-	-	-	-	-	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Pectinariidae	-	*Cistenides sp.**	-	-	-	-	-	-	-	-	-	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Pectinariidae	-	*Pectinaria* sp.	X	X	-	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	-	Terebellidae indet.	-	X	X	X	Y	X	Y	Y	Y	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Amaeana* sp.	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Lanassa* sp.	-	-	-	-	-	-	Y	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Lanassa venusta venusta*	-	-	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Laphania boecki*	-	-	-	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Leaena ebranchiata*	-	-	-	-	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Neoamphitrite affinis*	-	-	-	-	X	X	X	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Nicolea venustula*	-	X	-	-	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Paramphitrite birulai*	-	-	-	-	-	-	-	X	X	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Pista cristata*	-	-	-	X	-	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Pista maculata*	X	X	X	X	X	X	X	X	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Polycirrus medusa*	-	-	-	-	-	-	X	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Polycirrus* sp. complex	X	X	-	X	X	X	Y	Y	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Proclea graffii*	-	-	-	-	-	X	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Terebellidae	Terebellinae	*Amphitrite cirrata*	-	-	-	-	-	-	-	X	X	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Trichobranchidae	-	*Terebellides reishi*	-	-	-	-	X	-	-	-	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Trichobranchidae	-	*Terebellides* sp.	-	-	-	-	Y	X	Y	Y	Y	X
Annelida	-	Polychaeta	Sedentaria	Terebellida	Trichobranchidae	-	*Terebellides stroemii*	X	X	X	X	X	-	X	-	-	-

Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2010	2013	2015	2016	2017	2018	2019	2020	2021	2022
Annelida	-	Polychaeta	Sedentaria	Terebellida	Trichobranchidae	-	Trichobranchidae indet.	X	-	-	-	-	-	-	Y	-	-
Annelida	-	Polychaeta	Sedentaria	Terebellida	Trichobranchidae	-	*Trichobranchus glacialis*	X	-	-	-	X	X	X	X	-	-
Annelida	-	Polychaeta/Archiannelida	Polychaeta incertae sedis	Archiannelida	-	-	Archiannelid indet.	-	X	-	-	-	-	-	-	-	-
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	-	Naididae indet.	-	-	-	-	-	-	-	-	X	-
Arthropoda	Chelicerata	Arachnida	Acari	-	-	-	Acari indet.	X	X	-	-	-	-	X	X	-	-
Arthropoda	Chelicerata	Arachnida	Acari	Trombidiformes	Halacaridae	-	Halacaridae indet.	-	-	-	-	X	X	X	X	-	-
Arthropoda	Chelicerata	Pycnogonida	-	-	-	-	Pycnogonida indet.	X	-	X	-	X	-	-	-	-	-
Arthropoda	Chelicerata	Pycnogonida	-	Pantopoda	Ammotheidae	-	*Achelia spinosa*	-	-	-	X	-	-	-	-	-	-
Arthropoda	Chelicerata	Pycnogonida	-	Pantopoda	Ammotheidae	-	*Achelia* sp.	-	-	-	-	X	-	-	-	-	-
Arthropoda	Chelicerata	Pycnogonida	-	Pantopoda	Nymphonidae	-	*Nymphon hirtipes*	-	-	-	-	-	-	X	X	-	-
Arthropoda	Chelicerata	Pycnogonida	-	Pantopoda	Nymphonidae	-	*Nymphon* sp.	-	-	-	-	X	X	-	X	Y	X
Arthropoda	Crustacea	Hexanauplia	-	-	-	-	Cirripedia indet.	-	-	X	X	-	-	-	-	-	-
Arthropoda	Crustacea	Hexanauplia	Copepoda	-	-	-	Copepoda indet.	-	-	-	-	-	-	-	Y	-	-
Arthropoda	Crustacea	Hexanauplia	Copepoda	Calanoida	-	-	Calanoida indet.	-	-	-	-	-	-	-	-	Y	X
Arthropoda	Crustacea	Hexanauplia	Copepoda	Cyclopoida	-	-	Cyclopoida indet.	-	-	-	-	X	X	X	X	X	X
Arthropoda	Crustacea	Hexanauplia	Copepoda	Harpacticoida	-	-	Harpacticoida indet.	X	X	-	X	X	X	X	X	X	X
Arthropoda	Crustacea	Hexanauplia	Thecostraca	Sessilia	-	-	Balanomorpha indet.	-	-	-	-	X	X	X	X	X	X
Arthropoda	Crustacea	Hexanauplia	Thecostraca	Sessilia	Archaeobalanidae	Semibalabinae	*Semibalanus balanoides*	X	-	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Hexanauplia	Thecostraca	Sessilia	Balanidae	Balaninae	*Balanus* sp.	X	-	-	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	-	-	Amphipoda indet.	X	X	X	X	Y	X	X	X	Y	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Acanthonotozomatidae	-	*Acanthonotozoma inflatum*	-	-	-	-	-	-	X	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ampeliscidae	-	*Ampelisca eschrichtii*	-	-	X	X	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ampeliscidae	-	*Ampelisca* sp.	-	-	X	X	-	-	Y	-	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ampeliscidae	-	Ampeliscidae indet.	-	-	-	X	-	X	-	X	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ampeliscidae	-	*Byblis gaimardii*	X	-	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ampeliscidae	-	*Byblis* sp.	-	-	X	X	X	X	Y	X	Y	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ampeliscidae	-	*Haploops* sp.	-	-	X	X	-	-	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ampeliscidae	-	*Haploops tubicola*	X	X	-	X	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Amphilochidae	-	Amphilochidae indet.	-	-	-	-	Y	-	-	X	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Amphilochidae	-	*Amphilochus hamatus*	-	-	-	-	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Amphilochidae	-	*Amphilochus* sp.	-	-	-	-	-	X	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Aoridae	-	Aoridae indet.	-	-	-	-	-	-	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Atylidae	Atylinae	*Atylus carinatus*	X	X	X	X	X	X	X	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Atylidae	Atylinae	*Atylus* sp.	-	-	-	-	-	-	-	Y	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Atylidae	Nototropiinae	*Nototropis* sp.	-	-	X	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Calliopiidae	-	*Apherusa jurinei*	-	X	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Calliopiidae	-	*Apherusa megalops*	-	X	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Calliopiidae	-	Calliopiidae indet.	-	-	-	-	X	X	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	-	Corophiidae indet.	-	-	-	X	-	X	Y	X	Y	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	Corophiinae	*Corophium* sp.	X	X	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	Corophiinae	*Crassicorophium bonellii*	-	X	-	-	X	X	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	Corophiinae	*Crassicorophium clarencense*	-	-	-	-	-	-	-	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	Corophiinae	*Crassicorophium* sp.	-	-	-	-	-	-	-	-	Y	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	Corophiinae	*Monocorophium insidiosum*	-	X	-	-	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	Corophiinae	*Monocorophium* sp.	-	-	-	-	Y	X	Y	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	Protomedeiinae	*Protomedeia fasciata*	-	X	-	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Corophiidae	Protomedeiinae	*Protomedeia* sp.	-	-	-	-	X	-	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Dexaminidae	Dexamininae	*Dexamine* sp.	-	-	-	-	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Dexaminidae	Prophliantinae	*Guernea nordenskioldi*	X	X	X	X	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Dulichiidae	-	*Dulichia* sp.	-	-	-	-	-	-	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Dulichiidae	-	Dulichiidae indet.	-	-	-	-	-	-	-	-	Y	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Dulichiidae	-	*Dyopedos* sp.	-	-	-	-	X	X	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Eusiridae	-	*Rhachotropis aculeata*	X	-	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Eusiridae	-	*Rhachotropis helleri*	-	-	-	-	X	X	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Eusiridae	-	*Rhachotropis oculata*	-	X	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Eusiridae	-	*Rhachotropis* sp.	-	-	-	-	Y	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Gammaridae	-	*Gammarus oceanicus*	-	X	-	-	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Gammaridae	-	*Gammarus setosus*	-	-	-	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Gammaridae	-	*Gammarus* sp.	-	X	X	X	-	X	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	-	*Themisto libellula**	-	-	-	-	-	-	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	-	*Themisto* sp.	-	-	-	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ischyroceridae	-	Ischyroceridae indet.	X	-	-	-	-	-	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ischyroceridae	Ischyrocerinae	*Ischyrocerus anguipes*	-	X	X	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Ischyroceridae	Ischyrocerinae	*Ischyrocerus* sp.	-	-	X	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Lysianassidae	-	Lysianassidae indet.	X	-	X	-	Y	-	Y	-	Y	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Lysianassidae	-	Lysianassoidea indet.	-	-	-	-	Y	X	Y	X	X	X

Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2010	2013	2015	2016	2017	2018	2019	2020	2021	2022
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Melphidippidae	-	*Melphidippa* sp.	-	-	-	-	-	-	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Munnopsidae	Eurycopinae	*Eurycope* sp.	-	-	-	-	-	X	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Aceroides latipes*	-	-	-	-	-	-	X	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Aceroides* sp.	-	-	-	-	-	X	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Arrhis* sp.	-	-	-	-	-	X	X	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Bathymedon obtusifrons*	-	-	-	X	X	-	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Bathymedon* sp.	-	-	-	-	-	-	-	Y	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Deflexilodes* sp.	-	-	-	-	-	-	-	Y	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Deflexilodes tesselatus*	-	X	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Monoculodes latimanus*	-	X	-	-	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Monoculodes* sp.	X	X	X	X	Y	X	Y	X	Y	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Monoculopsis longicornis*	-	X	-	X	X	-	X	-	X	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Monoculopsis* sp.	-	-	-	-	-	-	Y	X	Y	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Oediceros borealis*	-	X	X	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	Oedicerotidae indet.	X	X	X	X	Y	X	Y	X	Y	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Paroediceros lynceus*	X	X	X	X	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Paroediceros* sp.	-	X	-	-	-	-	-	Y	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Rostroculodes borealis*	-	-	X	-	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Rostroculodes kroyeri*	-	-	X	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Rostroculodes longirostris*	-	-	-	-	X	-	-	-	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Rostroculodes* sp.	-	-	-	-	Y	X	Y	Y	Y	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Westwoodilla caecula*	-	-	X	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	-	*Westwoodilla* sp.	-	X	-	X	X	X	-	X	Y	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Opisidae	-	*Opisa eschrichti*	-	-	-	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Opisidae	-	*Opisa* sp.	-	-	-	-	-	-	-	-	Y	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Phoxocephalidae	-	Phoxocephalidae indet.*	-	-	-	-	-	-	-	-	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Phoxocephalidae	Harpiniinae	*Harpinia serrata*	X	-	X	X	X	X	-	X	X	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Phoxocephalidae	Harpiniinae	*Harpinia* sp.	-	-	X	X	Y	X	X	-	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Phoxocephalidae	Phoxocephalinae	*Phoxocephalus holbolli*	-	-	-	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Podoceridae	-	Podoceridae indet.	-	-	-	-	-	-	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Pontoporeiidae	-	*Monoporeia affinis*	X	X	X	X	X	X	X	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Pontoporeiidae	-	*Monoporeia sp. **	-	-	-	-	-	-	-	-	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Pontoporeiidae	-	*Pontoporeia femorata*	X	X	X	X	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Pontoporeiidae	-	Pontoporeiidae indet.	-	-	-	-	Y	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Scopelocheiridae	Scopelocheirinae	*Scopelocheirus hopei*	-	-	-	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Stenothoidae	-	*Hardametopa nasuta*	-	-	-	-	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Stenothoidae	-	*Metopa* sp.	-	X	-	-	-	-	X	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Stenothoidae	-	Stenothoidae indet.	X	-	-	X	Y	X	X	X	Y	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Synopiidae	-	*Tiron spiniferus*	-	-	-	-	-	-	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Tryphosidae	-	*Gronella groenlandica*	-	X	-	X	X	X	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Tryphosidae	-	*Hippomedon denticulatus*	-	-	X	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Tryphosidae	-	*Hippomedon propinqvus*	-	-	-	-	-	-	-	-	X	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Tryphosidae	-	*Hippomedon serratus*	-	-	-	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Tryphosidae	-	*Hippomedon* sp.	-	-	-	-	-	-	Y	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Tryphosidae	-	*Orchomene macroserratus*	X	-	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Tryphosidae	-	*Orchomene* sp.	-	-	-	-	X	X	Y	Y	Y	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Tryphosidae	-	*Orchomenella minuta*	-	X	-	X	-	X	X	X	X	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Tryphosidae	-	*Orchomenella pinguis*	-	-	-	X	X	X	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Tryphosidae	-	*Orchomenella* sp.	-	X	-	X	-	-	Y	Y	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Tryphosidae	-	Tryphosidae indet.	-	-	-	-	-	-	Y	Y	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Anonyx laticoxae*	-	-	-	-	-	-	X	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Anonyx lilljeborgi*	-	-	-	-	-	-	-	X	X	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Anonyx nugax*	X	X	X	X	X	-	X	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Anonyx ochoticus*	-	-	-	X	-	-	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Anonyx pacificus*	-	-	-	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Anonyx sarsi*	-	-	X	X	X	X	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Anonyx* sp.	-	X	X	X	Y	X	Y	X	Y	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Menigrates obtusifrons*	-	-	-	-	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Onisimus barentsi Group*	-	-	-	-	X	X	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Onisimus brevicaudatus*	-	-	-	-	-	X	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Onisimus litoralis*	-	-	X	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Onisimus normani*	-	-	X	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Onisimus plautus*	-	-	-	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Onisimus* sp.	X	-	-	-	Y	X	Y	Y	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	Uristidae indet.	-	-	-	-	Y	-	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	-	-	Cumacea indet.	-	X	X	X	Y	X	-	X	-	-

Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2010	2013	2015	2016	2017	2018	2019	2020	2021	2022
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Bodotriidae	Bodotriinae	*Cyclaspis longicaudata*	X	-	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	*Brachydiastylis resima*	X	X	X	X	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	Diastylidae indet.	-	-	-	-	Y	X	Y	-	Y	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	*Diastylis alaskensis*	-	-	-	-	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	*Diastylis bradyi*	-	-	-	-	X	X	-	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	*Diastylis echinata*	-	-	X	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	*Diastylis goodsiri*	X	-	X	-	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	*Diastylis lucifera*	-	-	X	-	X	X	-	X	X	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	*Diastylis rathkei*	X	X	X	-	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	*Diastylis scorpiodes*	X	-	X	X	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	*Diastylis sculpta*	-	X	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	*Diastylis* sp.	-	X	-	X	Y	X	Y	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	*Diastylis spinulosa*	X	-	X	-	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Diastylidae	-	*Diastyloides biplicatus*	-	-	-	-	X	X	-	-	X	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Lampropidae	-	*Hemilamprops cristatus*	-	-	-	-	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Lampropidae	-	Lampropidae indet.	-	-	X	-	Y	X	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Lampropidae	-	*Lamprops fuscatus*	X	X	X	X	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Lampropidae	-	*Lamprops* sp.	-	-	X	X	-	-	-	X	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Leuconidae	-	*Eudorella emarginata*	-	-	X	X	-	-	X	X	X	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Leuconidae	-	*Eudorella* sp.	X	-	X	X	Y	-	Y	X	Y	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Leuconidae	-	*Eudorella truncatula*	-	-	X	X	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Leuconidae	-	*Eudorellopsis* sp.	X	-	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Leuconidae	-	*Leucon nasica*	-	-	-	-	-	-	X	X	X	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Leuconidae	-	*Leucon nasicoides*	X	X	X	X	X	-	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Leuconidae	-	*Leucon* sp.	-	-	X	-	Y	X	Y	X	Y	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Leuconidae	-	Leuconidae indet.	-	-	-	-	Y	X	Y	-	Y	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Nannastacidae	-	*Campylaspis rubicunda*	-	-	-	-	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Nannastacidae	-	*Campylaspis* sp.	-	-	-	-	Y	-	-	-	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Cumacea	Nannastacidae	-	Nannastacidae indet.	-	-	-	-	-	-	-	Y	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Crangonidae	-	Crangonidae indet.	-	-	-	-	-	-	-	Y	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Crangonidae	-	*Sabinea septemcarinata*	X	-	X	-	X	X	X	X	X	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Crangonidae	-	*Sabinea* sp.	-	-	-	-	-	-	-	-	Y	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Crangonidae	-	*Sclerocrangon boreas*	-	-	-	X	X	X	-	-	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Crangonidae	-	*Sclerocrangon* sp.	-	-	-	-	-	-	-	Y	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Thoridae	-	*Lebbeus polaris*	X	-	-	-	-	X	X	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Thoridae	-	*Lebbeus* sp.	-	-	-	-	-	-	Y	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	-	-	Asellota indet.	-	-	-	-	Y	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	-	-	Isopoda indet.	-	-	-	-	-	-	-	Y	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	-	-	Isopoda sp. A	-	-	-	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Desmosomatidae	-	Desmosomatidae indet.	-	-	-	-	X	-	-	X	Y	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Desmosomatidae	Desmosomatinae	*Desmosoma* sp.	-	X	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Desmosomatidae	Desmosomatinae	*Eugerda* sp.	X	-	-	-	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Gnathiidae	-	*Gnathia maxillaris*	-	-	-	X	-	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Gnathiidae	-	*Gnathia* sp.	X	X	-	-	X	-	Y	X	Y	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Gnathiidae	-	Gnathiidae indet.	-	-	-	-	Y	X	Y	X	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Paramunnidae	-	*Pleurogonium rubicundum*	-	-	-	-	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Paramunnidae	-	*Pleurogonium* sp.	-	-	-	-	Y	-	-	-	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Paramunnidae	-	*Pleurogonium spinosissimum*	X	-	-	-	X	X	-	-	X	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	-	Mysida indet.	-	-	-	-	Y	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	Mysinae	*Mysis mixta*	-	X	-	X	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	Mysinae	*Mysis* sp.	-	X	-	-	-	X	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Tanaidacea	-	-	Tanaidacea indet.	X	X	X	X	Y	X	Y	Y	-	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Tanaidacea	Akanthophoreidae	-	*Akanthophoreus gracilis*	-	-	-	-	X	-	-	-	-	-
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Tanaidacea	Akanthophoreidae	-	*Akanthophoreus* sp.	-	-	-	-	Y	X	Y	X	Y	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Tanaidacea	Pseudotanaidae	Pseudotanainae	*Pseudotanais* sp.	-	-	-	-	X	X	Y	Y	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Tanaidacea	Sphyrapodidae	Pseudosphyrapodinae	*Pseudosphyrapus anomalus*	X	-	-	X	X	X	X	X	X	X
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Tanaidacea	Typhlotanaidae	-	*Typhlotanais* sp.	-	-	-	-	X	X	X	X	-	-
Arthropoda	Crustacea	Ostracoda	-	-	-	-	Ostracoda indet.	-	-	-	-	Y	-	-	Y	-	-
Arthropoda	Crustacea	Ostracoda	Myodocopa	-	-	-	Myodocopa indet.	X	X	X	X	-	-	-	-	-	-
Arthropoda	Crustacea	Ostracoda	Myodocopa	Myodocopida	Philomedidae	Philomedinae	*Philomedes* sp.	-	-	-	-	X	X	X	X	X	X
Arthropoda	Crustacea	Ostracoda	Podocopa	Podocopida	Cytheridae	-	Cytheridae indet.	-	-	-	-	-	-	X	-	X	-
Arthropoda	Crustacea	Ostracoda	Podocopa	Podocopida	Trachyleberididae	-	*Robertsonites tuberculatus*	-	-	-	-	X	-	-	-	-	-
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Curculionidae	-	Curculionidae indet.	-	-	-	-	-	X	-	-	-	-
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	-	-	Diptera indet.	-	-	-	-	Y	-	-	-	-	-
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	-	Chironomidae indet.	X	-	-	-	-	X	-	-	-	-
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironominae	Chironominae indet.	X	-	-	-	-	-	-	-	-	-

Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2010	2013	2015	2016	2017	2018	2019	2020	2021	2022
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Diamesinae	*Diamesa* sp.	-	-	-	-	-	-	-	X	-	-
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Orthocladiinae	*Cricotopus/Orthocladius* sp. Complex	-	-	-	-	-	-	-	X	-	-
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Orthocladiinae	*Eukiefferiella* sp.	-	-	-	-	-	-	-	X	-	-
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Orthocladiinae	Orthocladiinae indet.	X	-	-	-	X	X	-	X	-	-
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Empididae	Clinocerinae	*Clinocera* sp.	-	-	-	-	-	-	-	X	-	-
Brachiopoda	-	-	-	-	-	-	Brachiopoda indet.	-	-	-	-	-	-	-	-	X	-
Bryozoa	-	-	-	-	-	-	Bryozoa indet.	-	-	-	-	Y	X	-	X	Y	-
Bryozoa	-	Gymnolaemata	-	-	-	-	Gymnolaemata indet.	-	-	-	-	-	-	Y	-	-	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	-	-	Buguloidea indet.*	-	-	-	-	-	-	-	-	-	X
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	-	-	Cheilostomatida indet.	-	-	-	-	-	-	Y	X	Y	X
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	-	-	Schizoporelloidea indet.	-	-	-	-	-	-	-	-	X	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Bitectiporidae	-	*Schizomavella* sp.	-	-	-	-	-	-	-	-	X	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Calloporidae	-	*Callopora* sp.	-	-	-	-	-	-	-	-	X	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Calloporidae	-	Calloporidae indet.	-	-	-	-	-	X	X	X	Y	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Calloporidae	-	*Cauloramphus* sp.	-	-	-	-	-	-	-	-	X	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Candidae	-	Candidae indet.	-	-	-	-	-	-	-	-	Y	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Candidae	-	*Scrupocellaria* sp.	-	-	-	-	-	X	-	-	-	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Candidae	-	*Tricellaria* sp.	-	-	-	-	-	-	-	-	X	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Cribrilinidae	-	*Cribrilina* sp.	-	-	-	-	-	-	-	-	X	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Epistomiidae	-	*Synnotum* sp.	-	-	-	-	X	-	-	-	-	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Escharellidae	-	*Escharella* sp.	-	-	-	-	-	-	X	X	X	X
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Eucrateidae	-	*Eucratea* sp.	-	-	-	-	-	-	-	X	-	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Exochellidae	-	*Escharoides* sp.	-	-	-	-	-	-	-	-	X	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Fatkullinidae	-	*Stomacrustula pachystega*	-	-	-	-	-	-	-	-	X	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Hippothoidae	-	*Celleporella hyalina*	-	-	-	-	X	-	-	-	-	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Myriaporidae	-	*Leieschara* sp.	-	-	-	-	-	X	-	X	-	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Smittinidae	-	*Pseudoflustra* sp.	-	-	-	-	-	-	-	-	X	-
Bryozoa	-	Gymnolaemata	-	Cheilostomatida	Smittinidae	-	*Smittina* sp.	-	-	-	-	-	-	-	-	X	-
Bryozoa	-	Gymnolaemata	-	Ctenostomatida	-	-	Ctenostomatida indet.	-	-	-	-	X	X	-	-	-	-
Bryozoa	-	Gymnolaemata	-	Ctenostomatida	Alcyonidiidae	-	*Alcyonidium* sp.	-	-	-	-	-	X	X	X	X	-
Bryozoa	-	Gymnolaemata	-	Ctenostomatida	Triticellidae	-	*Triticella* sp.	-	-	-	-	-	X	-	-	-	-
Bryozoa	-	Gymnolaemata	-	Ctenostomatida	Vesiculariidae	-	*Amathia* sp.	-	-	-	-	X	-	X	-	-	-
Bryozoa	-	Stenolaemata	-	-	-	-	Stenolaemata indet.	-	-	-	-	-	-	Y	-	-	-
Bryozoa	-	Stenolaemata	-	Cyclostomatida	Crisiidae	-	*Crisia* sp.	-	-	-	-	X	X	X	X	X	-
Bryozoa	-	Stenolaemata	-	Cyclostomatida	Crisiidae	-	Crisiidae indet.*	-	-	-	-	-	-	-	-	-	X
Bryozoa	-	Stenolaemata	-	Cyclostomatida	Oncousoeciidae	-	*Oncousoecia* sp.	-	-	-	-	-	-	X	-	-	-
Bryozoa	-	Stenolaemata	-	Cyclostomatida	Tubuliporidae	-	*Tubulipora* sp.	-	-	-	-	-	-	X	X	X	-
Chordata	Tunicata	-	-	-	-	-	Tunicata indet.	-	-	-	X	-	-	-	-	-	-
Chordata	Tunicata	Ascidiacea	-	-	-	-	Ascidiacea indet.	-	-	-	-	Y	-	X	X	Y	X
Chordata	Tunicata	Ascidiacea	-	Aplousobranchia	-	-	Aplousobranchia indet.	-	-	-	-	-	X	X	X	-	-
Chordata	Tunicata	Ascidiacea	-	Phlebobranchia	Ascidiidae	-	*Ascidia callosa*	-	X	-	-	-	-	-	-	-	-
Chordata	Tunicata	Ascidiacea	-	Phlebobranchia	Ascidiidae	-	*Ascidia* sp.	-	X	X	-	X	X	Y	X	Y	-
Chordata	Tunicata	Ascidiacea	-	Stolidobranchia	-	-	Stolidobranchia indet.	-	-	-	-	-	-	-	Y	-	-
Chordata	Tunicata	Ascidiacea	-	Stolidobranchia	Molgulidae	-	*Molgula* sp.	-	X	-	-	-	X	X	-	-	-
Chordata	Tunicata	Ascidiacea	-	Stolidobranchia	Pyuridae	-	*Boltenia echinata*	-	-	X	-	X	X	X	X	-	X
Chordata	Tunicata	Ascidiacea	-	Stolidobranchia	Pyuridae	-	*Boltenia* sp.	-	-	-	-	-	-	-	Y	-	-
Chordata	Tunicata	Ascidiacea	-	Stolidobranchia	Styelidae	-	*Polycarpa fibrosa*	-	-	-	-	X	X	-	X	-	X
Chordata	Tunicata	Ascidiacea	-	Stolidobranchia	Styelidae	-	*Polycarpa* sp.	-	-	-	-	-	-	Y	Y	Y	X
Chordata	Tunicata	Ascidiacea	-	Stolidobranchia	Styelidae	-	Styelidae indet.	-	-	-	-	-	-	Y	-	-	-
Chordata	Vertebrata	-	-	-	-	-	Pisces indet.	-	-	-	-	X	-	-	-	-	-
Chordata	Vertebrata	Actinopterygii	-	Perciformes	Zoarcidae	-	Zoarcidae indet.	-	-	-	-	-	-	X	-	-	-
Chordata	Vertebrata	Actinopterygii	-	Scorpaeniformes	Cottidae	-	Cottidae indet.	-	-	-	-	-	-	X	X	-	-
Cnidaria	-	Anthozoa	-	-	-	-	Anthozoa indet.	-	-	-	-	-	-	-	Y	-	-
Cnidaria	-	Anthozoa	Ceriantharia	Spirularia	Cerianthidae	-	*Cerianthus lloydii*	-	-	-	-	-	-	-	X	-	-
Cnidaria	-	Anthozoa	Hexacorallia	Actiniaria	-	-	Actiniaria indet.	-	-	-	-	-	-	-	Y	-	-
Cnidaria	-	Anthozoa	Hexacorallia	Actiniaria	Actiniidae	-	*Urticina* sp.	-	-	-	-	X	-	-	-	-	-
Cnidaria	-	Anthozoa	Hexacorallia	Actiniaria	Edwardsiidae	-	Edwardsiidae indet.	-	-	-	-	-	-	X	X	-	-
Cnidaria	-	Anthozoa	Hexacorallia	Actiniaria	Halcampidae	-	*Halcampa* sp.	-	-	-	-	-	-	-	X	-	-
Cnidaria	-	Anthozoa	Hexacorallia	Actiniaria	Hormathiidae	-	*Hormathia digitata*	-	-	-	-	X	-	-	-	-	-
Cnidaria	-	Anthozoa	Hexacorallia	Zoantharia	Parazoanthidae	-	*Parazoanthus* sp.	-	-	-	-	X	-	-	-	-	-
Cnidaria	-	Hydrozoa	-	-	-	-	Hydrozoa indet.	-	-	-	-	Y	-	Y	X	-	-
Cnidaria	-	Hydrozoa	-	Leptothecata	Campanulariidae	-	Campanulariidae indet.	-	-	-	-	-	-	-	-	Y	X
Cnidaria	-	Hydrozoa	-	Leptothecata	Campanulinidae	-	*Calycella* sp.	-	-	-	-	-	-	-	-	X	-
Cnidaria	-	Hydrozoa	Hydroidolina	Anthoathecata	-	-	Anthoathecata indet.	-	-	-	-	-	-	Y	X	-	X
Cnidaria	-	Hydrozoa	Hydroidolina	Anthoathecata	Bougainvilliidae	-	Bougainvilliidae indet.	-	-	-	-	X	X	-	X	-	X
Cnidaria	-	Hydrozoa	Hydroidolina	Anthoathecata	Corynidae	-	Corynidae indet.	-	-	-	-	-	-	X	-	-	-

Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2010	2013	2015	2016	2017	2018	2019	2020	2021	2022
Cnidaria	-	Hydrozoa	Hydroidolina	Leptothecata	-	-	Leptothecata indet.	-	-	-	-	-	-	-	Y	Y	X
Cnidaria	-	Hydrozoa	Hydroidolina	Leptothecata	Lafoeidae	-	*Lafoea* sp.	-	-	-	-	-	-	X	-	-	-
Cnidaria	-	Hydrozoa	Trachylinae	Limnomedusae	Monobrachiidae	-	*Monobrachium parasitum*	-	-	-	-	X	X	X	X	X	X
Echinodermata	Asterozoa	Asteroidea	-	Forcipulatida	Asteriidae	-	Asteriidae indet.	-	-	X	-	-	-	-	-	-	-
Echinodermata	Asterozoa	Ophiuroidea	-	-	-	-	Ophiuroidea indet.	-	-	X	-	-	-	Y	Y	Y	X
Echinodermata	Asterozoa	Ophiuroidea	Myophiuroidea	Amphilepidida	-	-	Amphilepidida indet.	-	-	-	-	-	-	-	X	-	-
Echinodermata	Asterozoa	Ophiuroidea	Myophiuroidea	Ophiurida	Ophiopyrgidae	-	*Ophiopleura borealis*	-	-	-	-	-	-	X	X	-	-
Echinodermata	Asterozoa	Ophiuroidea	Myophiuroidea	Ophiurida	Ophiuridae	-	Ophiuridae indet.	-	-	-	-	-	-	Y	Y	Y	X
Echinodermata	Asterozoa	Ophiuroidea	Myophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	*Ophiocten affinis*	-	-	-	-	-	X	X	X	X	X
Echinodermata	Asterozoa	Ophiuroidea	Myophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	*Ophiocten sericeum*	X	X	-	-	-	-	-	-	-	-
Echinodermata	Asterozoa	Ophiuroidea	Myophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	*Ophiura robusta*	X	-	X	X	X	X	X	X	X	X
Echinodermata	Asterozoa	Ophiuroidea	Myophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	*Ophiura sarsii*	X	X	X	X	X	X	X	X	X	X
Echinodermata	Asterozoa	Ophiuroidea	Myophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	*Ophiura* sp.	-	-	X	-	Y	-	Y	Y	Y	X
Echinodermata	Echinozoa	Echinoidea	Euechinoidea	Camarodonta	Strongylocentrotidae	-	*Strongylocentrotus droebachiensis*	X	-	X	X	X	X	X	X	X	X
Echinodermata	Echinozoa	Echinoidea	Euechinoidea	Camarodonta	Strongylocentrotidae	-	*Strongylocentrotus pallidus*	-	-	-	-	-	-	-	X	-	-
Echinodermata	Echinozoa	Echinoidea	Euechinoidea	Camarodonta	Strongylocentrotidae	-	*Strongylocentrotus* sp.	-	X	-	-	Y	X	Y	Y	Y	X
Echinodermata	Echinozoa	Holothuroidea	-	-	-	-	Holothuroidea indet.*	-	-	-	-	-	-	-	-	-	X
Echinodermata	Echinozoa	Holothuroidea	-	-	-	-	Holothuroidea sp. A	-	-	-	-	X	X	-	-	-	-
Echinodermata	Echinozoa	Holothuroidea	Actinopoda	Dendrochirotida	Psolidae	-	*Psolus phantapus*	-	-	-	-	X	X	-	-	-	X
Echinodermata	Echinozoa	Holothuroidea	Actinopoda	Dendrochirotida	Psolidae	-	*Psolus* sp.	-	-	-	-	-	-	Y	-	-	-
Echinodermata	Echinozoa	Holothuroidea	Actinopoda	Molpadida	-	-	Molpadida indet.	-	-	-	-	X	X	-	-	-	-
Echinodermata	Echinozoa	Holothuroidea	Actinopoda	Molpadida	Eupyrgidae	-	*Eupyrgus scaber*	-	-	-	-	-	-	X	X	-	-
Echinodermata	Echinozoa	Holothuroidea	Paractinopoda	Apodida	-	-	Apodida indet.	-	-	-	-	-	-	Y	Y	-	-
Echinodermata	Echinozoa	Holothuroidea	Paractinopoda	Apodida	Myriotrochidae	-	*Myriotrochus rinkii*	-	-	-	X	-	-	X	X	X	X
Entoprocta	-	-	-	-	-	-	Entoprocta indet.	-	-	-	-	-	-	-	X	-	-
Entoprocta	-	-	-	Coloniales	Barentsiidae	-	*Barentsia* sp.	-	-	-	-	-	-	-	X	-	-
Hemichordata	-	Enteropneusta	-	-	-	-	Enteropneusta indet.	-	-	-	-	-	-	-	X	-	-
Mollusca	-	Bivalvia	-	-	-	-	Bivalvia indet.	-	X	X	X	Y	-	X	X	X	X
Mollusca	-	Bivalvia	-	-	-	-	Bivalvia sp. A	-	-	-	X	-	-	-	-	-	-
Mollusca	-	Bivalvia	-	Galeommatida	Lasaeidae	-	Lasaeidae indet.	-	-	-	-	-	-	-	-	X	-
Mollusca	-	Bivalvia	Autobranchia	-	Cuspidariidae	-	*Cuspidaria arctica*	-	-	X	-	-	-	-	-	-	-
Mollusca	-	Bivalvia	Autobranchia	-	Cuspidariidae	-	*Cuspidaria* sp.	X	-	-	-	-	X	-	X	Y	-
Mollusca	-	Bivalvia	Autobranchia	-	Lyonsiidae	-	*Lyonsia arenosa*	-	-	-	-	X	X	X	-	X	-
Mollusca	-	Bivalvia	Autobranchia	-	Periplomatidae	-	*Periploma aleuticum*	X	-	-	-	X	X	X	X	X	X
Mollusca	-	Bivalvia	Autobranchia	-	Thraciidae	-	*Thracia myopsis*	-	-	X	X	X	X	X	X	X	X
Mollusca	-	Bivalvia	Autobranchia	-	Thraciidae	-	*Thracia* sp.	-	-	-	-	Y	X	Y	-	Y	X
Mollusca	-	Bivalvia	Autobranchia	Adapedonta	Hiatellidae	-	*Hiatella arctica*	X	X	X	X	X	X	X	X	X	X
Mollusca	-	Bivalvia	Autobranchia	Arcida	Arcidae	-	*Bathyarca glacialis*	-	-	-	-	-	X	X	X	X	X
Mollusca	-	Bivalvia	Autobranchia	Cardiida	Cardiidae	Clinocardiinae	*Ciliatocardium ciliatum*	X	-	X	X	X	X	X	X	X	X
Mollusca	-	Bivalvia	Autobranchia	Cardiida	Cardiidae	Clinocardiinae	Clinocardiinae indet.	-	-	-	-	-	-	Y	-	-	-
Mollusca	-	Bivalvia	Autobranchia	Cardiida	Cardiidae	Clinocardiinae	*Serripes groenlandicus*	-	X	X	X	X	X	X	X	X	X
Mollusca	-	Bivalvia	Autobranchia	Cardiida	Cardiidae	Clinocardiinae	*Serripes* sp.	-	X	-	-	-	-	-	-	-	-
Mollusca	-	Bivalvia	Autobranchia	Cardiida	Cardiidae	-	Cardiidae indet.	-	-	-	-	Y	-	-	X	Y	-
Mollusca	-	Bivalvia	Autobranchia	Cardiida	Tellinidae	Macominae	*Limecola balthica*	-	-	X	X	X	X	X	-	-	-
Mollusca	-	Bivalvia	Autobranchia	Cardiida	Tellinidae	Macominae	*Macoma calcarea*	X	X	X	X	X	X	X	X	X	X
Mollusca	-	Bivalvia	Autobranchia	Cardiida	Tellinidae	Macominae	*Macoma moesta*	-	-	-	-	X	X	X	X	X	X
Mollusca	-	Bivalvia	Autobranchia	Cardiida	Tellinidae	Macominae	*Macoma* sp.	-	-	-	-	Y	X	-	-	Y	-
Mollusca	-	Bivalvia	Autobranchia	Cardiida	Tellinidae	Macominae	Macominae indet.	-	-	-	-	-	-	Y	Y	Y	X
Mollusca	-	Bivalvia	Autobranchia	Carditida	Astartidae	-	*Astarte borealis*	X	X	X	X	X	X	X	X	X	X
Mollusca	-	Bivalvia	Autobranchia	Carditida	Astartidae	-	*Astarte montagui*	X	-	X	X	X	X	X	X	X	X
Mollusca	-	Bivalvia	Autobranchia	Carditida	Astartidae	-	*Astarte* sp.	X	X	X	X	Y	X	Y	X	Y	X
Mollusca	-	Bivalvia	Autobranchia	Lucinida	Thyasiridae	-	*Axinopsida serricata*	-	-	-	-	X	-	X	-	-	X
Mollusca	-	Bivalvia	Autobranchia	Lucinida	Thyasiridae	-	*Axinopsida* sp.	-	-	-	-	-	-	Y	X	Y	-
Mollusca	-	Bivalvia	Autobranchia	Lucinida	Thyasiridae	-	*Thyasira flexuosa*	-	X	X	X	-	-	-	-	-	-
Mollusca	-	Bivalvia	Autobranchia	Lucinida	Thyasiridae	-	*Thyasira gouldi*	X	-	-	-	-	-	-	-	-	-
Mollusca	-	Bivalvia	Autobranchia	Lucinida	Thyasiridae	-	*Thyasira* sp.	-	-	-	-	X	X	Y	Y	Y	X
Mollusca	-	Bivalvia	Autobranchia	Lucinida	Thyasiridae	-	Thyasiridae indet.	-	-	-	-	Y	X	Y	Y	Y	X
Mollusca	-	Bivalvia	Autobranchia	Myida	Myidae	-	*Mya arenaria*	-	-	X	X	-	-	-	-	-	-
Mollusca	-	Bivalvia	Autobranchia	Myida	Myidae	-	*Mya* sp.	-	-	-	-	Y	X	Y	Y	Y	X
Mollusca	-	Bivalvia	Autobranchia	Myida	Myidae	-	*Mya truncata*	X	X	X	X	X	X	X	X	X	X
Mollusca	-	Bivalvia	Autobranchia	Mytilida	Mytilidae	-	Mytilidae indet.	X	-	-	-	Y	X	Y	Y	Y	-
Mollusca	-	Bivalvia	Autobranchia	Mytilida	Mytilidae	Crenellinae	*Crenella faba*	X	X	X	X	X	X	-	-	-	-
Mollusca	-	Bivalvia	Autobranchia	Mytilida	Mytilidae	Crenellinae	*Crenella* sp.	-	X	-	-	-	-	-	-	-	-
Mollusca	-	Bivalvia	Autobranchia	Mytilida	Mytilidae	Dacrydiinae	*Dacrydium vitreum*	X	-	-	-	-	X	-	X	-	-
Mollusca	-	Bivalvia	Autobranchia	Mytilida	Mytilidae	Musculinae	*Musculus discors*	X	X	X	X	X	X	X	X	X	X
Mollusca	-	Bivalvia	Autobranchia	Mytilida	Mytilidae	Musculinae	*Musculus niger*	-	X	-	-	X	-	X	X	-	X

Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2010	2013	2015	2016	2017	2018	2019	2020	2021	2022
Mollusca	-	Bivalvia	Autobranchia	Mytilida	Mytilidae	Musculinae	*Musculus* sp.	X	-	-	-	Y	-	Y	X	Y	X
Mollusca	-	Bivalvia	Autobranchia	Mytilida	Mytilidae	Mytilinae	*Mytilus edulis*	-	X	-	-	-	-	-	-	-	-
Mollusca	-	Bivalvia	Autobranchia	Mytilida	Mytilidae	Mytilinae	*Mytilus* sp.	-	-	-	-	X	-	-	-	-	-
Mollusca	-	Bivalvia	Autobranchia	Pectinida	-	-	Pectinoidea indet.	-	-	-	-	Y	-	-	-	Y	X
Mollusca	-	Bivalvia	Autobranchia	Pectinida	Pectinidae	-	Pectinidae indet.	-	-	-	-	Y	X	-	X	-	-
Mollusca	-	Bivalvia	Autobranchia	Pectinida	Pectinidae	Pedinae	*Chlamys islandica*	-	-	X	X	X	X	X	X	X	-
Mollusca	-	Bivalvia	Autobranchia	Pectinida	Propeamussiidae	-	Propeamussiidae indet.	-	-	-	-	Y	X	Y	Y	Y	-
Mollusca	-	Bivalvia	Autobranchia	Pectinida	Propeamussiidae	-	*Similipecten greenlandicus*	X	-	X	X	X	X	X	X	X	X
Mollusca	-	Bivalvia	Protobranchia	Nuculanida	-	-	Nuculanida indet.	-	-	-	-	-	-	Y	-	-	-
Mollusca	-	Bivalvia	Protobranchia	Nuculanida	-	-	Nuculanoidea indet.	-	-	-	-	Y	X	-	X	Y	X
Mollusca	-	Bivalvia	Protobranchia	Nuculanida	Nuculanidae	Nuculaninae	*Nuculana minuta*	-	X	X	X	X	X	X	X	X	X
Mollusca	-	Bivalvia	Protobranchia	Nuculanida	Nuculanidae	Nuculaninae	*Nuculana pernula*	X	X	X	X	X	X	X	X	X	X
Mollusca	-	Bivalvia	Protobranchia	Nuculanida	Nuculanidae	Nuculaninae	*Nuculana* sp.	-	-	X	-	Y	X	Y	Y	Y	X
Mollusca	-	Bivalvia	Protobranchia	Nuculanida	Yoldiidae	-	*Portlandia arctica*	X	X	X	X	X	-	X	X	-	X
Mollusca	-	Bivalvia	Protobranchia	Nuculanida	Yoldiidae	-	*Yoldiella frigida*	-	-	-	-	-	X	X	X	X	X
Mollusca	-	Bivalvia	Protobranchia	Nuculanida	Yoldiidae	-	*Yoldiella intermedia*	-	-	-	-	-	X	X	-	X	X
Mollusca	-	Bivalvia	Protobranchia	Nuculanida	Yoldiidae	-	*Yoldiella lenticula*	X	-	-	-	-	X	-	-	-	-
Mollusca	-	Bivalvia	Protobranchia	Nuculanida	Yoldiidae	-	*Yoldiella nana*	X	-	-	-	-	-	-	-	-	-
Mollusca	-	Bivalvia	Protobranchia	Nuculanida	Yoldiidae	-	*Yoldiella* sp.	-	-	-	-	-	-	-	Y	Y	X
Mollusca	-	Bivalvia	Protobranchia	Nuculanida	Yoldiidae	-	Yoldiidae indet.	-	-	-	-	Y	X	Y	Y	Y	X
Mollusca	-	Bivalvia	Protobranchia	Nuculida	Nuculidae	-	*Ennucula tenuis*	X	-	-	-	X	X	X	X	X	X
Mollusca	-	Bivalvia	Protobranchia	Nuculida	Nuculidae	-	*Nucula* sp.	-	-	X	-	-	-	-	-	-	-

Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2010	2013	2015	2016	2017	2018	2019	2020	2021	2022
Mollusca	-	Bivalvia	Protobranchia	Nuculida	Nuculidae	-	*Pronucula tenuis*	-	X	X	X	-	-	-	-	-	-
Mollusca	-	Caudofoveata	-	-	-	-	Caudofoveata indet.	-	-	-	-	-	-	-	Y	Y	-
Mollusca	-	Caudofoveata	-	Chaetodermatida	Chaetodermatidae	-	*Chaetoderma* sp.	-	-	X	X	X	X	X	X	X	X
Mollusca	-	Gastropoda	-	-	-	-	Gastropoda indet.	-	-	X	-	Y	X	Y	X	Y	X
Mollusca	-	Gastropoda	-	-	-	-	Gastropoda sp. A	-	-	-	X	-	-	-	-	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Littorinimorpha	Capulidae	-	*Ariadnaria borealis*	-	-	X	X	X	X	X	X	X	X
Mollusca	-	Gastropoda	Caenogastropoda	Littorinimorpha	Naticidae	-	*Naticidae (juvenile)*	-	-	X	-	-	-	-	-	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Littorinimorpha	Naticidae	-	Naticidae indet.	-	-	-	-	-	-	Y	X	Y	-
Mollusca	-	Gastropoda	Caenogastropoda	Littorinimorpha	Naticidae	Naticinae	*Cryptonatica affinis*	-	-	X	X	X	X	-	-	X	-
Mollusca	-	Gastropoda	Caenogastropoda	Littorinimorpha	Naticidae	Naticinae	*Euspira pallida*	X	-	-	-	X	X	X	X	X	X
Mollusca	-	Gastropoda	Caenogastropoda	Littorinimorpha	Naticidae	Polinicinae	*Bulbus* sp.	-	X	-	-	-	-	-	-	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Littorinimorpha	Rissoidae	-	*Boreocingula castanea*	-	X	-	X	-	X	X	X	X	X
Mollusca	-	Gastropoda	Caenogastropoda	Littorinimorpha	Rissoidae	-	Rissoidae indet.	-	-	-	-	X	X	Y	Y	Y	X
Mollusca	-	Gastropoda	Caenogastropoda	Littorinimorpha	Skeneopsidae	-	*Skeneopsis planorbis*	-	X	-	-	-	-	-	-	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Littorinimorpha	Velutinidae	-	Velutinidae indet.	-	-	-	-	X	X	-	-	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Buccinidae	-	Buccinidae indet.	-	-	-	-	Y	X	Y	-	Y	X
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Buccinidae	-	*Buccinum ciliatum*	-	-	-	-	-	-	X	-	-	X
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Buccinidae	-	*Buccinum hydrophanum*	-	-	-	-	-	X	X	X	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Buccinidae	-	Colus sp.	-	-	-	-	X	X	-	-	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Buccinidae	-	*Volutopsius norwegicus*	-	-	-	-	X	X	-	-	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Cancellariidae	Admetinae	*Admete viridula*	-	-	-	X	-	X	X	X	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Columbellidae	-	Columbellidae indet.	-	-	-	-	-	X	-	-	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Mangeliidae	-	Mangeliidae indet.	-	-	-	-	-	-	Y	X	Y	X
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Mangeliidae	-	*Oenopota* sp.	-	-	-	X	-	X	-	-	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Mangeliidae	-	*Oenopota violacea*	-	X	X	X	-	-	-	-	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Mangeliidae	-	*Propebela* sp.	-	-	-	-	X	-	-	-	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Mangeliidae	-	*Propepela nobilis*	-	-	-	X	-	-	-	-	-	-
Mollusca	-	Gastropoda	Caenogastropoda	Neogastropoda	Turridae	-	Turridae indet.	X	-	-	-	X	-	-	-	-	-
Mollusca	-	Gastropoda	Heterobranchia	Cephalaspidea	-	-	Cephalaspidea indet.	-	-	-	-	Y	X	Y	X	Y	X
Mollusca	-	Gastropoda	Heterobranchia	Cephalaspidea	Cylichnidae	-	*Cylichna alba*	X	-	X	X	-	X	X	X	X	-
Mollusca	-	Gastropoda	Heterobranchia	Cephalaspidea	Cylichnidae	-	*Cylichna gouldi*	-	-	X	X	-	-	-	-	-	-
Mollusca	-	Gastropoda	Heterobranchia	Cephalaspidea	Cylichnidae	-	*Cylichna* sp.	-	-	-	-	X	X	Y	X	Y	-
Mollusca	-	Gastropoda	Heterobranchia	Cephalaspidea	Cylichnidae	-	Cylichnidae indet.	-	-	-	-	Y	X	Y	X	Y	X
Mollusca	-	Gastropoda	Heterobranchia	Cephalaspidea	Cylichnidae	-	*Cylichnoides occultus*	X	-	-	-	X	X	X	X	-	-
Mollusca	-	Gastropoda	Heterobranchia	Cephalaspidea	Philinidae	Philininae	Philininae indet.	-	-	-	-	-	-	X	X	-	X
Mollusca	-	Gastropoda	Heterobranchia	Cephalaspidea	Retusidae	-	*Retusa obtusa*	-	X	-	-	-	-	-	-	-	-
Mollusca	-	Gastropoda	Heterobranchia	Cephalaspidea	Retusidae	-	*Retusa* sp.	-	-	-	-	-	-	-	Y	-	-
Mollusca	-	Gastropoda	Heterobranchia	Cephalaspidea	Retusidae	-	Retusidae indet.	-	X	-	-	-	-	-	-	-	-
Mollusca	-	Gastropoda	Heterobranchia	Cephalaspidea	Tornatinidae	-	*Acteocina canaliculata*	X	-	-	-	-	-	-	-	-	X
Mollusca	-	Gastropoda	Heterobranchia	Cephalaspidea	Tornatinidae	-	*Acteocina* sp.	-	-	-	-	X	-	X	X	-	-
Mollusca	-	Gastropoda	Patellogastropoda	-	-	-	Patellogastropoda indet.	-	X	X	-	Y	-	-	X	Y	X
Mollusca	-	Gastropoda	Patellogastropoda	-	Lepetidae	-	*Lepeta caeca*	X	X	X	X	X	X	X	X	X	X
Mollusca	-	Gastropoda	Patellogastropoda	-	Lottiidae	-	*Erginus rubellus*	-	-	-	-	-	-	X	-	-	-
Mollusca	-	Gastropoda	Patellogastropoda	-	Lottiidae	-	Lottiidae indet.	-	-	-	-	X	X	-	-	-	-
Mollusca	-	Gastropoda	Patellogastropoda	-	Lottiidae	-	*Testudinalia testudinalis*	X	X	X	-	-	X	-	-	-	-
Mollusca	-	Gastropoda	Vetigastropoda	Trochida	Colloniidae	Moelleriinae	*Moelleria costulata*	-	-	-	-	X	X	-	X	-	-
Mollusca	-	Gastropoda	Vetigastropoda	Trochida	Margaritidae	-	*Margarites groenlandicus*	-	X	X	X	X	X	X	-	X	-
Mollusca	-	Gastropoda	Vetigastropoda	Trochida	Margaritidae	-	*Margarites helicinus*	-	-	-	-	X	X	X	X	-	-
Mollusca	-	Gastropoda	Vetigastropoda	Trochida	Margaritidae	-	*Margarites olivaceus*	X	-	-	-	-	X	-	X	-	-
Mollusca	-	Gastropoda	Vetigastropoda	Trochida	Margaritidae	-	*Margarites* sp.	-	-	-	-	Y	X	Y	Y	-	-
Mollusca	-	Gastropoda	Vetigastropoda	Trochida	Trochidae	-	Trochidae indet.	X	-	-	-	X	X	-	-	-	-
Mollusca	-	Polyplacophora	-	-	-	-	Polyplacophora indet.	-	-	-	-	Y	-	-	-	-	-
Mollusca	-	Polyplacophora	Neoloricata	Chitonida	Tonicellidae	Tonicellinae	*Tonicella marmorea*	X	-	X	X	X	X	X	X	X	X
Mollusca	-	Scaphopoda	-	Gadilida	Gadilidae	-	Gadilidae indet.	-	-	-	-	-	-	Y	X	-	-
Mollusca	-	Scaphopoda	-	Gadilida	Gadilidae	-	*Siphonodentalium lobatum*	-	-	-	-	-	-	X	X	X	X
Mollusca	Aculifera	Aplacophora	-	-	-	-	Aplacophora indet.	-	-	-	-	X	X	-	-	-	-
Nematoda	-	-	-	-	-	-	Nematoda indet.	-	-	-	-	-	-	-	X	-	-
Nemertea	-	-	-	-	-	-	Nemertea indet.	-	X	X	X	Y	X	Y	X	Y	X
Nemertea	-	Hoplonemertea	-	-	-	-	Hoplonemertea indet.	-	-	-	-	-	-	Y	X	Y	-
Nemertea	-	Hoplonemertea	-	Monostilifera	Amphiporidae	-	Amphiporus sp.	-	-	-	-	-	-	-	X	-	-
Nemertea	-	Hoplonemertea	-	Monostilifera	Tetrastemmatidae	-	*Tetrastemma* sp.	-	-	-	-	X	-	X	-	-	-

Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2010	2013	2015	2016	2017	2018	2019	2020	2021	2022
Nemertea	-	Hoplonemertea	-	Monostilifera	Tetrastemmatidae	-	Tetrastemmatidae indet.	-	-	-	-	-	-	-	Y	-	-
Nemertea	-	Nemertea incertae sedis	-	-	-	-	Nermertea incertae sedis indet. (Anop	-	-	-	-	Y	X	-	-	-	-
Nemertea	-	Nemertea incertae sedis	-	-	-	-	Nermertea incertae sedis indet. (Enop	-	-	-	-	Y	X	-	-	-	-
Nemertea	-	Palaeonemertea	-	-	-	-	Palaeonemertea indet.*	-	-	-	-	-	-	-	-	-	X
Nemertea	-	Palaeonemertea	-	Archinemertea	Cephalotrichidae	-	*Cephalothrix* sp.	-	-	-	-	X	X	X	X	X	X
Nemertea	-	Palaeonemertea	-	Carinomiformes	Carinomidae	-	*Carinoma* sp.	-	-	-	-	-	X	-	X	-	-
Nemertea	-	Palaeonemertea	-	Tubulaniformes	Tubulanidae	-	*Tubulanus* sp.	-	-	-	-	-	X	X	X	-	-
Nemertea	-	Pilidiophora	-	Heteronemertea	-	-	Heteronemertea indet.	-	-	-	-	-	-	Y	-	Y	X
Nemertea	-	Pilidiophora	-	Heteronemertea	Lineidae	-	*Cerebratulus* sp.	-	X	X	-	X	X	X	X	-	-
Nemertea	-	Pilidiophora	-	Heteronemertea	Lineidae	-	Lineidae indet.	-	-	-	-	-	-	Y	X	Y	X
Nemertea	-	Pilidiophora	-	Heteronemertea	Lineidae	-	*Lineus* sp.	-	-	-	-	-	-	X	X	-	-
Platyhelminthes	-	-	-	-	-	-	Platyhelminthes indet.	-	-	-	-	X	X	-	-	-	-
Porifera	-	Calcarea	-	-	-	-	Calcarea indet.*	-	-	-	-	X	X	X	X	-	-
Porifera	-	Demospongiae	-	-	-	-	Demospongiae indet.	-	-	-	-	-	-	-	X	X	-
Priapulida	-	-	-	-	-	-	Priapulida indet.	-	X	-	-	-	-	Y	Y	Y	X
Priapulida	-	-	-	Prapulomorpha	Priapulidae	-	*Priapulus caudatus*	X	-	X	X	X	X	-	X	-	X
Priapulida	-	-	-	Prapulomorpha	Priapulidae	-	*Priapulus* sp.	-	-	-	-	Y	X	Y	Y	Y	X
Sipuncula	-	-	-	-	-	-	Sipuncula indet.	-	-	X	X	-	-	-	-	-	-
Sipuncula	-	Sipunculidea	-	Golfingiida	Golfingiidae	-	*Golfingia* sp.	-	-	-	-	X	X	X	X	X	-
Sipuncula	-	Sipunculidea	-	Golfingiida	Golfingiidae	-	Golfingiidae indet.	-	-	-	-	-	-	Y	X	Y	X
Sipuncula	-	Sipunculidea	-	Golfingiida	Golfingiidae	-	*Nephasoma* sp.	-	-	-	-	X	-	X	X	-	-
XXXX	-	-	-	-	-	-	Cyclostomatida indet.	-	-	-	-	-	-	Y	-	-	-
							# New Unique Taxa each year	135	84	53	50	113	47	41	34	16	1
							TOTAL # Taxa (COUNT)	135	147	156	188	237	320	318	370	266	244

APPENDIX 8A-2

Benthic Infauna Laboratory Data

biologica

Total abundance data in matrix format, including total taxa (species richness) for WSP Golder Baffinlands Iron Mine MEEMP, 2022.

Biologica Sample ID										mb22-060-045	mb22-060-046	mb22-060-047	mb22-060-048	mb22-060-049	mb22-060-050	mb22-060-051	mb22-060-052	mb22-060-053	mb22-060-054	mb22-060-055	mb22-060-056	mb22-060-057	mb22-060-058	mb22-060-059	mb22-060-060
Client Sample ID										SE-1	SE-2	SE-3	SE-4	SW-1	SW-2	SW-3	SW-4	SNE-1	SNE-2	SNE-3	SNE-4	SNW-1	SNW-2	SNW-3	SNW-4
Date Sampled										13-Aug-22	13-Aug-22	14-Aug-22	14-Aug-22	9-Aug-22	13-Aug-22	7-Aug-22	7-Aug-22	13-Aug-22	9-Aug-22	9-Aug-22	5-Aug-22	14-Aug-22	15-Aug-22	14-Aug-22	14-Aug-22
								Grand Total		Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
taxcode	grpcode	Phylum	Class	Order	Family	Subfamily	Taxon Name	Unique Taxa	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance
ANNE	ANHI	Annelida	Clitellata				Hirudinea indet.	1	1								1								
ANNE	ANOL	Annelida	Clitellata	Enchytraeida	Enchytraeidae		Enchytraeidae indet.	1	176		16		48	48	64										
ANNE	POER	Annelida	Polychaeta	Eunicida	Dorvilleidae		Ophryotrocha sp.	1	48						48										
ANNE	POER	Annelida	Polychaeta	Eunicida	Dorvilleidae		Parougia caeca	1	16									16							
ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Lumbrineridae indet.		32	16								16							
ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma fragilis	1	1,089		32	32	16		1		16	128	240	64	112	80	32	208	128
ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma impatiens	1	624	144	128	224	48			16	64								
ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma sp.		32									32							
ANNE	POER	Annelida	Polychaeta	Eunicida	Onuphidae	Hyalinoeciinae	Nothria conchylega	1	150										16	54	27		7	11	35
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Nereimyra aphroditoides	1	2,576	80	80	336	304	704	112	592		192				176			
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nephtyidae		Aglaophamus malmgreni	1	1												1				
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nephtyidae		Micronephthys cornuta	1	1,376	16	112	144	80				176	160	176	16		112	32	208	144
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nephtyidae		Nephtys ciliata	1	22			2						2	16				1	1	
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nereididae	Nereidinae	Nereis zonata	1	62	2		18	4			1	37								
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eteoninae	Eteone longa complex	1	113	16		1		16		16		16						32	16
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eteoninae	Eteone sp.		864			64	32	432	64	128			32	16	32	32		32	
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Phyllodocinae	Phyllodoce sp.	1	32							32									
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Gattyana cirrhosa	1	231			114			16	32	65	4							
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Harmothoe imbricata	1	176		16	48		16		80						16			
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Harmothoe propinqua	1	1			1													
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Harmothoe rarispina	1	1			1													
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Harmothoe sp.		48			16	16			16									
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Hesperonoe sp.	1	129		1				16	32	16					64			
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Melaenis loveni	1	1														1		
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Polynoinae indet.		128								32	32	16					32	16
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Sigalionidae	Pholoinae	Pholoe longa	1	1,936	432	416	432	112		16	240	224	16	16			32			
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Sigalionidae	Pholoinae	Pholoe minuta	1	6,128	1,168	1,120	1,904	752	32	16	176	160	336	48			224	80	112	
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Sigalionidae	Pholoinae	Pholoe sp.		3,184		80	208	32	32		192	976	240	480	288	80	80	80	288	128
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Sphaerodoridae		Ephesiella sp.	1	16													16			
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Sphaerodoridae		Sphaerodoropsis biserialis	1	16															16	
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Sphaerodoridae		Sphaerodoropsis minuta	1	16													16			
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Syllidae	Anoplosyllinae	Streptospinigera niuqtuut	1	32									32							
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Syllidae	Autolytinae	Myrianida sp.	1	1												1				
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Syllidae	Exogoninae	Exogone sp.	1	464	16	48	144	208		16			16						16	
ANNE	POSE	Annelida	Polychaeta	Sabellida	Fabriciidae		Fabriciidae indet.		16											16					
ANNE	POSE	Annelida	Polychaeta	Sabellida	Fabriciidae		Pseudofabricia sp.	1	80														16	48	16
ANNE	POSE	Annelida	Polychaeta	Sabellida	Oweniidae		Galathowenia oculata	1	291				16					32	3	9	29	51	58	67	26
ANNE	POSE	Annelida	Polychaeta	Sabellida	Oweniidae		Myriochele heeri	1	73					1				16	2		2		49		3
ANNE	POSE	Annelida	Polychaeta	Sabellida	Oweniidae		Myriochele sp.		3											3					
ANNE	POSE	Annelida	Polychaeta	Sabellida	Oweniidae		Owenia fusiformis	1	60			32										26	2		
ANNE	POSE	Annelida	Polychaeta	Sabellida	Oweniidae		Oweniidae indet.		2			2													
ANNE	POSE	Annelida	Polychaeta	Sabellida	Sabellidae	Sabellinae	Euchone analis	1	2		2														
ANNE	POSE	Annelida	Polychaeta	Sabellida	Sabellidae	Sabellinae	Euchone incolor	1	544	16	128	128	96					48				128			
ANNE	POSE	Annelida	Polychaeta	Sabellida	Sabellidae	Sabellinae	Euchone sp.		37				16						1	1	1		17	1	
ANNE	POSE	Annelida	Polychaeta	Sabellida	Sabellidae		Dialychone sp. 1	1	256			32	32					96				80	16		
ANNE	POSE	Annelida	Polychaeta	Sabellida	Sabellidae		Sabellidae indet.		225				32		32	1	32	16			16	16	32	48	
ANNE	POSE	Annelida	Polychaeta	Sabellida	Sabellidae		Sabellidae sp. 3	1	80			16			64										
ANNE	POSE	Annelida	Polychaeta	Sedentaria	Ampharetidae		Ampharete borealis	1	16																16
ANNE	POSE	Annelida	Polychaeta	Spionida	Apistobranchidae		Apistobranchus sp.	1	32				32												
ANNE	POSE	Annelida	Polychaeta	Spionida	Spionidae		Dipolydora quadrilobata	1	96		16	48	32												
ANNE	POSE	Annelida	Polychaeta	Spionida	Spionidae		Dipolydora sp.		49			1										32			16
ANNE	POSE	Annelida	Polychaeta	Spionida	Spionidae		Marenzelleria sp.	1	32						16	16									
ANNE	POSE	Annelida	Polychaeta	Spionida	Spionidae		Prionospio sp.	1	1,297			32	64		80			368				464	225	32	32
ANNE	POSE	Annelida	Polychaeta	Spionida	Spionidae		Pygospio elegans	1	368	16		16	48		176							112			
ANNE	POSE	Annelida	Polychaeta	Spionida	Spionidae		Scolelepis sp.	1	16						16										
ANNE	POSE	Annelida	Polychaeta	Spionida	Spionidae		Spio sp.	1	97	1			32		64										
ANNE	POSE	Annelida	Polychaeta	Spionida	Spionidae		Spionidae indet.		64				16	16	16										16
ANNE	POSE	Annelida	Polychaeta	Terebellida	Ampharetidae	Ampharetinae	Ampharete sp.	1	97			16			64				16				1		
ANNE	POSE	Annelida	Polychaeta	Terebellida	Ampharetidae	Ampharetinae	Lysippe labiata	1	16			16													
ANNE	POSE	Annelida	Polychaeta	Terebellida	Ampharetidae		Ampharetidae indet.		96						32		16					32	16		
ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Aphelochaeta sp.	1	352	16								112		16		112	96		
ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Chaetozone bathyala	1	2,256	176	464	368	368	80	32	16		256	32			304	80	64	16
ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Chaetozone careyi	1	240						48	192									
ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Chaetozone pigmentata	1	261		16	5			32	16		160					32		
ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Chaetozone setosa complex	1	96		16							80							
ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Chaetozone sp.		3,312	160	288	272	96	336	208	256	192	224	208		16	656	192	160	48
ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Cirratulidae indet.		2,000	80	32	512	192	48		80	32	112	224			592	16	48	32
ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Tharyx sp.	1	32		16							16							
ANNE	POSE	Annelida	Polychaeta	Terebellida	Flabelligeridae		Diplocirrus hirsutus	1	16															16	
ANNE	POSE	Annelida	Polychaeta	Terebellida	Melinnidae		Melinna elisabethae	1	39											16	2	1	2	1	17
ANNE	POSE	Annelida	Polychaeta	Terebellida	Melinnidae		Melinna sp.		3											2	1				
ANNE	POSE	Annelida	Polychaeta	Terebellida	Pectinariidae		Cistenides granulata	1	197	66	32	34	32			16	17								
ANNE	POSE	Annelida	Polychaeta	Terebellida	Pectinariidae		Cistenides hyperborea	1	19													1		17	1
ANNE	POSE	Annelida	Polychaeta	Terebellida	Pectinariidae		Cistenides sp.		80				16	16		16	16						16		
ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae	Terebellinae	Lanassa venusta venusta	1	16													16			
ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae	Terebellinae	Laphania boecki	**1**	32		**16**	**16**													
ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae	Terebellinae	Leaena ebranchiata	**1**	1			**1**													
ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae	Terebellinae	Pista maculata	1	62	5	11	9	15			4	18								
ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae	Terebellinae	Amphitrite cirrata	1	21		1						16	4							
ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae	Terebellinae	Polycirrus sp. complex	1	1														1		
ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae		Terebellidae indet.		128			16			64			48							
ANNE	POSE	Annelida	Polychaeta	Terebellida	Trichobranchidae	Trichobranchinae	Terebellides sp.	1	990	33	148	193	147		16	16	16	292				81	32		16
ANNE	POSE	Annelida	Polychaeta		Capitellidae		Capitella capitata complex	1	48						32		16								
ANNE	POSE	Annelida	Polychaeta		Capitellidae		Mediomastus sp.	1	577	64	16	144	32	65	32			48				32	64	64	16
ANNE	POSE	Annelida	Polychaeta		Capitellidae		Notomastus sp.	1	72		16										7				49
ANNE	POSE	Annelida	Polychaeta		Cossuridae		Cossura longocirrata	1	1,040	16	96	256	48			32	64	64	176			224	48	16	
ANNE	POSE	Annelida	Polychaeta		Maldanidae	Euclymeninae	Axiothella sp.	1	1														1		
ANNE	POSE	Annelida	Polychaeta		Maldanidae	Euclymeninae	Clymenura polaris	1	176	32		32								16		32	16	16	32
ANNE	POSE	Annelida	Polychaeta		Maldanidae	Euclymeninae	Euclymeninae indet.		81							16			16			1	16		32
ANNE	POSE	Annelida	Polychaeta		Maldanidae	Euclymeninae	Praxillella gracilis	1	48				16						16				16		
ANNE	POSE	Annelida	Polychaeta		Maldanidae	Maldaninae	Maldane sarsi	1	613	33	16	227	32				65		18	1	67		68	37	49
ANNE	POSE	Annelida	Polychaeta		Maldanidae	Nicomachinae	Nicomachinae indet.		2		1													1	
ANNE	POSE	Annelida	Polychaeta		Maldanidae	Nicomachinae	Petaloproctus tenuis	1	16																16
ANNE	POSE	Annelida	Polychaeta		Maldanidae	Rhodininae	Rhodine sp.	1	16								16								
ANNE	POSE	Annelida	Polychaeta		Maldanidae		Maldanidae indet.		33			16					16				1				
ANNE	POSE	Annelida	Polychaeta		Maldanidae		Rhodine loveni	1	16															16	
ANNE	POSE	Annelida	Polychaeta		Opheliidae	Ophelininae	Ophelina cylindricaudata	1	17				17												
ANNE	POSE	Annelida	Polychaeta		Opheliidae	Opheliinae	Ophelia sp.	1	16					16											
ANNE	POSE	Annelida	Polychaeta		Orbiniidae	Orbiniinae	Leitoscoloplos sp.	1	304									48		16		48	16	112	64
ANNE	POSE	Annelida	Polychaeta		Orbiniidae	Orbiniinae	Scoloplos armiger	1	290	112	48	32	33		1	16		32				16			
ANNE	POSE	Annelida	Polychaeta		Orbiniidae	Orbiniinae	Scoloplos sp.		192	32		80	48				16								16
ANNE	POSE	Annelida	Polychaeta		Orbiniidae		Orbiniidae indet.		96								16	64					16		
ANNE	POSE	Annelida	Polychaeta		Paraonidae		Aricidea hartmanae	1	288									96	32			112	32		16

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Total abundance data in matrix format, including total taxa (species richness) for WSP Golder Baffinlands Iron Mine MEEMP, 2022.

Biologica Sample ID										**mb22-060-045**	**mb22-060-046**	**mb22-060-047**	**mb22-060-048**	**mb22-060-049**	**mb22-060-050**	**mb22-060-051**	**mb22-060-052**	**mb22-060-053**	**mb22-060-054**	**mb22-060-055**	**mb22-060-056**	**mb22-060-057**	**mb22-060-058**	**mb22-060-059**	**mb22-060-060**
Client Sample ID										**SE-1**	**SE-2**	**SE-3**	**SE-4**	**SW-1**	**SW-2**	**SW-3**	**SW-4**	**SNE-1**	**SNE-2**	**SNE-3**	**SNE-4**	**SNW-1**	**SNW-2**	**SNW-3**	**SNW-4**
Date Sampled										**13-Aug-22**	**13-Aug-22**	**14-Aug-22**	**14-Aug-22**	**9-Aug-22**	**13-Aug-22**	**7-Aug-22**	**7-Aug-22**	**13-Aug-22**	**9-Aug-22**	**9-Aug-22**	**5-Aug-22**	**14-Aug-22**	**15-Aug-22**	**14-Aug-22**	**14-Aug-22**
								Grand Total		**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**	**Total**
taxcode	**grpcode**	**Phylum**	**Class**	**Order**	**Family**	**Subfamily**	**Taxon Name**	**Unique Taxa**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**
ANNE	POSE	Annelida	Polychaeta		Paraonidae		Aricidea minuta	1	400	32	32	128	144			32						32			
ANNE	POSE	Annelida	Polychaeta		Paraonidae		Aricidea nolani	1	176			32				16						16	96		16
ANNE	POSE	Annelida	Polychaeta		Paraonidae		Aricidea sp.		176			32	48						64			16		16	
ANNE	POSE	Annelida	Polychaeta		Paraonidae		Paraonidae indet.		32						16							16			
ANNE	POSE	Annelida	Polychaeta		Scalibregmatidae		Scalibregma inflatum	1	1,136	176	160	64	96		240	16	48	192				128	16		
ARTH	CHPY	Arthropoda	Pycnogonida	Pantopoda	Nymphonidae		Nymphon sp.	1	2				1			1									
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae		Ampelisca eschrichtii	1	1			1													
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae		Ampelisca sp.		16													16			
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae		Ampeliscidae indet.		16													16			
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae		Haploops tubicola	1	65	1		48					16								
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Amphilochidae		Amphilochidae indet.	1	16				16												
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Corophiidae	Corophiinae	Crassicorophium clarencense	1	48					32	16										
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Corophiidae		Corophiidae indet.		16							16									
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Dexaminidae	Prophliantinae	Guernea nordenskioldi	1	2,224	256	352	496	512				320	192				96			
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Bathymedon sp.	1	32			32													
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Monoculopsis sp.	1	208							160	48								
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Oedicerotidae indet.		256	16	16		16	16	32			144						16	
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Paroediceros lynceus	1	64				16										16	32	
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Rostroculodes longirostris	1	16							16									
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Rostroculodes sp.		128		16	80	32												
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Westwoodilla sp.	1	32							16		16							
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Phoxocephalidae		Harpinia sp.	1	16										16						
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Phoxocephalidae		Phoxocephalidae indet.		16													16			
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Pontogeneiidae		Pontoporeia femorata	1	16			16													
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Pontoporeiidae		Monoporeia sp.	1	32			16	16												
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Tryphosidae		Orchomene sp.	1	16								16								
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Tryphosidae		Tryphosidae indet.		32			16												16	
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Uristidae		Anonyx sp.	1	32			16	16												
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Uristidae		Onisimus sp.	1	32							32									
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda			Amphipoda indet.		112	16	48								16			32			
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda			Lysianassoidea indet.		192	16	48						16	64	48						
ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.	1	1,450			26	16	384	272	624	80			16		32			
ARTH	CRCO	Arthropoda	Copepoda	Harpacticoida			Harpacticoida indet.	1	32															32	
ARTH	CRCO	Arthropoda	Hexanauplia	Calanoida			Calanoida indet.	1	32	16						16									
ARTH	CRCO	Arthropoda	Hexanauplia	Cyclopoida			Cyclopoida indet.	1	96				48	16			16		16						
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Diastylidae		Brachydiastylis resima	1	96		16	16					64								
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Diastylidae		Diastylis goodsiri	1	4										2				1		1
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Diastylidae		Diastylis rathkei	1	80	16	32	16					16								
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Diastylidae		Diastylis scorpioides	1	144	32			16					64				16			16
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Diastylidae		Diastylis sp.		400		64	160	80	16	16		16	32				16			
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Diastylidae		Diastylis spinulosa	1	16													16			
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Lampropidae		Lamprops fuscatus	1	768		80	112	128	48	112	96	160					16			16
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Lampropidae		Lamprops sp.		16	16															
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Leuconidae		Eudorella truncatula	1	128			32	32					16					32		16
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Leuconidae		Leucon nasicoides	1	640		16	32	64				176	96	64	32	16	128			16
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Leuconidae		Leucon sp.		16			16													
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Leuconidae		Leuconidae indet.		32		16		16												
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Nannastacidae		Campylaspis rubicunda	1	16										16						
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Nannastacidae		Campylaspis sp.		16										16						
ARTH	CRDE	Arthropoda	Malacostraca	Decapoda	Crangonidae		Sclerocrangon boreas	1	1								1								
ARTH	CRIS	Arthropoda	Malacostraca	Isopoda	Gnathiidae		Gnathia sp.	1	80									16		16	32				16
ARTH	CRIS	Arthropoda	Malacostraca	Isopoda	Paramunnidae		Pleurogonium sp.	1	16													16			
ARTH	CROS	Arthropoda	Ostracoda	Myodocopida	Philomedidae		Philomedes sp.	1	8,336	400	448	1248	608	16		16	1776	576	1040	48		880	464	528	288
ARTH	CRTA	Arthropoda	Malacostraca	Tanaidacea	Akanthophoreidae		Akanthophoreus sp.	1	256		16		16				128			32	16	32		16	
ARTH	CRTA	Arthropoda	Malacostraca	Tanaidacea	Pseudotanaidae		Pseudotanais sp.	1	112			16					32		16					48	
ARTH	CRTA	Arthropoda	Malacostraca	Tanaidacea	Sphyrapodidae	Pseudosphyrapodinae	Pseudosphyrapus anomalus	1	1,456				16					288	736			192	224		
ARTH	CRTA	Arthropoda	Malacostraca	Tanaidacea			Tanaidacea indet.		48			16										16	16		
ECHI	ECEC	Echinodermata	Echinoidea	Camarodonta	Strongylocentrotidae		Strongylocentrotus sp.		16													16			
ECHI	ECEC	Echinodermata	Echinoidea	Camarodonta	Strongylocentrotidae		Strongylocentrotus droebachiensis	1	14		2	3	1					8							
ECHI	ECHO	Echinodermata	Holothuroidea	Apodida	Myriotrochidae		Myriotrochus rinkii	1	17																17
ECHI	ECHO	Echinodermata	Holothuroidea	Dendrochirotida	Psolidae		Psolus phantapus	1	16													16			
ECHI	ECHO	Echinodermata	Holothuroidea				Holothuroidea indet.		32									16					16		
ECHI	ECOP	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	Ophiocten affinis	1	3										2	1					
ECHI	ECOP	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	Ophiura robusta	1	107			3					9	1	5	60	19	4		6	
ECHI	ECOP	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	Ophiura sarsii	1	14								2	1			1	2	5	3	
ECHI	ECOP	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	Ophiura sp.		196								20					16	32	64	64
ECHI	ECOP	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	Ophiuridae indet.		24										4	4		2	6	2	6
ECHI	ECOP	Echinodermata	Ophiuroidea				Ophiuroidea indet.		224					16				48	32	16	16	48	16	16	16
MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida	Escharellidae		Escharella sp.	1	1												1				
MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida			Buguloidea indet.	1	16								16								
MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida			Cheilostomatida indet.		1			1													
MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida	Crisiidae		Crisiidae indet.	1	16													16			
MISC	CNHY	Cnidaria	Hydrozoa	Anthoathecata	Bougainvilliidae		Bougainvilliidae indet.	1	32													32			
MISC	CNHY	Cnidaria	Hydrozoa	Anthoathecata			Anthoathecata indet.		32	32															
MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.	1	16						16										
MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata			Leptothecata indet.		16							16									
MISC	CNHY	Cnidaria	Hydrozoa	Limnomedusae	Monobrachiidae		Monobrachium parasitum	1	4								1		2	1					
MISC	NTEA	Nemertea	Palaeonemertea	Archinemertea	Cephalothricidae		Cephalothrix sp.	1	64	16					16							32			
MISC	NTEA	Nemertea	Palaeonemertea				Palaeonemertea indet.		32								16					16			
MISC	NTEA	Nemertea	Pilidiophora	Heteronemertea	Lineidae		Lineidae indet.	1	98	16						1		16			1		48		16
MISC	NTEA	Nemertea	Pilidiophora	Heteronemertea			Heteronemertea indet.		1												1				
MISC	NTEA	Nemertea					Nemertea indet.		64	16		32						16							
MISC	PRIA	Cephalorhyncha	Priapulida	Priapulomorpha	Priapulidae		Priapulus caudatus	1	32											16		16			
MISC	PRIA	Cephalorhyncha	Priapulida	Priapulomorpha	Priapulidae		Priapulus sp.		16									16							
MISC	PRIA	Cephalorhyncha	Priapulida				Priapulida indet.		64			32					32								
MISC	SIPN	Sipuncula	Sipunculidea	Golfingiida	Golfingiidae		Golfingiidae indet.	1	17									1						16	
MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Pyuridae		Boltenia echinata	1	1		1														
MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Styelidae		Polycarpa fibrosa	1	1							1									
MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Styelidae		Polycarpa sp.		1			1													
MISC	URAS	Chordata	Ascidiacea				Ascidiacea indet.		16								16								
MOLL	MOAP	Mollusca	Caudofoveata	Chaetodermatida	Chaetodermatidae		Chaetoderma sp.	1	114				16						32		18		48		
MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica	1	546	46	47	68	69	89	33	136	56					2			
MOLL	MOBI	Mollusca	Bivalvia	Anomalodesmata	Thraciidae		Thracia myopsis	1	1														1		
MOLL	MOBI	Mollusca	Bivalvia	Anomalodesmata	Thraciidae		Thracia sp.		17				16								1				
MOLL	MOBI	Mollusca	Bivalvia	Cardiida	Cardiidae	Clinocardiinae	Ciliatocardium ciliatum	1	8		2	2				1	3								
MOLL	MOBI	Mollusca	Bivalvia	Cardiida	Cardiidae	Clinocardiinae	Serripes groenlandicus	1	81	5	4	4	1		32	16	19								
MOLL	MOBI	Mollusca	Bivalvia	Cardiida	Tellinidae	Macominae	Macoma calcarea	1	66			8	3			4	2		7	7	5	5	11	6	8
MOLL	MOBI	Mollusca	Bivalvia	Cardiida	Tellinidae	Macominae	Macoma moesta	1	169	1	3	4				1	88		8	20	3	2	19	2	18
MOLL	MOBI	Mollusca	Bivalvia	Cardiida	Tellinidae	Macominae	Macominae indet.		129	1			32					16			16	16	16		32
MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae		Astarte borealis	1	372	49	35	103	54	13		13	98	4				3			
MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae		Astarte montagui	1	1,231	174	114	190	143	2		3	279	224	13	5		73	7	1	3
MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae		Astarte sp.		352	64	16	64	16				48	32	32			32	32		16
MOLL	MOBI	Mollusca	Bivalvia	Lucinida	Thyasiridae		Axinopsida serricata	1	48								48								

Total abundance data in matrix format, including total taxa (species richness) for WSP Golder Baffinlands Iron Mine MEEMP, 2022.

Biologica Sample ID										mb22-060-045	mb22-060-046	mb22-060-047	mb22-060-048	mb22-060-049	mb22-060-050	mb22-060-051	mb22-060-052	mb22-060-053	mb22-060-054	mb22-060-055	mb22-060-056	mb22-060-057	mb22-060-058	mb22-060-059	mb22-060-060
Client Sample ID										SE-1	SE-2	SE-3	SE-4	SW-1	SW-2	SW-3	SW-4	SNE-1	SNE-2	SNE-3	SNE-4	SNW-1	SNW-2	SNW-3	SNW-4
Date Sampled										13-Aug-22	13-Aug-22	14-Aug-22	14-Aug-22	9-Aug-22	13-Aug-22	7-Aug-22	7-Aug-22	13-Aug-22	9-Aug-22	9-Aug-22	5-Aug-22	14-Aug-22	15-Aug-22	14-Aug-22	14-Aug-22
								Grand Total		Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
taxcode	**grpcode**	**Phylum**	**Class**	**Order**	**Family**	**Subfamily**	**Taxon Name**	**Unique Taxa**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**	**Abundance**
MOLL	MOBI	Mollusca	Bivalvia	Lucinida	Thyasiridae		Thyasira sp.	1	432	32	64	16	64	32			32	48				96	32		16
MOLL	MOBI	Mollusca	Bivalvia	Lucinida	Thyasiridae		Thyasiridae indet.		208	16			32					32		16		80			32
MOLL	MOBI	Mollusca	Bivalvia	Myida	Myidae		Mya sp.		147	32				2	16	17	48					32			
MOLL	MOBI	Mollusca	Bivalvia	Myida	Myidae		Mya truncata	1	142	27	8	30	33	20		8	16								
MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors	1	1		1														
MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus niger	1	16				16												
MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Musculus sp.		16		16														
MOLL	MOBI	Mollusca	Bivalvia	Nuculanida	Nuculanidae	Nuculaninae	Nuculana minuta	1	5				3				1						1		
MOLL	MOBI	Mollusca	Bivalvia	Nuculanida	Nuculanidae	Nuculaninae	Nuculana pernula	1	331	48	18	34	64				97	36	1		1	32			
MOLL	MOBI	Mollusca	Bivalvia	Nuculanida	Nuculanidae	Nuculaninae	Nuculana sp.		192			16					96	16	16	16			32		
MOLL	MOBI	Mollusca	Bivalvia	Nuculanida	Yoldiidae		Portlandia arctica	1	1														1		
MOLL	MOBI	Mollusca	Bivalvia	Nuculanida	Yoldiidae		Yoldiella frigida	1	96										32	32			16	16	
MOLL	MOBI	Mollusca	Bivalvia	Nuculanida	Yoldiidae		Yoldiella intermedia	1	48										32					16	
MOLL	MOBI	Mollusca	Bivalvia	Nuculanida	Yoldiidae		Yoldiella sp.		144												32		48		64
MOLL	MOBI	Mollusca	Bivalvia	Nuculanida	Yoldiidae		Yoldiidae indet.		48											48					
MOLL	MOBI	Mollusca	Bivalvia	Nuculanida			Nuculanoidea indet.		64		16					16		16		16					
MOLL	MOBI	Mollusca	Bivalvia	Nuculida	Nuculidae		Ennucula tenuis	1	1,236	16		64	32			16	16	68	176	192	16	64	208	128	240
MOLL	MOBI	Mollusca	Bivalvia	Pectinida	Propeamussiidae		Similipecten greenlandicus	1	154		2	18	14	1	2		19	8	16	8		16	16	33	1
MOLL	MOBI	Mollusca	Bivalvia	Pectinida			Pectinoidea indet.		2								1								1
MOLL	MOBI	Mollusca	Bivalvia	Venerida	Arcidae		Bathyarca glacialis	1	8												4		4		
MOLL	MOBI	Mollusca	Bivalvia		Periplomatidae		Periploma aleuticum	1	6			1	2						1				2		
MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.		147	32	16						19		16				32		32
MOLL	MOGA	Mollusca	Gastropoda	Cephalaspidea	Acteonidae		Acteocina sp.	1	48	32	16														
MOLL	MOGA	Mollusca	Gastropoda	Cephalaspidea	Cylichnidae		Cylichnidae indet.	1	64														16	32	16
MOLL	MOGA	Mollusca	Gastropoda	Cephalaspidea	Philinidae	Philininae	Philininae indet.	1	17				16											1	
MOLL	MOGA	Mollusca	Gastropoda	Cephalaspidea			Cephalaspidea indet.		64										16	16				16	16
MOLL	MOGA	Mollusca	Gastropoda	Littorinimorpha	Capulidae		Ariadnaria borealis	1	16										16						
MOLL	MOGA	Mollusca	Gastropoda	Littorinimorpha	Naticidae	Polinicinae	Euspira pallida	1	18			17	1												
MOLL	MOGA	Mollusca	Gastropoda	Littorinimorpha	Rissoidae		Boreocingula castanea	1	80			32	16				32								
MOLL	MOGA	Mollusca	Gastropoda	Littorinimorpha	Rissoidae		Rissoidae indet.		32				16		16										
MOLL	MOGA	Mollusca	Gastropoda	Neogastropoda	Buccinidae		Buccinidae indet.		16	16															
MOLL	MOGA	Mollusca	Gastropoda	Neogastropoda	Buccinidae		Buccinum ciliatum	1	1				1												
MOLL	MOGA	Mollusca	Gastropoda	Neogastropoda	Mangeliidae		Mangeliidae indet.	1	16				16												
MOLL	MOGA	Mollusca	Gastropoda		Lepetidae		Lepeta caeca	1	93									52				8		16	17
MOLL	MOGA	Mollusca	Gastropoda				Gastropoda indet.		96				48				16			16				16	
MOLL	MOGA	Mollusca	Gastropoda				Patellogastropoda indet.		16											16					
MOLL	MOPO	Mollusca	Polyplacophora	Chitonida	Tonicellidae	Tonicellinae	Tonicella marmorea	1	1									1							
MOLL	MOSC	Mollusca	Scaphopoda	Gadilida	Gadilidae		Siphonodentalium lobatum	1	16																16
							Total Abundance		**65,982**	**4,412**	**5,169**	**9,651**	**5,838**	**2,561**	**2,229**	**3,552**	**6,406**	**5,842**	**4,293**	**1,184**	**594**	**6,438**	**2,955**	**2,814**	**2,044**
							Total Unique Taxa (Species Richness)	**171**		**46**	**53**	**76**	**68**	**25**	**39**	**47**	**58**	**54**	**42**	**33**	**28**	**64**	**53**	**45**	**47**
							Grab Sampler		**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**	**Van veen**
							# of Composite Grabs		**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
							Total Density (Organisms/m^2)		**219,940**	**14,707**	**17,230**	**32,170**	**19,460**	**8,537**	**7,430**	**11,840**	**21,353**	**19,473**	**14,310**	**3,947**	**1,980**	**21,460**	**9,850**	**9,380**	**6,813**
Incidental Taxa:																									
MEMO	MEMO	Nematoda					Nematoda indet.		8,848	1,376	784	1,056	688	656	16	64	1,200	96	800	352	256	368	528	496	112
MEMO	MEMO						Egg/egg mass		624	16		16		32			48	16	128		32	208	16	112	
MEMO	MEMO	Arthropoda	Insecta				Insecta indet. (terrestrial)		16																16
MEMO	MEMO	Arthropoda	Ostracoda				Ostracoda indet. (planktonic)		6,816	1,296	560	704	368	48		544	1,744	896	112	48	48	208		48	192

APPENDIX 8A-3

Benthic Infauna Laboratory Methods

Marine Benthic Enumeration and Identification Methods
Client: Golder
Project: Baffinland Iron Mine MEEMP, 2022
Protocol: EEM

Sample Inventory

Sample arrival: 6-Sept-22
Number of samples: 16
Number of jars:
Screen size: 500 µm and 1.0 cm
Biologica project number: 22-060

The chain of custody documents were checked and approved with the client. Samples were transferred from formalin into 70% ethanol and stained with Rose Bengal to aid in sorting. Each sample was provided a unique identification number and placed in the queue for analysis.

Table 1. Summary of benthic samples processed for Golder Baffinland Iron Mine MEEMP, 2022.

Client Sample ID	Date Sampled	Biologica Sample ID	# of Jars	Field Screen	Field Split	Final Split	Organisms Counted
SE-1	13-Aug-22	mb22-060-045	1	500 µm	1/4	1/16	435
			2	10,000 µm	Whole	Whole	140
SE-2	13-Aug-22	mb22-060-046	1	500 µm	1/4	1/16	397
			2	10,000 µm	Whole	Whole	161
SE-3	14-Aug-22	mb22-060-047	1	500 µm	1/4	1/16	700
			2	10,000 µm	Whole	Whole	227
SE-4	14-Aug-22	mb22-060-048	1	500 µm	1/4	1/16	423
			2	10,000 µm	Whole	Whole	126
SW-1	9-Aug-22	mb22-060-049	4	500 µm	1/4	1/16	201
			2	10,000 µm	Whole	Whole	81
SW-2	13-Aug-22	mb22-060-050	1	500 µm	1/4	1/16	140
			1	10,000 µm	Whole	Whole	5
SW-3	7-Aug-22	mb22-060-051	1	500 µm	1/4	1/16	255
			1	10,000 µm	Whole	Whole	80
SW-4	7-Aug-22	mb22-060-052	1	500 µm	1/4	1/16	576
			2	10,000 µm	Whole	Whole	182
SNE-1	13-Aug-22	mb22-060-053	2	500 µm	1/4	1/16	420
			1	10,000 µm	1/4	1/4	31
			2	10,000 µm	Whole	Whole	6
SNE-2	9-Aug-22	mb22-060-054	1	500 µm	1/4	1/16	330
			1	10,000 µm	Whole	Whole	53
SNE-3	9-Aug-22	mb22-060-055	1	500 µm	1/4	1/16	95
			1	10,000 µm	Whole	Whole	64
SNE-4	5-Aug-22	mb22-060-056	1	500 µm	1/4	1/16	53

Client Sample ID	Date Sampled	Biologica Sample ID	# of Jars	Field Screen	Field Split	Final Split	Organisms Counted
			2	10,000 µm	Whole	Whole	82
SNW-1	14-Aug-22	mb22-060-057	2	500 µm	1/4	1/16	447
			2	10,000 µm	Whole	Whole	70
SNW-2	15-Aug-22	mb22-060-058	1	500 µm	1/4	1/16	213
			1	10,000 µm	Whole	Whole	91
SNW-3	14-Aug-22	mb22-060-059	1	500 µm	1/4	1/16	214
			1	10,000 µm	Whole	Whole	46
SNW-4	14-Aug-22	mb22-060-060	2	500 µm	1/4	1/16	145
			1	10,000 µm	Whole	Whole	44

Sample Processing

Sorting and Subsampling:

All samples were sorted using dissecting microscopes at 10–40x magnification by trained personnel. Microscopic sorting is the only way to ensure >90% of organisms are removed from the debris, which is required by EEM (Environment Canada; Environmental Effects Monitoring) guidelines for marine benthic analyses. To minimize potential sorter bias, samples were distributed among technicians such that no one person sorted all the replicates of a given sample.

Due to historically the large volumes and high abundances in the samples, samples were fractioned in the field into a 1.0 cm macro fraction and 500 µm fine fraction. This strategy was developed to maximize the detection of large and rare individuals in the macro fraction while accurately enumerating smaller organisms in the fine fraction. The macro 1.0 cm fraction was analyzed whole, with all large organisms (>1.0 cm) removed from the sample, as was done in 2020 and 2021. One exception was sample SNE-1, which had the 1.0 cm fraction split in the field and had both a whole and ¼ split portion, both portions of this sample were checked in their entirety. The abundances of these large organisms should be comparable to historical estimates (SEM Ltd., 2016; Biologica, 2017–2019). In addition, all large debris in this fraction were checked microscopically, including rocks and other large debris to ensure encrusting organisms were accurately enumerated.

Biologica subsampled the fine 500 µm fraction. The 500 µm fraction was split in the field to 1/4. Biologica subsequently split this fraction by a second 1/4, for a final 1/16 split. Subsampling was done with a Caton tray (Caton, 1991). The sample was spread evenly over a Caton grid, and sequential random quadrats were selected and sorted until the minimum 1/4 lab split was reached.

Sub-sampling accuracy was assessed by sorting the remaining sample for 10% of all sub-sampled samples and comparing the fractions to one another. Refer to Table 2 for sub-sampling accuracy results.

Sorting QA/QC:

To ensure sorting efficiency was >95%, whole and/or partial sub-samples were re-sorted. Sorting efficiency was calculated using the following equation (where total count = final total number of organisms in sample):

Sorting efficiency = [1−(# of organisms in spot check or re-sort / total organisms)] x 100
*Total organisms includes the original count and the number found from the re-sort

Sorting efficiency QA/QC was performed on 19% of samples. 25% of the debris was re-sorted for the selected samples. All samples checked must meet or exceed 95% sorting efficiency. Any samples falling below 95% sorting efficiency were re-sorted in their entirety, and additional checks were undertaken as necessary. For quality assurance, QA re-sorts were performed on 10% of samples. Two samples were randomly selected and re-sorted in their entirety. Refer to Table 2 for sorting efficiency results.

Table 2. Summary of sorting QA/QC results for Golder Baffinland Iron Mine MEEMP, 2022.

Client Sample ID	Biologica Sample ID	Sorting Efficiency QA Whole Re-sorts	Subsampling Accuracy
SE-1	mb22-060-045		
SE-2	mb22-060-046		
SE-3	mb22-060-047		
SE-4	mb22-060-048	98.23%	85.06%
SW-1	mb22-060-049		
SW-2	mb22-060-050		
SW-3	mb22-060-051		
SW-4	mb22-060-052		
SNE-1	mb22-060-053	99.46%	
SNE-2	mb22-060-054		94.48%
SNE-3	mb22-060-055		
SNE-4	mb22-060-056		
SNW-1	mb22-060-057		
SNW-2	mb22-060-058		
SNW-3	mb22-060-059		
SNW-4	mb22-060-060		
	Average:	**98.85%**	**89.77%**

Identification and Invasive Species Detection:

All organisms were identified using a combination of dissecting (10–40x) and compound microscopes (100–1000x) and standard taxonomic keys (see methodological and taxonomic references) to the lowest practicable level (species whenever possible). All specimens were archived in air-tight glass vials with glycerin and 70% ethanol for long-term storage. Taxonomic data were recorded in Biologica's custom database.

During the identification process, taxonomists recorded if any identified taxa were beyond their recorded range and/or potentially introduced (originating from another location) or invasive (both introduced and appearing to proliferate with possible detrimental effects to the ecosystem and/or industry). One genus of interest over the past several years of sampling has been *Marenzelleria.* Multiple specimens were externally verified by DNA analysis by Dr. Vasily Radashevsky from the National Scientific Center of Marine Biology and were confirmed to be *Marenzelleria wireni*. Historical identifications can all be taken to this species identification.

No taxa observed were identified as putative invasive taxa. One new taxa to the project was identified, *Myrianida* sp., which has been described and identified in the arctic and Baffinlands region. There were also a few levels of identification that were new to the project, however all of these identifications have been present at a lower level (genus/species) in the past.

Data Management and Analysis

All data were recorded in Biologica's custom database. Total abundances were extrapolated for samples split in the field to represent the abundance from the whole sample. Organism densities were calculated by dividing the total organism abundance (extrapolated if the sample was split) using the area of a Van Veen grab (0.1 m^2), with three composite Van Veen grabs (3 x 0.1m^2) for each sample.

Results were provided to the Golder project manager in Excel spreadsheets via email.

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APPENDIX 8B-1

Incidental Taxa Identifications 2022

Phylum Class/Order	Family	Taxa	Method
Annelida			
Polychaeta/-	-	Polychaeta indet.	Fish Stomachs, Quadrats
Polychaeta/Phyllodocida	Nereididae	*Nereis zonata*	Quadrats
Polychaeta/Phyllodocida	Polynoidae	*Harmothoe* sp.	Quadrats
Polychaeta/Terebellida	Pectinariidae	*Cistenides granulata*	Quadrats
Polychaeta/Terebellida	Terebellidae	*Pista maculata*	Quadrats
Polychaeta/Phyllodocida	Nereididae	Nereididae indet.	Fish Stomachs
Polychaeta/Sabellida	Sabellidae	Sabellidae indet.	Quadrats
Polychaeta/Terebellida	Pectinariidae	Pectinariidae indet.	Fish Stomachs
Errantia/Lumbrineridae	-	Lumbrineridae indet.	Fish Stomachs
Errantia/Nephtyidae	-	*Nephtys* sp.	Fish Stomachs
Errantia/Phyllodocidae	-	Phyllodocidae indet.	Fish Stomachs
Arthropoda			
-/-	-	Crustacea indet.	Fish Stomachs
Hexanauplia/Calanoida	-	Calanoida indet.	Fish Stomachs
Hexanauplia/Calanoida	Calanidae	*Calanus hyperboreus*	Fish Stomachs
Hexanauplii/Calanoida	Calanidae	*Calanus glacialis*	Fish Stomachs
Hexanauplii/Calanoida	Calanidae	*Calanus* sp.	Fish Stomachs
Malacostraca/Amphipoda	-	Amphipoda indet.	Fish Stomachs
Malacostraca/Amphipoda	-	Hyperiidea indet.	Fish Stomachs
Malacostraca/Amphipoda	-	Lysianassoidea indet.	Fish Stomachs
Malacostraca/Amphipoda	Atylidae	*Atylus carinatus*	Fish Stomachs
Malacostraca/Amphipoda	Gammaridae	*Gammarus* sp.	Fish Stomachs
Malacostraca/Amphipoda	Hyperiidae	*Themisto* sp.	Fish Stomachs
Malacostraca/Amphipoda	Oedicerotidae	*Westwoodilla* sp.	Fish Stomachs
Malacostraca/Amphipoda	Uristidae	*Onisimus* sp.	Fish Stomachs
Malacostraca/Mysida	-	Mysida indet.	Fish Stomachs
Malacostraca/Mysida	Mysidae	*Mysis* sp.	Fish Stomachs
Thecostraca/Balanomorpha	Balanidae	***Balanus crenatus***	Incidentals (Trawl)
Chaetognatha			
-/-	-	Chaetognatha indet.	Fish Stomachs
Chlorophyta			
-/-	-	Chlorophyta indet.	Quadrats
Ulvophyceae/Cladophorales	Cladophoraceae	*Chaetomorpha melagonium*	Quadrats
Chordata			
Ascidiacea/Phlebobranchia	Ascidiidae	*Ascidia* sp.	Incidentals (Trawl)
Ascidiacea/Stolidobranchia	Pyuridae	***Halocynthia pyriformis***	Incidentals (Trawl)
Ascidiacea/Stolidobranchia	Styelidae	*Polycarpa* sp.	Quadrats
Actinopterygii/-	-	Pisces indet.	Fish Stomachs
Actinopterygii/Perciformes	Cottidae	Cottidae indet.	Fishing Efforts, Fish Stomachs
Actinopterygii/Perciformes	Cottidae	*Gymnocanthus tricuspis*	Fishing Efforts
Actinopterygii/Perciformes	Cottidae	***Icelus spatula***	Fishing Efforts
Actinopterygii/Perciformes	Cottidae	*Myoxocephalus quadricornis*	Quadrats, Fishing Efforts
Actinopterygii/Perciformes	Cottidae	*Myoxocephalus scorpioides*	Fishing Efforts
Actinopterygii/Perciformes	Cottidae	*Myoxocephalus scorpius*	Quadrats, Fishing Efforts
Actinopterygii/Perciformes	Cottidae	*Triglops pingelii*	Fishing Efforts
Actinopterygii/Perciformes	Cyclopteridae	*Cyclopterus lumpus*	Quadrats
Actinopterygii/Perciformes	Gadidae	Gadidae indet.	Fishing Efforts
Actinopterygii/Perciformes	Gadidae	*Gadus ogac*	Fishing Efforts
Actinopterygii/Perciformes	Salmonidae	*Salvelinus alpinus*	Fishing Efforts
Actinopterygii/Perciformes	Zoarcidae	***Gymnelus hemifasciatus***	Fishing Efforts
Actinopterygii/Perciformes	Zoarcidae	*Lycodes mucosus*	Quadrats, Fishing Efforts
Cnidaria			
Anthozoa/Actiniaria	Actinostolidae	***Stomphia* sp.**	Incidentals (Trawl)
Anthozoa/-	-	Ceriantharia indet.	Quadrats

Phylum Class/Order	Family	Taxa	Method
Echinodermata			
Echinoidea/Camarodonta	Strongylocentrotidae	*Strongylocentrotus droebachiensis*	Quadrats
Holothuroidea/-	-	Holothuroidea indet.	Quadrats
Ophiuroidea/Ophiurida	Ophiuridae	Ophiuridae indet.	Quadrats
Mollusca			
Bivalvia/-	-	Bivalvia indet.	Fish Stomachs
Bivalvia/Adapedonta	Hiatellidae	*Hiatella arctica*	Quadrats
Bivalvia/Cardiida	Cardiidae	*Serripes groenlandicus*	Quadrats
Bivalvia/Carditida	Astartidae	*Astarte borealis*	Quadrats
Bivalvia/Carditida	Astartidae	*Astarte* sp.	Quadrats
Bivalvia/Myida	Myidae	*Mya* sp.	Quadrats
Bivalvia/Myida	Myidae	*Mya truncata*	Quadrats
Bivalvia/Mytilida	-	Mytilida indet.	Quadrats
Bivalvia/Mytilida	Mytilidae	*Musculus discors*	Quadrats
Bivalvia/Adapedonta	Hiatellidae	*Hiatella* sp.	Fish Stomachs
Bivalvia/Pectinida	Pectinidae	*Chlamys islandica*	Quadrats
Bivalvia/Pectinida	Propeamussiidae	*Similipecten greenlandicus*	Quadrats
Gastropoda/-	-	Gastropoda indet.	Fish Stomachs
Gastropoda/Neogastropoda	Buccinidae	*Colus* sp.	Incidentals (Trawl)
Gastropoda/Nudibranchia	Dendronotidae	*Dendronotus* sp.	Incidentals (Trawl)
Gastropoda/Nudibranchia	-	Nudibranchia Indet.	Quadrats
Gastropoda/Pteropoda	Limacinidae	*Limacina* sp.	Fish Stomachs
Gastropoda/Trochida	Margaritidae	*Margarites groenlandicus umbilicalis*	Incidentals (Trawl)
Gastropoda/Trochida	Margaritidae	*Margarites* sp.	Quadrats
Nemertea			
-/-	-	Nemertea indet.	Quadrats
Ochrophyta			
-/-	-	Ochrophyta indet.	Quadrats
Phaeophyceae/Desmarestiales	Desmarestiaceae	*Desmarestia* sp.	Quadrats
Phaeophyceae/Ectocarpales	Acinetosporaceae	*Pylaiella* sp.	Quadrats
Phaeophyceae/Fucales	Fucaceae	*Fucus distichus*	Quadrats
Phaeophyceae/Laminariales	Agaraceae	*Agarum clathratum*	Quadrats
Phaeophyceae/Laminariales	Laminariaceae	*Saccharina latissima*	Quadrats
Phaeophyceae/Sphacelariales	Sphacelariaceae	*Battersia* sp.	Quadrats
Platyhelminthes			
Cestoda/-	-	**Cestoda indet.**	Fish Stomachs
Rhodophyta			
-/-	-	Rhodophyta indet.	Quadrats
Florideophyceae/Ceramiales	Rhodomelaceae	*Savoiea arctica*	Algae Collections
Florideophyceae/Gigartinales	Phyllophoraceae	*Coccotylus truncatus*	Quadrats

Notes: taxa identified to the lowest practical taxonomic level; indet.= indeterminate (taxa which could not be identified beyond the taxonomic level listed); sp.=species; cf.=compare with (taxa is an inexact match to the designated taxa).
Taxa in bold indicate new observations in MEEMP and NIS/AIS programs
All taxa cross-referenced with NIS/AIS resources: Fofonoff et al. 2022, ISSG 2022, Rius et al. 2022, Molnar et al. 2008, Casas-Monroy et al. 2014

APPENDIX 8B-2

Quadrat and Trawl Laboratory Data

biologica

Raw abundance data in long format for Golder Baffinlands, 2022 Quadrat Trawl.

Client	Project	Year	Sample Type	Split	Biologica Sample ID	Client Sample ID	Date Sampled	taxcode	grpcode	Phylum	Class	Order	Family	Subfamily	Taxon Name	A	Int	J	Total Abundance	Unique Taxa Count	Comments
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-125	Q5	2-Aug-22	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nereididae	Nereidinae	Nereis zonata	1			1	1	In tube
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-125	Q5	2-Aug-22	ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae	Terebellinae	Pista maculata	1			1	1	In tube
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-126	Q8	4-Aug-22	MEMO	MEMO	Mollusca	Bivalvia	Carditida	Astartidae		Astarte borealis (dead)	2			2		Dead, shell only
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-127	Q11	6-Aug-22	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors	2			2	1	
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-128	Q14	6-Aug-22	MOLL	MOBI	Mollusca	Bivalvia	Cardiida	Cardiidae	Clinocardiinae	Serripes groenlandicus		2		2	1	
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-128	Q14	6-Aug-22	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Harmothoe sp.	1			1	1	Damaged, no elytra
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-129	TR01	15-Aug-22	MOLL	MOGA	Mollusca	Gastropoda	Trochida	Margaritidae		Margarites groenlandicus umbilicalis	1			1	1	
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-130	TR01	15-Aug-22	MISC	PIXX	Chordata	Actinopterygii (Pisces)	Scorpaeniformes	Cottidae		Cottidae indet.			1	1	1	
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-131	TR01	15-Aug-22	MISC	PIXX	Chordata	Actinopterygii (Pisces)	Scorpaeniformes	Cottidae		Icelus spatula	2			2	1	Spatulate sculpin
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-132	TR02	15-Aug-22	MISC	CNAN	Cnidaria	Anthozoa	Actiniaria	Actinostolidae		Stomphia sp.	1			1	1	Attached to Colus sp.
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-132	TR02	15-Aug-22	MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Pyuridae		Halocynthia pyriformis	1			1	1	
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-132	TR02	15-Aug-22	MISC	URAS	Chordata	Ascidiacea	Phlebobranchia	Ascidiidae		Ascidia sp.	1			1	1	
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-132	TR02	15-Aug-22	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanus crenatus	2			2	1	
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-132	TR02	15-Aug-22	MOLL	MOGA	Mollusca	Gastropoda	Neogastropoda	Buccinidae		Colus sp.	1			1	1	Almost completely covered by Stomphia sp.
Golder	Baffinlands	2022	Quadrat Trawl	Whole	mb22-060-132	TR02	15-Aug-22	MOLL	MOGA	Mollusca	Gastropoda	Nudibranchia	Dendronotidae		Dendronotus sp.	1			1	1	

APPENDIX 8B-3

Quadrat Algae Laboratory Data

Raw abundance data in long format for Golder Baffinlands, 2022 Algae.

Client	Project	Year	Sample Type	Split	Biologica Sample ID	Client Sample ID	Date Sampled	Phylum	Class	Order	Family	Taxon Name	ID Comment	Comments
Golder	Baffinlands	2022	Algae	Whole	mb22-060-133	Q5	2-Aug-22	Rhodophyta	Florideophyceae	Ceramiales	Rhodomelaceae	Savoiea arctica	Red Algae	Ethanol preserved, red algae
Golder	Baffinlands	2022	Algae	Whole	mb22-060-133	Q5	2-Aug-22	Rhodophyta	Florideophyceae	Ceramiales	Rhodomelaceae	Savoiea arctica	Red Algae	Pressed red algae
Golder	Baffinlands	2022	Algae	Whole	mb22-060-134	Q8	4-Aug-22	Rhodophyta	Florideophyceae	Ceramiales	Rhodomelaceae	Savoiea arctica	Red Algae	Ethanol preserved, red algae
Golder	Baffinlands	2022	Algae	Whole	mb22-060-135	Q21	7-Aug-22	n/a	n/a	n/a	n/a	Not algae	Possibly moss	Ethanol/formalin preserved, brown fuzzy algae
Golder	Baffinlands	2022	Algae	Whole	mb22-060-135	Q21	7-Aug-22	n/a	n/a	n/a	n/a	Not algae	Possibly moss	Pressed brown fuzzy algae

APPENDIX 8B-4

Fish Stomach Laboratory Data

biologica

Abundance and biomass data in long format for WSP Golder Baffinland Iron Mine MEEMP, 2022

Client	Project	Year	Fish	Biologica Sample ID	Client Sample ID	Date Sampled	% Fullness	%Material Digested	Full Stomach Weight (g)	Source	GroupCode	Phylum	Subphylum	Class	Subclass	Order	Family	Taxon	Stage	Total Abundance	Total WW (g)	WW/Individual (g)	Total Unique Taxa	Comments	Processing Note
WSP Golder	22-060	2022	Arctic char	ms22-060-136	BAFF22UDPFARCH4001	01-Aug-22	75	25	28.22877	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	A/parts	178	3.52697	0.01981	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-136	BAFF22UDPFARCH4001	01-Aug-22	75	25	28.22877	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	Onisimus sp.	A/parts	7	0.19860	0.02837	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-136	BAFF22UDPFARCH4001	01-Aug-22	75	25	28.22877	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	Onisimus sp.	Int	2	0.00394	0.00197			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-136	BAFF22UDPFARCH4001	01-Aug-22	75	25	28.22877	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Hyperiidea indet.	Parts		10.93050	10.93050			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-136	BAFF22UDPFARCH4001	01-Aug-22	75	25	28.22877	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus glacialis	A/parts	554	2.78943	0.00504	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-136	BAFF22UDPFARCH4001	01-Aug-22	75	25	28.22877	Planktonic	MOGA	Mollusca		Gastropoda				Gastropoda indet.	A/parts	2	0.01211	0.00606	1	Likely Limacina sp.	Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-136	BAFF22UDPFARCH4001	01-Aug-22	75	25	28.22877	Undetermined	PIXX	Chordata	Vertebrata	Actinopterygii				Pisces indet.	Parts	1	0.02398	0.02398	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-136	BAFF22UDPFARCH4001	01-Aug-22	75	25	28.22877	Parasite	PLTY	Platyhelminthes	Rhabditophora	Cestoda				Cestoda indet.	A/parts		n/a	n/a		Parasite found outside stomach	Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-136	BAFF22UDPFARCH4001	01-Aug-22	75	25	28.22877	Undetermined	XXXX							Unidentified tissue	Parts		0.09521	0.09521			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-137	BAFF22UDPFARCH4002	01-Aug-22	10	75	19.23652	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	Onisimus sp.	Int	2	0.05175	0.02588	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-137	BAFF22UDPFARCH4002	01-Aug-22	10	75	19.23652	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus glacialis	A	15	0.05601	0.00373	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-137	BAFF22UDPFARCH4002	01-Aug-22	10	75	19.23652	Undetermined	CRXX	Arthropoda	Crustacea					Crustacea indet.	Parts		0.04636	0.04636			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-137	BAFF22UDPFARCH4002	01-Aug-22	10	75	19.23652	Undetermined	PIXX	Chordata	Vertebrata	Actinopterygii				Pisces indet.	Parts	1	0.18281	0.18281	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-137	BAFF22UDPFARCH4002	01-Aug-22	10	75	19.23652	Parasite	PLTY	Platyhelminthes	Rhabditophora	Cestoda				Cestoda indet.	A	9	n/a	n/a		Parasite found outside stomach	Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-138	BAFF22UDPFARCH4003	01-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Arctic char	ms22-060-139	BAFF22UDPFARCH4004	01-Aug-22	10	25	36.26076	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	A	3	0.05560	0.01853	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-139	BAFF22UDPFARCH4004	01-Aug-22	10	25	36.26076	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	Onisimus sp.	Int	4	0.10283	0.02571	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-139	BAFF22UDPFARCH4004	01-Aug-22	10	25	36.26076	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus glacialis	A	2	0.00699	0.00350	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-139	BAFF22UDPFARCH4004	01-Aug-22	10	25	36.26076	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida		Mysida indet.	Parts	2	0.03092	0.01546	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-139	BAFF22UDPFARCH4004	01-Aug-22	10	25	36.26076	Undetermined	CRXX	Arthropoda	Crustacea					Crustacea indet.	Parts		0.00964	0.00964			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-139	BAFF22UDPFARCH4004	01-Aug-22	10	25	36.26076	Planktonic	MOGA	Mollusca		Gastropoda				Gastropoda indet.	A	1	0.00243	0.00243	1	Likely Limacina sp.	Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-139	BAFF22UDPFARCH4004	01-Aug-22	10	25	36.26076	Undetermined	PIXX	Chordata	Vertebrata	Actinopterygii				Pisces indet.	Parts		0.15606	0.15606	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-139	BAFF22UDPFARCH4004	01-Aug-22	10	25	36.26076	Undetermined	XXXX							Unidentified tissue	Parts		0.01906	0.01906			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-140	BAFF22UDPFARCH4005	01-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Arctic char	ms22-060-141	BAFF22UDPFARCH4006	01-Aug-22	0	100	12.08173	Planktonic	CHAE	Chaetognatha						Chaetognatha indet.	A	240	1.19760	0.00499	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-141	BAFF22UDPFARCH4006	01-Aug-22	0	100	12.08173	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	A	6	0.13107	0.02185	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-141	BAFF22UDPFARCH4006	01-Aug-22	0	100	12.08173	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	Int	2	0.01302	0.00651			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-141	BAFF22UDPFARCH4006	01-Aug-22	0	100	12.08173	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus glacialis	A	42	0.29742	0.00708	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-141	BAFF22UDPFARCH4006	01-Aug-22	0	100	12.08173	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	Mysis sp.	Parts	2	0.01846	0.00923	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-141	BAFF22UDPFARCH4006	01-Aug-22	0	100	12.08173	Undetermined	CRXX	Arthropoda	Crustacea					Crustacea indet.	Parts		0.00668	0.00668			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-141	BAFF22UDPFARCH4006	01-Aug-22	0	100	12.08173	Planktonic	MOGA	Mollusca		Gastropoda				Gastropoda indet.	A	2	0.00746	0.00373	1	Likely Limacina sp.	Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-141	BAFF22UDPFARCH4006	01-Aug-22	0	100	12.08173	Undetermined	PIXX	Chordata	Vertebrata	Actinopterygii		Scorpaeniformes	Cottidae	Cottidae indet.	J	1	0.04218	0.04218	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-141	BAFF22UDPFARCH4006	01-Aug-22	0	100	12.08173	Undetermined	XXXX							Unidentified tissue	Parts		0.21462	0.21462			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-142	BAFF22UDPFARCH4007	01-Aug-22	75	75	47.12631	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplia	Copepoda	Calanoida		Calanoida indet.	Parts		5.31158	5.31158			Multiple cysts from parasites
WSP Golder	22-060	2022	Arctic char	ms22-060-142	BAFF22UDPFARCH4007	01-Aug-22	75	75	47.12631	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus glacialis	A	196	2.05593	0.01049	1		Multiple cysts from parasites
WSP Golder	22-060	2022	Arctic char	ms22-060-142	BAFF22UDPFARCH4007	01-Aug-22	75	75	47.12631	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida		Mysida indet.	A/parts	11	0.08551	0.00777	1		Multiple cysts from parasites
WSP Golder	22-060	2022	Arctic char	ms22-060-143	BAFF22UDPFARCH4008	01-Aug-22	100	50	37.06238	Benthic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Lysianassoidea indet.	Int	1	0.00316	0.00316	1		Cysts with parasites on the outside of the stomach
WSP Golder	22-060	2022	Arctic char	ms22-060-143	BAFF22UDPFARCH4008	01-Aug-22	100	50	37.06238	Undetermined	PIXX	Chordata	Vertebrata	Actinopterygii				Pisces indet.	Parts	1	11.54032	11.54032	1		Cysts with parasites on the outside of the stomach
WSP Golder	22-060	2022	Arctic char	ms22-060-144	BAFF22UDPFARCH4009	01-Aug-22	75	75	13.16472	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	A	98	1.90763	0.01947	1		
WSP Golder	22-060	2022	Arctic char	ms22-060-144	BAFF22UDPFARCH4009	01-Aug-22	75	75	13.16472	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus sp.	A	4	0.01411	0.00353	1		
WSP Golder	22-060	2022	Arctic char	ms22-060-144	BAFF22UDPFARCH4009	01-Aug-22	75	75	13.16472	Undetermined	CRXX	Arthropoda	Crustacea					Crustacea indet.	Parts		4.78919	4.78919			
WSP Golder	22-060	2022	Arctic char	ms22-060-144	BAFF22UDPFARCH4009	01-Aug-22	75	75	13.16472	Undetermined	XXXX							Unidentified tissue	Parts		0.17964	0.17964			
WSP Golder	22-060	2022	Arctic char	ms22-060-145	BAFF22UDPFARCH4010	04-Aug-22	75	75	34.69561	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	A	27	0.40074	0.01484	1		Multiple cysts on outside of stomach, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-145	BAFF22UDPFARCH4010	04-Aug-22	75	75	34.69561	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus sp.	A	18	0.07351	0.00408	1		Multiple cysts on outside of stomach, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-145	BAFF22UDPFARCH4010	04-Aug-22	75	75	34.69561	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida		Mysida indet.	Int	2	0.01509	0.00755	1		Multiple cysts on outside of stomach, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-145	BAFF22UDPFARCH4010	04-Aug-22	75	75	34.69561	Undetermined	CRXX	Arthropoda	Crustacea					Crustacea indet.	Parts		6.32418	6.32418			Multiple cysts on outside of stomach, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-145	BAFF22UDPFARCH4010	04-Aug-22	75	75	34.69561	Parasite	PLTY	Platyhelminthes	Rhabditophora	Cestoda				Cestoda indet.	A/parts		n/a	n/a		Parasite found outside stomach	Multiple cysts on outside of stomach, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-145	BAFF22UDPFARCH4010	04-Aug-22	75	75	34.69561	Undetermined	XXXX							Unidentified tissue	Parts		0.71343	0.71343			Multiple cysts on outside of stomach, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-146	BAFF22UDPFARCH4011	11-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Arctic char	ms22-060-147	BAFF22UDPFARCH4012	11-Aug-22	50	75	5.90992	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	A	5	0.07688	0.01538	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-147	BAFF22UDPFARCH4012	11-Aug-22	50	75	5.90992	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Hyperiidea indet.	A	1	0.02362	0.02362			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-147	BAFF22UDPFARCH4012	11-Aug-22	50	75	5.90992	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida		Mysida indet.	Int	1	0.00847	0.00847	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-147	BAFF22UDPFARCH4012	11-Aug-22	50	75	5.90992	Undetermined	CRXX	Arthropoda	Crustacea					Crustacea indet.	Parts		0.71357	0.68911			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Arctic char	ms22-060-148	BAFF22UDPFARCH4013	11-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Arctic char	ms22-060-149	BAFF22UDPFARCH4014	13-Aug-22	100	50	13.28410	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	A	2	0.07644	0.03822	1		Large cuts on both ends of the stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-149	BAFF22UDPFARCH4014	13-Aug-22	100	50	13.28410	Benthic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Amphipoda indet.	A/parts	1	0.00173	0.00173			Large cuts on both ends of the stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-149	BAFF22UDPFARCH4014	13-Aug-22	100	50	13.28410	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Hyperiidea indet.	A/parts	15	0.42402	0.02827			Large cuts on both ends of the stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-149	BAFF22UDPFARCH4014	13-Aug-22	100	50	13.28410	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida		Mysida indet.	Int/parts	11	0.14166	0.01288	1		Large cuts on both ends of the stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-149	BAFF22UDPFARCH4014	13-Aug-22	100	50	13.28410	Planktonic	CRXX	Arthropoda	Crustacea					Crustacea indet.	A/parts		0.81296	0.81296			Large cuts on both ends of the stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-149	BAFF22UDPFARCH4014	13-Aug-22	100	50	13.28410	Planktonic	MOGA	Mollusca		Gastropoda				Gastropoda indet.	A/parts	202	1.46236	0.00724	1	Likely Limacina sp.	Large cuts on both ends of the stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-149	BAFF22UDPFARCH4014	13-Aug-22	100	50	13.28410	n/a	PIXX	Chordata	Vertebrata	Actinopterygii				Pisces indet.	Parts		0.11054	0.11054	1		Large cuts on both ends of the stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-149	BAFF22UDPFARCH4014	13-Aug-22	100	50	13.28410	Undetermined	XXXX							Unidentified tissue	Parts		3.00385	3.00385			Large cuts on both ends of the stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-150	BAFF22UDPFARCH4015	13-Aug-22	100	75	17.89527	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Hyperiidea indet.	A	80	1.91046	0.02388	1		
WSP Golder	22-060	2022	Arctic char	ms22-060-150	BAFF22UDPFARCH4015	13-Aug-22	100	75	17.89527	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida		Mysida indet.	Int	19	0.07806	0.00411	1		
WSP Golder	22-060	2022	Arctic char	ms22-060-150	BAFF22UDPFARCH4015	13-Aug-22	100	75	17.89527	Undetermined	CRXX	Arthropoda	Crustacea					Crustacea indet.	Parts		7.49702	7.49702			
WSP Golder	22-060	2022	Arctic char	ms22-060-150	BAFF22UDPFARCH4015	13-Aug-22	100	75	17.89527	Undetermined	XXXX							Unidentified tissue	Parts		0.00521	0.00521			
WSP Golder	22-060	2022	Arctic char	ms22-060-151	BAFF22UDPFARCH4016	13-Aug-22	25	75	2.75893	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Hyperiidea indet.	A	1	0.01161	0.01161	1		Cysts on stomach
WSP Golder	22-060	2022	Arctic char	ms22-060-151	BAFF22UDPFARCH4016	13-Aug-22	25	75	2.75893	Planktonic	CRXX	Arthropoda	Crustacea					Crustacea indet.	Parts		0.16761	0.16761			Cysts on stomach
WSP Golder	22-060	2022	Arctic char	ms22-060-152	BAFF22UDPFARCH4017	14-Aug-22	50	75	58.44798	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	A	49	1.22791	0.02506	1		Stomach with a large tear. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-152	BAFF22UDPFARCH4017	14-Aug-22	50	75	58.44798	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	Onisimus sp.	Int	4	0.10096	0.02524	1		Stomach with a large tear. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-152	BAFF22UDPFARCH4017	14-Aug-22	50	75	58.44798	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	Onisimus sp.	J	1	0.00001	0.00001			Stomach with a large tear. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-152	BAFF22UDPFARCH4017	14-Aug-22	50	75	58.44798	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida		Mysida indet.	Int	72	0.63668	0.00884	1		Stomach with a large tear. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-152	BAFF22UDPFARCH4017	14-Aug-22	50	75	58.44798	Undetermined	CRXX	Arthropoda	Crustacea					Crustacea indet.	Parts		7.00184	7.00184			Stomach with a large tear. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-152	BAFF22UDPFARCH4017	14-Aug-22	50	75	58.44798	Planktonic	MOGA	Mollusca		Gastropoda	Heterobranchia	Pteropoda	Limacinidae	Limacina sp.	A	68	0.60138	0.00884	1		Stomach with a large tear. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-152	BAFF22UDPFARCH4017	14-Aug-22	50	75	58.44798	n/a	PIXX	Chordata	Vertebrata	Actinopterygii				Pisces indet.	J/parts	9	0.67717	0.07524	1		Stomach with a large tear. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-153	BAFF22UDPFARCH4018	14-Aug-22	50	50	10.27667	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	A	3	0.09272	0.03091	1		
WSP Golder	22-060	2022	Arctic char	ms22-060-153	BAFF22UDPFARCH4018	14-Aug-22	50	50	10.27667	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida		Mysida indet.	Int	7	0.05742	0.00820	1		
WSP Golder	22-060	2022	Arctic char	ms22-060-153	BAFF22UDPFARCH4018	14-Aug-22	50	50	10.27667	Planktonic	CRXX	Arthropoda	Crustacea					Crustacea indet.	Parts		2.51577	2.51577			
WSP Golder	22-060	2022	Arctic char	ms22-060-154	BAFF22UDPFARCH4019	14-Aug-22	75	50	19.96117	Benthic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Gammaridae	Gammarus sp.	Int	1	0.00242	0.00242	1		
WSP Golder	22-060	2022	Arctic char	ms22-060-154	BAFF22UDPFARCH4019	14-Aug-22	75	50	19.96117	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	A	62	2.39596	0.03864	1		
WSP Golder	22-060	2022	Arctic char	ms22-060-154	BAFF22UDPFARCH4019	14-Aug-22	75	50	19.96117	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus sp.	A	2	0.00637	0.00319	1		
WSP Golder	22-060	2022	Arctic char	ms22-060-154	BAFF22UDPFARCH4019	14-Aug-22	75	50	19.96117	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	Mysis sp.	Int	1	0.07982	0.07982	1		
WSP Golder	22-060	2022	Arctic char	ms22-060-154	BAFF22UDPFARCH4019	14-Aug-22	75	50	19.96117	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	Mysis sp.	J	29	0.34788	0.01200			
WSP Golder	22-060	2022	Arctic char	ms22-060-154	BAFF22UDPFARCH4019	14-Aug-22	75	50	19.96117	Undetermined	CRXX	Arthropoda	Crustacea					Crustacea indet.	Parts		3.06756	3.06756			
WSP Golder	22-060	2022	Arctic char	ms22-060-154	BAFF22UDPFARCH4019	14-Aug-22	75	50	19.96117	n/a	PIXX	Chordata	Vertebrata	Actinopterygii		Scorpaeniformes	Cottidae	Cottidae indet.	Parts	3	0.16405	0.05468	1		
WSP Golder	22-060	2022	Arctic char	ms22-060-154	BAFF22UDPFARCH4019	14-Aug-22	75	50	19.96117	n/a	PIXX	Chordata	Vertebrata	Actinopterygii				Pisces indet.	Parts		0.15385	0.15385			
WSP Golder	22-060	2022	Arctic char	ms22-060-155	BAFF22UDPFARCH4020	14-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Arctic char	ms22-060-156	BAFF22UDPFARCH4021	14-Aug-22	100	50	18.52528	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	A/parts	108	7.92676	0.07340	1		Stomach with a tear, had to cut jar to remove stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-156	BAFF22UDPFARCH4021	14-Aug-22	100	50	18.52528	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida		Mysida indet.	J	26	0.33054	0.01271	1		Stomach with a tear, had to cut jar to remove stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-156	BAFF22UDPFARCH4021	14-Aug-22	100	50	18.52528	Undetermined	CRXX	Arthropoda	Crustacea					Crustacea indet.	Parts		0.41954	0.41954			Stomach with a tear, had to cut jar to remove stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-156	BAFF22UDPFARCH4021	14-Aug-22	100	50	18.52528	Planktonic	MOGA	Mollusca		Gastropoda				Gastropoda indet.	Parts		0.04878	0.04878	1	Likely Limacina sp.	Stomach with a tear, had to cut jar to remove stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-156	BAFF22UDPFARCH4021	14-Aug-22	100	50	18.52528	n/a	PIXX	Chordata	Vertebrata	Actinopterygii				Pisces indet.	J/parts	2	0.20558	0.10279	1		Stomach with a tear, had to cut jar to remove stomach. Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Arctic char	ms22-060-157	BAFF22UDPFARCH4022	14-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Arctic char	ms22-060-158	BAFF22UDPFARCH4023	14-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Arctic char	ms22-060-159	BAFF22UDPFARCH4024	14-Aug-22	0	100	22.87218	n/a	n/a							Empty Stomach	n/a	n/a	n/a	n/a			Cysts on stomach
WSP Golder	22-060	2022	Arctic char	ms22-060-160	BAFF22UDPFARCH4025	14-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Arctic char	ms22-060-161	BAFF22UDPFARCH4026	14-Aug-22	0	100	19.03472	n/a	n/a							Empty Stomach	n/a	n/a	n/a	n/a			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-162	BAFF22UDPFFHSC1001	03-Aug-22	75	100	21.17034	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus sp.	A	12	0.07145	0.00595	1		Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-162	BAFF22UDPFFHSC1001	03-Aug-22	75	100	21.17034	Non-food	Non-food							Plant material	n/a	n/a	n/a	n/a			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-162	BAFF22UDPFFHSC1001	03-Aug-22	75	100	21.17034	Non-food	Non-food							Sand	n/a	n/a	n/a	n/a			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-162	BAFF22UDPFFHSC1001	03-Aug-22	75	100	21.17034	Undetermined	XXXX							Unidentified tissue	Parts		4.33145	4.33145		Possibly pectinariid tissue, crustacea and fish	Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-163	BAFF22UDPFFHSC1002	03-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-164	BAFF22UDPFFHSC1003	03-Aug-22	100	50	60.07860	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida		Mysida indet.	J	1	0.00714	0.00714	1		Stomach punctured, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-164	BAFF22UDPFFHSC1003	03-Aug-22	100	50	60.07860	Benthic	MOBI	Mollusca		Bivalvia				Bivalvia indet.	Int	1	0.02673	0.02673	1		Stomach punctured, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-164	BAFF22UDPFFHSC1003	03-Aug-22	100	50	60.07860	Benthic	POER	Annelida	Polychaeta	Errantia	Phyllodocida	Nephtyidae		Nephtys sp.	A	4	3.02899	0.75725	1		Stomach punctured, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-164	BAFF22UDPFFHSC1003	03-Aug-22	100	50	60.07860	Benthic	POER	Annelida	Polychaeta	Errantia	Phyllodocida	Phyllodocidae		Phyllodocidae indet.	A	3	6.03139	2.01046	1		Stomach punctured, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-164	BAFF22UDPFFHSC1003	03-Aug-22	100	50	60.07860	Benthic	POER	Annelida		Polychaeta	Errantia	Phyllodocida	Nereididae	Nereididae indet.	A	1	2.08380	2.08380	1		Stomach punctured, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-164	BAFF22UDPFFHSC1003	03-Aug-22	100	50	60.07860	Benthic	POSE	Annelida	Polychaeta	Errantia	Eunicida	Lumbrineridae		Lumbrineridae indet	A	10	7.23003	0.72300	1		Stomach punctured, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-164	BAFF22UDPFFHSC1003	03-Aug-22	100	50	60.07860	Benthic	POSE	Annelida		Polychaeta	Sedentaria	Terebellida	Pectinariidae	Pectinariidae indet.	A	95	16.61232	0.17487	1	Weight includes tube	Stomach punctured, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-164	BAFF22UDPFFHSC1003	03-Aug-22	100	50	60.07860	Undetermined	POXX	Annelida		Polychaeta				Polychaeta indet.	Parts		13.80303	13.80303			Stomach punctured, some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-165	BAFF22UDPFFHSC1004	03-Aug-22	50	100	24.54933	Benthic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Amphipoda indet.	Parts	1	0.00838	0.00838	1		Digested material and stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-165	BAFF22UDPFFHSC1004	03-Aug-22	50	100	24.54933	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus sp.	A	1	0.00111	0.00111	1		Digested material and stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-165	BAFF22UDPFFHSC1004	03-Aug-22	50	100	24.54933	Benthic	POER	Annelida		Polychaeta	Errantia	Phyllodocida	Nereididae	Nereididae indet.	Parts		0.28541	0.28541	1		Digested material and stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-165	BAFF22UDPFFHSC1004	03-Aug-22	50	100	24.54933	Benthic	POSE	Annelida		Polychaeta	Sedentaria	Terebellida	Pectinariidae	Pectinariidae indet.	A	2	0.70309	0.35155	1	Weight includes tube	Digested material and stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-165	BAFF22UDPFFHSC1004	03-Aug-22	50	100	24.54933	Undetermined	XXXX							Unidentified tissue	Parts		17.05629	17.05629			Digested material and stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-166	BAFF22UDPFFHSC1005	03-Aug-22	100	50	22.40272	Benthic	POSE	Annelida		Polychaeta	Sedentaria	Terebellida	Pectinariidae	Pectinariidae indet.	A/parts		14.50580	13.97583	1	Cistenides granulata - tubes with tissue	Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-167	BAFF22UDPFFHSC1006	03-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-168	BAFF22UDPFFHSC1007	03-Aug-22	75	75	3.27621	Non-food	Non-food							Plant material	n/a	n/a	n/a	n/a			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-168	BAFF22UDPFFHSC1007	03-Aug-22	75	75	3.27621	Non-food	Non-food							Sand	n/a	n/a	n/a	n/a			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-168	BAFF22UDPFFHSC1007	03-Aug-22	75	75	3.27621	Benthic	POER	Annelida	Polychaeta	Errantia	Phyllodocida	Phyllodocidae		Phyllodocidae indet.	Parts	1	0.04589	0.04589	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-168	BAFF22UDPFFHSC1007	03-Aug-22	75	75	3.27621	Benthic	POSE	Annelida		Polychaeta	Sedentaria	Terebellida	Pectinariidae	Pectinariidae indet.	A	4	1.05956	0.26489	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-168	BAFF22UDPFFHSC1007	03-Aug-22	75	75	3.27621	Undetermined	XXXX							Unidentified tissue	Parts		3.27621	3.27621			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-169	BAFF22UDPFFHSC1008	03-Aug-22	100	50	10.91103	Benthic	POSE	Annelida		Polychaeta	Sedentaria	Terebellida	Pectinariidae	Pectinariidae indet.	A/parts	8	6.05159	0.75645	1	Weight includes tube	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-170	BAFF22UDPFFHSC1009	03-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-171	BAFF22UDPFFHSC1010	03-Aug-22	100	75	8.40336	Benthic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Atylidae	Atylus carinatus	A	5	0.90809	0.18162	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-171	BAFF22UDPFFHSC1010	03-Aug-22	100	75	8.40336	Benthic	MOBI	Mollusca		Bivalvia	Autobranchia	Adapedonta	Hiatellidae	Hiatella sp.	A	1	0.37750	0.37750	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-171	BAFF22UDPFFHSC1010	03-Aug-22	100	75	8.40336	Non-food	Non-food							Plant material	n/a	n/a	n/a	n/a		Leaf	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-171	BAFF22UDPFFHSC1010	03-Aug-22	100	75	8.40336	Non-food	Non-food							Plant material	n/a	n/a	n/a	n/a			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-171	BAFF22UDPFFHSC1010	03-Aug-22	100	75	8.40336	Non-food	Non-food							Sand	n/a	n/a	n/a	n/a			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-171	BAFF22UDPFFHSC1010	03-Aug-22	100	75	8.40336	Benthic	POSE	Annelida		Polychaeta	Sedentaria	Terebellida	Pectinariidae	Pectinariidae indet.	A/parts	1	0.31706	0.31706	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-171	BAFF22UDPFFHSC1010	03-Aug-22	100	75	8.40336	Undetermined	XXXX							Unidentified tissue	Parts		2.39780	2.39780		Primarily amphipod tissue	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-172	BAFF22UDPFFHSC1011	03-Aug-22	50	75	5.15676	Benthic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Oedicerotidae	Westwoodilla sp.	A	1	0.06744	0.06744	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-172	BAFF22UDPFFHSC1011	03-Aug-22	50	75	5.15676	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus sp.	A	1	0.00230	0.00230	1		

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Abundance and biomass data in long format for WSP Golder Baffinland Iron Mine MEEMP, 2022

Client	Project	Year	Fish	Biologica Sample ID	Client Sample ID	Date Sampled	% Fullness	%Material Digested	Full Stomach Weight (g)	Source	GroupCode	Phylum	Subphylum	Class	Subclass	Order	Family	Taxon	Stage	Total Abundance	Total WW (g)	WW/Individual (g)	Total Unique Taxa	Comments	Processing Note
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-172	BAFF22UDPFFHSC1011	03-Aug-22	50	75	5.15676	Non-food	Non-food							Plant material	n/a	n/a	n/a	n/a			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-172	BAFF22UDPFFHSC1011	03-Aug-22	50	75	5.15676	Non-food	Non-food							Sand	n/a	n/a	n/a	n/a			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-172	BAFF22UDPFFHSC1011	03-Aug-22	50	75	5.15676	Undetermined	POXX	Annelida		Polychaeta				Polychaeta indet.	A/parts	1	0.23247	0.23247	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-172	BAFF22UDPFFHSC1011	03-Aug-22	50	75	5.15676	Undetermined	XXXX							Unidentified tissue	Parts		0.11503	0.11503			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-173	BAFF22UDPFFHSC1012	03-Aug-22	75	75	20.59477	Non-food	Non-food							Plant material	n/a	n/a	n/a	n/a			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-173	BAFF22UDPFFHSC1012	03-Aug-22	75	75	20.59477	Non-food	Non-food							Sand	n/a	n/a	n/a	n/a			Some stomach contents found outside of stomach.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-173	BAFF22UDPFFHSC1012	03-Aug-22	75	75	20.59477	Undetermined	POXX	Annelida		Polychaeta				Polychaeta indet.	Parts		13.47945	13.47945	1		Some stomach contents found outside of stomach. Included in contents analysis and total stomach weight.
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-174	BAFF22UDPFFHSC1013	03-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-175	BAFF22UDPFFHSC1014	03-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-176	BAFF22UDPFFHSC1015	04-Aug-22	0	100	3.30989	Benthic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Gammaridae	Gammarus sp.	A	1	0.03037	0.03037	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-177	BAFF22UDPFFHSC1016	04-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-178	BAFF22UDPFFHSC1017	05-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-179	BAFF22UDPFFHSC1018	05-Aug-22	25	50	6.48083	Planktonic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	Themisto sp.	A	1	0.00821	0.00821	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-179	BAFF22UDPFFHSC1018	05-Aug-22	25	50	6.48083	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplia	Copepoda	Calanoida	Calanidae	Calanus hyperboreus	A	3	0.01729	0.00576	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-179	BAFF22UDPFFHSC1018	05-Aug-22	25	50	6.48083	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus glacialis	A	33	0.11953	0.00362	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-179	BAFF22UDPFFHSC1018	05-Aug-22	25	50	6.48083	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	Mysis sp.	J	9	0.04833	0.00537	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-179	BAFF22UDPFFHSC1018	05-Aug-22	25	50	6.48083	Undetermined	XXXX							Unidentified tissue	Parts		0.10315	0.10315			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-180	BAFF22UDPFFHSC1019	05-Aug-22	50	75	22.00151	Undetermined	XXXX							Unidentified tissue	Parts		3.11362	3.11362	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-181	BAFF22UDPFFHSC1020	05-Aug-22	75	75	9.82731	Undetermined	EGGS	Chordata	Vertebrata	Actinopterygii				Pisces indet.	Egg	18	0.07079	0.00393	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-181	BAFF22UDPFFHSC1020	05-Aug-22	75	75	9.82731	Benthic	POSE	Annelida		Polychaeta	Sedentaria	Terebellida	Pectinariidae	Pectinariidae indet.	A/parts	8	1.52837	0.19105	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-181	BAFF22UDPFFHSC1020	05-Aug-22	75	75	9.82731	Undetermined	XXXX							Unidentified tissue	Parts		0.19470	0.19470			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-182	BAFF22UDPFFHSC1021	05-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-183	BAFF22UDPFFHSC1022	05-Aug-22	25	75	2.96787	Benthic	CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Lysianassoidea indet.	Int	1	0.01598	0.01598	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-183	BAFF22UDPFFHSC1022	05-Aug-22	25	75	2.96787	Planktonic	CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae	Calanus sp.	A	2	0.00631	0.00316	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-183	BAFF22UDPFFHSC1022	05-Aug-22	25	75	2.96787	Planktonic	CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	Mysis sp.	J	1	0.00451	0.00451	1		
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-183	BAFF22UDPFFHSC1022	05-Aug-22	25	75	2.96787	Undetermined	XXXX							Unidentified tissue	Parts		0.05026	0.05026			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-184	BAFF22UDPFFHSC1023	05-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-185	BAFF22UDPFFHSC1024	05-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-186	BAFF22UDPFFHSC1025	05-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-187	BAFF22UDPFFHSC1026	05-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-188	BAFF22UDPFFHSC1027	05-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-189	BAFF22UDPFFHSC1028	05-Aug-22	0	100	5.38837	n/a	n/a							Empty Stomach	n/a	n/a	n/a	n/a			
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-190	BAFF22UDPFFHSC1029	05-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-191	BAFF22UDPFFHSC1030	05-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-192	BAFF22UDPFFHSC1031	05-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-193	BAFF22UDPFFHSC1032	06-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-194	BAFF22UDPFFHSC1033	06-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-195	BAFF22UDPFFHSC1034	06-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-196	BAFF22UDPFFHSC1035	06-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-197	BAFF22UDPFFHSC1036	06-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-198	BAFF22UDPFFHSC1037	06-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-199	BAFF22UDPFFHSC1038	06-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-200	BAFF22UDPFFHSC1039	06-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-201	BAFF22UDPFFHSC1040	06-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	
WSP Golder	22-060	2022	Fourhorn sculpin	ms22-060-202	BAFFUTGTFHSC2001	10-Aug-22	n/a	n/a	n/a	n/a								Not Analyzed	n/a	n/a	n/a	n/a		Archived_Not Processed	

APPENDIX 8B-5

Fish Stomach Laboratory Methods

Fish Stomach Enumeration and Identification Methods
Client: WSP Golder
Project: Baffinland Iron Mine MEEMP

Sample Inventory

Sample arrival: 6-Sept-22
Number of samples: 67, 33 processed
Biologica project number: ms22-060

Upon arrival, the samples were examined and double-checked against the chain of custody to ensure that (1) all samples were accounted for, and (2) each sample had the appropriate number of jars as indicated on the COC. Any discrepancies were reported to the client and were resolved before further sample handling. Samples were then assigned a unique identification number. Stomachs arrived already removed from fish and preserved in formalin.

Table 1. Summary of fish stomachs processed for WSP Golder Baffinland Iron Mine MEEMP, 2022.

Client Sample ID	Date Sampled	Biologica Sample ID	Fish	% Stomach Fullness	% Material Digested	Full Stomach Weight (g)
BAFF22UDPFARCH4001	01-Aug-22	ms22-060-136	Arctic char	75	25	28.22877
BAFF22UDPFARCH4002	01-Aug-22	ms22-060-137	Arctic char	10	75	19.23652
BAFF22UDPFARCH4003	01-Aug-22	ms22-060-138	Arctic char	Archived		
BAFF22UDPFARCH4004	01-Aug-22	ms22-060-139	Arctic char	10	25	36.26076
BAFF22UDPFARCH4005	01-Aug-22	ms22-060-140	Arctic char	Archived		
BAFF22UDPFARCH4006	01-Aug-22	ms22-060-141	Arctic char	0	100	12.08173
BAFF22UDPFARCH4007	01-Aug-22	ms22-060-142	Arctic char	75	75	47.12631
BAFF22UDPFARCH4008	01-Aug-22	ms22-060-143	Arctic char	100	50	37.06238
BAFF22UDPFARCH4009	01-Aug-22	ms22-060-144	Arctic char	75	75	13.16472
BAFF22UDPFARCH4010	04-Aug-22	ms22-060-145	Arctic char	75	75	34.69561
BAFF22UDPFARCH4011	11-Aug-22	ms22-060-146	Arctic char	Archived		
BAFF22UDPFARCH4012	11-Aug-22	ms22-060-147	Arctic char	50	75	5.90992
BAFF22UDPFARCH4013	11-Aug-22	ms22-060-148	Arctic char	Archived		
BAFF22UDPFARCH4014	13-Aug-22	ms22-060-149	Arctic char	100	50	13.28410
BAFF22UDPFARCH4015	13-Aug-22	ms22-060-150	Arctic char	100	75	17.89527
BAFF22UDPFARCH4016	13-Aug-22	ms22-060-151	Arctic char	25	75	2.75893
BAFF22UDPFARCH4017	14-Aug-22	ms22-060-152	Arctic char	50	75	58.44798
BAFF22UDPFARCH4018	14-Aug-22	ms22-060-153	Arctic char	50	50	10.27667
BAFF22UDPFARCH4019	14-Aug-22	ms22-060-154	Arctic char	75	50	19.96117
BAFF22UDPFARCH4020	14-Aug-22	ms22-060-155	Arctic char	Archived		
BAFF22UDPFARCH4021	14-Aug-22	ms22-060-156	Arctic char	100	50	18.52528
BAFF22UDPFARCH4022	14-Aug-22	ms22-060-157	Arctic char	Archived		
BAFF22UDPFARCH4023	14-Aug-22	ms22-060-158	Arctic char	Archived		
BAFF22UDPFARCH4024	14-Aug-22	ms22-060-159	Arctic char	0	100	22.87218
BAFF22UDPFARCH4025	14-Aug-22	ms22-060-160	Arctic char	Archived		
BAFF22UDPFARCH4026	14-Aug-22	ms22-060-161	Arctic char	0	100	19.03472
BAFF22UDPFFHSC1001	03-Aug-22	ms22-060-162	Fourhorn sculpin	75	100	21.17034

Client Sample ID	Date Sampled	Biologica Sample ID	Fish	% Stomach Fullness	% Material Digested	Full Stomach Weight (g)
BAFF22UDPFFHSC1002	03-Aug-22	ms22-060-163	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1003	03-Aug-22	ms22-060-164	Fourhorn sculpin	100	50	60.07860
BAFF22UDPFFHSC1004	03-Aug-22	ms22-060-165	Fourhorn sculpin	50	100	24.54933
BAFF22UDPFFHSC1005	03-Aug-22	ms22-060-166	Fourhorn sculpin	100	50	22.40272
BAFF22UDPFFHSC1006	03-Aug-22	ms22-060-167	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1007	03-Aug-22	ms22-060-168	Fourhorn sculpin	75	75	3.27621
BAFF22UDPFFHSC1008	03-Aug-22	ms22-060-169	Fourhorn sculpin	100	50	10.91103
BAFF22UDPFFHSC1009	03-Aug-22	ms22-060-170	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1010	03-Aug-22	ms22-060-171	Fourhorn sculpin	100	75	8.40336
BAFF22UDPFFHSC1011	03-Aug-22	ms22-060-172	Fourhorn sculpin	50	75	5.15676
BAFF22UDPFFHSC1012	03-Aug-22	ms22-060-173	Fourhorn sculpin	75	75	20.59477
BAFF22UDPFFHSC1013	03-Aug-22	ms22-060-174	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1014	03-Aug-22	ms22-060-175	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1015	04-Aug-22	ms22-060-176	Fourhorn sculpin	0	100	3.30989
BAFF22UDPFFHSC1016	04-Aug-22	ms22-060-177	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1017	05-Aug-22	ms22-060-178	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1018	05-Aug-22	ms22-060-179	Fourhorn sculpin	25	50	6.48083
BAFF22UDPFFHSC1019	05-Aug-22	ms22-060-180	Fourhorn sculpin	50	75	22.00151
BAFF22UDPFFHSC1020	05-Aug-22	ms22-060-181	Fourhorn sculpin	75	75	9.82731
BAFF22UDPFFHSC1021	05-Aug-22	ms22-060-182	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1022	05-Aug-22	ms22-060-183	Fourhorn sculpin	25	75	2.96787
BAFF22UDPFFHSC1023	05-Aug-22	ms22-060-184	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1024	05-Aug-22	ms22-060-185	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1025	05-Aug-22	ms22-060-186	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1026	05-Aug-22	ms22-060-187	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1027	05-Aug-22	ms22-060-188	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1028	05-Aug-22	ms22-060-189	Fourhorn sculpin	0	100	5.38837
BAFF22UDPFFHSC1029	05-Aug-22	ms22-060-190	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1030	05-Aug-22	ms22-060-191	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1031	05-Aug-22	ms22-060-192	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1032	06-Aug-22	ms22-060-193	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1033	06-Aug-22	ms22-060-194	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1034	06-Aug-22	ms22-060-195	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1035	06-Aug-22	ms22-060-196	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1036	06-Aug-22	ms22-060-197	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1037	06-Aug-22	ms22-060-198	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1038	06-Aug-22	ms22-060-199	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1039	06-Aug-22	ms22-060-200	Fourhorn sculpin	Archived		
BAFF22UDPFFHSC1040	06-Aug-22	ms22-060-201	Fourhorn sculpin	Archived		
BAFFUTGTFHSC2001	10-Aug-22	ms22-060-202	Fourhorn sculpin	Archived		

Sample Processing

Before dissection and identification, the percent fullness and percent digestion of each stomach was recorded based on the professional judgement of the taxonomist(s). For each new project, if multiple taxonomists are involved, they must agree on the categorization for the first 30 stomachs to ensure consistency of reporting.

The stomach contents were dissected out and weighed as per the following protocol:

1. Intestines were removed just anterior to the pyloric caecae and discarded. The esophagus was included with the stomach.

2. Excess moisture was blotted from the food bolus with paper towel, avoiding excessive pressure on the food bolus and the full stomach weight was taken. For stomachs that were damaged prior to analysis the stomach contents found outside of the stomach were weighed individually in their prey grouping and added to the total stomach weight.

3. A longitudinal incision was made with a scalpel or scissors, avoiding damage to the contents, to reveal the food bolus. At this time stomach fullness was determined and the corresponding code for the degree of fullness is recorded (Table 2). Fullness was estimated by considering two factors: the degree of distention of the stomach, and the weight of the bolus relative to the size of the fish.

Table 2. Stomach fullness categories.

0	Empty
10	Trace of prey
25	Trace–25% full
50	25–50% full
75	50–75% full
100	75–100% full (distended)

4. Percent digestion was determined based on the following categories. This ranking was given before the bolus was dissected based on observable condition of the prey organisms (Table 3).

Table 3. Percent digestion of stomach contents.

0	All material is undigested, only whole organisms visible
0–10	Trace only; few posterior-most prey items are digested
25	10–25% digested. Posterior-most 25% digested and more than half of the organisms are whole
50	25–50% digested; approximately half of the organisms are whole
75	50–75% digested, less than half of organisms are whole
100	All material is digested, no whole organisms visible

5. Material that was obviously composed of parasites, stomach lining, rocks, or any other non-prey is removed. (These items were not included in the stomach weight, but were noted in the comments).

6. The bolus was dissected, working anterior-posterior. Prey items were identified to the lowest practical taxonomic level (species when possible). Digested and unidentifiable material were categorized (e.g., unidentified Insect parts, digested tissue, non-food, etc.). Each identifiable unit (taxon or category) was placed in small drops of water on petri dish to prevent desiccation during the identification process. Chironomidae were slide-mounted for identification.

7. All prey categories (taxa and unidentifiable categories) were blotted and weighed to the nearest 0.01 mg of wet weight.

Data

Results were provided to the WSP Golder Baffinland manager in Excel spreadsheets via email.

Selected Methodological and Taxonomic References

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APPENDIX 8C-1

Taxa Presence/Absence on Settlement Substrates 2021-2022

Phylum Class/Order	Family	Taxa	2021	2022
Annelida				
Clitellata/-	-	Hirudinea indet.	X	
Clitellata/Enchytraeida	Enchytraeidae	Enchytraeidae indet.		X
Polychaeta/Eunicida	Lumbrineridae	*Scoletoma fragilis*		X
Polychaeta/Eunicida	Lumbrineridae	*Scoletoma impatiens*		X
Polychaeta/Eunicida	Lumbrineridae	*Scoletoma* sp.		Y
Polychaeta/Phyllodocida	Hesionidae	Hesionidae indet.	Y	Y
Polychaeta/Phyllodocida	Hesionidae	*Nereimyra aphroditoides*	X	X
Polychaeta/Phyllodocida	Hesionidae	*Nereimyra punctata*		X
Polychaeta/Phyllodocida	Nephtyidae	*Micronephthys cornuta*	X	X
Polychaeta/Phyllodocida	Nereididae	*Nereis zonata*	X	X
Polychaeta/Phyllodocida	Nereididae	Nereididae indet.	Y	
Polychaeta/Phyllodocida	Pholoidae	*Pholoe longa*	X	X
Polychaeta/Phyllodocida	Pholoidae	*Pholoe minuta*	X	X
Polychaeta/Phyllodocida	Pholoidae	*Pholoe* sp.	Y	Y
Polychaeta/Phyllodocida	Phyllodocidae	*Eteone longa complex*		X
Polychaeta/Phyllodocida	Phyllodocidae	*Eteone* sp.	X	Y
Polychaeta/Phyllodocida	Phyllodocidae	*Phyllodoce* sp.	X	
Polychaeta/Phyllodocida	Phyllodocidae	Phyllodocidae indet.	Y	
Polychaeta/Phyllodocida	Polynoidae	*Gattyana cirrhosa*	X	X
Polychaeta/Phyllodocida	Polynoidae	*Harmothoe imbricata*	X	
Polychaeta/Phyllodocida	Polynoidae	*Harmothoe rarispina*	X	
Polychaeta/Phyllodocida	Polynoidae	*Harmothoe sp.*	Y	X
Polychaeta/Phyllodocida	Polynoidae	Polynoinae indet.	Y	Y
Polychaeta/Phyllodocida	Syllidae	*Pionosyllis* sp.	X	
Polychaeta/Phyllodocida	Syllidae	Syllidae indet.	Y	
Polychaeta/Sabellida	Sabellidae	*Dialychone* sp.	X	X
Polychaeta/Sabellida	Sabellidae	*Euchone incolor*	X	
Polychaeta/Sabellida	Sabellidae	*Euchone* sp.	Y	X
Polychaeta/Sabellida	Sabellidae	Sabellidae indet.	Y	Y
Polychaeta/Sabellida	Serpulidae	*Bushiella (Jugaria)* sp.		X
Polychaeta/Sabellida	Serpulidae	*Circeis* sp.	X	
Polychaeta/Sabellida	Serpulidae	Serpulidae indet.	Y	Y
Polychaeta/Spionida	Spionidae	*Dipolydora quadrilobata*		X
Polychaeta/Spionida	Spionidae	*Marenzelleria* sp.	X	
Polychaeta/Spionida	Spionidae	*Scolelepis* sp.	X	
Polychaeta/Spionida	Spionidae	Spionidae indet.	Y	Y
Polychaeta/Terebellida	Ampharetidae	*Ampharete* sp.	X	
Polychaeta/Terebellida	Ampharetidae	Ampharetidae indet.	Y	X
Polychaeta/Terebellida	Cirratulidae	*Chaetozone bathyala*	X	X
Polychaeta/Terebellida	Cirratulidae	*Chaetozone* sp.	Y	Y
Polychaeta/Terebellida	Cirratulidae	*Aphelochaeta* sp.		X
Polychaeta/Terebellida	Cirratulidae	Cirratulidae indet.		Y
Polychaeta/Terebellida	Pectinariidae	*Cistenides granulata*	X	X
Polychaeta/Terebellida	Terebellidae	*Pista maculata*		X
Polychaeta/Terebellida	Terebellidae	*Polycirrus* sp. complex		X
Polychaeta/Terebellida	Terebellidae	Terebellidae indet.	X	Y
Polychaeta/Terebellida	Trichobranchidae	*Terebellides* sp.	X	X
Polychaeta/Terebellida	Trichobranchidae	*Trichobranchus glacialis*		X
Polychaeta/-	Capitellidae	*Capitella capitata* complex		X
Polychaeta/-	Capitellidae	*Mediomastus* sp.	X	X
Polychaeta/-	Cossuridae	*Cossura longocirrata*	X	X
Polychaeta/-	Maldanidae	*Maldane sarsi*		X
Polychaeta/-	Orbiniidae	*Scoloplos* sp.		X
Polychaeta/-	Paraonidae	*Aricidea* sp.		X
Polychaeta/-	Paraonidae	Paraonidae indet.		Y
Polychaeta/-	Scalibregmatidae	*Scalibregma inflatum*	X	X
Polychaeta/-	Scalibregmatidae	Scalibregmatidae indet.	Y	
Polychaeta/-	-	Polychaeta indet.		Y
Polychaeta/-	-	Sedentaria indet.		X
-/Phyllodocida	Polynoidae	*Bylgides* sp.		X
-/-	-	Annelida indet.		Y
Arthropoda				
Arachnida/-	-	Acari indet.	X	
Hexanauplia/Calanoida	-	Calanoida indet.		X
Malacostraca/Amphipoda	Atylidae	*Atylus carinatus*	X	
Malacostraca/Amphipoda	Ampeliscidae	*Ampelisca* sp.		X
Malacostraca/Amphipoda	Ampeliscidae	*Haploops tubicola*		X
Malacostraca/Amphipoda	Calliopiidae	Calliopiidae indet.	Y	
Malacostraca/Amphipoda	Calliopiidae	*Apherusa* sp.	X	
Malacostraca/Amphipoda	Corophiidae	*Crassicorophium* sp.	X	
Malacostraca/Amphipoda	Corophiidae	Corophiidae indet.	Y	
Malacostraca/Amphipoda	Dexaminidae	*Guernea nordenskioldi*	X	X
Malacostraca/Amphipoda	Gammaridae	*Gammarus oceanicus*	X	X
Malacostraca/Amphipoda	Gammaridae	*Gammarus setosus*		X
Malacostraca/Amphipoda	Gammaridae	*Gammarus* sp.	Y	Y
Malacostraca/Amphipoda	Ischyroceridae	*Ischyrocerus anguipes*	X	
Malacostraca/Amphipoda	Oedicerotidae	*Monoculodes* sp.	X	X
Malacostraca/Amphipoda	Oedicerotidae	Oedicerotidae indet.	Y	Y
Malacostraca/Amphipoda	Pontogeneiidae	*Pontoporeia femorata*		X
Malacostraca/Amphipoda	Stenothoidae	Stenothoidae indet.		X
Malacostraca/Amphipoda	Tryphosidae	*Orchomene* sp.		X
Malacostraca/Amphipoda	-	Lysianassoidea indet.	X	
Malacostraca/Amphipoda	-	Amphipoda indet.		Y
Malacostraca/Cumacea	Diastylidae	*Brachydiastylis resima*		X
Malacostraca/Cumacea	Lampropidae	*Lamprops* sp.		X
Malacostraca/Cumacea	Leuconidae	*Eudorella truncatula*		X
Malacostraca/Cumacea	Leuconidae	*Leucon nasicoides*		X
Malacostraca/Cumacea	Leuconidae	*Leucon* sp.		Y
Malacostraca/Decapoda	Thoridae	*Lebbeus polaris*	X	
Ostracoda/Myodocopida	Philomedidae	*Philomedes* sp.	X	X
Ostracoda/-	-	Ostracoda indet.		Y
Thecostraca/Balanomorpha	-	Balanomorpha indet.	X	X

Taxa Presence/Absence on Settlement Substrates 2021-2022

Phylum Class/Order	Family	Taxa	2021	2022
Bryozoa				
Gymnolaemata/Cheilostomatida	Calloporidae	Calloporidae indet.		X
Gymnolaemata/Cheilostomatida	-	Cheilostomatida indet.		Y
Gymnolaemata/Ctenostomatida	Alcyonidiidae	*Alcyonidium* sp.		X
Stenolaemata/Cyclostomatida	Lichenoporidae	*Lichenopora* sp.	X	X
Stenolaemata/Cyclostomatida	Lichenoporidae	Lichenoporidae indet.	Y	Y
Stenolaemata/Cyclostomatida	Tubuliporidae	Tubuliporidae indet.	X	
Stenolaemata/Cyclostomatida	-	Cyclostomatida indet.		Y
-/-	-	Bryozoa indet.	Y	Y
Cephaloryhncha				
Priapulida/-	-	Priapulida indet.		X
Chlorophyta				
Ulvophyceae/Acrosiphoniales	Acrosiphoniaceae	*Spongomorpha aeruginosa*	X	*
Ulvophyceae/Cladophorales	Cladophoraceae	*Rhizoclonium* sp.	X	*
Ulvophyceae/Ulotrichales	Ulotrichaceae	*Ulothrix* sp.	X	*
Ulvophyceae/Ulotrichales	Ulotrichaceae	Ulotrichaceae indet.	X	*
Ulvophyceae/Ulvales	Ulvaceae	*Ulva* cf. *prolifera*	X	*
Chordata				
Ascidiacea/Stolidobranchia	Molgulidae	*Molgula* sp.	X	
Ascidiacea/Stolidobranchia	Molgulidae	Molgulidae indet.		X
Ascidiacea/Stolidobranchia	Pyuridae	*Boltenia echinata*		X
Ascidiacea/-	-	Ascidiacea indet.		Y
Ciliophora				
-/-	-	Ciliophora indet.	X	
Cnidaria				
Anthozoa/Actiniaria	-	Actiniaria indet.	X	
Hydrozoa/Anthoathecata	Corynidae	*Sarsia* sp.	X	
Hydrozoa/Anthoathecata	-	Anthoathecata indet.	Y	
Hydrozoa/Leptothecata	Campanulariidae	Campanulariidae indet.	X	X
Hydrozoa/Leptothecata	-	Leptothecata indet.		Y
Hydrozoa/-	-	Hydrozoa indet.		Y
Echinodermata				
Asteroidea/Forcipulatida	Asteriidae	*Leptasterias (Leptasterias) muelleri*	X	
Asteroidea/Forcipulatida	Asteriidae	Asteriidae indet.		X
Echinoidea/Camarodonta	Strongylocentrotidae	*Strongylocentrotus droebachiensis*	X	X
Ophiuroidea/Ophiurida	Ophiuridae	*Ophiura robusta*		X
Ophiuroidea/Ophiurida	Ophiuridae	*Ophiura sarsii*	X	
Ophiuroidea/-	-	Ophiuroidea indet.		Y
Foraminifera				
-/-	-	Foraminifera indet.	X	X
Mollusca				
Bivalvia/Adapedonta	Hiatellidae	*Hiatella arctica*	X	X
Bivalvia/Cardiida	Tellinidae	*Macoma calcarea*		X
Bivalvia/Carditida	Astartidae	*Astarte* sp.	Y	Y
Bivalvia/Carditida	Astartidae	*Astarte borealis*	X	X
Bivalvia/Carditida	Astartidae	*Astarte montagui*	X	X
Bivalvia/Lucinida	Thyasiridae	*Thyasira* sp.		X
Bivalvia/Myida	Myidae	*Mya* sp.	X	X
Bivalvia/Mytilida	Mytilidae	*Arvella faba*	X	X
Bivalvia/Mytilida	Mytilidae	*Musculus discors*	X	X
Bivalvia/Mytilida	Mytilidae	*Musculus* sp.	Y	Y
Bivalvia/Mytilida	Mytilidae	***Musculus glacialis***		X
Bivalvia/Mytilida	Mytilidae	Mytilidae indet.	Y	Y
Bivalvia/Nuculanida	Nuculanidae	*Nuculana minuta*	X	X
Bivalvia/Nuculida	Nuculidae	*Ennucula tenuis*	X	X
Bivalvia/-	-	Bivalvia indet.	Y	Y
Gastropoda/Nudibranchia	Dendronotidae	*Dendronotus* sp.	X	X
Gastropoda/Trochida	Margaritidae	*Margarites groenlandicus*	X	
Gastropoda/Trochida	Margaritidae	*Margarites helicinus*	X	
Gastropoda/Trochida	Margaritidae	*Margarites* sp.		X
Gastropoda/-	Lottiidae	Lottiidae indet.	X	Y
Gastropoda/-	Lottiidae	*Testudinalia testudinalis*		X
Gastropoda/-	-	Patellogastropoda indet.	X	
Gastropoda/-	-	Gastropoda indet.	Y	
Ochrophyta				
Phaeophyceae/Ectocarpales	Acinetosporaceae	*Pylaiella* cf. *varia*	X	*
Phaeophyceae/Ectocarpales	Chordariaceae	cf. *Trachynema groenlandicum*	X	*
Phaeophyceae/Ectocarpales	Chordariaceae	Chordariaceae indet.	Y	*
Phaeophyceae/Fucales	Fucaceae	cf. *Fucus distichus*	X	*
Phaeophyceae/Sphacelariales	-	Sphacelariales indet.	X	*
Nematoda				
-/-	-	Nematoda indet.		X
Pilidiophora/Heteronemertea	Lineidae	Lineidae indet.		X
-/-	-	Nemertea indet.		Y
		# New Unique Taxa each year	**70**	**76**
		TOTAL # Taxa (COUNT)	**97**	**119**

* Macroalgae results for settlement substrates remain pending as of February 28, 2023
Notes: taxa identified to the lowest practical taxonomic level; indet.= indeterminate (taxa which could not be identified beyond the taxonomic level listed); sp.=species; cf.=compare with (taxa is an inexact match to the designated taxa).
Taxa in bold indicate new observations in MEEMP and NIS/AIS programs
All taxa cross-referenced with NIS/AIS resources: Fofonoff et al. 2023, ISSG 2023, Rius et al. 2023, Molnar et al. 2008, Casas-Monroy et al. 2014

APPENDIX 8C-2

Settlement Substrate Laboratory Data

Abbreviations & Definitions

Worksheets:

1. Abbreviations & Definitions	Glossary of terms and outline of report.
2. Data-Long	Raw abundance data in long format.

Percent Cover:

1	Mobile organisms
2	Covering 0-25% of surfaces
3	Covering 25-50% of surfaces
4	Covering 50-75% of surfaces
5	Covering 75-100% of surfaces

Life Stages:

A	Adult
Int	Intermediate - has adult features but not of typical reproductive size
J	Juvenile
L	Larvae
N	Nymph
P	Pupa
Col	Colony
Deut	Deutonymph
MEMO	Incidental taxa/fragments not included in data, or whose abundance is not generally captured accurately by 1.0mm screen.

Total Number of Taxa	Number of unique taxa (=species richness), not including higher-order taxa for which there exists a lower-order identification (e.g. not including *Lumbrineris* sp. if there exists *Lumbrineris cruzensis* in the data).

Total Number of Organisms	Total Abundance, not including incidental taxa
URL	Unique, rare, large (>1.0 cm) taxa removed from the whole sample
BDL	Below detection limit. Used for biomass measurements for weights less than 0.00001g.

Biologica Coding

Major Taxonomic Groups:

Miscellaneous	
BRAC	Brachiopoda
BRYO	Bryozoa
CNAN	Cnidaria Anthozoa
CNHY	Cnidaria Hydrozoa
CNXX	Cnidaria
ENTO	Entoprocta
EURA	Echiura
HEMI	Hemichordata
KINO	Kinorhyncha
NTEA	Nemertea
PHOR	Phoronida
PIXX	Pisces
PLTY	Platyhelminthes
PORI	Porifera
PRIA	Priapulida
SIPN	Sipuncula
TARD	Tardigrada
URAS	Ascidiacea
Annelida	
ANHI	Annelida Hirudinea
ANOL	Annelida Oligochaeta
POER	Polychaeta Errantia
POSE	Polychaeta Sedentaria
POXX	Polychaeta
Arthropoda	
CHPY	Chelicerata Pycnogonida
CHAC	Chelicerata Arachnida
CRAM	Crustacea Amphipoda
CRCI	Crustacea Cirripedia
CRCO	Crustacea Copepoda
CRCU	Crustacea Cumacea
CRDE	Crustacea Decapoda
CRIS	Crustacea Isopoda
CRLE	Crustacea Leptostraca
CRMY	Crustacea Mysidacea
CROS	Crustacea Ostracoda
CRTA	Crustacea Tanaidacea
CRXX	Crustacea
Echinodermata	
ECAS	Echinodermata Asteroidea
ECCR	Echinodermata Crinoidea
ECEC	Echinodermata Echinoidea
ECHO	Echinodermata Holothuroidea
ECOP	Echinodermata Ophiuroidea
Mollusca	
MOAP	Mollusca Aplacophora
MOBI	Mollusca Bivalvia
MOCE	Mollusca Cephalopoda
MOGA	Mollusca Gastropoda
MOPO	Mollusca Polyplacophora
MOSC	Mollusca Scaphopoda

biologica

Abundance data in long format for WSP Golder Baffinland Iron Mine MEEMP, 2022 Quadrat and Settlement Subtrates including both plates and baskets.

Client	Project	Year	Sample Type	Biologica Sample ID	Client Sample ID	Date Sampled	Organism Type	Surface	taxcode	grpcode	Phylum	Class	Order	Family	Subfamily	Taxon Name	A	Int	J	Total Abundance	Unique Taxa Count	Percent Cover	Comments
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata			Leptothecata indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			1	1	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe sp.			1	1	1	1	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta				Sedentaria indet.			2	2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Attached	Top	MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida			Cheilostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Attached	Top	MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Pyuridae		Boltenia echinata			1	1	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Attached	Top	MISC	URAS	Chordata	Ascidiacea				Ascidiacea indet.			1	1		2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-073	Q1 Red Plate	06-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			2	2	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	3	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Attached	Bottom	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Attached	Bottom	MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Molgulidae		Molgulidae indet.			1	1	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			30	30	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Hesionidae indet.			7	7	1	1	Degraded
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta				Sedentaria indet.		3	3	6	1	1	Degraded
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Mobile	n/a	MEMO	MEMO	Nematoda					Nematoda indet.	2			2		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	4	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Attached	Top	MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida			Cheilostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Attached	Top	MISC	BRYO	Bryozoa					Bryozoa indet.				Present		2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-074	Q3 Red Plate	03-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		12	13	25	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-075	Q4 Red Plate	06-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-075	Q4 Red Plate	06-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-075	Q4 Red Plate	06-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa					Bryozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-075	Q4 Red Plate	06-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		6	5	11	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-075	Q4 Red Plate	06-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae		Terebellidae indet.	1			1	1	1	Degraded
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-075	Q4 Red Plate	06-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-075	Q4 Red Plate	06-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-075	Q4 Red Plate	06-Aug-22	Attached	Top	MISC	BRYO	Bryozoa					Bryozoa indet.				Present	1	2	Attached to Balanomorpha
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-075	Q4 Red Plate	06-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-075	Q4 Red Plate	06-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-075	Q4 Red Plate	06-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			9	9	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	3	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa	Gymnolaemata	Ctenostomatida	Alcyonidiidae		Alcyonidium sp.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa					Bryozoa indet.				Present		2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present		2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Bottom	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Bottom	MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Molgulidae		Molgulidae indet.			1	1	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Bottom	MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Pyuridae		Boltenia echinata			1	1	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		7	26	33	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Mobile	n/a	ANNE	ANXX	Annelida					Annelida indet.			1	1		1	Degraded
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae		Terebellidae indet.	1			1	1	1	Degraded
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Top	MISC	BRYO	Bryozoa					Bryozoa indet.				Present	1	2	Attached to Balanomorpha
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata			Leptothecata indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present		2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-076	Q5 Red Plate	02-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		4	24	28	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Bottom	ANNE	POSE	Annelida	Polychaeta	Sabellida	Serpulidae	Spirorbinae	Bushiella (Jugaria) sp.	2	2		4	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Bottom	ANNE	POSE	Annelida	Polychaeta	Sabellida	Serpulidae		Serpulidae indet.			8	8		2	Degraded
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa	Gymnolaemata	Ctenostomatida	Alcyonidiidae		Alcyonidium sp.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida	Lichenoporidae		Lichenopora sp.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa					Bryozoa indet.				Present		2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present		2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		9	3	12	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Nereimyra aphroditoides	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe sp.			1	1	1	1	Degraded
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Mobile	n/a	MOLL	MOGA	Mollusca	Gastropoda	Nudibranchia	Dendronotidae		Dendronotus sp.			1	1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Top	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida	Lichenoporidae		Lichenopora sp.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Top	MISC	BRYO	Bryozoa					Bryozoa indet.				Present		2	Attached to Balanomorpha
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		3	9	12	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-077	Q6 Red Plate	10-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Crenellinae	Arvella faba		1		1	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	3	

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Abundance data in long format for WSP Golder Baffinland Iron Mine MEEMP, 2022 Quadrat and Settlement Subtrates including both plates and baskets.

Client	Project	Year	Sample Type	Biologica Sample ID	Client Sample ID	Date Sampled	Organism Type	Surface	taxcode	grpcode	Phylum	Class	Order	Family	Subfamily	Taxon Name	A	Int	J	Total Abundance	Unique Taxa Count	Percent Cover	Comments
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	3	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa					Bryozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Bottom	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			14	14	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Hesionidae indet.			1	1		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Nereimyra punctata	1		4	5	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe sp.			2	2		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	3	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Top	MISC	BRYO	Bryozoa					Bryozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		4	19	23	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-078	Q7 Red Plate	04-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			3	3	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Attached	Bottom	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Hesionidae indet.			25	25	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	2			2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe sp.			4	4		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae		Terebellidae indet.			3	3	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Attached	Top	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida	Lichenoporidae		Lichenopora sp.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Attached	Top	MISC	BRYO	Bryozoa					Bryozoa indet.				Present		2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		10	35	45	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-079	Q8 Red Plate	04-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			14	14	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Bottom	ANNE	POSE	Annelida	Polychaeta	Sabellida	Serpulidae		Serpulidae indet.			126	126	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	4	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Bottom	MEMO	MEMO	Annelida	Polychaeta	Sabellida	Serpulidae	Spirorbinae	Bushiella (Jugaria) sp.	1	3		4		2	Empty tube
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida	Lichenoporidae		Lichenopora sp.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa					Bryozoa indet.				Present		2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		5		5	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Hesionidae indet.			1	1	1	1	Degraded
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae		Terebellidae indet.	2			2	1	1	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Inorganic	n/a	MEMO	MEMO						Plastic				Present		1	Pieces of blue plastic attached to plate, <4 cm
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.		2	3	5		1	Damaged/no shell
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	3	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	3	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Top	MISC	BRYO	Bryozoa					Bryozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		1	8	9	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-080	Q9 Red Plate	08-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			1	1	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-081	Q11 Red Plate	06-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-081	Q11 Red Plate	06-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida			Cheilostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-081	Q11 Red Plate	06-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-081	Q11 Red Plate	06-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-081	Q11 Red Plate	06-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-081	Q11 Red Plate	06-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-082	Q12 Red Plate	06-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-082	Q12 Red Plate	06-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-082	Q12 Red Plate	06-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-082	Q12 Red Plate	06-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-082	Q12 Red Plate	06-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-082	Q12 Red Plate	06-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-083	Q13 Red Plate	03-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-083	Q13 Red Plate	03-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-083	Q13 Red Plate	03-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-083	Q13 Red Plate	03-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-083	Q13 Red Plate	03-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-083	Q13 Red Plate	03-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-084	Q14 Red Plate	06-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-084	Q14 Red Plate	06-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			1	1	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-084	Q14 Red Plate	06-Aug-22	Mobile	n/a	MEMO	MEMO	Echinodermata	Ophiuroidea				Ophiuroidea indet. (fragment)	1			1		1	Arm fragment
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-084	Q14 Red Plate	06-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-084	Q14 Red Plate	06-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.			1	1		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-084	Q14 Red Plate	06-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-084	Q14 Red Plate	06-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-084	Q14 Red Plate	06-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-084	Q14 Red Plate	06-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-085	Q15 Red Plate	02-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-085	Q15 Red Plate	02-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-085	Q15 Red Plate	02-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	

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Abundance data in long format for WSP Golder Baffinland Iron Mine MEEMP, 2022 Quadrat and Settlement Subtrates including both plates and baskets.

Client	Project	Year	Sample Type	Biologica Sample ID	Client Sample ID	Date Sampled	Organism Type	Surface	taxcode	grpcode	Phylum	Class	Order	Family	Subfamily	Taxon Name	A	Int	J	Total Abundance	Unique Taxa Count	Percent Cover	Comments
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-085	Q15 Red Plate	02-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-085	Q15 Red Plate	02-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-086	Q17 Red Plate	04-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-086	Q17 Red Plate	04-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-086	Q17 Red Plate	04-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-086	Q17 Red Plate	04-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-086	Q17 Red Plate	04-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-086	Q17 Red Plate	04-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			13	13	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-086	Q17 Red Plate	04-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			1	1	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-087	Q18 Red Plate	04-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-087	Q18 Red Plate	04-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-087	Q18 Red Plate	04-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda			Amphipoda indet.			1	1	1	1	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-087	Q18 Red Plate	04-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-087	Q18 Red Plate	04-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-087	Q18 Red Plate	04-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-087	Q18 Red Plate	04-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-087	Q18 Red Plate	04-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			9	9	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-088	Q19 Red Plate	08-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-088	Q19 Red Plate	08-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-088	Q19 Red Plate	08-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda			Amphipoda indet.			1	1	1	1	Degraded
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-088	Q19 Red Plate	08-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-088	Q19 Red Plate	08-Aug-22	Inorganic	n/a	MEMO	MEMO						Plastic				Present		1	Piece of pink plastic
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-088	Q19 Red Plate	08-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-088	Q19 Red Plate	08-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-088	Q19 Red Plate	08-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-088	Q19 Red Plate	08-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present		2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-088	Q19 Red Plate	08-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		4	1	5	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-089	Q20 Red Plate	04-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-089	Q20 Red Plate	04-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-089	Q20 Red Plate	04-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa					Bryozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-089	Q20 Red Plate	04-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			3	3	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-089	Q20 Red Plate	04-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-089	Q20 Red Plate	04-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-089	Q20 Red Plate	04-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-089	Q20 Red Plate	04-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-089	Q20 Red Plate	04-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			5	5	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-090	Q1 Red Basket	06-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-090	Q1 Red Basket	06-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-090	Q1 Red Basket	06-Aug-22	Mobile	n/a	MEMO	MEMO	Annelida	Polychaeta				Polychaeta indet. (fragment)	1			1		1	Fragment
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-090	Q1 Red Basket	06-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			2	2	1	2	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Nereimyra punctata			2	2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Polynoinae indet.			2	2		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Mobile	n/a	ANNE	POER	Annelida		Phyllodocida	Polynoidae	Polynoinae	Bylgides sp.	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae	Terebellinae	Pista maculata	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Capitellidae		Mediomastus sp.	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Mobile	n/a	ECHI	ECOP	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	Ophiura robusta		2		2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Attached	n/a	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	Attached to Bivalvia
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			2	2	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae	Musculinae	Astarte sp.			1	1		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae		Astarte montagui			1	1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			2	2	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-091	Q3 Red Basket	03-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.			1	1		1	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma fragilis	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma impatiens		1		1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Nereimyra punctata	1	1	1	3	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nereididae	Nereidinae	Nereis zonata			1	1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe longa	3			3	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe sp.	6			6		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Gattyana cirrhosa	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Trichobranchidae	Musculinae	Terebellides sp.	1		1	2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Capitellidae		Capitella capitata complex	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Scalibregmatidae		Scalibregma inflatum		1		1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Dexaminidae	Prophliantinae	Guernea nordenskioldi	2			2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Monoculodes sp.		1		1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Stenothoidae	Stenothoinae	Stenothoidae indet.	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Lampropidae		Lamprops sp.	5			5	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Leuconidae		Eudorella truncatula		1		1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Leuconidae		Leucon nasicoides	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Leuconidae		Leucon sp.			1	1		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ARTH	CROS	Arthropoda	Ostracoda	Myodocopida	Philomedidae	Musculinae	Philomedes sp.	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	ARTH	CROS	Arthropoda	Ostracoda				Ostracoda indet.	1			1		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida			Cheilostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Attached	n/a	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	Attached to Bivalvia
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			1	1	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae		Astarte montagui		1		1	1	1	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors	1	1		2	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-092	Q4 Red Basket	06-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.		1		1		1	Damaged/no shell
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-093	Q5 Red Basket	02-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-093	Q5 Red Basket	02-Aug-22	Attached	n/a	ANNE	POSE	Annelida	Polychaeta	Sabellida	Serpulidae		Serpulidae indet.			5	5	1	2	

biologica

Abundance data in long format for WSP Golder Baffinland Iron Mine MEEMP, 2022 Quadrat and Settlement Subtrates including both plates and baskets.

Client	Project	Year	Sample Type	Biologica Sample ID	Client Sample ID	Date Sampled	Organism Type	Surface	taxcode	grpcode	Phylum	Class	Order	Family	Subfamily	Taxon Name	A	Int	J	Total Abundance	Unique Taxa Count	Percent Cover	Comments
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-093	Q5 Red Basket	02-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Pectinariidae	Musculinae	Cistenides granulata	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-093	Q5 Red Basket	02-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-093	Q5 Red Basket	02-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae		Astarte borealis	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-093	Q5 Red Basket	02-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors		2	3	5	1	2	Damaged x2
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma impatiens	4			4	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Nereimyra punctata	3		3	6	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nephtyidae		Micronephthys cornuta	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nereididae	Nereidinae	Nereis zonata	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe longa	2			2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	5			5	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Gattyana cirrhosa	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Attached	n/a	ANNE	POSE	Annelida	Polychaeta	Sabellida	Serpulidae		Serpulidae indet.			1	1	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae	Musculinae	Chaetozone bathyala	2			2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Aphelochaeta sp.		2		2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Chaetozone sp.		1	5	6	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Trichobranchidae	Musculinae	Terebellides sp.	1	1		2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Trichobranchidae	Trichobranchinae	Trichobranchus glacialis		1		1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Capitellidae		Mediomastus sp.	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Cossuridae		Cossura longocirrata	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Maldanidae	Maldaninae	Maldane sarsi	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Orbiniidae	Orbiniinae	Scoloplos sp.		1		1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Dexaminidae	Prophliantinae	Guernea nordenskioldi	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Leuconidae		Leucon nasicoides	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	ARTH	CROS	Arthropoda	Ostracoda	Myodocopida	Philomedidae	Musculinae	Philomedes sp.	8			8	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida			Cheilostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida			Cyclostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	MISC	NTEA	Nemertea	Pilidiophora	Heteronemertea	Lineidae		Lineidae indet.	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	MISC	NTEA	Nemertea					Nemertea indet.			2	2		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			4	4	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Lucinida	Thyasiridae		Thyasira sp.			1	1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Mytilidae indet.			1	1	1	2	Damaged/no shell
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-094	Q6 Red Basket	10-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.			1	1		1	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Nereimyra punctata	1		3	4	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe longa	2	1		3	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe sp.	1		1	2		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Harmothoe sp.		1		1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Aphelochaeta sp.		2		2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Cirratulidae indet.		1		1		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Pectinariidae	Musculinae	Cistenides granulata	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Capitellidae		Capitella capitata complex	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Capitellidae		Mediomastus sp.	12	6		18	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Paraonidae		Aricidea sp.	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda			Amphipoda indet.		1		1	1	1	Degraded
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Diastylidae		Brachydiastylis resima	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Attached	n/a	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	Attached to Bivalvia
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae	Musculinae	Astarte sp.		1		1	1	1	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Crenellinae	Arvella faba	1			1	1	2	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors		1	9	10	1	2	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-095	Q7 Red Basket	04-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Mytilidae indet.			2	2		2	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma fragilis		1		1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Nereimyra punctata			4	4	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe longa	4			4	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	8	2		10	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eteoninae	Eteone longa complex	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Attached	n/a	ANNE	POSE	Annelida	Polychaeta	Sabellida	Serpulidae		Serpulidae indet.			11	11	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Chaetozone sp.		1		1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Cirratulidae indet.		1		1		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae	Terebellinae	Polycirrus sp. complex	1	1		2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Capitellidae		Mediomastus sp.	2		1	3	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Paraonidae		Paraonidae indet.			1	1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae		Ampelisca sp.		1		1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda			Amphipoda indet.		1		1		1	Damaged, anterior end only
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Diastylidae		Brachydiastylis resima	3	1		4	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida			Cheilostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Attached	n/a	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	Attached to Bivalvia
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			13	13	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae		Astarte montagui		2		2	1	1	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Myida	Myidae		Mya sp.			1	1	1	1	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Musculus glacialis		1	6	7	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Mytilidae indet.			4	4		2	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Nuculanida	Nuculanidae	Nuculaninae	Nuculana minuta	1			1	1	1	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-096	Q8 Red Basket	04-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Nuculida	Nuculidae		Ennucula tenuis	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma sp.	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Nereimyra punctata	1		1	2	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Harmothoe sp.	1			1	1	1	

biologica

Abundance data in long format for WSP Golder Baffinland Iron Mine MEEMP, 2022 Quadrat and Settlement Subtrates including both plates and baskets.

Client	Project	Year	Sample Type	Biologica Sample ID	Client Sample ID	Date Sampled	Organism Type	Surface	taxcode	grpcode	Phylum	Class	Order	Family	Subfamily	Taxon Name	A	Int	J	Total Abundance	Unique Taxa Count	Percent Cover	Comments
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Pectinariidae	Musculinae	Cistenides granulata	1			1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Capitellidae		Mediomastus sp.		1		1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Oedicerotidae indet.			1	1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Mobile	n/a	ECHI	ECOP	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	Ophiura robusta		1		1	1	1	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			2	2	1	2	
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Crenellinae	Arvella faba			5	5	1	2	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors		5	3	8	1	2	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus sp.			9	9		2	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Mytilidae indet.			5	5		2	Damaged
Golder	Baffinlands	2022	Quadrat Substrate	mb22-060-097	Q10 Red Basket	04-Aug-22	Attached	n/a	MOLL	MOGA	Mollusca	Gastropoda		Lottiidae		Lottiidae indet.	1			1	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-098	Centre-S Annual Plate	09-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-098	Centre-S Annual Plate	09-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-098	Centre-S Annual Plate	09-Aug-22	Attached	Bottom	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-098	Centre-S Annual Plate	09-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-098	Centre-S Annual Plate	09-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.			1	1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-098	Centre-S Annual Plate	09-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-098	Centre-S Annual Plate	09-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-098	Centre-S Annual Plate	09-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-098	Centre-S Annual Plate	09-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-098	Centre-S Annual Plate	09-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		1	8	9	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa					Bryozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		1		1	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Sabellida	Sabellidae	Sabellinae	Dialychone sp.	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae		Terebellidae indet.	1		3	4	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.			2	2	1	1	Damaged/no shell
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Attached	Top	MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida	Calloporidae		Calloporidae indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-099	Centre-S Red Plate	09-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		1	6	7	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-100	East-D Annual Plate	09-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-100	East-D Annual Plate	09-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-100	East-D Annual Plate	09-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-100	East-D Annual Plate	09-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			3	3	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-100	East-D Annual Plate	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Hesionidae indet.			1	1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-100	East-D Annual Plate	09-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-100	East-D Annual Plate	09-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-100	East-D Annual Plate	09-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-100	East-D Annual Plate	09-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-100	East-D Annual Plate	09-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-100	East-D Annual Plate	09-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			4	4	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Bottom	ANNE	POSE	Annelida	Polychaeta	Sabellida	Sabellidae		Sabellidae indet.			2	2	1	2	Degraded
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa					Bryozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			5	5	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Hesionidae indet.			1	1	1	1	Degraded
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae		Terebellidae indet.			10	10	1	1	Degraded
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta				Sedentaria indet.			5	5		1	Degraded
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Top	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida	Lichenoporidae		Lichenopora sp.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Top	MISC	BRYO	Bryozoa					Bryozoa indet.				Present		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			6	6	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-101	East-D Red Plate	09-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Mytilidae indet.			1	1	1	2	Damaged x1
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-102	East-M Annual Plate	09-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-102	East-M Annual Plate	09-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa					Bryozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-102	East-M Annual Plate	09-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-102	East-M Annual Plate	09-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-102	East-M Annual Plate	09-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-102	East-M Annual Plate	09-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-102	East-M Annual Plate	09-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-102	East-M Annual Plate	09-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			2	2	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Bottom	ANNE	POSE	Annelida	Polychaeta	Sabellida	Serpulidae	Spirorbinae	Bushiella (Jugaria) sp.	1			1	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	3	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida			Cheilostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa	Gymnolaemata	Ctenostomatida	Alcyonidiidae		Alcyonidium sp.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa					Bryozoa indet.				Present		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		1	1	2	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	

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Abundance data in long format for WSP Golder Baffinland Iron Mine MEEMP, 2022 Quadrat and Settlement Subtrates including both plates and baskets.

Client	Project	Year	Sample Type	Biologica Sample ID	Client Sample ID	Date Sampled	Organism Type	Surface	taxcode	grpcode	Phylum	Class	Order	Family	Subfamily	Taxon Name	A	Int	J	Total Abundance	Unique Taxa Count	Percent Cover	Comments
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Top	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida	Lichenoporidae		Lichenopora sp.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Top	MISC	BRYO	Bryozoa					Bryozoa indet.				Present		2	Attached to Balanomorpha
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-103	East-M Red Plate	09-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		1	15	16	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-104	East-S Annual Plate	09-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-104	East-S Annual Plate	09-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-104	East-S Annual Plate	09-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-104	East-S Annual Plate	09-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-104	East-S Annual Plate	09-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-104	East-S Annual Plate	09-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-104	East-S Annual Plate	09-Aug-22	Attached	Top	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida	Lichenoporidae		Lichenoporidae indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-104	East-S Annual Plate	09-Aug-22	Attached	Top	MISC	BRYO	Bryozoa					Bryozoa indet.				Present		2	Attached to Balanomorpha
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-104	East-S Annual Plate	09-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-104	East-S Annual Plate	09-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-104	East-S Annual Plate	09-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			3	3	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-105	East-S Red Plate	09-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-105	East-S Red Plate	09-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-105	East-S Red Plate	09-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-105	East-S Red Plate	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Nereimyra punctata			1	1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-105	East-S Red Plate	09-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-105	East-S Red Plate	09-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-105	East-S Red Plate	09-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-105	East-S Red Plate	09-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-105	East-S Red Plate	09-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-106	West-D Annual Plate	07-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-106	West-D Annual Plate	07-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-106	West-D Annual Plate	07-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-106	West-D Annual Plate	07-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			1	1	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-106	West-D Annual Plate	07-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-106	West-D Annual Plate	07-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-106	West-D Annual Plate	07-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-106	West-D Annual Plate	07-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-106	West-D Annual Plate	07-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			2	2	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae		Terebellidae indet.			1	1	1	1	Degraded
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Mobile	n/a	ARTH	CRCO	Arthropoda	Hexanauplia	Calanoida			Calanoida indet.	2			2	1	1	Degraded
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Mobile	n/a	MEMO	MEMO	Nematoda					Nematoda indet.	1			1		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		2	13	15	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-107	West-D Red Plate	07-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			2	2	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-108	West-M Annual Plate	07-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-108	West-M Annual Plate	07-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-108	West-M Annual Plate	07-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	Gelatinous egg masses
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-108	West-M Annual Plate	07-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-108	West-M Annual Plate	07-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Bottom	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Bottom	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			21	21	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			1	1	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Mobile	n/a	MEMO	MEMO	Nematoda					Nematoda indet.	4			4		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	3	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata	Campanulariidae		Campanulariidae indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Top	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica		1	10	11	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			1	1	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-109	West-M Red Plate	07-Aug-22	Attached	Top	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Mytilidae indet.			1	1		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-110	West-S Annual Plate	07-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-110	West-S Annual Plate	07-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-110	West-S Annual Plate	07-Aug-22	Attached	Bottom	MISC	BRYO	Bryozoa					Bryozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-110	West-S Annual Plate	07-Aug-22	Mobile	n/a	MEMO	MEMO						Egg/egg mass				Present		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-110	West-S Annual Plate	07-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-110	West-S Annual Plate	07-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-110	West-S Annual Plate	07-Aug-22	Attached	Top	MISC	CNHY	Cnidaria	Hydrozoa				Hydrozoa indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-111	West-S Red Plate	07-Aug-22	Attached	Bottom	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-111	West-S Red Plate	07-Aug-22	Attached	Bottom	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-111	West-S Red Plate	07-Aug-22	Attached	Bottom	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-111	West-S Red Plate	07-Aug-22	Attached	Bottom	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			1	1	1	2	

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Abundance data in long format for WSP Golder Baffinland Iron Mine MEEMP, 2022 Quadrat and Settlement Subtrates including both plates and baskets.

Client	Project	Year	Sample Type	Biologica Sample ID	Client Sample ID	Date Sampled	Organism Type	Surface	taxcode	grpcode	Phylum	Class	Order	Family	Subfamily	Taxon Name	A	Int	J	Total Abundance	Unique Taxa Count	Percent Cover	Comments
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-111	West-S Red Plate	07-Aug-22	Attached	Top	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-111	West-S Red Plate	07-Aug-22	Attached	Top	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	3	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-112	Centre-S Annual Basket	09-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-112	Centre-S Annual Basket	09-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-112	Centre-S Annual Basket	09-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida			Cyclostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-112	Centre-S Annual Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			1	1	1	2	Damaged
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-112	Centre-S Annual Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Mytilidae indet.			2	2		2	Damaged
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-113	Centre-S Red Basket	09-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-113	Centre-S Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nereididae	Nereidinae	Nereis zonata	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-113	Centre-S Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Spionida	Spionidae		Spionidae indet.			1	1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-113	Centre-S Red Basket	09-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Gammaridae		Gammarus sp.		1		1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-113	Centre-S Red Basket	09-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-113	Centre-S Red Basket	09-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida			Cyclostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-113	Centre-S Red Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			2	2	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-113	Centre-S Red Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			21	21	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-113	Centre-S Red Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus sp.			10	10		2	Damaged
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-113	Centre-S Red Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Mytilidae indet.			3	3		2	Damaged
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-113	Centre-S Red Basket	09-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.		1	3	4		1	Damaged/no shell
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-113	Centre-S Red Basket	09-Aug-22	Attached	n/a	MOLL	MOGA	Mollusca	Gastropoda		Lottiidae		Testudinalia testudinalis		1		1	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	ANOL	Annelida	Clitellata	Enchytraeida	Enchytraeidae		Enchytraeidae indet.	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma fragilis	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma impatiens	4	5	1	10	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma sp.		1		1		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Hesionidae		Nereimyra punctata	1	1	5	7	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nephtyidae		Micronephthys cornuta	5	1		6	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nereididae	Nereidinae	Nereis zonata	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe longa	7	3		10	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	16			16	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe sp.	24	4		28		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eteoninae	Eteone sp.			1	1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Gattyana cirrhosa		1		1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Harmothoe sp.		1		1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Spionida	Spionidae		Dipolydora quadrilobata		1	1	2	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Spionida	Spionidae		Spionidae indet.			1	1		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Ampharetidae		Ampharetidae indet.		1		1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae	Musculinae	Chaetozone bathyala	6			6	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Cirratulidae indet.		2	1	3		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Pectinariidae	Musculinae	Cistenides granulata	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Trichobranchidae	Musculinae	Terebellides sp.			4	4	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Capitellidae		Mediomastus sp.	1	2		3	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Cossuridae		Cossura longocirrata	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Maldanidae	Maldaninae	Maldane sarsi	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Orbiniidae	Orbiniinae	Scoloplos sp.		1		1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Scalibregmatidae		Scalibregma inflatum			1	1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae		Haploops tubicola	1	2		3	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Dexaminidae	Prophliantinae	Guernea nordenskioldi	5	5		10	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Pontogeneiidae		Pontoporeia femorata			6	6	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ARTH	CROS	Arthropoda	Ostracoda	Myodocopida	Philomedidae	Musculinae	Philomedes sp.	3			3	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ECHI	ECAS	Echinodermata	Asteroidea	Forcipulatida	Asteriidae		Asteriidae indet.			1	1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	ECHI	ECEC	Echinodermata	Echinoidea	Camarodonta	Strongylocentrotidae		Strongylocentrotus droebachiensis			1	1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida			Cyclostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Attached	n/a	MISC	FORA	Foraminifera					Foraminifera indet.				Present	1	2	Attached to Bivalvia
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	MISC	PRIA	Cephalorhyncha	Priapulida				Priapulida indet.			1	1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Attached	n/a	MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Molgulidae		Molgulidae indet.			8	8	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Attached	n/a	MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Pyuridae		Boltenia echinata			11	11	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Attached	n/a	MISC	URAS	Chordata	Ascidiacea				Ascidiacea indet.			5	5		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			1	1	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Cardiida	Tellinidae	Macominae	Macoma calcarea		1		1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae		Astarte borealis		1	2	3	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae		Astarte montagui		5	1	6	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Myida	Myidae		Mya sp.			1	1	1	1	Degraded
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-114	East-D Red Basket	09-Aug-22	Mobile	n/a	MOLL	MOGA	Mollusca	Gastropoda	Trochida	Margaritidae		Margarites sp.	1			1	1	1	Damaged/degraded
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-115	East-M Annual Basket	09-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-115	East-M Annual Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nereididae	Nereidinae	Nereis zonata	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-115	East-M Annual Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe sp.	1	1		2	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-115	East-M Annual Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Cirratulidae indet.		1	1	2	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-115	East-M Annual Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Trichobranchidae	Musculinae	Terebellides sp.	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-115	East-M Annual Basket	09-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-115	East-M Annual Basket	09-Aug-22	Mobile	n/a	ECHI	ECOP	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	Ophiura robusta		1		1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-115	East-M Annual Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			2	2	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-115	East-M Annual Basket	09-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae		Astarte borealis			2	2	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-115	East-M Annual Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus sp.			1	1	1	2	Damaged
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Attached	n/a	ANNE	POSE	Annelida	Polychaeta	Sabellida	Serpulidae		Serpulidae indet.			2	2	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Cirratulidae indet.			2	2	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Capitellidae		Mediomastus sp.		1		1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Cossuridae		Cossura longocirrata	2			2	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Mobile	n/a	ECHI	ECOP	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae	Ophiurinae	Ophiura robusta		2		2	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida			Cheilostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida			Cyclostomatida indet.				Present	1	2	

biologica

Abundance data in long format for WSP Golder Baffinland Iron Mine MEEMP, 2022 Quadrat and Settlement Subtrates including both plates and baskets.

Client	Project	Year	Sample Type	Biologica Sample ID	Client Sample ID	Date Sampled	Organism Type	Surface	taxcode	grpcode	Phylum	Class	Order	Family	Subfamily	Taxon Name	A	Int	J	Total Abundance	Unique Taxa Count	Percent Cover	Comments
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Attached	n/a	MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Molgulidae		Molgulidae indet.			7	7	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Attached	n/a	MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Pyuridae		Boltenia echinata			5	5	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			11	11	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae	Musculinae	Astarte sp.			2	2		1	Damaged
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Carditida	Astartidae		Astarte montagui	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-116	East-M Red Basket	09-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.			2	2		1	Damaged/no shell
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-117	East-S Annual Basket	09-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-117	East-S Annual Basket	09-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-117	East-S Annual Basket	09-Aug-22	Attached	n/a	MOLL	MOGA	Mollusca	Gastropoda		Lottiidae		Testudinalia testudinalis		1		1	1	2	Damaged
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-118	East-S Red Basket	09-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-118	East-S Red Basket	09-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Gymnolaemata	Ctenostomatida	Alcyonidiidae		Alcyonidium sp.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-118	East-S Red Basket	09-Aug-22	Attached	n/a	MISC	CNHY	Cnidaria	Hydrozoa	Leptothecata			Leptothecata indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-118	East-S Red Basket	09-Aug-22	Attached	n/a	MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Molgulidae		Molgulidae indet.			1	1	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-118	East-S Red Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica			3	3	1	2	Damaged
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-118	East-S Red Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors			8	8	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-118	East-S Red Basket	09-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Mytilidae indet.			1	1		2	Damaged
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-118	East-S Red Basket	09-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.			3	3		1	Damaged/no shell
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-119	West-D Annual Basket	07-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-119	West-D Annual Basket	07-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-119	West-D Annual Basket	07-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors	2	5	4	11	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	5			5	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe sp.	5			5		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Harmothoe sp.	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta		Capitellidae		Mediomastus sp.		1		1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Gammaridae		Gammarus oceanicus	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Attached	n/a	MISC	URAS	Chordata	Ascidiacea	Stolidobranchia	Molgulidae		Molgulidae indet.			1	1	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Myida	Myidae		Mya sp.			1	1	1	1	Degraded
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors	1	14	116	131	1	2	Damaged
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus sp.			15	15		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.			7	7		1	Damaged/no shell
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-120	West-D Red Basket	07-Aug-22	Attached	n/a	MOLL	MOGA	Mollusca	Gastropoda		Lottiidae		Testudinalia testudinalis			6	6	1	2	Damaged
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-121	West-M Annual Basket	07-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-121	West-M Annual Basket	07-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-121	West-M Annual Basket	07-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors	1	3	1	5	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-121	West-M Annual Basket	07-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Mytilidae indet.			6	6		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-122	West-M Red Basket	07-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-122	West-M Red Basket	07-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	6			6	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-122	West-M Red Basket	07-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Gammaridae		Gammarus sp.			1	1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-122	West-M Red Basket	07-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-122	West-M Red Basket	07-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae	Musculinae	Musculus discors	4	9	58	71	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-122	West-M Red Basket	07-Aug-22	Attached	n/a	MOLL	MOBI	Mollusca	Bivalvia	Mytilida	Mytilidae		Mytilidae indet.			4	4		2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-122	West-M Red Basket	07-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.			6	6		1	Damaged/no shell
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-123	West-S Annual Basket	07-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-123	West-S Annual Basket	07-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida			Cyclostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Attached	n/a	ALGAE	ALGAE						Algae ID in progress				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Mobile	n/a	ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe sp.		1		1		1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Mobile	n/a	ANNE	POSE	Annelida	Polychaeta	Sabellida	Sabellidae	Sabellinae	Euchone sp.	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Gammaridae		Gammarus setosus	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Oedicerotidae indet.		1		1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Mobile	n/a	ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Tryphosidae		Orchomene sp.	1			1	1	1	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Attached	n/a	ARTH	CRCI	Arthropoda	Thecostraca	Balanomorpha			Balanomorpha indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida			Cheilostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Attached	n/a	MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida			Cyclostomatida indet.				Present	1	2	
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia	Myida	Myidae		Mya sp.		1	3	4	1	1	Damaged
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Mobile	n/a	MOLL	MOBI	Mollusca	Bivalvia				Bivalvia indet.			3	3		1	Damaged/no shell
Golder	Baffinlands	2022	Settlement Substrate	mb22-060-124	West-S Red Basket	07-Aug-22	Attached	n/a	MOLL	MOGA	Mollusca	Gastropoda		Lottiidae		Lottiidae indet.			1	1	1	2	Damaged/no shell

Sample Type	Client Sample ID	Deploy	Organism Ty	Taxon Name	A	Int	J	Percent Cover	Comments
Quadrat Substrate	Q1 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q1 Red Plate	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q1 Red Plate	2	Attached	Leptothecata indet.				2	
Quadrat Substrate	Q1 Red Plate	2	Attached	Musculus discors			1	2	
Quadrat Substrate	Q1 Red Plate	2	Mobile	Pholoe sp.			1	1	Damaged
Quadrat Substrate	Q1 Red Plate	2	Mobile	Sedentaria indet.			2	1	
Quadrat Substrate	Q1 Red Plate	2	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q1 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q1 Red Plate	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q1 Red Plate	2	Attached	Cheilostomatida indet.				2	
Quadrat Substrate	Q1 Red Plate	2	Attached	Campanulariidae indet.				2	
Quadrat Substrate	Q1 Red Plate	2	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q1 Red Plate	2	Attached	Boltenia echinata			1	2	
Quadrat Substrate	Q1 Red Plate	2	Attached	Ascidiacea indet.			1	2	
Quadrat Substrate	Q1 Red Plate	2	Attached	Hiatella arctica			2	2	
Quadrat Substrate	Q3 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q3 Red Plate	2	Attached	Balanomorpha indet.				3	
Quadrat Substrate	Q3 Red Plate	2	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q3 Red Plate	2	Attached	Molgulidae indet.			1	2	
Quadrat Substrate	Q3 Red Plate	2	Attached	Hiatella arctica			30	2	
Quadrat Substrate	Q3 Red Plate	2	Mobile	Hesionidae indet.			7	1	Degraded
Quadrat Substrate	Q3 Red Plate	2	Mobile	Sedentaria indet.		3	3	1	Degraded
Quadrat Substrate	Q3 Red Plate	2	Mobile	Nematoda indet.	2			1	
Quadrat Substrate	Q3 Red Plate	2	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q3 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q3 Red Plate	2	Attached	Balanomorpha indet.				4	
Quadrat Substrate	Q3 Red Plate	2	Attached	Cheilostomatida indet.				2	
Quadrat Substrate	Q3 Red Plate	2	Attached	Bryozoa indet.				2	
Quadrat Substrate	Q3 Red Plate	2	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q3 Red Plate	2	Attached	Hiatella arctica		12	13	2	
Quadrat Substrate	Q4 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q4 Red Plate	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q4 Red Plate	2	Attached	Bryozoa indet.				2	
Quadrat Substrate	Q4 Red Plate	2	Attached	Hiatella arctica		6	5	2	
Quadrat Substrate	Q4 Red Plate	2	Mobile	Terebellidae indet.	1			1	Degraded
Quadrat Substrate	Q4 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q4 Red Plate	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q4 Red Plate	2	Attached	Bryozoa indet.				2	Attached to Balanomorpha
Quadrat Substrate	Q4 Red Plate	2	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q4 Red Plate	2	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q4 Red Plate	2	Attached	Hiatella arctica			9	2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Balanomorpha indet.				3	
Quadrat Substrate	Q5 Red Plate	2	Attached	Alcyonidium sp.				2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Bryozoa indet.				2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Campanulariidae indet.				2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Molgulidae indet.			1	2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Boltenia echinata			1	2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Hiatella arctica		7	26	2	
Quadrat Substrate	Q5 Red Plate	2	Mobile	Annelida indet.			1	1	Degraded
Quadrat Substrate	Q5 Red Plate	2	Mobile	Terebellidae indet.	1			1	Degraded
Quadrat Substrate	Q5 Red Plate	2	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q5 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Bryozoa indet.				2	Attached to Balanomorpha
Quadrat Substrate	Q5 Red Plate	2	Attached	Leptothecata indet.				2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q5 Red Plate	2	Attached	Hiatella arctica		4	24	2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Bushiella (Jugaria) sp.	2	2		2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Serpulidae indet.			8	2	Degraded
Quadrat Substrate	Q6 Red Plate	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Alcyonidium sp.				2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Lichenopora sp.				2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Bryozoa indet.				2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Campanulariidae indet.				2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Hiatella arctica		9	3	2	
Quadrat Substrate	Q6 Red Plate	2	Mobile	Nereimyra aphroditoides	1			1	
Quadrat Substrate	Q6 Red Plate	2	Mobile	Pholoe sp.			1	1	Degraded
Quadrat Substrate	Q6 Red Plate	2	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q6 Red Plate	2	Mobile	Dendronotus sp.			1	1	
Quadrat Substrate	Q6 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Balanomorpha indet.				2	

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Sample Type	Client Sample ID	Deploy	Organism Ty	Taxon Name	A	Int	J	Percent Cover	Comments
Quadrat Substrate	Q6 Red Plate	2	Attached	Lichenopora sp.				2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Bryozoa indet.				2	Attached to Balanomorpha
Quadrat Substrate	Q6 Red Plate	2	Attached	Campanulariidae indet.				2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Hiatella arctica		3	9	2	
Quadrat Substrate	Q6 Red Plate	2	Attached	Arvella faba		1		2	
Quadrat Substrate	Q7 Red Plate	2	Attached	Algae ID in progress				3	
Quadrat Substrate	Q7 Red Plate	2	Attached	Balanomorpha indet.				3	
Quadrat Substrate	Q7 Red Plate	2	Attached	Bryozoa indet.				2	
Quadrat Substrate	Q7 Red Plate	2	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q7 Red Plate	2	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q7 Red Plate	2	Attached	Hiatella arctica			14	2	
Quadrat Substrate	Q7 Red Plate	2	Mobile	Hesionidae indet.			1	1	
Quadrat Substrate	Q7 Red Plate	2	Mobile	Nereimyra punctata	1		4	1	
Quadrat Substrate	Q7 Red Plate	2	Mobile	Pholoe minuta	1			1	
Quadrat Substrate	Q7 Red Plate	2	Mobile	Pholoe sp.			2	1	
Quadrat Substrate	Q7 Red Plate	2	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q7 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q7 Red Plate	2	Attached	Balanomorpha indet.				3	
Quadrat Substrate	Q7 Red Plate	2	Attached	Bryozoa indet.				2	
Quadrat Substrate	Q7 Red Plate	2	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q7 Red Plate	2	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q7 Red Plate	2	Attached	Hiatella arctica		4	19	2	
Quadrat Substrate	Q7 Red Plate	2	Attached	Musculus discors			3	2	
Quadrat Substrate	Q8 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q8 Red Plate	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q8 Red Plate	2	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q8 Red Plate	2	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q8 Red Plate	2	Mobile	Hesionidae indet.			25	1	
Quadrat Substrate	Q8 Red Plate	2	Mobile	Pholoe minuta	2			1	
Quadrat Substrate	Q8 Red Plate	2	Mobile	Pholoe sp.			4	1	
Quadrat Substrate	Q8 Red Plate	2	Mobile	Terebellidae indet.			3	1	
Quadrat Substrate	Q8 Red Plate	2	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q8 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q8 Red Plate	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q8 Red Plate	2	Attached	Lichenopora sp.				2	
Quadrat Substrate	Q8 Red Plate	2	Attached	Bryozoa indet.				2	
Quadrat Substrate	Q8 Red Plate	2	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q8 Red Plate	2	Attached	Hiatella arctica		10	35	2	
Quadrat Substrate	Q8 Red Plate	2	Attached	Musculus discors			14	2	
Quadrat Substrate	Q9 Red Plate	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q9 Red Plate	2	Attached	Serpulidae indet.			126	2	
Quadrat Substrate	Q9 Red Plate	2	Attached	Balanomorpha indet.				4	
Quadrat Substrate	Q9 Red Plate	2	Attached	Bushiella (Jugaria) sp.	1	3		2	Empty tube
Quadrat Substrate	Q9 Red Plate	2	Attached	Lichenopora sp.				2	
Quadrat Substrate	Q9 Red Plate	2	Attached	Bryozoa indet.				2	
Quadrat Substrate	Q9 Red Plate	2	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q9 Red Plate	2	Attached	Hiatella arctica		5		2	
Quadrat Substrate	Q9 Red Plate	2	Mobile	Hesionidae indet.			1	1	Degraded
Quadrat Substrate	Q9 Red Plate	2	Mobile	Terebellidae indet.	2			1	Damaged
Quadrat Substrate	Q9 Red Plate	2	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q9 Red Plate	2	Inorganic	Plastic				1	Pieces of blue plastic attached to plate, <4 cm
Quadrat Substrate	Q9 Red Plate	2	Mobile	Bivalvia indet.		2	3	1	Damaged/no shell
Quadrat Substrate	Q9 Red Plate	2	Attached	Algae ID in progress				3	
Quadrat Substrate	Q9 Red Plate	2	Attached	Balanomorpha indet.				3	
Quadrat Substrate	Q9 Red Plate	2	Attached	Bryozoa indet.				2	
Quadrat Substrate	Q9 Red Plate	2	Attached	Campanulariidae indet.				2	
Quadrat Substrate	Q9 Red Plate	2	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q9 Red Plate	2	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q9 Red Plate	2	Attached	Hiatella arctica		1	8	2	
Quadrat Substrate	Q9 Red Plate	2	Attached	Musculus discors			1	2	
Quadrat Substrate	Q11 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q11 Red Plate	1	Attached	Cheilostomatida indet.				2	
Quadrat Substrate	Q11 Red Plate	1	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q11 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q11 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q11 Red Plate	1	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q12 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q12 Red Plate	1	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q12 Red Plate	1	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q12 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q12 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q12 Red Plate	1	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q13 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q13 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q13 Red Plate	1	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q13 Red Plate	1	Attached	Algae ID in progress				2	

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Sample Type	Client Sample ID	Deploy	Organism Ty	Taxon Name	A	Int	J	Percent Cover	Comments
Quadrat Substrate	Q13 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q13 Red Plate	1	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q14 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q14 Red Plate	1	Attached	Hiatella arctica			1	2	
Quadrat Substrate	Q14 Red Plate	1	Mobile	Ophiuroidea indet. (fragment)	1			1	Arm fragment
Quadrat Substrate	Q14 Red Plate	1	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q14 Red Plate	1	Mobile	Bivalvia indet.			1	1	
Quadrat Substrate	Q14 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q14 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q14 Red Plate	1	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q14 Red Plate	1	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q15 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q15 Red Plate	1	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q15 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q15 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q15 Red Plate	1	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q17 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q17 Red Plate	1	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q17 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q17 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q17 Red Plate	1	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q17 Red Plate	1	Attached	Hiatella arctica			13	2	
Quadrat Substrate	Q17 Red Plate	1	Attached	Musculus discors			1	2	
Quadrat Substrate	Q18 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q18 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q18 Red Plate	1	Mobile	Amphipoda indet.			1	1	Damaged
Quadrat Substrate	Q18 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q18 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q18 Red Plate	1	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q18 Red Plate	1	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q18 Red Plate	1	Attached	Hiatella arctica			9	2	
Quadrat Substrate	Q19 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q19 Red Plate	1	Attached	Campanulariidae indet.				2	
Quadrat Substrate	Q19 Red Plate	1	Mobile	Amphipoda indet.			1	1	Degraded
Quadrat Substrate	Q19 Red Plate	1	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q19 Red Plate	1	Inorganic	Plastic				1	Piece of pink plastic
Quadrat Substrate	Q19 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q19 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q19 Red Plate	1	Attached	Campanulariidae indet.				2	
Quadrat Substrate	Q19 Red Plate	1	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q19 Red Plate	1	Attached	Hiatella arctica		4	1	2	
Quadrat Substrate	Q20 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q20 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q20 Red Plate	1	Attached	Bryozoa indet.				2	
Quadrat Substrate	Q20 Red Plate	1	Attached	Hiatella arctica			3	2	
Quadrat Substrate	Q20 Red Plate	1	Attached	Algae ID in progress				2	
Quadrat Substrate	Q20 Red Plate	1	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q20 Red Plate	1	Attached	Hydrozoa indet.				2	
Quadrat Substrate	Q20 Red Plate	1	Attached	Foraminifera indet.				2	
Quadrat Substrate	Q20 Red Plate	1	Attached	Hiatella arctica			5	2	
Quadrat Substrate	Q1 Red Basket	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q1 Red Basket	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q1 Red Basket	2	Mobile	Polychaeta indet. (fragment)	1			1	Fragment
Quadrat Substrate	Q1 Red Basket	2	Attached	Musculus discors			2	2	Damaged
Quadrat Substrate	Q3 Red Basket	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q3 Red Basket	2	Mobile	Nereimyra punctata			2	1	
Quadrat Substrate	Q3 Red Basket	2	Mobile	Pholoe minuta	1			1	
Quadrat Substrate	Q3 Red Basket	2	Mobile	Polynoinae indet.			2	1	
Quadrat Substrate	Q3 Red Basket	2	Mobile	Bylgides sp.	1			1	
Quadrat Substrate	Q3 Red Basket	2	Mobile	Pista maculata	1			1	
Quadrat Substrate	Q3 Red Basket	2	Mobile	Mediomastus sp.	1			1	
Quadrat Substrate	Q3 Red Basket	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q3 Red Basket	2	Mobile	Ophiura robusta		2		1	
Quadrat Substrate	Q3 Red Basket	2	Attached	Foraminifera indet.				2	Attached to Bivalvia
Quadrat Substrate	Q3 Red Basket	2	Attached	Hiatella arctica			2	2	
Quadrat Substrate	Q3 Red Basket	2	Mobile	Astarte sp.			1	1	
Quadrat Substrate	Q3 Red Basket	2	Mobile	Astarte montagui			1	1	
Quadrat Substrate	Q3 Red Basket	2	Attached	Musculus discors			2	2	
Quadrat Substrate	Q3 Red Basket	2	Mobile	Bivalvia indet.			1	1	Damaged
Quadrat Substrate	Q4 Red Basket	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Scoletoma fragilis	1			1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Scoletoma impatiens		1		1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Nereimyra punctata	1	1	1	1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Nereis zonata			1	1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Pholoe longa	3			1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Pholoe minuta	1			1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Pholoe sp.	6			1	

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Sample Type	Client Sample ID	Deploy	Organism Ty	Taxon Name	A	Int	J	Percent Cover	Comments
Quadrat Substrate	Q4 Red Basket	2	Mobile	Gattyana cirrhosa	1			1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Terebellides sp.	1		1	1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Capitella capitata complex	1			1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Scalibregma inflatum		1		1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Guernea nordenskioldi	2			1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Monoculodes sp.		1		1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Stenothoidae indet.	1			1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Lamprops sp.	5			1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Eudorella truncatula		1		1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Leucon nasicoides	1			1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Leucon sp.			1	1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Philomedes sp.	1			1	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Ostracoda indet.	1			1	
Quadrat Substrate	Q4 Red Basket	2	Attached	Cheilostomatida indet.				2	
Quadrat Substrate	Q4 Red Basket	2	Attached	Hydrozoa indet.				2	Attached to Bivalvia
Quadrat Substrate	Q4 Red Basket	2	Attached	Hiatella arctica			1	2	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Astarte montagui		1		1	Damaged
Quadrat Substrate	Q4 Red Basket	2	Attached	Musculus discors	1	1		2	
Quadrat Substrate	Q4 Red Basket	2	Mobile	Bivalvia indet.		1		1	Damaged/no shell
Quadrat Substrate	Q5 Red Basket	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q5 Red Basket	2	Attached	Serpulidae indet.			5	2	
Quadrat Substrate	Q5 Red Basket	2	Mobile	Cistenides granulata	1			1	
Quadrat Substrate	Q5 Red Basket	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q5 Red Basket	2	Mobile	Astarte borealis	1			1	
Quadrat Substrate	Q5 Red Basket	2	Attached	Musculus discors		2	3	2	Damaged x2
Quadrat Substrate	Q6 Red Basket	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Scoletoma impatiens	4			1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Nereimyra punctata	3		3	1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Micronephthys cornuta	1			1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Nereis zonata	1			1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Pholoe longa	2			1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Pholoe minuta	5			1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Gattyana cirrhosa	1			1	
Quadrat Substrate	Q6 Red Basket	2	Attached	Serpulidae indet.			1	2	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Chaetozone bathyala	2			1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Aphelochaeta sp.		2		1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Chaetozone sp.		1	5	1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Terebellides sp.	1	1		1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Trichobranchus glacialis		1		1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Mediomastus sp.	1			1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Cossura longocirrata	1			1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Maldane sarsi	1			1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Scoloplos sp.		1		1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Guernea nordenskioldi	1			1	
Quadrat Substrate	Q6 Red Basket	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Leucon nasicoides	1			1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Philomedes sp.	8			1	
Quadrat Substrate	Q6 Red Basket	2	Attached	Cheilostomatida indet.				2	
Quadrat Substrate	Q6 Red Basket	2	Attached	Cyclostomatida indet.				2	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Lineidae indet.	1			1	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Nemertea indet.			2	1	
Quadrat Substrate	Q6 Red Basket	2	Attached	Hiatella arctica			4	2	
Quadrat Substrate	Q6 Red Basket	2	Mobile	Thyasira sp.			1	1	
Quadrat Substrate	Q6 Red Basket	2	Attached	Mytilidae indet.			1	2	Damaged/no shell
Quadrat Substrate	Q6 Red Basket	2	Mobile	Bivalvia indet.			1	1	Damaged
Quadrat Substrate	Q7 Red Basket	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Nereimyra punctata	1		3	1	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Pholoe longa	2	1		1	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Pholoe minuta	1			1	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Pholoe sp.	1		1	1	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Harmothoe sp.		1		1	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Aphelochaeta sp.		2		1	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Cirratulidae indet.		1		1	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Cistenides granulata	1			1	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Capitella capitata complex	1			1	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Mediomastus sp.	12	6		1	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Aricidea sp.	1			1	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Amphipoda indet.		1		1	Degraded
Quadrat Substrate	Q7 Red Basket	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q7 Red Basket	2	Mobile	Brachydiastylis resima	1			1	
Quadrat Substrate	Q7 Red Basket	2	Attached	Hydrozoa indet.				2	Attached to Bivalvia
Quadrat Substrate	Q7 Red Basket	2	Mobile	Astarte sp.		1		1	Damaged
Quadrat Substrate	Q7 Red Basket	2	Attached	Arvella faba	1			2	Damaged
Quadrat Substrate	Q7 Red Basket	2	Attached	Musculus discors		1	9	2	Damaged
Quadrat Substrate	Q7 Red Basket	2	Attached	Mytilidae indet.			2	2	Damaged
Quadrat Substrate	Q8 Red Basket	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Scoletoma fragilis		1		1	

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Sample Type	Client Sample ID	Deploy	Organism Ty	Taxon Name	A	Int	J	Percent Cover	Comments
Quadrat Substrate	Q8 Red Basket	2	Mobile	Nereimyra punctata			4	1	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Pholoe longa	4			1	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Pholoe minuta	8	2		1	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Eteone longa complex	1			1	
Quadrat Substrate	Q8 Red Basket	2	Attached	Serpulidae indet.			11	2	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Chaetozone sp.		1		1	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Cirratulidae indet.		1		1	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Polycirrus sp. complex	1	1		1	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Mediomastus sp.	2		1	1	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Paraonidae indet.			1	1	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Ampelisca sp.		1		1	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Amphipoda indet.		1		1	Damaged, anterior end only
Quadrat Substrate	Q8 Red Basket	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Brachydiastylis resima	3	1		1	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Egg/egg mass				1	
Quadrat Substrate	Q8 Red Basket	2	Attached	Cheilostomatida indet.				2	
Quadrat Substrate	Q8 Red Basket	2	Attached	Foraminifera indet.				2	Attached to Bivalvia
Quadrat Substrate	Q8 Red Basket	2	Attached	Hiatella arctica			13	2	
Quadrat Substrate	Q8 Red Basket	2	Mobile	Astarte montagui		2		1	Damaged
Quadrat Substrate	Q8 Red Basket	2	Mobile	Mya sp.			1	1	Damaged
Quadrat Substrate	Q8 Red Basket	2	Attached	Musculus glacialis		1	6	2	
Quadrat Substrate	Q8 Red Basket	2	Attached	Mytilidae indet.			4	2	Damaged
Quadrat Substrate	Q8 Red Basket	2	Mobile	Nuculana minuta	1			1	Damaged
Quadrat Substrate	Q8 Red Basket	2	Mobile	Ennucula tenuis	1			1	
Quadrat Substrate	Q10 Red Basket	2	Attached	Algae ID in progress				2	
Quadrat Substrate	Q10 Red Basket	2	Mobile	Scoletoma sp.	1			1	
Quadrat Substrate	Q10 Red Basket	2	Mobile	Nereimyra punctata	1		1	1	
Quadrat Substrate	Q10 Red Basket	2	Mobile	Harmothoe sp.	1			1	
Quadrat Substrate	Q10 Red Basket	2	Mobile	Cistenides granulata	1			1	
Quadrat Substrate	Q10 Red Basket	2	Mobile	Mediomastus sp.		1		1	
Quadrat Substrate	Q10 Red Basket	2	Mobile	Oedicerotidae indet.			1	1	
Quadrat Substrate	Q10 Red Basket	2	Attached	Balanomorpha indet.				2	
Quadrat Substrate	Q10 Red Basket	2	Mobile	Ophiura robusta		1		1	
Quadrat Substrate	Q10 Red Basket	2	Attached	Hiatella arctica			2	2	
Quadrat Substrate	Q10 Red Basket	2	Attached	Arvella faba			5	2	Damaged
Quadrat Substrate	Q10 Red Basket	2	Attached	Musculus discors		5	3	2	Damaged
Quadrat Substrate	Q10 Red Basket	2	Attached	Musculus sp.			9	2	Damaged
Quadrat Substrate	Q10 Red Basket	2	Attached	Mytilidae indet.			5	2	Damaged
Quadrat Substrate	Q10 Red Basket	2	Attached	Lottiidae indet.	1			2	
Settlement Substrate	Centre-S Annual Plate	1	Attached	Algae ID in progress				2	
Settlement Substrate	Centre-S Annual Plate	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	Centre-S Annual Plate	1	Attached	Foraminifera indet.				2	
Settlement Substrate	Centre-S Annual Plate	1	Mobile	Egg/egg mass				1	
Settlement Substrate	Centre-S Annual Plate	1	Mobile	Bivalvia indet.			1	1	
Settlement Substrate	Centre-S Annual Plate	1	Attached	Algae ID in progress				2	
Settlement Substrate	Centre-S Annual Plate	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	Centre-S Annual Plate	1	Attached	Hydrozoa indet.				2	
Settlement Substrate	Centre-S Annual Plate	1	Attached	Foraminifera indet.				2	
Settlement Substrate	Centre-S Annual Plate	1	Attached	Hiatella arctica		1	8	2	
Settlement Substrate	Centre-S Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	Centre-S Red Plate	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	Centre-S Red Plate	2	Attached	Bryozoa indet.				2	
Settlement Substrate	Centre-S Red Plate	2	Attached	Hydrozoa indet.				2	
Settlement Substrate	Centre-S Red Plate	2	Attached	Hiatella arctica		1		2	
Settlement Substrate	Centre-S Red Plate	2	Mobile	Dialychone sp.	1			1	
Settlement Substrate	Centre-S Red Plate	2	Mobile	Terebellidae indet.	1		3	1	
Settlement Substrate	Centre-S Red Plate	2	Mobile	Egg/egg mass				1	
Settlement Substrate	Centre-S Red Plate	2	Mobile	Bivalvia indet.			2	1	Damaged/no shell
Settlement Substrate	Centre-S Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	Centre-S Red Plate	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	Centre-S Red Plate	2	Attached	Calloporidae indet.				2	
Settlement Substrate	Centre-S Red Plate	2	Attached	Hydrozoa indet.				2	
Settlement Substrate	Centre-S Red Plate	2	Attached	Foraminifera indet.				2	
Settlement Substrate	Centre-S Red Plate	2	Attached	Hiatella arctica		1	6	2	
Settlement Substrate	East-D Annual Plate	1	Attached	Algae ID in progress				2	
Settlement Substrate	East-D Annual Plate	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-D Annual Plate	1	Attached	Hydrozoa indet.				2	
Settlement Substrate	East-D Annual Plate	1	Attached	Hiatella arctica			3	2	
Settlement Substrate	East-D Annual Plate	1	Mobile	Hesionidae indet.			1	1	
Settlement Substrate	East-D Annual Plate	1	Mobile	Egg/egg mass				1	
Settlement Substrate	East-D Annual Plate	1	Attached	Algae ID in progress				2	
Settlement Substrate	East-D Annual Plate	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-D Annual Plate	1	Attached	Hydrozoa indet.				2	
Settlement Substrate	East-D Annual Plate	1	Attached	Foraminifera indet.				2	
Settlement Substrate	East-D Annual Plate	1	Attached	Hiatella arctica			4	2	
Settlement Substrate	East-D Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	East-D Red Plate	2	Attached	Sabellidae indet.			2	2	Degraded

Sample Type	Client Sample ID	Deploy	Organism Ty	Taxon Name	A	Int	J	Percent Cover	Comments
Settlement Substrate	East-D Red Plate	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-D Red Plate	2	Attached	Bryozoa indet.				2	
Settlement Substrate	East-D Red Plate	2	Attached	Hydrozoa indet.				2	
Settlement Substrate	East-D Red Plate	2	Attached	Hiatella arctica			5	2	
Settlement Substrate	East-D Red Plate	2	Mobile	Hesionidae indet.			1	1	Degraded
Settlement Substrate	East-D Red Plate	2	Mobile	Terebellidae indet.			10	1	Degraded
Settlement Substrate	East-D Red Plate	2	Mobile	Sedentaria indet.			5	1	Degraded
Settlement Substrate	East-D Red Plate	2	Mobile	Egg/egg mass				1	
Settlement Substrate	East-D Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	East-D Red Plate	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-D Red Plate	2	Attached	Lichenopora sp.				2	
Settlement Substrate	East-D Red Plate	2	Attached	Bryozoa indet.				2	
Settlement Substrate	East-D Red Plate	2	Attached	Hydrozoa indet.				2	
Settlement Substrate	East-D Red Plate	2	Attached	Foraminifera indet.				2	
Settlement Substrate	East-D Red Plate	2	Attached	Hiatella arctica			6	2	
Settlement Substrate	East-D Red Plate	2	Attached	Mytilidae indet.			1	2	Damaged x1
Settlement Substrate	East-M Annual Plate	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-M Annual Plate	1	Attached	Bryozoa indet.				2	
Settlement Substrate	East-M Annual Plate	1	Attached	Hydrozoa indet.				2	
Settlement Substrate	East-M Annual Plate	1	Mobile	Egg/egg mass				1	
Settlement Substrate	East-M Annual Plate	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-M Annual Plate	1	Attached	Hydrozoa indet.				2	
Settlement Substrate	East-M Annual Plate	1	Attached	Foraminifera indet.				2	
Settlement Substrate	East-M Annual Plate	1	Attached	Hiatella arctica			2	2	
Settlement Substrate	East-M Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	East-M Red Plate	2	Attached	Bushiella (Jugaria) sp.	1			2	
Settlement Substrate	East-M Red Plate	2	Attached	Balanomorpha indet.				3	
Settlement Substrate	East-M Red Plate	2	Attached	Cheilostomatida indet.				2	
Settlement Substrate	East-M Red Plate	2	Attached	Alcyonidium sp.				2	
Settlement Substrate	East-M Red Plate	2	Attached	Bryozoa indet.				2	
Settlement Substrate	East-M Red Plate	2	Attached	Campanulariidae indet.				2	
Settlement Substrate	East-M Red Plate	2	Attached	Hydrozoa indet.				2	
Settlement Substrate	East-M Red Plate	2	Attached	Hiatella arctica		1	1	2	
Settlement Substrate	East-M Red Plate	2	Mobile	Egg/egg mass				1	
Settlement Substrate	East-M Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	East-M Red Plate	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-M Red Plate	2	Attached	Lichenopora sp.				2	
Settlement Substrate	East-M Red Plate	2	Attached	Bryozoa indet.				2	Attached to Balanomorpha
Settlement Substrate	East-M Red Plate	2	Attached	Campanulariidae indet.				2	
Settlement Substrate	East-M Red Plate	2	Attached	Hydrozoa indet.				2	
Settlement Substrate	East-M Red Plate	2	Attached	Foraminifera indet.				2	
Settlement Substrate	East-M Red Plate	2	Attached	Hiatella arctica		1	15	2	
Settlement Substrate	East-S Annual Plate	1	Attached	Algae ID in progress				2	
Settlement Substrate	East-S Annual Plate	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-S Annual Plate	1	Attached	Hydrozoa indet.				2	
Settlement Substrate	East-S Annual Plate	1	Mobile	Egg/egg mass				1	
Settlement Substrate	East-S Annual Plate	1	Attached	Algae ID in progress				2	
Settlement Substrate	East-S Annual Plate	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-S Annual Plate	1	Attached	Lichenoporidae indet.				2	
Settlement Substrate	East-S Annual Plate	1	Attached	Bryozoa indet.				2	Attached to Balanomorpha
Settlement Substrate	East-S Annual Plate	1	Attached	Hydrozoa indet.				2	
Settlement Substrate	East-S Annual Plate	1	Attached	Foraminifera indet.				2	
Settlement Substrate	East-S Annual Plate	1	Attached	Hiatella arctica			3	2	
Settlement Substrate	East-S Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	East-S Red Plate	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-S Red Plate	2	Attached	Hydrozoa indet.				2	
Settlement Substrate	East-S Red Plate	2	Mobile	Nereimyra punctata			1	1	
Settlement Substrate	East-S Red Plate	2	Mobile	Egg/egg mass				1	
Settlement Substrate	East-S Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	East-S Red Plate	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-S Red Plate	2	Attached	Hydrozoa indet.				2	
Settlement Substrate	East-S Red Plate	2	Attached	Foraminifera indet.				2	
Settlement Substrate	West-D Annual Plate	1	Attached	Algae ID in progress				2	
Settlement Substrate	West-D Annual Plate	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-D Annual Plate	1	Attached	Hydrozoa indet.				2	
Settlement Substrate	West-D Annual Plate	1	Attached	Musculus discors			1	2	
Settlement Substrate	West-D Annual Plate	1	Mobile	Egg/egg mass				1	
Settlement Substrate	West-D Annual Plate	1	Attached	Algae ID in progress				2	
Settlement Substrate	West-D Annual Plate	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-D Annual Plate	1	Attached	Hydrozoa indet.				2	
Settlement Substrate	West-D Annual Plate	1	Attached	Hiatella arctica			2	2	
Settlement Substrate	West-D Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	West-D Red Plate	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-D Red Plate	2	Attached	Campanulariidae indet.				2	
Settlement Substrate	West-D Red Plate	2	Attached	Hydrozoa indet.				2	
Settlement Substrate	West-D Red Plate	2	Mobile	Terebellidae indet.			1	1	Degraded
Settlement Substrate	West-D Red Plate	2	Mobile	Calanoida indet.	2			1	Degraded

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Sample Type	Client Sample ID	Deploy	Organism Ty	Taxon Name	A	Int	J	Percent Cover	Comments
Settlement Substrate	West-D Red Plate	2	Mobile	Nematoda indet.	1			1	
Settlement Substrate	West-D Red Plate	2	Mobile	Egg/egg mass				1	
Settlement Substrate	West-D Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	West-D Red Plate	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-D Red Plate	2	Attached	Campanulariidae indet.				2	
Settlement Substrate	West-D Red Plate	2	Attached	Hydrozoa indet.				2	
Settlement Substrate	West-D Red Plate	2	Attached	Foraminifera indet.				2	
Settlement Substrate	West-D Red Plate	2	Attached	Hiatella arctica		2	13	2	
Settlement Substrate	West-D Red Plate	2	Attached	Musculus discors			2	2	
Settlement Substrate	West-M Annual Plate	1	Attached	Algae ID in progress				2	
Settlement Substrate	West-M Annual Plate	1	Attached	Hydrozoa indet.				2	
Settlement Substrate	West-M Annual Plate	1	Mobile	Egg/egg mass				1	Gelatinous egg masses
Settlement Substrate	West-M Annual Plate	1	Attached	Algae ID in progress				2	
Settlement Substrate	West-M Annual Plate	1	Attached	Hydrozoa indet.				2	
Settlement Substrate	West-M Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	West-M Red Plate	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-M Red Plate	2	Attached	Campanulariidae indet.				2	
Settlement Substrate	West-M Red Plate	2	Attached	Hydrozoa indet.				2	
Settlement Substrate	West-M Red Plate	2	Attached	Foraminifera indet.				2	
Settlement Substrate	West-M Red Plate	2	Attached	Hiatella arctica			21	2	
Settlement Substrate	West-M Red Plate	2	Attached	Musculus discors			1	2	
Settlement Substrate	West-M Red Plate	2	Mobile	Nematoda indet.	4			1	
Settlement Substrate	West-M Red Plate	2	Mobile	Egg/egg mass				1	
Settlement Substrate	West-M Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	West-M Red Plate	2	Attached	Balanomorpha indet.				3	
Settlement Substrate	West-M Red Plate	2	Attached	Campanulariidae indet.				2	
Settlement Substrate	West-M Red Plate	2	Attached	Hydrozoa indet.				2	
Settlement Substrate	West-M Red Plate	2	Attached	Foraminifera indet.				2	
Settlement Substrate	West-M Red Plate	2	Attached	Hiatella arctica		1	10	2	
Settlement Substrate	West-M Red Plate	2	Attached	Musculus discors			1	2	
Settlement Substrate	West-M Red Plate	2	Attached	Mytilidae indet.			1	2	
Settlement Substrate	West-S Annual Plate	1	Attached	Algae ID in progress				2	
Settlement Substrate	West-S Annual Plate	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-S Annual Plate	1	Attached	Bryozoa indet.				2	
Settlement Substrate	West-S Annual Plate	1	Mobile	Egg/egg mass				1	
Settlement Substrate	West-S Annual Plate	1	Attached	Algae ID in progress				2	
Settlement Substrate	West-S Annual Plate	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-S Annual Plate	1	Attached	Hydrozoa indet.				2	
Settlement Substrate	West-S Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	West-S Red Plate	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-S Red Plate	2	Attached	Foraminifera indet.				2	
Settlement Substrate	West-S Red Plate	2	Attached	Musculus discors			1	2	
Settlement Substrate	West-S Red Plate	2	Attached	Algae ID in progress				2	
Settlement Substrate	West-S Red Plate	2	Attached	Balanomorpha indet.				3	
Settlement Substrate	Centre-S Annual Basket	1	Attached	Algae ID in progress				2	
Settlement Substrate	Centre-S Annual Basket	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	Centre-S Annual Basket	1	Attached	Cyclostomatida indet.				2	
Settlement Substrate	Centre-S Annual Basket	1	Attached	Musculus discors			1	2	Damaged
Settlement Substrate	Centre-S Annual Basket	1	Attached	Mytilidae indet.			2	2	Damaged
Settlement Substrate	Centre-S Red Basket	2	Attached	Algae ID in progress				2	
Settlement Substrate	Centre-S Red Basket	2	Mobile	Nereis zonata	1			1	
Settlement Substrate	Centre-S Red Basket	2	Mobile	Spionidae indet.			1	1	
Settlement Substrate	Centre-S Red Basket	2	Mobile	Gammarus sp.		1		1	
Settlement Substrate	Centre-S Red Basket	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	Centre-S Red Basket	2	Attached	Cyclostomatida indet.				2	
Settlement Substrate	Centre-S Red Basket	2	Attached	Hiatella arctica			2	2	
Settlement Substrate	Centre-S Red Basket	2	Attached	Musculus discors			21	2	
Settlement Substrate	Centre-S Red Basket	2	Attached	Musculus sp.			10	2	Damaged
Settlement Substrate	Centre-S Red Basket	2	Attached	Mytilidae indet.			3	2	Damaged
Settlement Substrate	Centre-S Red Basket	2	Mobile	Bivalvia indet.		1	3	1	Damaged/no shell
Settlement Substrate	Centre-S Red Basket	2	Attached	Testudinalia testudinalis		1		2	
Settlement Substrate	East-D Red Basket	2	Attached	Algae ID in progress				2	
Settlement Substrate	East-D Red Basket	2	Mobile	Enchytraeidae indet.	1			1	
Settlement Substrate	East-D Red Basket	2	Mobile	Scoletoma fragilis	1			1	
Settlement Substrate	East-D Red Basket	2	Mobile	Scoletoma impatiens	4	5	1	1	
Settlement Substrate	East-D Red Basket	2	Mobile	Scoletoma sp.		1		1	
Settlement Substrate	East-D Red Basket	2	Mobile	Nereimyra punctata	1	1	5	1	
Settlement Substrate	East-D Red Basket	2	Mobile	Micronephthys cornuta	5	1		1	
Settlement Substrate	East-D Red Basket	2	Mobile	Nereis zonata	1			1	
Settlement Substrate	East-D Red Basket	2	Mobile	Pholoe longa	7	3		1	
Settlement Substrate	East-D Red Basket	2	Mobile	Pholoe minuta	16			1	
Settlement Substrate	East-D Red Basket	2	Mobile	Pholoe sp.	24	4		1	
Settlement Substrate	East-D Red Basket	2	Mobile	Eteone sp.			1	1	
Settlement Substrate	East-D Red Basket	2	Mobile	Gattyana cirrhosa		1		1	
Settlement Substrate	East-D Red Basket	2	Mobile	Harmothoe sp.		1		1	
Settlement Substrate	East-D Red Basket	2	Mobile	Dipolydora quadrilobata		1	1	1	
Settlement Substrate	East-D Red Basket	2	Mobile	Spionidae indet.			1	1	

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Sample Type	Client Sample ID	Deploy	Organism Ty	Taxon Name	A	Int	J	Percent Cover	Comments
Settlement Substrate	East-D Red Basket	2	Mobile	Ampharetidae indet.		1		1	
Settlement Substrate	East-D Red Basket	2	Mobile	Chaetozone bathyala	6			1	
Settlement Substrate	East-D Red Basket	2	Mobile	Cirratulidae indet.		2	1	1	
Settlement Substrate	East-D Red Basket	2	Mobile	Cistenides granulata	1			1	
Settlement Substrate	East-D Red Basket	2	Mobile	Terebellides sp.			4	1	
Settlement Substrate	East-D Red Basket	2	Mobile	Mediomastus sp.	1	2		1	
Settlement Substrate	East-D Red Basket	2	Mobile	Cossura longocirrata	1			1	
Settlement Substrate	East-D Red Basket	2	Mobile	Maldane sarsi	1			1	
Settlement Substrate	East-D Red Basket	2	Mobile	Scoloplos sp.		1		1	
Settlement Substrate	East-D Red Basket	2	Mobile	Scalibregma inflatum			1	1	
Settlement Substrate	East-D Red Basket	2	Mobile	Haploops tubicola	1	2		1	
Settlement Substrate	East-D Red Basket	2	Mobile	Guernea nordenskioldi	5	5		1	
Settlement Substrate	East-D Red Basket	2	Mobile	Pontoporeia femorata			6	1	
Settlement Substrate	East-D Red Basket	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-D Red Basket	2	Mobile	Philomedes sp.	3			1	
Settlement Substrate	East-D Red Basket	2	Mobile	Asteriidae indet.			1	1	
Settlement Substrate	East-D Red Basket	2	Mobile	Strongylocentrotus droebachiensis			1	1	
Settlement Substrate	East-D Red Basket	2	Attached	Cyclostomatida indet.				2	
Settlement Substrate	East-D Red Basket	2	Attached	Foraminifera indet.				2	Attached to Bivalvia
Settlement Substrate	East-D Red Basket	2	Mobile	Priapulida indet.			1	1	
Settlement Substrate	East-D Red Basket	2	Attached	Molgulidae indet.			8	2	
Settlement Substrate	East-D Red Basket	2	Attached	Boltenia echinata			11	2	
Settlement Substrate	East-D Red Basket	2	Attached	Ascidiacea indet.			5	2	
Settlement Substrate	East-D Red Basket	2	Attached	Hiatella arctica			1	2	
Settlement Substrate	East-D Red Basket	2	Mobile	Macoma calcarea		1		1	
Settlement Substrate	East-D Red Basket	2	Mobile	Astarte borealis		1	2	1	
Settlement Substrate	East-D Red Basket	2	Mobile	Astarte montagui		5	1	1	
Settlement Substrate	East-D Red Basket	2	Mobile	Mya sp.			1	1	Degraded
Settlement Substrate	East-D Red Basket	2	Mobile	Margarites sp.	1			1	Damaged/degraded
Settlement Substrate	East-M Annual Basket	1	Attached	Algae ID in progress				2	
Settlement Substrate	East-M Annual Basket	1	Mobile	Nereis zonata	1			1	
Settlement Substrate	East-M Annual Basket	1	Mobile	Pholoe sp.	1	1		1	
Settlement Substrate	East-M Annual Basket	1	Mobile	Cirratulidae indet.		1	1	1	
Settlement Substrate	East-M Annual Basket	1	Mobile	Terebellides sp.	1			1	
Settlement Substrate	East-M Annual Basket	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-M Annual Basket	1	Mobile	Ophiura robusta		1		1	
Settlement Substrate	East-M Annual Basket	1	Attached	Hiatella arctica			2	2	
Settlement Substrate	East-M Annual Basket	1	Mobile	Astarte borealis			2	1	
Settlement Substrate	East-M Annual Basket	1	Attached	Musculus sp.			1	2	Damaged
Settlement Substrate	East-M Red Basket	2	Attached	Algae ID in progress				2	
Settlement Substrate	East-M Red Basket	2	Mobile	Pholoe minuta	1			1	
Settlement Substrate	East-M Red Basket	2	Attached	Serpulidae indet.			2	2	
Settlement Substrate	East-M Red Basket	2	Mobile	Cirratulidae indet.			2	1	
Settlement Substrate	East-M Red Basket	2	Mobile	Mediomastus sp.		1		1	
Settlement Substrate	East-M Red Basket	2	Mobile	Cossura longocirrata	2			1	
Settlement Substrate	East-M Red Basket	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-M Red Basket	2	Mobile	Ophiura robusta		2		1	
Settlement Substrate	East-M Red Basket	2	Attached	Cheilostomatida indet.				2	
Settlement Substrate	East-M Red Basket	2	Attached	Cyclostomatida indet.				2	
Settlement Substrate	East-M Red Basket	2	Attached	Molgulidae indet.			7	2	
Settlement Substrate	East-M Red Basket	2	Attached	Boltenia echinata			5	2	
Settlement Substrate	East-M Red Basket	2	Attached	Hiatella arctica			11	2	
Settlement Substrate	East-M Red Basket	2	Mobile	Astarte sp.			2	1	Damaged
Settlement Substrate	East-M Red Basket	2	Mobile	Astarte montagui	1			1	
Settlement Substrate	East-M Red Basket	2	Mobile	Bivalvia indet.			2	1	Damaged/no shell
Settlement Substrate	East-S Annual Basket	1	Attached	Algae ID in progress				2	
Settlement Substrate	East-S Annual Basket	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-S Annual Basket	1	Attached	Testudinalia testudinalis		1		2	Damaged
Settlement Substrate	East-S Red Basket	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	East-S Red Basket	2	Attached	Alcyonidium sp.				2	
Settlement Substrate	East-S Red Basket	2	Attached	Leptothecata indet.				2	
Settlement Substrate	East-S Red Basket	2	Attached	Molgulidae indet.			1	2	
Settlement Substrate	East-S Red Basket	2	Attached	Hiatella arctica			3	2	Damaged
Settlement Substrate	East-S Red Basket	2	Attached	Musculus discors			8	2	
Settlement Substrate	East-S Red Basket	2	Attached	Mytilidae indet.			1	2	Damaged
Settlement Substrate	East-S Red Basket	2	Mobile	Bivalvia indet.			3	1	Damaged/no shell
Settlement Substrate	West-D Annual Basket	1	Attached	Algae ID in progress				2	
Settlement Substrate	West-D Annual Basket	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-D Annual Basket	1	Attached	Musculus discors	2	5	4	2	
Settlement Substrate	West-D Red Basket	2	Attached	Algae ID in progress				2	
Settlement Substrate	West-D Red Basket	2	Mobile	Pholoe minuta	5			1	
Settlement Substrate	West-D Red Basket	2	Mobile	Pholoe sp.	5			1	
Settlement Substrate	West-D Red Basket	2	Mobile	Harmothoe sp.	1			1	
Settlement Substrate	West-D Red Basket	2	Mobile	Mediomastus sp.		1		1	
Settlement Substrate	West-D Red Basket	2	Mobile	Gammarus oceanicus	1			1	
Settlement Substrate	West-D Red Basket	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-D Red Basket	2	Attached	Molgulidae indet.			1	2	

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Sample Type	Client Sample ID	Deploy	Organism Ty	Taxon Name	A	Int	J	Percent Cover	Comments
Settlement Substrate	West-D Red Basket	2	Mobile	Mya sp.			1	1	Degraded
Settlement Substrate	West-D Red Basket	2	Attached	Musculus discors	1	14	116	2	Damaged
Settlement Substrate	West-D Red Basket	2	Attached	Musculus sp.			15	2	
Settlement Substrate	West-D Red Basket	2	Mobile	Bivalvia indet.			7	1	Damaged/no shell
Settlement Substrate	West-D Red Basket	2	Attached	Testudinalia testudinalis			6	2	Damaged
Settlement Substrate	West-M Annual Basket	1	Attached	Algae ID in progress				2	
Settlement Substrate	West-M Annual Basket	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-M Annual Basket	1	Attached	Musculus discors	1	3	1	2	
Settlement Substrate	West-M Annual Basket	1	Attached	Mytilidae indet.			6	2	
Settlement Substrate	West-M Red Basket	2	Attached	Algae ID in progress				2	
Settlement Substrate	West-M Red Basket	2	Mobile	Pholoe minuta	6			1	
Settlement Substrate	West-M Red Basket	2	Mobile	Gammarus sp.			1	1	
Settlement Substrate	West-M Red Basket	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-M Red Basket	2	Attached	Musculus discors	4	9	58	2	
Settlement Substrate	West-M Red Basket	2	Attached	Mytilidae indet.			4	2	
Settlement Substrate	West-M Red Basket	2	Mobile	Bivalvia indet.			6	1	Damaged/no shell
Settlement Substrate	West-S Annual Basket	1	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-S Annual Basket	1	Attached	Cyclostomatida indet.				2	
Settlement Substrate	West-S Red Basket	2	Attached	Algae ID in progress				2	
Settlement Substrate	West-S Red Basket	2	Mobile	Pholoe minuta	1			1	
Settlement Substrate	West-S Red Basket	2	Mobile	Pholoe sp.		1		1	
Settlement Substrate	West-S Red Basket	2	Mobile	Euchone sp.	1			1	
Settlement Substrate	West-S Red Basket	2	Mobile	Gammarus setosus	1			1	
Settlement Substrate	West-S Red Basket	2	Mobile	Oedicerotidae indet.		1		1	
Settlement Substrate	West-S Red Basket	2	Mobile	Orchomene sp.	1			1	
Settlement Substrate	West-S Red Basket	2	Attached	Balanomorpha indet.				2	
Settlement Substrate	West-S Red Basket	2	Attached	Cheilostomatida indet.				2	
Settlement Substrate	West-S Red Basket	2	Attached	Cyclostomatida indet.				2	
Settlement Substrate	West-S Red Basket	2	Mobile	Mya sp.		1	3	1	Damaged
Settlement Substrate	West-S Red Basket	2	Mobile	Bivalvia indet.			3	1	Damaged/no shell
Settlement Substrate	West-S Red Basket	2	Attached	Lottiidae indet.			1	2	Damaged/no shell

APPENDIX 8C-3

Settlement Substrate Laboratory Methods

Marine Benthic Enumeration and Identification Methods
Client: WSP Golder
Project: Baffinland Iron Mine MEEMP, 2022
Quadrat and Settlement Substrate (Plates and Baskets)

Sample Inventory

Sample arrival: 6-Sept-22
Number of samples: 25 + 27
Number of jars: 25 + 27
Screen size: 500 µm
Biologica project number: 22-060

The chain of custody documents were checked and approved with the client. Samples were assigned a unique identification number. For processing, samples were analyzed in water and then transferred back into 10% Formalin for storage.

Table 1. Summary of quadrat and settlement substrate including both plates and baskets processed for WSP Golder Baffinland Iron Mine MEEMP, 2022.

Sample Type	Substrate	Client Sample ID	Date Sampled	Biologica Sample ID
Quadrat Substrate	Plate	Q1 Red Plate	06-Aug-22	mb22-060-073
Quadrat Substrate	Plate	Q3 Red Plate	03-Aug-22	mb22-060-074
Quadrat Substrate	Plate	Q4 Red Plate	06-Aug-22	mb22-060-075
Quadrat Substrate	Plate	Q5 Red Plate	02-Aug-22	mb22-060-076
Quadrat Substrate	Plate	Q6 Red Plate	10-Aug-22	mb22-060-077
Quadrat Substrate	Plate	Q7 Red Plate	04-Aug-22	mb22-060-078
Quadrat Substrate	Plate	Q8 Red Plate	04-Aug-22	mb22-060-079
Quadrat Substrate	Plate	Q9 Red Plate	08-Aug-22	mb22-060-080
Quadrat Substrate	Plate	Q11 Red Plate	06-Aug-22	mb22-060-081
Quadrat Substrate	Plate	Q12 Red Plate	06-Aug-22	mb22-060-082
Quadrat Substrate	Plate	Q13 Red Plate	03-Aug-22	mb22-060-083
Quadrat Substrate	Plate	Q14 Red Plate	06-Aug-22	mb22-060-084
Quadrat Substrate	Plate	Q15 Red Plate	02-Aug-22	mb22-060-085
Quadrat Substrate	Plate	Q17 Red Plate	04-Aug-22	mb22-060-086
Quadrat Substrate	Plate	Q18 Red Plate	04-Aug-22	mb22-060-087
Quadrat Substrate	Plate	Q19 Red Plate	08-Aug-22	mb22-060-088
Quadrat Substrate	Plate	Q20 Red Plate	04-Aug-22	mb22-060-089
Quadrat Substrate	Basket	Q1 Red Basket	06-Aug-22	mb22-060-090
Quadrat Substrate	Basket	Q3 Red Basket	03-Aug-22	mb22-060-091
Quadrat Substrate	Basket	Q4 Red Basket	06-Aug-22	mb22-060-092
Quadrat Substrate	Basket	Q5 Red Basket	02-Aug-22	mb22-060-093
Quadrat Substrate	Basket	Q6 Red Basket	10-Aug-22	mb22-060-094
Quadrat Substrate	Basket	Q7 Red Basket	04-Aug-22	mb22-060-095

Sample Type	Substrate	Client Sample ID	Date Sampled	Biologica Sample ID
Quadrat Substrate	Basket	Q8 Red Basket	04-Aug-22	mb22-060-096
Quadrat Substrate	Basket	Q10 Red Basket	04-Aug-22	mb22-060-097
Settlement Substrate	Plate	Centre-S Annual Plate	09-Aug-22	mb22-060-098
Settlement Substrate	Plate	Centre-S Red Plate	09-Aug-22	mb22-060-099
Settlement Substrate	Plate	East-D Annual Plate	09-Aug-22	mb22-060-100
Settlement Substrate	Plate	East-D Red Plate	09-Aug-22	mb22-060-101
Settlement Substrate	Plate	East-M Annual Plate	09-Aug-22	mb22-060-102
Settlement Substrate	Plate	East-M Red Plate	09-Aug-22	mb22-060-103
Settlement Substrate	Plate	East-S Annual Plate	09-Aug-22	mb22-060-104
Settlement Substrate	Plate	East-S Red Plate	09-Aug-22	mb22-060-105
Settlement Substrate	Plate	West-D Annual Plate	07-Aug-22	mb22-060-106
Settlement Substrate	Plate	West-D Red Plate	07-Aug-22	mb22-060-107
Settlement Substrate	Plate	West-M Annual Plate	07-Aug-22	mb22-060-108
Settlement Substrate	Plate	West-M Red Plate	07-Aug-22	mb22-060-109
Settlement Substrate	Plate	West-S Annual Plate	07-Aug-22	mb22-060-110
Settlement Substrate	Plate	West-S Red Plate	07-Aug-22	mb22-060-111
Settlement Substrate	Basket	Centre-S Annual Basket	09-Aug-22	mb22-060-112
Settlement Substrate	Basket	Centre-S Red Basket	09-Aug-22	mb22-060-113
Settlement Substrate	Basket	East-D Red Basket	09-Aug-22	mb22-060-114
Settlement Substrate	Basket	East-M Annual Basket	09-Aug-22	mb22-060-115
Settlement Substrate	Basket	East-M Red Basket	09-Aug-22	mb22-060-116
Settlement Substrate	Basket	East-S Annual Basket	09-Aug-22	mb22-060-117
Settlement Substrate	Basket	East-S Red Basket	09-Aug-22	mb22-060-118
Settlement Substrate	Basket	West-D Annual Basket	07-Aug-22	mb22-060-119
Settlement Substrate	Basket	West-D Red Basket	07-Aug-22	mb22-060-120
Settlement Substrate	Basket	West-M Annual Basket	07-Aug-22	mb22-060-121
Settlement Substrate	Basket	West-M Red Basket	07-Aug-22	mb22-060-122
Settlement Substrate	Basket	West-S Annual Basket	07-Aug-22	mb22-060-123
Settlement Substrate	Basket	West-S Red Basket	07-Aug-22	mb22-060-124

Sample Processing

The top and bottom surface of each sample was scanned to identify epifaunal taxa, including invertebrates and macroalgae. Macroalgae samples were collected and preserved in formalin for identification. Each taxon was assigned a value to categorize the percent coverage (Table 2).

Table 2. Percent cover categories for WSP Golder Baffinland Iron Mine MEEMP, 2022.

Category	Percent Cover
1	Mobile organisms
2	Covering 0-25% of surfaces
3	Covering 25-50% of surfaces
4	Covering 50-75% of surfaces
5	Covering 75-100% of surfaces

All macrofaunal (>0.5mm) mobile/unattached organisms (worms, amphipods molluscs) were identified and counted. Polychaetes with cemented tubes and molluscs that attach with byssal threads were considered attached, all other polychaetes and molluscs were considered mobile. Attached/encrusting organisms, including macro algae were counted or assigned a percent cover category if they were colonial. All samples contained colonial and solitary diatoms which were not identified.

Data

Results were provided to the WSP Golder project manager in Excel spreadsheets via email.

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APPENDIX 8D-1

Zooplankton Taxa Presence/Absence from Survey Years 2010-2022

Appendix 8D-1
Zooplankton Taxa Presence/Absence from Survey Years 2014-2022

Phylum Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2014	2015	2016	2017	2018	2019	2020	2022
Annelida														
-	Polychaeta	-	-	-	-	Polychaeta indet.*	x	x	x	x	x	x	x	x
-	Polychaeta	Sedentaria	-	Sabellariidae	-	Sabellariidae indet.				x				
Arthropoda														
-	-	-	-	-	-	Arthropoda indet.*							x	
Chelicerata	Arachnida	Acari	Trombidiformes	-	-	Hydrachnidia indet		x						
Crustacea	-	-	-	-	-	Crustacea indet.				x	x	x		x
Crustacea	Branchiopoda	Phyllopoda	Diplostraca	-	-	Cladocera indet.						x		
Crustacea	Branchiopoda	Phyllopoda	Diplostraca/Anomopoda	Bosminidae	-	*Bosmina longicornis*		x	x					
Crustacea	Branchiopoda	Phyllopoda	Diplostraca/Anomopoda	Bosminidae	-	*Bosmina* sp.	x							
Crustacea	Branchiopoda	Phyllopoda	Diplostraca/Anomopoda	Bosminidae	-	Bosminidae indet.**				x			x	x
Crustacea	Branchiopoda	Phyllopoda	Diplostraca/Anomopoda	Chydoridae	-	*Chydorus sphaericus*			x					
Crustacea	Branchiopoda	Phyllopoda	Diplostraca/Anomopoda	Daphniidae	-	*Daphnia* sp.***		x					x	x
Crustacea	Hexanauplia	-	-	-	-	Cirripedia indet.		x	x					
Crustacea	Hexanauplia	Copepoda	-	-	-	Copepoda indet.*	x	x	x		x	x	x	x
Crustacea	Hexanauplia	Copepoda	Calanoida	-	-	Calanoida indet.*	x	x		x	x	x	x	x
Crustacea	Hexanauplia	Copepoda	Calanoida	Acartiidae	-	*Acarti* sp.***							x	
Crustacea	Hexanauplia	Copepoda	Calanoida	Acartiidae	-	*Acartia hudsonica*			x					x
Crustacea	Hexanauplia	Copepoda	Calanoida	Acartiidae	-	*Acartia longiremis*	x	x	x	x		x	x	x
Crustacea	Hexanauplia	Copepoda	Calanoida	Acartiidae	-	*Acartia* sp.*	x		x	x	x	x	x	
Crustacea	Hexanauplia	Copepoda	Calanoida	Calanidae	-	*Calanus finmarchicus*	x	x	x	x	x	x	x	x
Crustacea	Hexanauplia	Copepoda	Calanoida	Calanidae	-	*Calanus glacialis*	x	x	x	x	x	x	x	x
Crustacea	Hexanauplia	Copepoda	Calanoida	Calanidae	-	*Calanus hyperboreus*	x	x	x	x	x	x	x	x
Crustacea	Hexanauplia	Copepoda	Calanoida	Calanidae	-	*Calanus* sp.*				x	x	x	x	x
Crustacea	Hexanauplia	Copepoda	Calanoida	Centropagidae	-	*Centropages* sp.		x			x			
Crustacea	Hexanauplia	Copepoda	Calanoida	Centropagidae	-	*Limnocalanus macrurus*							x	x
Crustacea	Hexanauplia	Copepoda	Calanoida	Clausocalanidae	-	*Ctenocalanus* sp.					x			
Crustacea	Hexanauplia	Copepoda	Calanoida	Clausocalanidae	-	*Ctenocalanus vanus*				x	x			
Crustacea	Hexanauplia	Copepoda	Calanoida	Clausocalanidae	-	*Microcalanus* sp.				x	x	x	x	x
Crustacea	Hexanauplia	Copepoda	Calanoida	Clausocalanidae	-	*Pseudocalanus* sp. *	x	x	x	x	x	x	x	x
Crustacea	Hexanauplia	Copepoda	Calanoida	Lucicutilidae	-	*Lucicutia longicornis*			x					
Crustacea	Hexanauplia	Copepoda	Calanoida	Lucicutilidae	-	*Lucicutia* sp	x							
Crustacea	Hexanauplia	Copepoda	Calanoida	Metridinidae	-	*Metridia* sp.		x		x	x			
Crustacea	Hexanauplia	Copepoda	Calanoida	Pontellidae	-	Pontellidae indet.	x							
Crustacea	Hexanauplia	Copepoda	Calanoida	Rathkeidae	-	*Rathkea* sp.				x				
Crustacea	Hexanauplia	Copepoda	Calanoida	Scolecitrichidae	-	*Scolecithricella* sp.				x	x			
Crustacea	Hexanauplia	Copepoda	Calanoida	Temoridae	-	*Eurytemora herdmani*		x						
Crustacea	Hexanauplia	Copepoda	Cyclopoida	-	-	Cyclopoida indet.*				x	x	x	x	x
Crustacea	Hexanauplia	Copepoda	Cyclopoida	Corycaeidae	-	*Corycaeus* sp.		x						
Crustacea	Hexanauplia	Copepoda	Cyclopoida	Cyclopoidae	-	*Cyclops scutifer***							x	x
Crustacea	Hexanauplia	Copepoda	Cyclopoida	Oithonidae	-	*Oithona atlantica*	x	x	x	x	x			
Crustacea	Hexanauplia	Copepoda	Cyclopoida	Oithonidae	-	*Oithona similis*	x	x	x	x	x	x	x	
Crustacea	Hexanauplia	Copepoda	Cyclopoida	Oithonidae	-	*Oithona* sp.*	x	x	x	x	x	x	x	x
Crustacea	Hexanauplia	Copepoda	Cyclopoida	Oncaeidae	-	*Oncaea minuta*	x	x						
Crustacea	Hexanauplia	Copepoda	Cyclopoida	Oncaeidae	-	*Oncaea* sp.*	x	x		x	x	x	x	
Crustacea	Hexanauplia	Copepoda	Cyclopoida	Oncaeidae	-	Oncaeidae indet.			x	x				
Crustacea	Hexanauplia	Copepoda	Cyclopoida	Oncaeidae	-	*Triconia borealis*			x	x				
Crustacea	Hexanauplia	Copepoda	Cyclopoida	Sapphirinidae	-	*Sapphirina* sp.		x	x	x				
Crustacea	Hexanauplia	Copepoda	Harpacticoida	-	-	Harpacticoida indet.*			x		x	x	x	x
Crustacea	Hexanauplia	Copepoda	Harpacticoida	Ectinosomatidae	-	*Microsetella norvegica*	x	x	x	x	x	x	x	x
Crustacea	Hexanauplia	Copepoda	Harpacticoida	Ectinosomatidae	-	*Microsetella* sp.				x	x	x		
Crustacea	Hexanauplia	Copepoda	Harpacticoida	Peltidiidae	Clytemnestrinae	Clytemnestra scutellata	x		x					
Crustacea	Hexanauplia	Copepoda	Harpacticoida	Peltidiidae	Clytemnestrinae	Clytemnestra sp.				x				
Crustacea	Hexanauplia	Copepoda	Harpacticoida	Tachidiidae	-	*Euterpina acutifrons*		x	x	x				
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	-	-	Amphipoda indet.		x	x	x				
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	-	-	Lysianassoidea indet.					x			x
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Calliopiidae	-	*Apherusa* sp.					x			
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	-	*Hyperia medusarum*				x				
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	-	Hyperiidae indet.*					x	x		x
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	-	Hyperiidea indet.*								x
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	-	*Hyperoche medusarum*				x			x	
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	-	*Themisto abyssorum*				x				
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	-	*Themisto libellula*				x	x	x	x	x
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae	-	*Themisto* sp.	x			x	x			x
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Onisimus glacialis*						x		
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Onisimus litoralis*					x			
Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae	-	*Onisimus* sp.					x			x
Crustacea	Malacostraca	Eumalacostraca	Decapoda	-	-	Caridea indet.					x			
Crustacea	Malacostraca	Eumalacostraca	Decapoda	Crangonidae	-	Cragonidae indet.					x			
Crustacea	Malacostraca	Eumalacostraca	Decapoda	Crangonidae	-	*Sabinea septemcarinata*				x	x			x
Crustacea	Malacostraca	Eumalacostraca	Decapoda	Hippolytidae	-	Hippolytidae indet.					x			
Crustacea	Malacostraca	Eumalacostraca	Decapoda	Sapphirinidae	-	*Sapphirina opalina*		x						
Crustacea	Malacostraca	Eumalacostraca	Euphausiacea	-	-	Euphausiacea indet.					x			
Crustacea	Malacostraca	Eumalacostraca	Isopoda	-	-	Isopoda indet.*				x	x	x	x	x
Crustacea	Malacostraca	Eumalacostraca	Mysida	-	-	Mysida indet.	x							
Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	Mysinae	*Mysis litoralis*				x				
Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	Mysinae	*Mysis* sp.*					x		x	x
Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae	Erythropinae	*Erythrops* sp.					x			
Crustacea	Ostracoda	-	-	-	-	Ostracoda indet.					x			
Crustacea	Thecostraca	Cirripedia	Balanomorpha	-	-	Balanomorpha indet.*				x	x	x	x	x
Hexapoda	Insecta	-	-	-	-	Insecta indet.***							x	
Hexapoda	Insecta	Pterygota	Diptera	-	-	Diptera indet.***							x	
Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	-	Chironomidae indet.***							x	

Appendix 8D-1
Zooplankton Taxa Presence/Absence from Survey Years 2014-2022

Phylum Subphylum	Class	Subclass	Order	Family	Subfamily	Taxa	2014	2015	2016	2017	2018	2019	2020	2022
Bryozoa														
-	-	-	-	-	-	Bryozoa indet.					x			
Chaetognatha														
-	-	-	-	-	-	Chaetognatha indet.			x					
-	Sagittoidea	-	Aphragmophora	Sagittidae	-	*Parasagitta elegans*	x			x	x	x	x	x
-	Sagittoidea	-	Aphragmophora	Sagittidae	-	*Parasagitta* sp.				x	x			
-	Sagittoidea	-	Aphragmophora	Sagittidae	-	Sagittidae indet.	x	x	x					
-	Sagittoidea	-	Phragmophora	Eukrohniidae	-	*Eukrohnia hamata*	x							
Chordata														
Tunicata	Appendicularia	-	Copelata	Fritillariidae	Fritillariinae	*Fritillaria* sp.*		x	x		x	x	x	
Tunicata	Appendicularia	-	Copelata	Oikopleuridae	Oikopleurinae	*Oikopleura* sp.*		x		x	x	x	x	x
Tunicata	Ascidiacea	-	-	-	-	Ascidiacea indet.*								x
Vertebrata	Actinopterygii	-	Gadiformes	Gadidae	-	Gadidae indet.				x	x	x		x
Vertebrata	Actinopterygii	-	Perciformes	Ammodytidae	-	*Ammodytes* sp.					x		x	x
Vertebrata	Actinopterygii	-	Perciformes	Pholidae	-	*Pholis fasciata*				x				
Vertebrata	Actinopterygii	-	Scorpaeniformes	Cottidae	-	Cottidae indet.				x				
Vertebrata	Actinopterygii	-	Scorpaeniformes	Liparidae	-	*Liparis* sp.							x	
Cnidaria														
-	-	-	-	-	-	Cnidaria indet.*			x	x	x	x	x	
-	Hydrozoa	Hydroidolina	Anthoathecata	-	-	Anthoathecata indet.		x						
-	Hydrozoa	Hydroidolina	Anthoathecata	Bougainvilliidae	-	*Bougainvillia* sp.							x	
-	Hydrozoa	Hydroidolina	Anthoathecata	Corymorphidae	-	*Euphysa* sp.		x			x	x		x
-	Hydrozoa	Hydroidolina	Anthoathecata	Pandeidae	-	*Catablema vesicarium*				x	x			
-	Hydrozoa	Hydroidolina	Anthoathecata	Pandeidae	-	Pandeidae indet.*							x	x
-	Hydrozoa	Hydroidolina	Anthoathecata	Tubulariidae	-	*Hybocodon prolifer*						x		
-	Hydrozoa	Hydroidolina	Leptothecata	Campanulariidae	-	*Obelia* sp.						x		
-	Hydrozoa	Hydroidolina	Siphonophorae	-	-	Siphonophore indet.					x			
-	Hydrozoa	Trachylinae	Narcomedusae	Solmundaeginidae	-	*Aeginopsis laurentii*				x	x	x		x
-	Hydrozoa	Trachylinae	Trachymedusae	Rhopalonematidae	-	*Aglantha digitale*	x			x	x	x	x	x
-	Hydrozoa	Trachylinae	Trachymedusae	Rhopalonematidae	-	*Aglantha sp.*				x	x			
-	Scyphozoa	-	-	-	-	Scyphozoa indet.*								x
Ctenophora														
-	-	-	-	-	-	Ctenophora indet.		x				x		x
-	Nuda	-	Beroida	Beroidae	-	*Beroe cucumis*			x					
-	Nuda	-	Beroida	Beroidae	-	*Beroe gracilis*		x						
-	Nuda	-	Beroida	Beroidae	-	*Beroe* sp.					x			x
-	Tentaculata	-	Cydippida	Mertensiidae	-	*Mertensia ovum**								x
Echinodermata														
-	-	-	-	-	-	Echinodermata indet.	x	x	x					
Echinozoa	Echinoidea	-	-	-	-	Echinoidea indet.*				x	x	x	x	
Asterozoa	Ophiuroidea	-	-	-	-	Ophiuroidea indet.*								x
Mollusca														
-	Bivalvia	-	-	-	-	Bivalvia indet.*	x	x	x	x	x	x	x	x
-	Gastropoda	-	-	-	-	Gastropoda indet.*				x	x	x	x	x
-	Gastropoda	Heterobranchia	Pteropoda	-	-	Gymnosomata indet.	x							
-	Gastropoda	Heterobranchia	Pteropoda	Clionidae	-	*Clione limacina*	x	x		x	x	x	x	x
-	Gastropoda	Heterobranchia	Pteropoda	Limacinidae	-	*Limacina helicina*	x	x		x	x	x	x	x
-	Gastropoda	Heterobranchia	Pteropoda	Limacinidae	-	*Limacina* sp.*	x		x	x			x	x
Nemertea														
-	-	-	-	-	-	Nemertea indet.				x				
Rotifera														
-	-	-	-	-	-	Rotifera indet.				x				
-	Eurotatoria	Monogononta	Ploima	Synchaetidae	-	*Synchaeta hyperborea*			x					
-	Eurotatoria	Monogononta	Ploima	Synchaetidae	-	*Synchaeta* sp.				x				

Notes: Taxa in bold indicate the first observation of the taxa during MEEMP and NIS/AIS surveys. Taxa identified to the lowest practical taxonomic level; presence/absence for previous years taken from SEM 2015, 2016, 2017a, Golder 2018, Golder 2019a, Golder 2020a, Golder 2021a. *=Species or taxa from lower taxonomic levels identified in other survey years and/or in other survey methods; **=Freshwater taxon; ***= Incidental (benthic or terrestrial taxa or life stages); indet.= indeterminate (taxa could not be identified beyond the taxonomic level listed); sp.=species.

APPENDIX 8D-2

Zooplankton Laboratory Data

Zooplankton total abundance data matrix for WSP Golder Baffinlands Iron Mine MEEMP, 2022.

Biologica Sample ID										Grand Total		mz22-060-061	mz22-060-062	mz22-060-063	mz22-060-064	mz22-060-065	mz22-060-066	mz22-060-067	mz22-060-068	mz22-060-069	mz22-060-070	mz22-060-071	mz22-060-072	mz22-060-062_QA
Client Sample ID												ZV-01	ZV-02	ZV-03	ZV-04	ZV-05	ZV-06	ZH-01	ZH-02	ZH-03	ZH-04	ZH-05	ZH-06	ZV-02_QA
Date Sampled												7-Aug-22	7-Aug-22	7-Aug-22	7-Aug-22	7-Aug-22	7-Aug-22	11-Aug-22	11-Aug-22	14-Aug-22	9-Aug-22	14-Aug-22	9-Aug-22	7-Aug-22
Groupcode	Phylum	Subphylum	Class	Subclass	Order	Family	Subfamily	Taxon	Stage	Total Unique Taxa	Total Abundance (#/sample)	Total Abundance (#/sample)	Total Abundance (#/sample)	Total Abundance (#/sample)	Total Abundance (#/sample)	Total Abundance (#/sample)	Total Abundance (#/sample)	Total Abundance (#/sample)	Total Abundance (#/sample)	Total Abundance (#/sample)	Total Abundance (#/sample)	Total Abundance (#/sample)	Total Abundance (#/sample)	Total Abundance (#/sample)
CHAE	Chaetognatha		Sagittoidea		Aphragmophora	Sagittidae		Parasagitta elegans	A	1	1,917	85	137	119	14	91	124	256	804	16	94	94	83	89
CHAE	Chaetognatha		Sagittoidea		Aphragmophora	Sagittidae		Parasagitta elegans	J		4,052	16	1,280	1,280	192	32	40	299	608	27	80	160	38	768
CNHY	Cnidaria		Hydrozoa	Hydroidolina	Anthoathecata	Corymorphidae		Euphysa sp.	Medusa	1	2											2		
CNHY	Cnidaria		Hydrozoa	Hydroidolina	Anthoathecata	Pandeidae		Pandeidae indet.	Medusa	1	19	1		1	2	1	1	3	3	2		5		
CNHY	Cnidaria		Hydrozoa	Trachylinae	Narcomedusae	Solmundaeginidae		Aeginopsis laurentii	Medusa	1	1				1									
CNHY	Cnidaria		Hydrozoa	Trachylinae	Trachymedusae	Rhopalonematidae		Aglantha digitale	Medusa	1	515	2	5	5	8	4	5	272	48	54	22	62	28	5
CNSC	Cnidaria		Scyphozoa					Scyphozoa indet.	Medusa	1	2							1			1			
CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae		Hyperiidae indet.	J		24							21		1			2	
CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae		Themisto libellula	A	1	7					1	1	2				3		
CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae		Themisto libellula	J		32											32		
CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyperiidae		Themisto sp.	J		2			1	1									
CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae		Onisimus sp.	A	1	21							1	5	2	1	12		
CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Uristidae		Onisimus sp.	J		8											8		
CRAM	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda			Hyperiidea indet.	J		1												1	
CRCI	Arthropoda	Crustacea	Thecostraca	Cirripedia	Balanomorpha			Balanomorpha indet.	Cypris	1	5									5				
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Acartiidae		Acartia longiremis	V	1	85							21	64					
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Acartiidae		Acartia longiremis	VIf		27							21		5				
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Acartiidae		Acartia sp.	V		82									5	32	32	13	
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae		Calanus finmarchicus	V	1	40					16	8				16			
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae		Calanus finmarchicus	VIm		16	16												
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae		Calanus glacialis	V	1	5,698	88	512	384	208	208	336	448	32	4	304	2,752	422	608
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae		Calanus glacialis	VIf		214	8	16	32	16	8	8			1	16	96	13	32
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae		Calanus glacialis	VIm		8	8												
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae		Calanus hyperboreus	I-IV	1	1,258	32	80	64	80	32	64	256	416		112	96	26	96
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae		Calanus hyperboreus	V		790	8	96	80	128	8	24	128	32	1	144	128	13	80
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae		Calanus hyperboreus	VIf		17				16						1			
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Calanidae		Calanus sp.	I-IV		6,796	328	688	496	496	216	312	747	704	6	960	1,344	499	672
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Centropagidae		Limnocalanus macrurus	V	1	314			16					32	48	96	32	90	
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Centropagidae		Limnocalanus macrurus	VIf		35					8				11	16			
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Centropagidae		Limnocalanus macrurus	VIm		19						8			11				16
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Clausocalanidae		Microcalanus sp.	VIm	1	16		16											
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Clausocalanidae		Pseudocalanus sp. complex	V	1	1,474	160	176	192	224	32	48	128	256	5	80	160	13	112
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Clausocalanidae		Pseudocalanus sp. complex	VIf		162			16				21	32		48	32	13	
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida	Clausocalanidae		Pseudocalanus sp. complex	VIm		32								32					
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Calanoida			Calanoida indet.	I-IV		5,108	736	1,024	288	288	200	216	448	672	59	608	480	90	720
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Cyclopoida	Oithonidae		Oithona sp.	I-IV	1	225,049	40,192	35,328	44,544	40,192	23,723	36,608	320	1,056	539	1,280	448	819	41,728
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Cyclopoida	Oithonidae		Oithona sp.	V		32,253	4,608	2,560	4,096	5,632	2,731	3,072	2,112	2,368	517	2,048	1,152	1,357	3,328
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Cyclopoida	Oithonidae		Oithona sp.	VIf		5,781	1,024	1,024	256	1,024	512	512	597	384	32	192	160	64	768
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Cyclopoida	Oithonidae		Oithona sp.	VIm		690	256						149	224	16		32	13	
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Cyclopoida			Cyclopoida indet.	I-IV		2,312	1,792	256	256		8								
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Harpacticoida	Ectinosomatidae		Microsetella norvegica	I-IV	1	7,285	1,280	1,536	768	512	853	2,304				32			768
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Harpacticoida	Ectinosomatidae		Microsetella norvegica	V		22,256	3,840	4,864	4,864	2,304	2,560	3,584	192	32	16				2,816
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Harpacticoida	Ectinosomatidae		Microsetella norvegica	VIf		3,413	512	1,024	512	256	853	256							512
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Harpacticoida	Ectinosomatidae		Microsetella norvegica	VIm		939	256	256		256	171								
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda				Copepoda indet.	Nauplius		381,087	56,064	69,120	76,544	58,624	53,760	66,560	149	64	16	160		26	79,104
CRDE	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Crangonidae		Sabinea septemcarinata	Megalopa	1	11		1	1		2	1		1	1	1	2	1	1
CRDE	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Crangonidae		Sabinea septemcarinata	Zoea		1					1								
CRIS	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda			Isopoda indet.	Cryptoniscid larvae	1	482		16			8	8	107		43	32	256	13	
CRMY	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Mysida	Mysidae		Mysis sp.	A	1	1			1										
CRXX	Arthropoda	Crustacea						Crustacea indet.	Nauplius		256		256											
CTEN	Ctenophora		Nuda		Beroida	Beroidae		Beroe sp.	A	1	1	1												
CTEN	Ctenophora							Ctenophora indet.	A		2				1	1								
CTEN	Ctenophora							Ctenophora indet.	J		1					1								
CTEN	Ctenophora		Tentaculata		Cydippida	Mertensiidae		Mertensia ovum	A	1	16							3	13					
ECOP	Echinodermata	Asterozoa	Ophiuroidea					Ophiuroidea indet.	Pluteus	1	32								32					
EGGS								Egg/egg mass	Egg		5,671	1,792	1,536	512	512	171	1,024	107		5			13	512
MOBI	Mollusca		Bivalvia					Bivalvia indet.	Veliger	1	3,413	768	256	256	512	853	768							256
MOGA	Mollusca		Gastropoda	Heterobranchia	Pteropoda	Clionidae		Clione limacina	A	1	127	3		1		1		33	24	18	5	34	8	
MOGA	Mollusca		Gastropoda	Heterobranchia	Pteropoda	Clionidae		Clione limacina	J		431	32	16	16	16	2	5	64	64	21	32	160	3	32
MOGA	Mollusca		Gastropoda	Heterobranchia	Pteropoda	Limacinidae		Limacina helicina	A	1	67		1			1		1		20	1	38	5	1
MOGA	Mollusca		Gastropoda	Heterobranchia	Pteropoda	Limacinidae		Limacina sp.	A		3								3					
MOGA	Mollusca		Gastropoda	Heterobranchia	Pteropoda	Limacinidae		Limacina sp.	J		67			16			8			11	32			
MOGA	Mollusca		Gastropoda					Gastropoda indet.	Veliger		3,627	768	1,280	512		683	256	21		11	64	32		768
PIXX	Chordata	Vertebrata	Actinopteri	Teleostei	Gadiformes	Gadidae		Gadidae indet.	L	1	2									1		1		
PIXX	Chordata	Vertebrata	Actinopteri	Teleostei	Perciformes	Ammodytidae		Ammodytes sp.	L	1	2									1		1		
POXX	Annelida		Polychaeta					Polychaeta indet.	Metatrochophore	1	16			16										
URAP	Chordata	Tunicata	Appendicularia		Copelata	Oikopleuridae		Oikopleura sp.	J	1	256						256							
URAS	Chordata	Tunicata	Ascidiacea					Ascidiacea indet.	L	1	21							21						
									Total Abundance:		**724,370**	**114,676**	**123,360**	**136,145**	**111,515**	**87,751**	**116,417**	**6,951**	**8,005**	**1,531**	**6,510**	**7,846**	**3,664**	**133,792**
									Total Unique Taxa (species Richness):	**32**	**188**	**12**	**13**	**16**	**13**	**18**	**17**	**17**	**16**	**19**	**16**	**18**	**13**	**12**
Freshwater Taxa:																								
CRCL	Arthropoda	Crustacea	Branchiopoda			Bosminidae		Bosminidae indet.	A	1	96							43		53				
CRCL	Arthropoda	Crustacea	Branchiopoda			Daphnidae		Daphnia sp.	A	1	37									37				
CRCO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Cyclopoida			Cyclopoida indet.	I-IV	1	287							21		176	64		26	
CRCO	Arthropoda	Crustacea	Hexanauplia	Copepoda	Cyclopoida	Cyclopidae		Cyclops scutifer	VIf	1	141									32	32	64	13	
									Total Abundance:		**561**							**64**		**299**	**96**	**64**	**38**	
									Total Unique Taxa (species Richness):	**4**	**7**							**1**		**3**	**1**	**1**	**1**	
Incidental:																								
MEMO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Harpacticoida			Harpacticoida indet. (benthic)	V		16									16				
MEMO	Arthropoda	Crustacea	Hexanauplii	Copepoda	Harpacticoida			Harpacticoida indet. (benthic)	VIf		5									5				
MEMO	Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda			Lysianassoidea indet. (benthic)	A		1			1										

APPENDIX 8D-3

Zooplankton Laboratory Methods

biologica

Marine Zooplankton Enumeration and Identification Methods
Client: WSP Golder
Project: Baffinland Iron Mine MEEMP

Sample Inventory

Sample arrival: 6-Sept-22
Number of samples: 12
Number of jars: 12
Field screen size: Horizontal Tows = 250 µm
Vertical Tows = 64 µm
Biologica project number: mz22-060

Upon arrival, the samples were examined and double-checked against the chain of custody to ensure that (1) all samples were accounted for, and (2) each sample had the appropriate number of jars as indicated on the COC. Any discrepancies were reported to the client and were resolved before further sample handling. Samples were assigned a unique internal identification number and stored in ascending order in the sample storage area. For processing, samples were analyzed in water and then transferred back into 10% Formalin for storage.

Sample Processing

Marine zooplankton samples were analyzed in 2-4 fractions as described below. All subsamples are obtained using a Folsom Splitter. Among the subsamples, a total count of a minimum of 300 organisms were identified.

(1) A “URL” fraction (Unique, Large, and Rare) comprised of unique, large and rare organisms. These tend to have low abundance. The whole sample is scanned and these organisms are removed for identification. Ichthyoplankton are included in this fraction unless they have very high abundances.
(2) One to three fraction(s) comprised of all remaining organisms in the sample. The number of fractions is determined by the size distribution and abundances of organisms in the sample. Counts are included in the fraction which most accurately captures the per-taxon abundances. All taxa (and stages) are identified in only one fraction.

The fractions were analyzed through a stereo microscope at 10–40x magnification. All organisms were identified by taxonomic experts to the lowest taxonomic level using a compound microscope (100–400x magnification), appropriate dissection tools, and standard taxonomic references. For copepods, the stage of development was also recorded (copepodite stages I–V) as is the sex for mature individuals (copepod stage VI).

In addition, all non-copepod taxa were assigned a size stage consistent with sizing of the Zooplankton Taxonomy Laboratory at the Institute of Ocean Sciences (Sidney, BC). These size stages are s0 (<1.0 mm), s1 (1-5 mm), s2 (5-10 mm), s3 (10-15 mm), s4 (15-20 mm), s5 (20-25 mm), s6 (25-30mm), s7 (30-35mm) and s8 (35-40mm).

Zooplankton were identified to species wherever possible, although immature copepods lack differentiating features required for identification beyond order (e.g., Calanoida, Cyclopoida, or Harpacticoida). All identifications were performed using taxonomic references and collaborations with external experts, where necessary.

Table 1. Summary of zooplankton samples processed for WSP Golder Baffinland Iron Mine MEEMP, 2022.

Client Sample ID	Date Sampled	Tow	Biologica Sample ID	Fraction	Split	Specimens Counted*
ZV-01	7-Aug-22	Vertical	mz22-060-061	Fraction 1	1/256	437
				Fraction 2	1/16	28
				Fraction 3	1/8	66
				URL	Whole	36
ZV-02	7-Aug-22	Vertical	mz22-060-062	Fraction 1	1/256	468
				Fraction 2	1/16	124
				URL	Whole	32
ZV-03	7-Aug-22	Vertical	mz22-060-063	Fraction 1	1/256	523
				Fraction 2	1/16	107
				URL	Whole	33
ZV-04	7-Aug-22	Vertical	mz22-060-064	Fraction 1	1/256	427
				Fraction 2	1/16	104
				URL	Whole	27
ZV-05	7-Aug-22	Vertical	mz22-060-065	Fraction 1	3/512	508
				Fraction 2	1/8	107
				URL	Whole	26
ZV-06	7-Aug-22	Vertical	mz22-060-066	Fraction 1	1/256	446
				Fraction 2	1/8	148
				URL	Whole	33
ZH-01	11-Aug-22	Horizontal	mz22-060-067	Fraction 1	3/64	297
				Fraction 2	1/16	35
				URL	Whole	12
ZH-02	11-Aug-22	Horizontal	mz22-060-068	Fraction 1	1/32	245
				Fraction 2	1/4	17
				Fraction 3	1/2	24
				URL	Whole	49
ZH-03	14-Aug-22	Horizontal	mz22-060-069	Fraction 1	3/16	321
				Fraction 2	1/2	27
				URL	Whole	58
ZH-04	9-Aug-22	Horizontal	mz22-060-070	Fraction 1	1/32	129
				Fraction 2	1/16	151
				Fraction 3	1/2	15
				URL	Whole	32

Client Sample ID	Date Sampled	Tow	Biologica Sample ID	Fraction	Split	Specimens Counted*
ZH-05	14-Aug-22	Horizontal	mz22-060-071	Fraction 1	1/32	241
				Fraction 2	1/2	86
				URL	Whole	26
ZH-06	9-Aug-22	Horizontal	mz22-060-072	Fraction 1	5/64	283
				URL	Whole	67

*Freshwater taxa, eggs and MEMO organisms not included in raw specimen count.

QA/QC

Ten percent (10%) of samples were reanalyzed to assess subsampling accuracy and consistency of enumeration. The sample was chosen at random and processed at different times to reduce counting and identification bias. The percent agreement between QA samples is reported in Table 2.

Table 2. Summary of taxonomic QA/QC results for WSP Golder Baffinland Iron Mine MEEMP, 2022.

Biologica Sample ID	Client Sample ID	Total Abundance (Original Replicate)	Total Abundance (QA Replicate)	Percent Agreement
mz22-060-062	ZV-02	123,104	133,584	**91.49%**

Percent Agreement:
{100 – [(difference in abundance between samples/total abundance of original sample) x 100]} %

Data

Taxonomic data were recorded in Biologica's custom database. Results were provided to the WSP Golder project manager in Excel spreadsheets via email.

Methodological and Taxonomic References

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APPENDIX 8E-1

Record of New and Flagged Taxa Risk Status 2022

Record of New and Flagged Taxa Risk Status 2022

Phylum Class/Order	Family	Subfamily	Taxa	Project Component	Flagged for Verification	Results of Independent Verification	Risk Category	Watchlist or Trigger List?	Distribution References
Annelida									
Polychaeta/Phyllodocida	Polynoidae	Polynoinae	*Hesperonoe* sp.	Benthic Infauna	Flagged (on Watchlist)	TBD	Low Risk	Watchlist	1, 2
Polychaeta/Phyllodocida	Syllidae	Autolytinae	*Myrianida* sp.	Benthic Infauna	No	N/A	No Risk	N/A	1, 2, 4, 6, 8
Polychaeta/Spionida	Spionidae	-	*Marenzelleria* sp.	Benthic Infauna	No*	N/A	Low Risk	Watchlist	1, 2, 7
Arthropoda									
Thecostraca/Balanomorpha	Balanidae	-	*Balanus crenatus*	Incidentals	No	N/A	No Risk	N/A	1, 2, 3, 5, 8, 12, 13
Bryophyta									
-/-	-	-	Bryophyta indet.	Quadrat Surveys	Yes	TBD	TBD	TBD	2
Bryozoa									
Gymnolaemata/Cheilostomatida	-	-	Buguloidea indet.	Benthic Infauna	Yes	TBD	TBD	TBD	1, 2, 6, 8
Chordata									
Actinopterygii/Perciformes	Cottidae	-	*Icelus spatula*	Fish Captures	No	N/A	No Risk	N/A	1, 2, 6, 9, 14
Actinopterygii/Perciformes	Zoarcidae	Gymnelidae	*Gymnelus hemifasciatus*	Fish Captures	No	N/A	No Risk	N/A	1, 2, 14
Ascidiacea/Stolidobranchia	Pyuridae	-	*Halocynthia pyriformis*	Incidentals	No	N/A	No Risk	N/A	1, 2, 3, 6
Cnidaria									
Anthozoa/Actiniaria	Actinostolidae	-	*Stomphia* sp.	Incidentals	No	N/A	No Risk	N/A	1, 2, 9
Mollusca									
Bivalvia/Mytilida	Mytilidae	-	*Musculus glacialis*	Settlement Substrates	No	N/A	No Risk	N/A	1, 2, 6
Gastropoda/Trochida	Margaritidae	-	*Margarites groenlandicus umbalicalis*	Incidentals	No	N/A	No Risk	N/A	1, 2, 6, 8
Platyhelminthes									
Cestoda/-	-	-	Cestoda indet.	Incidentals	No	N/A	No Risk	N/A	1, 2, 5, 10, 11

Notes: Taxa identified to the lowest practical taxonomic level; indet.= indeterminate (taxa which could not be identified beyond the taxonomic level listed); sp.=species.

Taxa distribution references: 1: WoRMS 2022, 2: GBIF 2022, 3: Cusson 2018, 4: Gagnon and Torgersen 2021, 5: Chain et al. 2016, 6: Miller et al. 2014, 7: Radashevsky 2022, Pers. Comm., 8. Goldsmit 2016, 9: DFO 2019, 10: Stewart 2013, 11: Stewart and Bernier 1999, 12: Ellis and Wilce 1961, 13: OBIS 2011 14: Coad and Reist 2018

All taxa cross-referenced with NIS/AIS resources: Fofonoff et al. 2022, ISSG 2022, Rius et al. 2022, Molnar et al. 2008, Casas-Monroy et al. 2014.

**Marenzelleria* sp. are on the Program watchlist, however the specimens were damaged and lacking the features required to resolve identification with confidence and were therefore not sent for verification. The specimens closely matched *M. wireni*, but the identification could not be confirmed.

APPENDIX 8E-2

Record of Independent Verifications

Appendix 8E-1
Record of Independent Verifications 2018-2022

Original ID	2018 Samples	2018 ID Verification (Lab/Inst. Name)*	2019 Samples	2019 Sample Locations	Sent for Verification (in 2020)	2019 ID Verification (Lab/Inst. Name)	2020 Samples	2020 Sample Locations	Sent for Verification (in 2021)?	2020 ID Verification (Lab/Inst. Name)	2021 Samples	2021 Sample Locations	Sent for Verification (in 2022)	2021 ID Verification (Lab/Inst. Name)	2022 Samples	2022 Sample Locations	Sent for Verification (in 2023)	2022 ID Verification (Lab/Inst. Name)
Polydora cornuta	Yes	*Polydora* sp. (Laval)	none				None				None				None			
Pseudofabricia aberrans	Yes	*Pseudofabricia* sp. nr. *aberrans* (Biologica) *Manayunkia aestruania* (Laval)	yes	SNW-4, SNE-3 through SNE-5, SNE-8	Yes	*Pseudofabricia* sp. nr. *aberrans* (Biologica) *Fabricia stellaris* (Laval)	Yes	SNW-4, SNE-2, SNE-5, SNE-8 through SNE-11, SNE-13 through SNE-15	Yes	*Pseudofabricia* sp. nr. *aberrans* (Biologica) *Fabricia stellaris* (Laval)	Yes	SNW-3	Yes	Family Fabriciidae (CCDB, Columbia Science) *Pseudofabricia* sp. nr. *aberrans* (EcoAnalysts Inc.)**	Yes (*Pseudofabricia* sp.)	SNW-2, SNW-3, SNW-4	No	N/A
Rhodine bitorquata	Yes	*Rhodine loveni* (Biologica) *Rhodine gracilior* (Laval)	yes				None				None				None			
Rhodine sp.	Yes		yes	BNE-8	Yes	*Rhodine* sp.	None				None				Yes	SW-4	No	N/A
Styelidae indet.	Yes	*Polycarpa fibrosa* (Biologica)	none				Yes		No		Yes		No		None			
Ammodytes sp.	Yes	*Ammodytes* sp.	none				Yes	Incidental	Yes	*Ammodytes hexapterus* (CCDB)	None				Yes	Incidental	No	N/A
Eteone spilotus	Yes	*Eteone* sp. (Biologica and Laval) *Eteone longa* (Potential ID from Laval)	multiple *Eteone* species		No		None				None				None			
Monocorophium insidosium	Yes	*Monocorophium insidosium* (Biologica) *Crassicorophium bonelli* (Laval)	none				None				None				None			
Monocorophium sp.	Yes	*Monocorophium sp.* (Biologica) *Crassicorophium bonelli* (Laval)	yes	SE-2, SE-4, SW-2, SW-6, SNE-7	Yes	*Crassicorophium* sp. (Laval)	None				None				None			
Mya arenaria *Mya truncata* *Mya* sp.	Yes	*Mya truncata* (Biologica) *Mya* sp. (Biologica) Imparientia (superorder) (Biologica)	none				None				None				Yes	Multiple Stations	No	N/A
Polycarpa pomaria	Yes	*Polycarpa fibrosa* (Biologica)	none				None				None				None			
Marenzelleria viridis *Marenzelleria* sp.	No		yes	SE-2, SW-2,	Yes	*Marenzelleria viridis* (Laval)	Yes	SW-11 through SW-14	Yes	*Marenzelleria viridis* (Laval) *Marenzelleria wireni*, *Marenzelleria arctia, Marenzelleria neglecta* (Radashevsky)***	Yes (*Marenzelleria* sp.)	SW-2, SW-3, Centre M Basket	Yes	*Marenzelleria wireni* (Radashevsky)	Yes (*Marenzelleria* sp.)	SW-2, SW-3	No	N/A
Sosane sp. nr. *Wireni*	No		yes	SNE-6,	Yes	*Sosane wireni* (Laval)	Yes	SNW-9, SNE-10, SNE-12	Yes	*Sosane wireni* (Laval)	None				None			
Oncousoecia sp.	No		yes	SNE-5	Yes	Tubuliporina (Laval)	None				None				None			
Euphilomedes sp.	No		yes	Fish Stomachs	No	*Philomedes* sp. (Biologica)	None				None				None			
Nereimyra aphroditoides	Former name		yes	Archive	Yes	*Nereimyra* sp. (Biologica)	Yes		No		Yes		No		None			
Streptospinigera niuqtuut	Former name		yes	Archive	Yes	*Streptospinigera niuqtuut* (Biologica)	Yes		No		None				Yes	SNE-1	No	N/A
Harmothoe propinqua	No		none				Yes	SW-6	Yes	*Harmothoe extenuata* (Laval)	None				Yes	SE-3	No	N/A
Harmothoe viridis	No		none				Yes	SE-11	Yes	*Harmothoe imbricata* (Biologica and Laval)	None				None			
Hesperonoe sp.	No		none				Yes	SNE-7	Yes	*Hesperonoe* sp. (Biologica) *Bylgides* sp. (Laval)	None				Yes	SE-2, SW-2, SW-3, SW-4, SNW-1	Yes	Pending
Ampharete petersenae	No		none				Yes	SW-3, SW-7, SW-10, SW-11, SW-13 through SW-15, SE-5 through SE-13, SE-15, SNW-7	Yes	*Ampharete petersenae* (Laval)	Yes	SE-1, SE-3, SW-4	Yes	Pending	None			
Paramphitrite birulai	No		none				Yes	SW-8, SW-10	Yes	*Amphitrite birulai* (Laval)	Yes	SE-1	Yes	Pending	None			
Crassicorophium sp.	No		none				None				Yes	SE-3, Centre S Basket 1, Centre M Basket 1	Yes	Inconclusive/ Corophiidae indet. (CCDB) *Crassicorophium clarencense* (Friday Harbor)	Yes (*C. clarenscense*)	SW-1, SW-2	No	N/A
Diastyloides biplicatus	No		none				None				Yes	SW-4	Yes	*Diastylis* sp. (Laval)	None			
Tricellaria sp.	No		none				None				Yes	SNE-2	Yes	Candidae indet. (Laval)	None			
Buguloidea indet	No		none				None				None				Yes	SW-4	Yes	Pending
Bryophyta indet	No		none				None				None				Yes	Q21	Yes	Pending

Note: Grey cells indicate no action (i.e., no specimen in samples, therefore none sent for verification)

* Biologica: Biologica Environmental Services; Laval: The Benthic Ecology Lab at Université Laval; CCDB: Canadian Centre for DNA Barcoding at the University of Guelph, Radashevsky: Dr. Vasily Radashevsky of the Russian National Scientific Center of Marine Biology; Friday Harbor: Dr. Craig Staude at Friday Harbour Laboratories at the University of Washington

**EcoAnalysts and Columbia Science examined specimens from 2018 and 2019 collections

*** Radashevsky examined specimens from 2017-2020, no specimens matched *M. viridis* , at least one specimen was conclusively identified as *M. wireni* , a high probability of *M. arctia* was given for specimens from Phillips Creek, other specimens were a high probability of *M. wireni* and/or *M. neglecta*

APPENDIX 8E-3

Program Watch List

Appendix 8E-3
Program Watchlist

Phylum Class/Order	Family	Subfamily	Taxa	Risk Category	Year Added	Year Removed
Polychaeta/Phyllodocida	Polynoidae	Polynoinae	*Hesperonoe* sp.	Low Risk	2020	N/A
Polychaeta/Sabellida	Fabriciidae		*Pseudofabricia* sp. nr. *aberrans*	Low Risk	2018	2021
Polychaeta/Spionida	Spionidae		*Marenzelleria viridis* (*Marenzelleria* sp.)*	High Risk	2019	N/A
Polychaeta/Terebellida	Ampharetidae	Ampharetinae	*Ampharete petersenae*	Low Risk	2020	2021
Polychaeta/Terebellida	Ampharetidae	Ampharetinae	*Sosane wireni*	Low Risk	2019	N/A
Polychaeta/Terebellida	Terebellidae		*Amphitrite birulai/Paramphitrite birulai*	Low Risk	2020	N/A
Malacostraca/Amphipoda	Corophiidae	Corophiinae	*Crassicorophium* sp.	Low Risk	2018**	N/A
Malacostraca/Amphipoda	Corophiidae	Corophiinae	*Monocorophium* sp.	High Risk	2018**	N/A
Actinopterygii/Perciformes	Ammodytidae		*Ammodytes hexapterus*	Low Risk	2020	N/A

**Marenzelleria viridis* and *Marenzelleria* species, other than *M. wireni* and *M. arctia*

** *Monocorophium* and *Crassicorophium* sp. were previously identified during baseline surveys, but flagged for review in 2018

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REPORT

Chapter 9.0 Tide Gauge Results

2022 Milne Port Marine Environmental Effects Monitoring Program (MEEMP) and Non-Indigenous Species and Aquatic Invasive Species (NIS/AIS) Monitoring Program

Submitted to:

Baffinland Iron Mines Corporation

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1663724-430i-R-Rev0-64000

27 April 2023

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Appendix 9B
Tidal gauge Calibration Documents

Appendix 9C
Tidal gauge Data Deliverable

(delivered electronically; this appendix is intentionally blank)

ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Definition
ASCII	American Standard Code for Information Interchange
CGVD	Canadian Geodetic Vertical Datum
cm	Centimetre
CTD	Conductivity-Temperature-Depth
dbar	Decibar (a unit of pressure)
˚C	Degrees Celsius
EDT	Eastern Daylight Time
EEM	Environmental Effects Monitoring
GPS	Global Positioning System
m	Metre
NAD83	North American Datum of 1983
PC	Project Certificate
PSU	Practical Salinity Unit
QC	Quality Controlled
RTK	Real-time kinematic
UTC	Coordinated Universal Time
UTM	Universal Transverse Mercator

9.0 TIDAL GAUGE RESULTS

9.1 Introduction

In 2022, Baffinland Iron Mines Corporation (Baffinland) undertook water level measurements with a tidal gauge stationed at the Milne Port Ore Dock. The tidal gauge monitoring program is intended to satisfy requirements of the Mary River Project's (the Project) Environmental Effects Monitoring (EEM) programs and address Terms and Conditions Nos. 1, 76 and 83 of Project Certificate (PC) No. 005. This is the sixth year of this program, which commenced in 2017. This report presents the results of the tidal gauge monitoring program during the 2022 season. A brief summary of results across all years is also provided below. Please see Appendix 9A for the tidal gauge installation instructions, Appendix 9B for the tidal gauge calibration documents, and Appendix 9C for the tidal gauge data, delivered electronically.

9.2 Methodology

9.2.1 Unit Conversions

All dates and times are reported in Coordinated Universal Time (UTC), four hours ahead of the local time zone, Eastern Daylight Time (EDT). All horizontal positions are reported in Universal Transverse Mercator (UTM) coordinates referenced to the North American Datum of 1983 (NAD83). Elevations are referenced to the Canadian Geodetic Vertical Datum (CGVD).

9.2.2 Study Design

The approach to installing the tidal gauge on the Milne Port Ore Dock ladder was identical to that of 2020 and 2021 (Golder, 2021; Golder, 2022). This was intended to keep a repeatable installation location and elevation from season to season, which is essential to support inter-annual comparison of water level data.

An RBRconcerto Conductivity-Temperature-Depth (CTD) sensor was used to measure conductivity, temperature, and water levels at the Milne Port Ore Dock. An RBRsolo D logger was deployed as a redundancy to measure water levels in case of the RBRconcerto failing. The RBR sensors are both designed to be simple, but accurate and self-contained instruments capable of working in cold (rated to -5 ˚C) and corrosive (i.e., saline) environments. The RBR sensors were mounted in an aluminum housing which was secured to the Milne Port ore dock ladder through two welded L-brackets. The ladder is typically installed for the open water period (approximately July to October). The ore dock ladder was chosen as the sampling location as it provides a stable mounting point that is reinstalled each year as part of standard port operations. The RBR sensors and the sampling specifications are summarized in Table 9-1. The instruments recorded data at intervals according to these specifications, and each data observation recorded by the sensor represents a record, or data point. Additional details on the tide tidal gauge design, installation and recovery, and mounting hardware are provided in the Milne Port Tidal Gauge Installation and Recovery Instructions (Appendix 9A).

Table 9-1: Tidal gauge Instrumentation and Sampling Strategy

Instrumentation	Sampling Strategy	Nominal Instrument Accuracy
Sensor: RBRconcerto CTD	Measurement Interval: 300 s Sampling Rate: 1 Hz Averaging Duration: 60 s	Temperature accuracy: ±0.002˚C Conductivity accuracy: ±0.005 mS/cm Pressure accuracy: ±0.05% of full-scale range (0.025 dbar)
Sensor: RBRsolo D	Sampling Rate: 1 Hz	Pressure accuracy: ±0.05% of full-scale range (20 dbar)

9.2.3 Deployment and Recovery

The RBR sensors were calibrated at the factory prior to their deployment in 2021, but no additional calibration was conducted prior to the 2022 season. Calibration results in 2021 were well within the nominal instrument accuracy shown in Table 9-1. The standard deviation of calibration errors for the pressure sensor on the RBRconcerto CTD over the full-scale range of calibration (10 – 60 dbar) was approximately -0.000757 dbar or less than 0.1 cm. The calibration certificates from 2021 are included in Appendix 9B.

In 2022, the RBR sensors were visually inspected, programmed, and synchronized to UTC time by Baffinland personnel prior to deployment. The deployment and recovery of the RBR sensors, attached to the Milne Port Ore Dock ladder, was conducted by Baffinland personnel on 5 July 2022 and 16 October 2022, respectively. Post-retrieval, a GPS RTK (real-time kinematic) survey was conducted to determine the elevation and position of the ladder top plate (Table 9-2). This involved surveying the location the top plate occupied during the deployment and calculating an average elevation, then adding the thickness of the top plate to the elevation (2.54 cm). The standard deviation of the elevation measurements was approximately 7.8 cm. Following recovery of the RBR sensors, the data was downloaded by Baffinland personnel and sent to WSP.

Table 9-2: RTK GPS Survey 2022

Survey Point	Easting (m)	Northing (m)	UTM Zone	Ladder Top Plate Elevation (m, CGVD)	Tidal Gauge Elevation (m, CGVD)1	Tidal Gauge Elevation (m, Chart Datum)
1	503226.229	7976632.758	17W	3.357	-3.069	-1.869
2	503226.446	7976632.959	17W	3.398	-3.028	-1.828
3	503226.591	7976633.191	17W	3.459	-2.967	-1.767
4	503226.773	7976633.476	17W	3.501	-2.925	-1.725
5	503227.062	7976633.396	17W	3.432	-2.994	-1.794
6	503226.857	7976633.178	17W	3.349	-3.077	-1.877
7	503226.694	7976632.926	17W	3.396	-3.030	-1.830
8	503226.469	7976632.643	17W	3.404	-3.022	-1.822
9	503226.653	7976632.483	17W	3.419	-3.007	-1.807
10	503226.871	7976632.768	17W	3.451	-2.975	-1.775
11	503227.066	7976633.04	17W	3.404	-3.022	-1.822
12	503227.207	7976633.216	17W	3.321	-3.105	-1.905
13	503227.334	7976633.088	17W	3.243	-3.183	-1.983
14	503227.143	7976632.844	17W	3.295	-3.131	-1.931
15	503226.942	7976632.574	17W	3.300	-3.126	-1.926
16	503226.776	7976632.353	17W	3.230	-3.196	-1.996
Mean Elevation, m				3.373	-3.053	-1.853
Standard Deviation, m				0.077816		

Notes: CGVD=Canadian Geodetic Vertical Datum; Horizontal datum is UTM NAD 83, Zone 17W; Elevations assume Chart Datum is 1.2 m below CGVD; [1]Distance from the tidal gauge pressure sensor to the surveyed steel ladder top plate is 6.426 m based on an email communication with Baffinland personnel (Pennel, 2022)

Table 9-3 shows the elevation of the ladder top plate and tidal gauge measured in the Milne Port tidal gauge programs from 2017 to 2022. It is noted that the same procedure has been followed for the installation of the ladder top plate and the tidal gauge each year, however, the results of the RTK GPS survey show the elevation of the ladder top plate and tidal gauge increasing year-on-year from 2017 to 2021, with a total elevation difference of 0.24 m (standard deviation of 0.0943m and trend of 0.0569 m/year). In 2022 the ladder top plate elevation was averaged as 3.373 m CGVD, 0.343 m lower than the 2021 ladder top plate elevation.

Table 9-3: Elevation of Ladder Top Plate and Tidal Gauge from 2017 to 2022

Year	Ladder Top Plate Elevation (m CGVD)	Tidal gauge tidal gauge Elevation (m CGVD)
2017	3.474	-2.941
2018	3.501	-2.914
2019	3.568	-2.847
2020	3.586	-2.829
2021	3.716	-2.699
2022	3.373	-3.053
Standard Deviation, m	0.1162	n/a
Trend, m/year	0.0045 (no significant trend)	n/a

Notes: n/a=not applicable

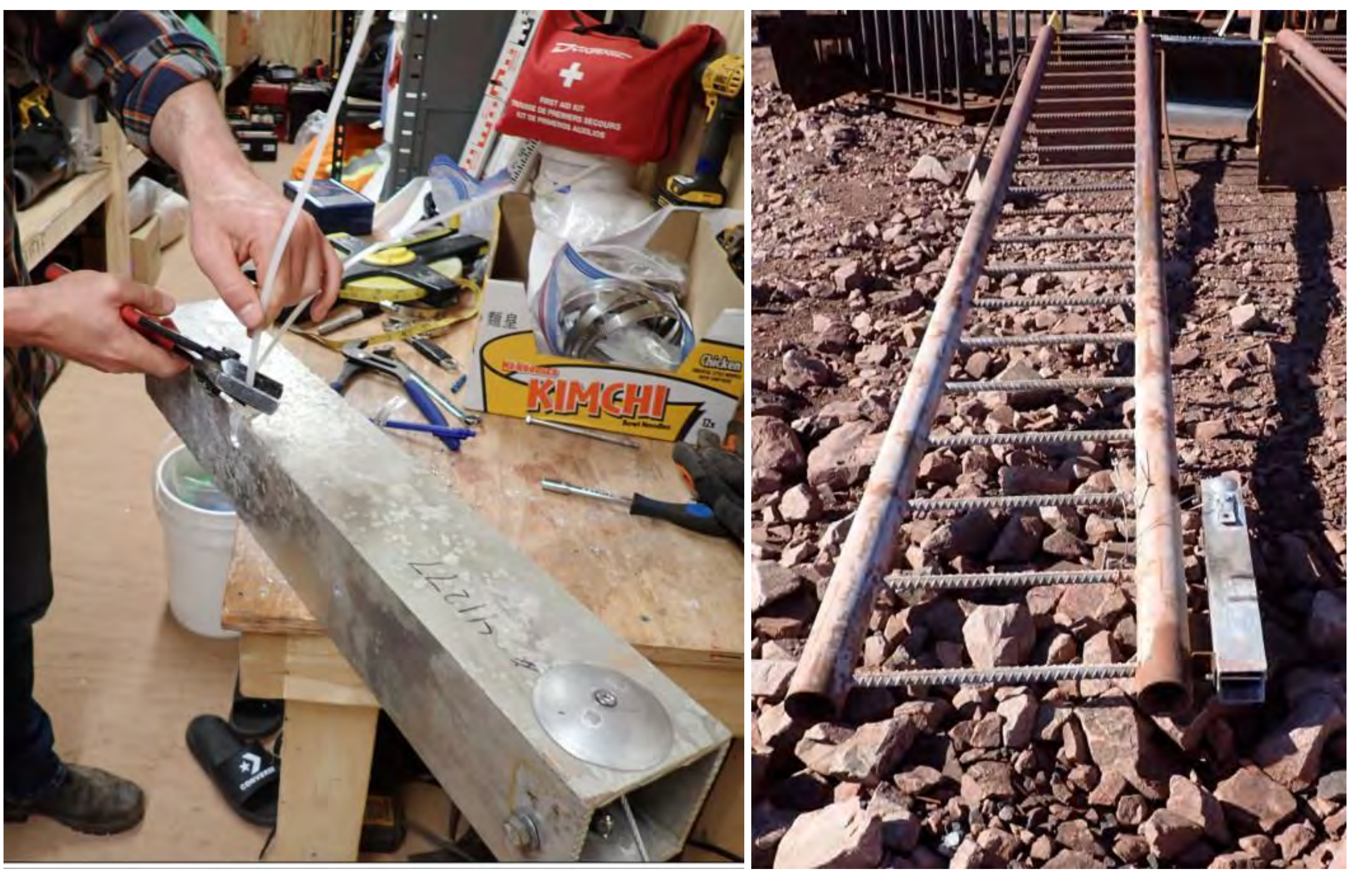

Figure 9-1: Left: Preparing the tidal gauge housing for deployment. Right: Ore dock ladder following removal, with the tidal gauge housing shown on the bottom right of the ladder (Photos: Pennel, 2022).

9.3 Data Processing

A preliminary review of the data recorded by the RBR sensors was performed following recovery. Quality checks included the following:

- Reviewing time series measured by the instruments, including various diagnostic parameters.
- Checking internal recorder and file status.
- Plotting and viewing the time series data.

The data from the RBR sensors was extracted from raw instrument format to ASCII-encoded datausing the instrument specific software Ruskin®. The RBRconcerto successfully recorded for the entire duration of the deployment, so full data processing was carried out for the RBRconcerto (which measures conductivity, temperature, and pressure) but the backup sensor RBRsolo (which only measures pressure) stopped recording prematurely on August 27 2022. Plots of measured parameters were generated, and post-processing and quality-checking of RBRConcerto data was completed using the MATLAB® (MathWorks, 2021) scientific computing software and included:

- Measurements made by the instrument while it was out of water, as determined from either the pressure or salinity gauge, were replaced with a -999 value.
- Data were filtered for values above a maximum water temperature and salinity. The maximum water temperature was defined as 15 ˚C and salinity as 36 PSU. These values were selected from a review of historical data. The 36 PSU value would represent full sea water and Milne Port has freshwater inputs that result in salinities lower than full sea water. Filtered values were replaced with a -999 value.
- Where applicable, data were filtered for periods when the change in pressure between consecutive samples exceeded 0.5 dbar (corresponding to an elevation difference of approximately 0.5 m). It was assumed that a sudden change in observed sea level at this rate would represent an error. Filtered values were replaced with a -999 value.
- Flagged and missing data values, identified onboard the instrument, were replaced with a -999 value. A visual review of the data was conducted to potentially identify and if necessary to remove or flag spurious data but no manual editing was required.
- The instrument deployment and recovery dates and percentage of valid data from the deployment period are provided in Table 9-4. Quality Controlled (QC) data are provided electronically (Appendix 9C).

Table 9-4: Recorded Data Statistics for the RBRconcerto CTD Sensor

Instrument	Date/Time Deployed (UTC)	Date/Time Recovered (UTC)	Total Records Recorded (#)	Total Records Expected (#)	Flagged and Missing Data (#)	Percent Valid Data (%)
RBRconcerto CTD	05 July 2022, 19:17:00	16 October 2022, 13:57:00	29601	29601	0	100

9.4 Data Summary

9.4.1 Tidal Gauge

Time series of temperature, conductivity, salinity, and water level referenced to CGVD as measured by the RBRconcerto at the Milne Port Ore Dock over the length of the deployment are shown in Figure 9-2. The tidal gauge shows a distinct seasonal pattern for near-surface water in Milne Inlet. This pattern was observed in previous years and is discussed in more detail below (Golder, 2018; 2019; 2020; 2021; 2022).

The processes observed in the dataset fall into two general time periods which have been identified every year since the tidal gauge monitoring began in 2017. The first time period is from the tidal gauge's deployment on 05 July 2022 and gradually transitions to the conditions of the second time period in early September, so that an exact 'end date' is not specified. During the first time period, the RBRconcerto measured large fluctuations in temperature and salinity. The temperature fluctuated between approximately 0 and 13 degrees C and the salinity fluctuated between approximately 0 and 33 PSU. These ranges are most likely the result of freshwater runoff from Phillips Creek during the spring freshet and the melting of sea ice in Milne Inlet near Milne Port. These processes, which typically occur early in the open-water season, cause the surface layer to be warmer and less saline than the water column beneath the pycnocline (a zone where water conditions transition from the warmer, fresher water of the surface layer to colder, more saline water at greater depth). As the water level varies with the tidal cycle, the tidal gauge, being positioned at a constant height above the sea floor, alternates between recording conditions in the surface layer during lower tides and those below the pycnocline during higher tides.

The second time period has been observed from early September to the tidal gauge's retrieval date, which in 2022 was 16 October. This time period begins after the spring freshet ends and sees the temperature and salinity time series stabilize, as less fresh water is entering Milne Inlet. Small diurnal fluctuations are observed in the temperature and salinity data in September but these mostly cease beginning in October. It is likely that these diurnal fluctuations are driven by tidal forcing (movement of water due to tides), upwelling (upward current transporting water from deeper depths to the surface) and/or downwelling (downward current transporting surface water to deeper depths) during wind events, and continued freshwater runoff. As the water level varies with the tidal cycle, the tidal gauge alternates between being positioned in the surface and deeper water layers, as was also the case in the first time period, although the differences between the layers are less marked in the second time period. Overall, temperature was generally lower and salinity was generally higher in the second time period than in the first time period. In the second time period, temperature ranged from -1 to 6 degrees C, with a mean of 2 degrees C; and salinity ranged from 10 to 32 PSU, with a mean of 26 PSU. These colder and more saline conditions likely occur in response to the autumn weather conditions. Air temperature in Milne Port decreases, there is less snowmelt and therefore less freshwater runoff, and fall storms with high winds cause the surface layer of the water column to become well mixed with the layers below. This results in generally colder and more saline surface waters, as observed in the temperature and salinity measurements from early September to the end of the deployment.

The water level data shows that tides in Milne Port follow a mixed semidiurnal tidal cycle. Seven neap tides and seven spring tides occurred during the tidal gauge deployment in 2022. The mean water level observed was -0.41 m CGVD. The maximum water level observed was 0.74 m CGVD and the minimum water level observed was -1.61 m CGVD.

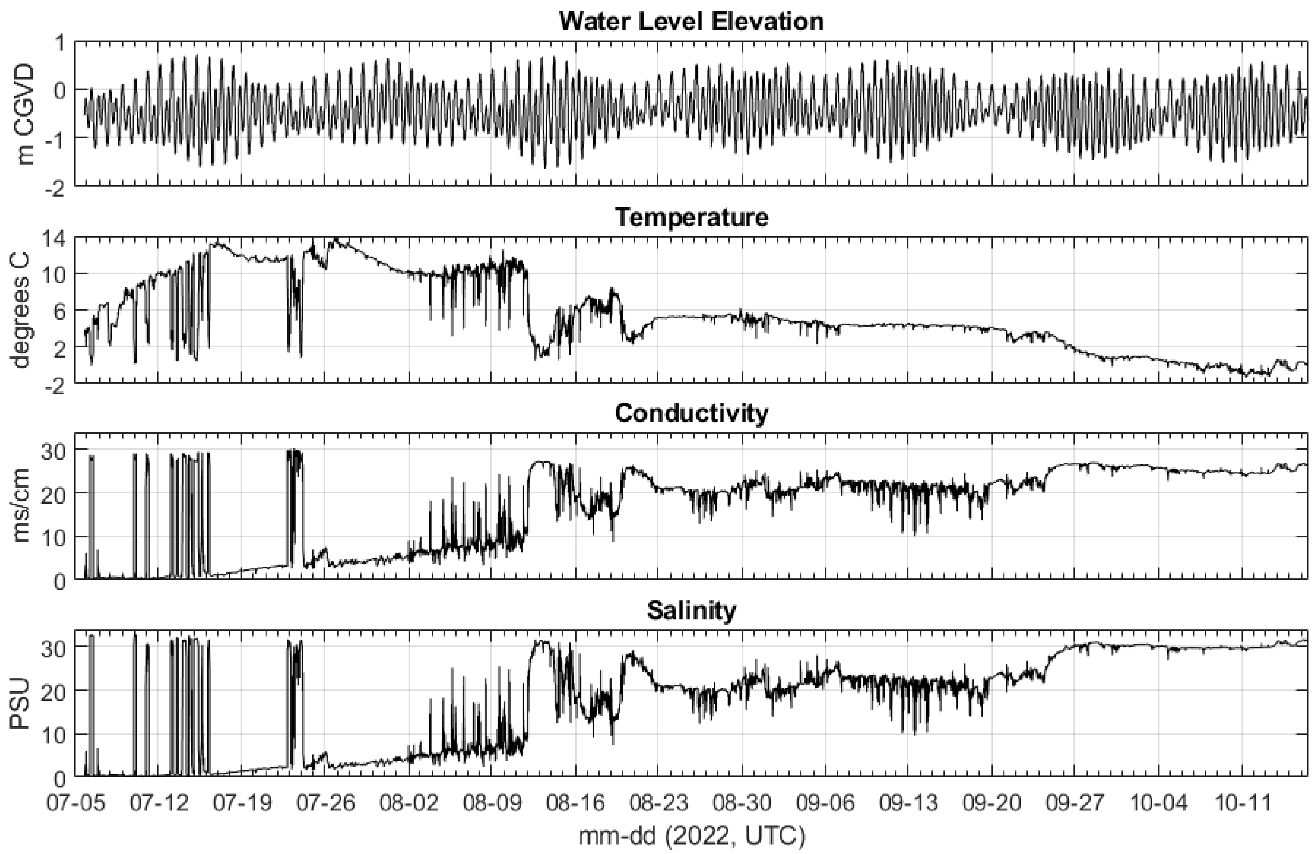

Figure 9-2: Time series of water level elevation, temperature, conductivity, and salinity measured at Milne Port Tidal Gauge by the RBRconcerto CTD Sensor from 5 July 2022 to 16 October 2022 in UTC.

9.5 Monitoring Effects of Climate Change Induced Sea Level Change

As noted in the introductory statements, the tidal gauge monitoring program is intended to satisfy requirements of the Mary River Project's (the Project) Environmental Effects Monitoring (EEM) programs and address Terms and Conditions Nos. 1, 76 and 83 of Project Certificate No. 005.

The objective of Condition No. 1 is to provide feedback on the impacts that climate change might be having on the Milne Port facilities. The condition states that the Proponent shall use GPS monitoring or a similar means of monitoring at both Steensby Port (not constructed) and Milne Port, with tidal gauges to monitor the relative sea levels and storm surges at these sites. The results of GPS surveys of the tidal gauge position from 2017 to 2021 showed the elevation of the tidal gauge to be increasing year-on-year at a mean rate of 0.0569 m/year. This elevation trend is approximately a factor of 10 larger than the estimated isostatic uplift in the region (James et al., 2014; James et al., 2021). The NAD83V70VG model of vertical land motion for Canada (Robin et al., 2020 cited in James et al., 2021) indicates uplift rates of approximately 5 mm/year for northern Baffin Island. The results of GPS surveys in 2022, however, show the elevation of the tidal gauge to have decreased by 0.354 m from 2021. The fluctuations in elevation measurement (initial increasing trend followed by a marked decrease in 2022) appear to be largely attributable to GPS measurement error (see below).

There is currently uncertainty regarding the contribution of both global sea level rise and land uplift rates on year-to-year differences in water level elevation measured by the tidal gauge. A significant proportion of the uncertainty appears to derive from measurement error in the elevation of the ladder top plate position (see Table 9-1 and Table 9-2).

Nonetheless, significant trends in relative sea level are likely too small to be measurable in the short term given that relative sea-level projections for the next 30 to 50 years indicate that relative sea level will either fall or be near neutral for northern Baffin Island (James et al, 2021). Sea level projections are made relative to the solid surface of the Earth, and land uplift from regional isostatic adjustments for Northern Baffin Island is projected to offset projected global and regional sea-level rise for the short to medium term future. In other words, relative changes in sea level are likely to be very small differences between two small quantities both with high uncertainty. Global sea level change is therefore unlikely to result in any significant climate change-induced sea level impact on the project in the foreseeable future.

Given the scale of GPS measurement errors from year to year, significantly more accurate local elevation control as well as high precision atmospheric pressure correction of the water surface elevation measurements would be required to quantify relative sea level change using the Milne Port tidal data, as changes in relative sea level are expected to be on the scale of fractions of a millimeter per year. However, it should be noted that quantitative measurements of relative sea level change within this degree of precision and accuracy are generally considered beyond the scope of environmental effects monitoring undertaken by projects in Canada.

9.6 Raw Data

In addition to this report, WSP has provided the tidal gauge data that was processed, and quality checked following the methods described in Section 2.4. The data is provided electronically and referenced as Appendix 9C. All dates and times are reported in UTC time.

9.7 Closure

This report presents the results of the 2022 Tidal Gauge Monitoring Program for Milne Port. We trust the information contained in this report is sufficient for your present needs. Should you have any additional questions regarding the project, please do not hesitate to contact the undersigned.

WSP Canada Inc.

Alex MacMillan, PEng
Geo-Coastal Engineer

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ACM/SR/lih

https://golderassociates.sharepoint.com/sites/11206g/Deliverables (Do Not Use)/Issued to Client_For WP/400-499/1663724-430i-R-Rev0-64000/1663724-430i-R-Rev0-64000-2022 MEEMP 9.0 Tide Gauge 27APR_23.docx

9.8 References

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APPENDIX 9A

Tidal gauge Installation Instructions

TECHNICAL MEMORANDUM

DATE 4 July 2022 **Reference No.** 1663724-390-TM-Rev0

TO Matt Weaver, Josh Pennell, Julia Horgan, Patricia Tomliens, Dave Hasek
Baffinland

CC Connor Devereaux, Kendra Button, Todd Swenson, Krista Johnson, Phil Rouget, Niallan O'Brien

FROM Phil Osborne **EMAIL phil.osborne@wsp.com**

MILNE PORT TIDE GAUGE INSTALLATION AND RECOVERY INSTRUCTIONS

Golder Associates Ltd. (Golder) was retained by Baffinland in 2022 to re-install the tide gauge, an RBRconcerto CTD, first deployed in 2017 at Milne Port to provide water level monitoring on-site during the open-water season (typically July to October). In 2021 an RBRsolo D logger was added for redundancy, which will be deployed again in 2022. The objective of this technical memorandum is to provide installation instructions for the tide gauge at Milne Port and itemize the necessary consumables for installation.

1.0 ALUMINIUM MOUNTING SYSTEM OVERVIEW

The tide gauge is housed inside a 26-inch long aluminium square tube (4-inch diameter) to provide protection from vessels and reduce wind and wave effects. The aluminium square tube is mounted to the ladder with two steel L brackets that will be welded to the side of the bottom of the steel ladder located on the ore dock (Figure 1).

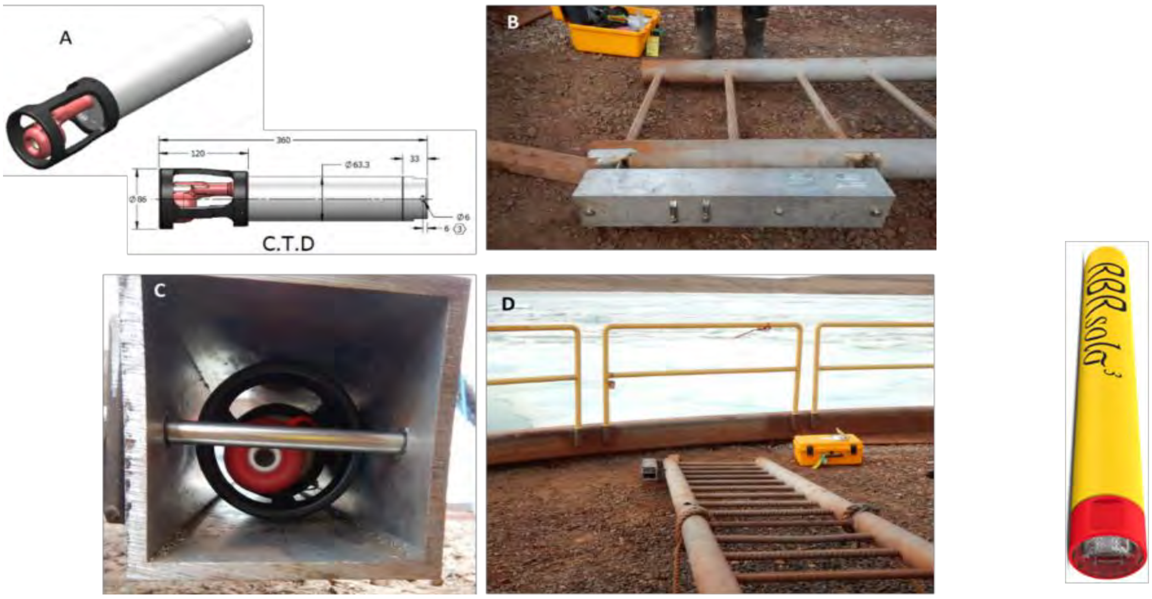


Figure 1: Overview of tide gauge installation. In 2022, an RBRsolo (right) will be included for redundancy.

2.0 TIDE GAUGE DEPLOYMENT CONFIGURATION

Both tide gauges were left on site in 2021 and will need to be cleaned, reconfigured, have new batteries placed inside, and enabled for data collection. The following steps are required for both the RBRconcerto^3 and RBRsolo:

- Download and install the latest version of Ruskin software and logger drivers onto laptop computer and download the Ruskin User Guide for Standard Loggers (RBRconcerto^3) and Ruskin User Guide for Compact Loggers (RBRsolo).
- Follow and fill out the checklists for “Instrument Servicing” and “Deployment Setup” on the “DEPLOYMENT” sheet (Attachment 1).
- Unscrew the battery endcap counter-clockwise to expose the USB connector port and battery compartment.
- Replace all batteries with new batteries:
  - **Li-ion (C123 or 123) batteries for RBRconcerto^3**
  - **Alkaline (AA) for RBRsolo**
- Replace desiccant packs.
- Locate the USB connector on each instrument; plug one end of the communications cable (found in the RBR logger box) into the RBR logger and the other end of the cable into the USB port of a computer with Ruskin software installed. The cable for both the RBRsolo and RBRconcerto^3 is USB-C. Both cables terminate with a conventional USB-A connector which plugs into the computer (Figure 2).

Figure 2 : Cable Types for RBR Loggers (USB-C to USB-A)

- Start RBR Ruskin software on the computer:
  - Select the Concerto logger in the **Navigator** view.
  - Ensure it contains sensors you expect on the **Information** tab.
  - Refer to the RBR RUSKIN Software Users Guide for Standard Loggers and Ruskin User Guide for Compact Loggers (RBRsolo).
- Enter correct deployment configuration for the RBRconcerto[3] (Figure 3) and select "Enable". The configuration will yield the following settings:
  - The sensors in the instrument will start a sample sequence every 5 minutes.
  - The sensors will take one measurement every second for 1 minute (total of 60 samples per sequence).
  - These samples will be averaged to obtain mean values of pressure (water level), water temperature and conductivity for each 5-minute sequence.
- Check for prompt that the instrument logging is "enabled".
- Follow similar steps to configure the RBRsolo using the Ruskin software (Figure 4) and select "Enable". The configuration will yield the following settings:
  - The sensor in the instrument will sample in continuous mode.
  - The sensor will take one measurement every second.
- Check for prompt that the instrument logging is "enabled".
- Carefully remove the O-ring, inspect for damage and replace if necessary. Clean O-ring with lint free Kimtech Kimwipes® (Kleenex®/other tissues are unacceptable, must be Kim Wipes). Ensure that the O-ring surface is free of dirt, fibres, or grit.

- Clean all surfaces on the inside of the instrument housing which make contact with the O-ring and the end cap with lint free Kimtech Kimwipes® and rubbing alcohol. Ensure that the surfaces are free of dirt and particles. This cleaning step will ensure that the housing remains watertight.
- If the O-ring is not damaged, apply a thin layer of Dow Corning Molykote® 111 silicone grease to the O-ring (grease is available in the RBR logger box), distribute it evenly on the O-ring and return the O-ring back in its location in the instrument. Ensure that the O-ring is seated evenly in its groove without any twist or deformation.
- Make sure the Wi-Fi setting is kept OFF on the deployment setup screen for the RBRconcerto[3] (Figure 3).
- Close the instrument by screwing the end cap back on. Note that hand tightening of the end cap is sufficient. Follow the instructions in the RBRconcerto[3] and RBRsolo documentation for closing the instrument.

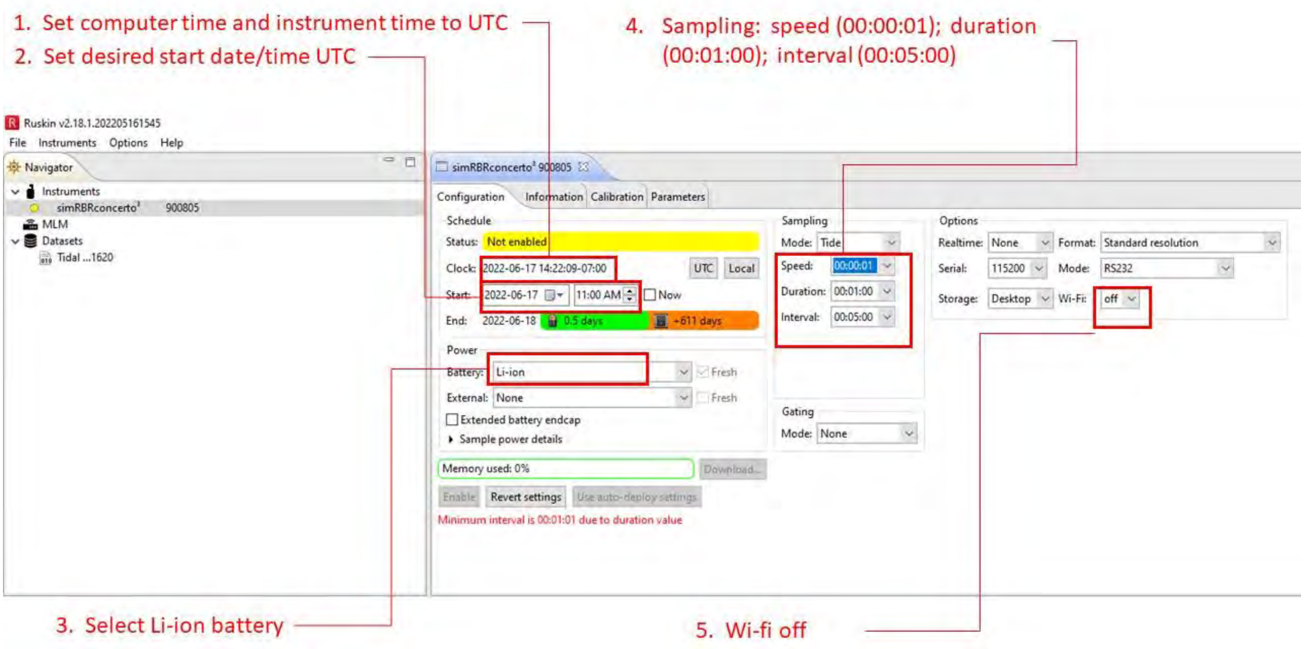


Figure 3 : Example of RBRconcerto³ Tide Gauge Configuration

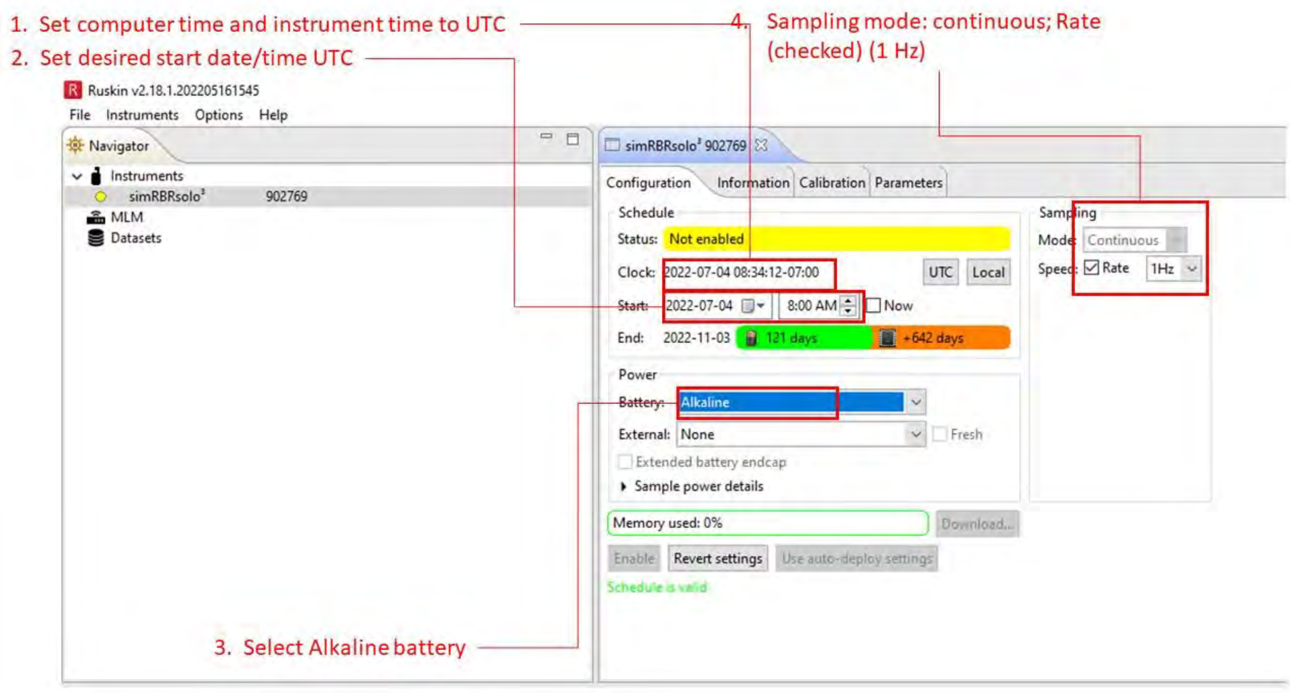


Figure 4 : Example of RBRsolo Tide Gauge Configuration

3.0 TIDE GAUGE INSTALLATION

Step 1) Two 1/4" diameter holes need to be drilled in the aluminum tube. These holes will be used to add a length of 3 mm 316 stainless steel wire rope as redundant security against a hardware failure (Figure 5). On the outside of the aluminum tube two zinc anodes should be replaced with new anodes and secured with one stainless steel bolt (316 stainless 1/2" x 1") per anode (Figure 7).

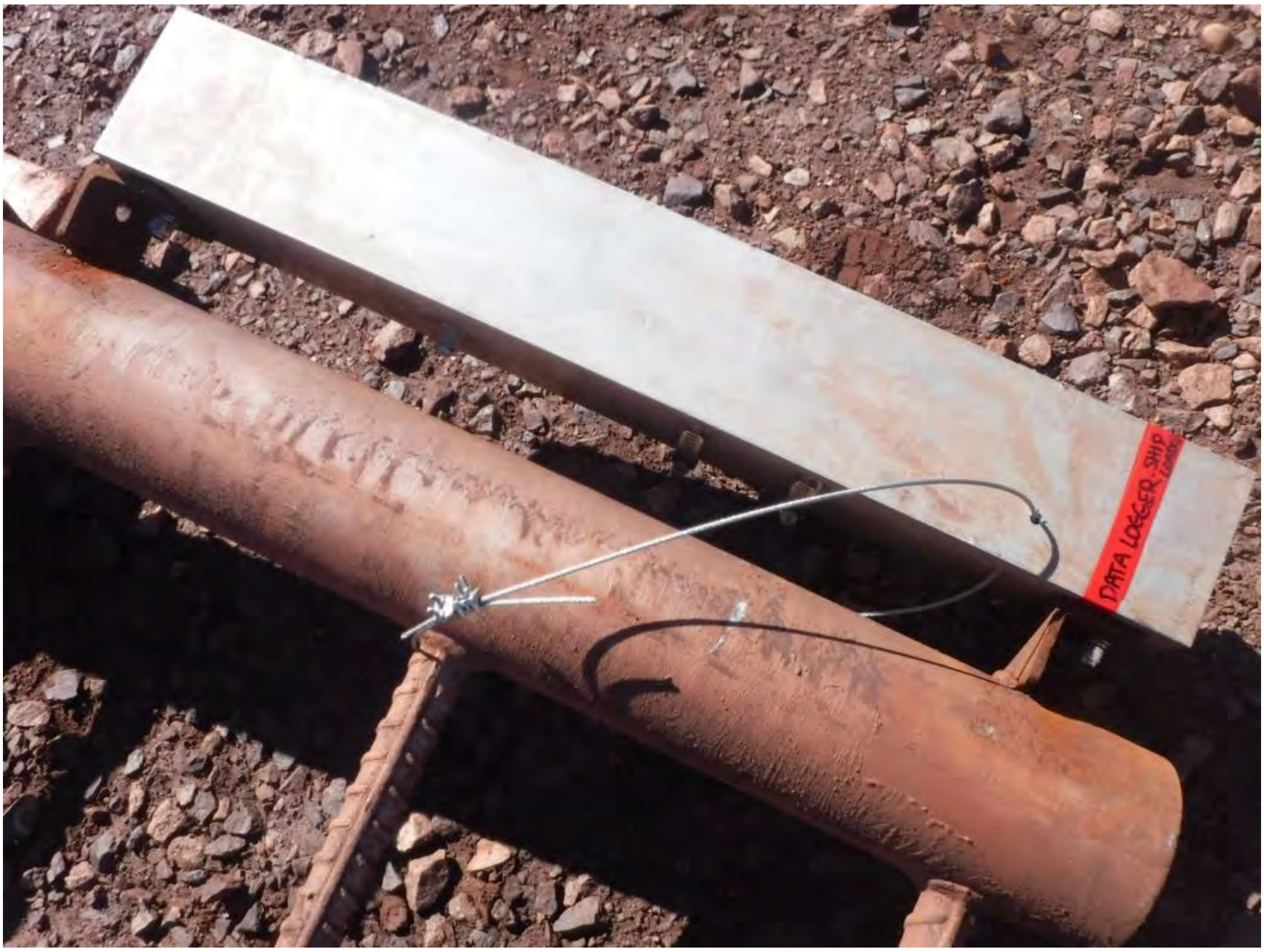


Figure 5: Hardware attaching aluminium tube to steel L brackets and wire rope for redundancy of the L bracket attachments.

Step 2) The redundant tide gauge (RBRsolo – small yellow cylinder) should clamped to the inside of the aluminum housing opposite to the RBRconcerto. The sensor on the RBRsolo (red cap end) should be facing the same direction as the sensor end of the RBRconcerto[3] (red/black end). In addition, thread a zip tie through the hole at the end of the RBRsolo and loop it around the cross bolt at the top the aluminum housing as a security device. Measure and record the vertical distance between the sensor on the primary tide gauge and the sensor on the redundant tide gauge. Take a photo of the instruments clamped together for reference.

Step 3) The primary tide gauge (RBRconcerto[3] – white Delrin cylinder) should be mounted inside the aluminium square tube with one stainless steel bolt (316 stainless 1/4" x 4 1/2"), washer, nylon shoulder washer, lock nut (Figure 7) and two stainless steel hose clamps wrapping around both the RBR loggers, using caution to not overtighten against the plastic housing. The bolt should be passed through the hole on the end cap of the larger RBRconcerto[3], making sure not to twist the end cap in the process, and secured to the square tube with nylon shoulder washers inserted in the drilled holes on the aluminium square tube (Figure 7). The larger white RBRconcerto[3] (not the yellow RBRsolo) instrument should rest against the inside face of the aluminium tube (Figure 6).

Figure 6 : Hardware attaching aluminum tube to L brackets and view of the primary tide gauge mounted in the tube. Yellow oval shows location of the ¼" bolt that should pass through the end cap of the primary RBRconcerto³ tide gauge.

Note that the RBRsolo tide gauge is not shown in Figure 6, but would be sitting to the right of the RBRconcerto³ instrument in the photo.

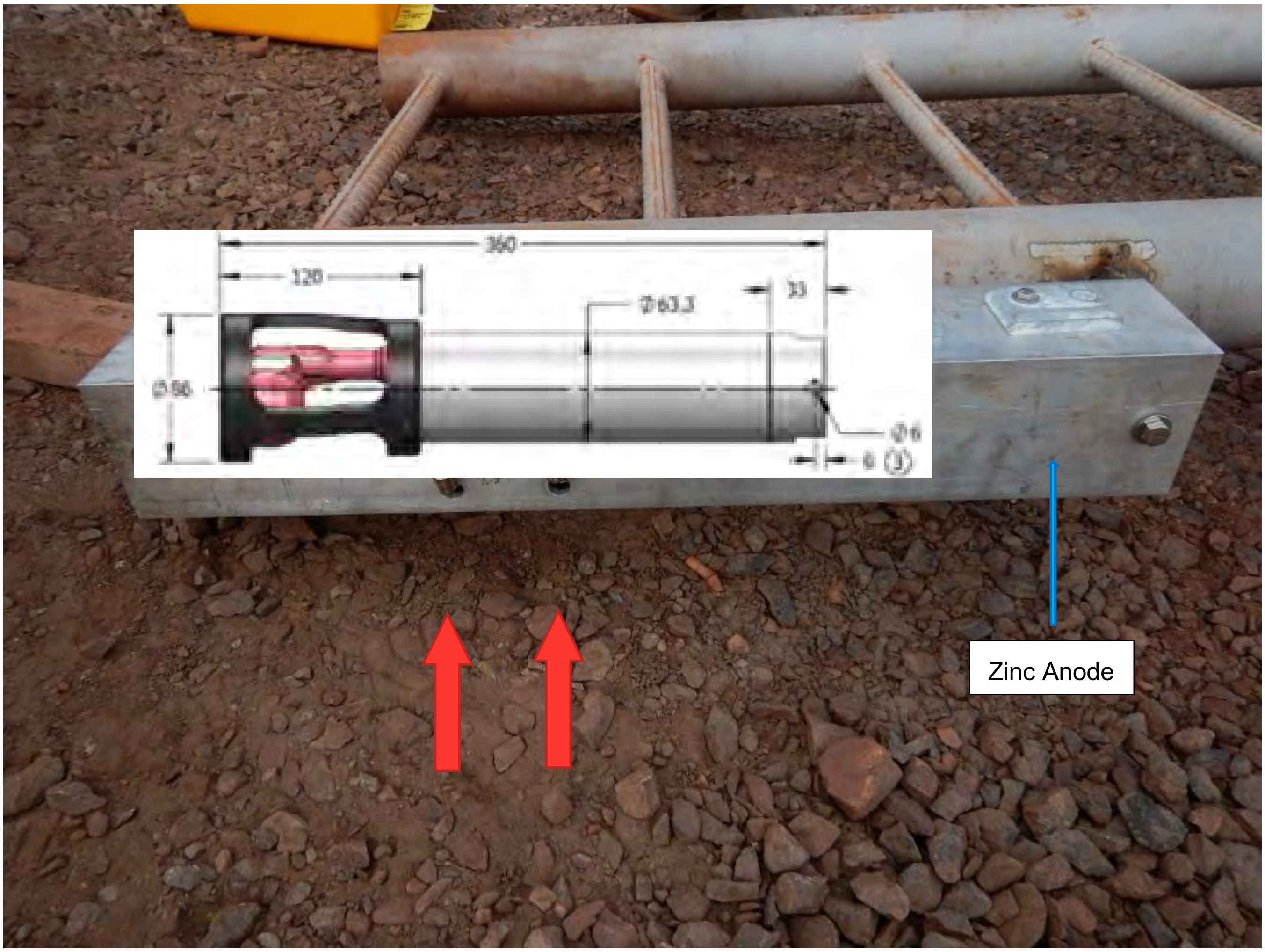


Figure 7: Hardware attaching RBRconcerto[3] and RBRsolo tide gauges to aluminium tube. Arrows show the location of the hose clamps which mount the RBRconcerto tide gauge to the square tube and the zinc anodes. An additional single clamp should be installed on the opposite side of the aluminum tube for the RBRsolo tide gauge.

Step 4) The aluminum square tube is mounted to the ladder at two steel L brackets that are welded to the side of the bottom of the steel ladder located on the ore dock. The primary RBRconcerto[3] tide gauge should be mounted such that the red and black end cap is pointing downwards towards the seabed. The integrity of the welds on the ladder should be inspected before mounting the square tube on the brackets. Mount the aluminium tube to the L brackets with stainless steel bolts (316 stainless 3/8” x 5”), washers, nylon shoulder washers, lock washers and lock nuts (Figure 8).

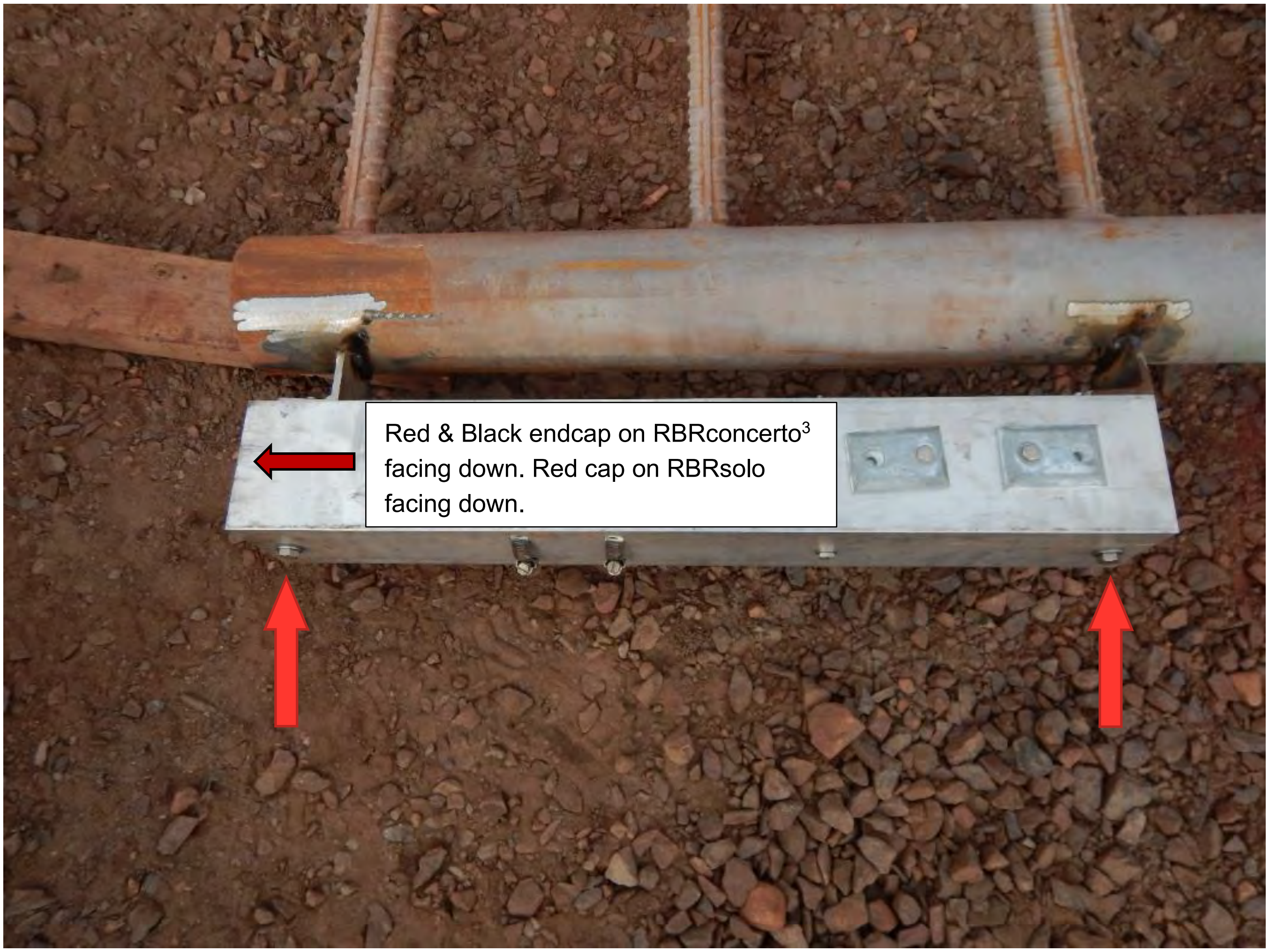


Figure 8: Aluminium square housing tube mounted to the bottom of the steel ladder located at the ore dock. Arrows show location of mounting bolts which attach the square tube to the L brackets on the steel ladder.

Step 5) Add a length of 3 mm 316 stainless steel wire rope passed through the two holes on the square tube, and around the bottom ladder rung, and join wire rope together with 2 wire rope clips (1/8" stainless steel). This is to provide a redundant mounting system (Figure 5).

Step 6) Take photos during each step of the installation process for documentation purposes and provide a record of hardware used and any changes to the above steps.

Step 7) The elevation and position of the ladder top plate needs to be precisely surveyed relative to an elevation control monument in the Port. Golder recommends that in 2022, the elevation of the ladder top plate be surveyed relative to a survey control monument using a precision survey instrument such as a theodolite or total station which employs optical levelling. Golder recommends that geodetic data regarding the survey control monument be monitored and retained over time so that change in ground position (uplift/subsidence) can be evaluated in relation to tide levels monitored using the tide gauge. Baffinland should provide Golder with all available geodetic history of the Port survey control.

Additionally, the distance from the primary tide gauge pressure sensor to the ladder top plate and from the bottom of the aluminum tube to the ladder top plate should be measured. The pressure sensor is located behind the plastic sensor cover on the downward facing end of the primary tide gauge (Figure 9). The distance from the bottom of the aluminum tube to a point at the top plate of the ladder and from the pressure sensor to a point at the top plate of the ladder needs to be precisely measured. In the past this was measured as 6.57 m and 6.42 m in 2018, respectively, using a tape measure.

Figure 9: Pressure sensor location, shown by the arrow, on the downward facing end of the primary RBRconcerto³ tide gauge

4.0 HARDWARE LIST

The following is a list of necessary hardware to complete the tide gauge installation:

Item Description	Quantity
26” aluminum square tube	1
Stainless steel L-brackets	2
316 stainless steel hex bolt 5”- 3/8”	2
316 stainless steel lock nut 3/8”	2
316 stainless steel lock washer 3/8”	2
316 stainless steel washer 3/8”	4
Nylon shoulder washer 3/8”	6
316 stainless steel hex bolt 4 1/2”- 1/4”	2
316 stainless steel lock nut 1/4”	2
316 stainless steel washer 1/4”	4
Nylon shoulder washer 1/4"	2
Zinc anode	2
316 stainless steel hex bolt 1” – 1/2"	2
316 stainless steel washer 1/2"	2
316 stainless steel lock nut 1/2"	2
316 stainless steel ½” band width hose clamps 2 9/16”-3 1/2” diameter	2
3mm 316 stainless steel wire rope	1 roll
1/8” stainless steel wire rope clip	2
~15” long high-quality nylon zip ties	1 pack
3 mm (1/8”) thick neoprene rubber sheet	To yield 1” w x 6” l strips as needed

5.0 TIDE GAUGE RECOVERY

Upon recovery of the tide gauge from the ore dock ladder the following steps should be done.

Step 1) The distance from the primary RBRconcerto^3 tide gauge pressure sensor (Figure 9) to the bottom of the aluminium tube, and the distance from the bottom of the aluminium tube to the steel ladder top plate should be recorded and accompanied by a photo of the measurements (i.e. a photo of the tape measure). The distance from the secondary RBRsolo tide gauge sensor to the RBRconcerto^3 tide gauge sensor should also be recorded.

Step 2) If feasible, data from both tide gauges should be downloaded using the Ruskin software before shipping the instruments to Golder. The Ruskin software can be obtained from https://rbr-global.com/products/software. The following steps should be followed when using Ruskin:

- Unscrew the tide gauge end cap to expose the USB port and battery compartment.
- Plug one end of the data cable (found in the RBR logger box) into the RBR logger and the other end of the cable into the computer. The cable for both loggers should be a USB-C cable.
- Open the software program Ruskin. The instrument should appear in the Navigator tab under the subheading Instruments.
- Click on the Download tab and select “download”. Save the .RSK file to a location on the local machine.
- Disconnect the USB cable from the logger and computer.
- Screw the tide gauge end cap back on.
- DO NOT select stop logging or enable logging.
- DO NOT remove the batteries from the instrument.

6.0 CLOSURE

We trust this information is sufficient for your needs at this time. Should you have any questions or concerns, please do not hesitate to contact the undersigned.

Golder Associates Ltd.

Ashwin Gadgil, PhD, EIT
Coastal Engineer & Hydrodynamic Modeller

Sundar Prasad, PhD
Senior Coastal & Metocean Specialist

REGISTERED PROFESSIONAL GEOSCIENTIST
P.D. OSBORNE
LICENSEE
L3986
NT/NU
2022/07/04

Phil Osborne, PhD, PGeo
Principal, Senior Coastal Geomorphologist

AG/SP/PO/jts

Attachments: Attachment 1 – RBR Loggers

https://golderassociates.sharepoint.com/sites/11206g/deliverables (do not use)/issued to client_for wp/300-399/1663724-390-tm-rev0-64000/1663724-390-tm-rev0-64000-tide gauge instructions 2022 wsp 04jul_22.docx

PERMIT TO PRACTICE #1003064
Engineers & Geoscientists BC

ATTACHMENT 1

RBR Loggers

RBR Loggers

RECOVERY AND DEPLOYMENT CHECKLIST

Project:	Project #:	Site Location:	Date:
Technicians:	Computer used:	Serial number:	
Instrument model:			

RECOVERY CHECKLIST:

☐ Inspected for visual damage and corrosion

☐ Clean and rinse with freshwater

Instrument time:		Date of last deployment:
GPS time:		Months deployed:
Clock drift:		☐ Download data file
Data file size:		Data file name:
	Record number	Date and Time
First record:		
First good record:		
Last good record:		
Last record:		

MAINTENANCE CHECKLIST:

☐ O-rings replaced

☐ Batteries replaced

☐ Desiccant replaced

BATTERY VOLTAGE (3V CR123A):

OLD

NEW

DEPLOYMENT SETUP:

RBR Ruskin version		Sync to GPS-UTC time? Make note if not UTC	Yes / No
Firmware version		Planned deployment duration?	
Start Logging:		Measurement speed	
End Logging:		Averaging Duration	
Sampling Regime:	Continuous / Average	Averaging Measurement Period	
Memory required:		Battery required:	

☐ Logger status enabled?

COMMENTS:

APPENDIX 9B

Tidal gauge Calibration Documents

RBR

Conductivity Calibration Certificate

RBRconcerto³ C.T.D|fast8 s/n: 207642

References: Autosal8400B#66289, MS-315#15506, SSW P163, RC#002

Reference Resistance (ohm)	Reference Conductivity (mS/cm)	Voltage Ratio, V	Measured Conductivity (mS/cm)	Calibration Error (mS/cm)
open	0.0000	-0.000104	-0.0003	-0.0003
694.023	6.1094	0.039142	6.1089	-0.0005
331.918	12.7744	0.081960	12.7742	-0.0002
150.011	28.2649	0.181483	28.2663	0.0014
100.007	42.3974	0.272263	42.3974	0.0000
75.013	56.5240	0.363012	56.5238	-0.0002
55.511	76.3819	0.490584	76.3821	0.0001
47.018	90.1790	0.579215	90.1787	-0.0003

Coefficients

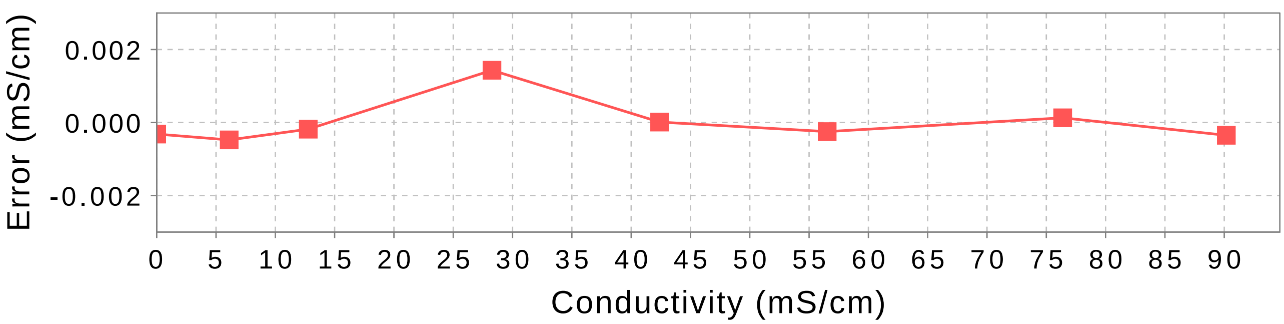
C0:	15.885748E-3
C1:	155.6639
X0:	435.98202E-6
X1:	-8.058266E-6
X2:	600E-9
X3:	14.90292
X4:	10

Bath	Voltage Ratio	Temperature (ITS-90)	Salinity (PSS-78)	Conductivity (mS/cm)
T15S35	0.2749927	14.90292	35.0002	42.8223
T25S35	0.3428941	25.30215	35.0038	53.3921

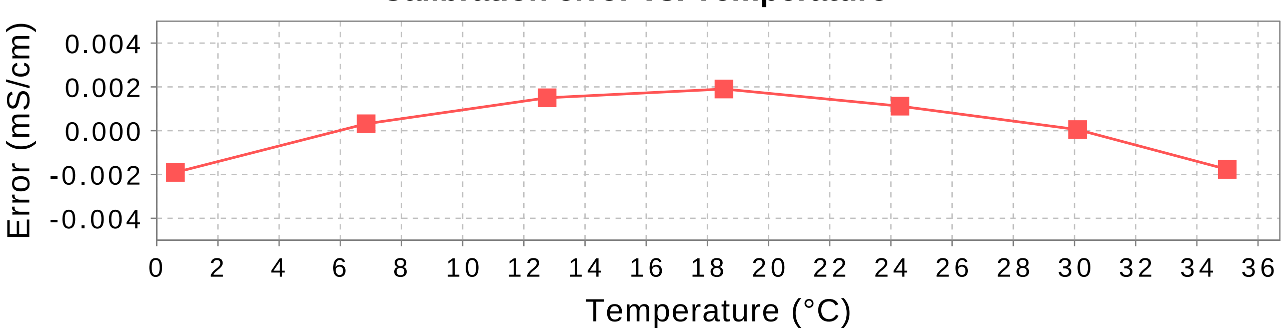
Cell Constant @T15S35 = 4.24004 1/cm

$$C_{cor} = \frac{C_0 + C_1 * V - X_0 * (T - X_3)}{1 + X_1 * (T - X_3) + X_2 * (P - X_4))}$$

Calibration error vs. Conductivity



Calibration error vs. Temperature



Calibration Date: 2021-06-09
Issue Date: 2021-06-09
File Name: 207642_20210609_1636C.rsk

Operator: Jeff Walker
jwalker

Approver:
kmalorny

RBR

Pressure Calibration Certificate

RBRconcerto³ C.T.D|fast8 s/n: 207642
Instrument rating: 50 dbar s/n: K296591
Nominal accuracy: 0.05%FS (0.025 dbar)
Reference instrument: Mensor CPC6050 s/n: 41000CAM

Applied pressure, P_{app} (dbar)	Voltage ratio, V	Measured pressure, P_c (dbar)	Calibration error (dbar)
10.058	0.048683	10.0568	-0.0009
15.000	0.069505	15.0016	0.0019
19.999	0.090546	19.9997	0.0003
25.000	0.111586	24.9991	-0.0004
30.000	0.132625	29.9992	-0.0006
34.999	0.153661	34.9994	-0.0000
40.000	0.174695	39.9992	-0.0003
45.000	0.195735	45.0005	0.0006
50.000	0.216768	50.0000	0.0002
55.000	0.237808	55.0002	0.0003
60.000	0.258848	59.9998	-0.0004

Coefficients

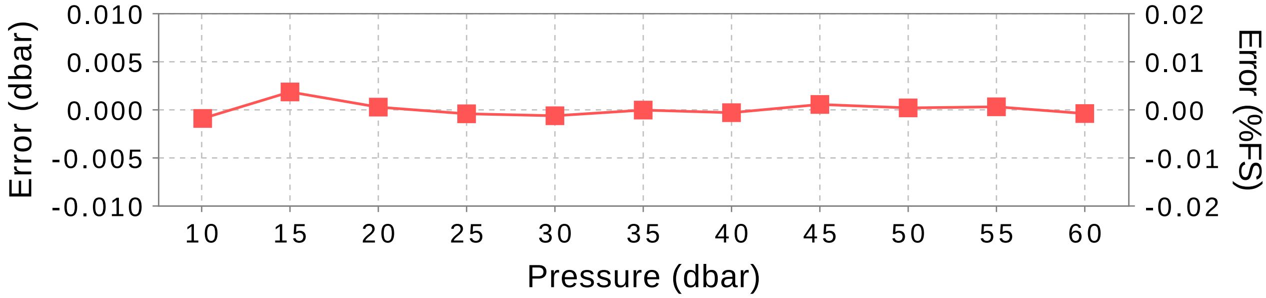
C0:	-914.03097E-3
C1:	237.17517
C2:	3.0330358
C3:	-5.737307
X0:	10.0577
X1:	7.842538E-3
X2:	48.955848E-6
X3:	214.32402E-9
X4:	-93.56487E-6
X5:	21.411144

$$P_c = X_0 + \frac{P_m - X_0 - X_1(T - X_5) - X_2(T - X_5)^2 - X_3(T - X_5)^3}{1 + X_4(T - X_5)}$$

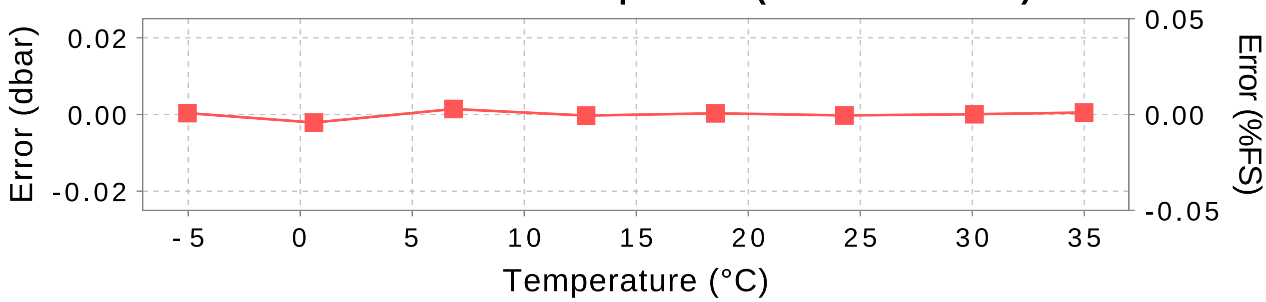
Head (mm) = 582

$$P_m = C_0 + C_1 V + C_2 V^2 + C_3 V^3$$

Calibration error vs. Pressure (Tcal = 21.4°C)



Calibration error vs. Temperature (Patm = 9.99 dbar)



Calibration Date: 2021-06-08
Issue Date: 2021-06-08
File Name: 207642_20210608_1308P.rsk

Operator: afalicki

Approver: kmalorny

RBR

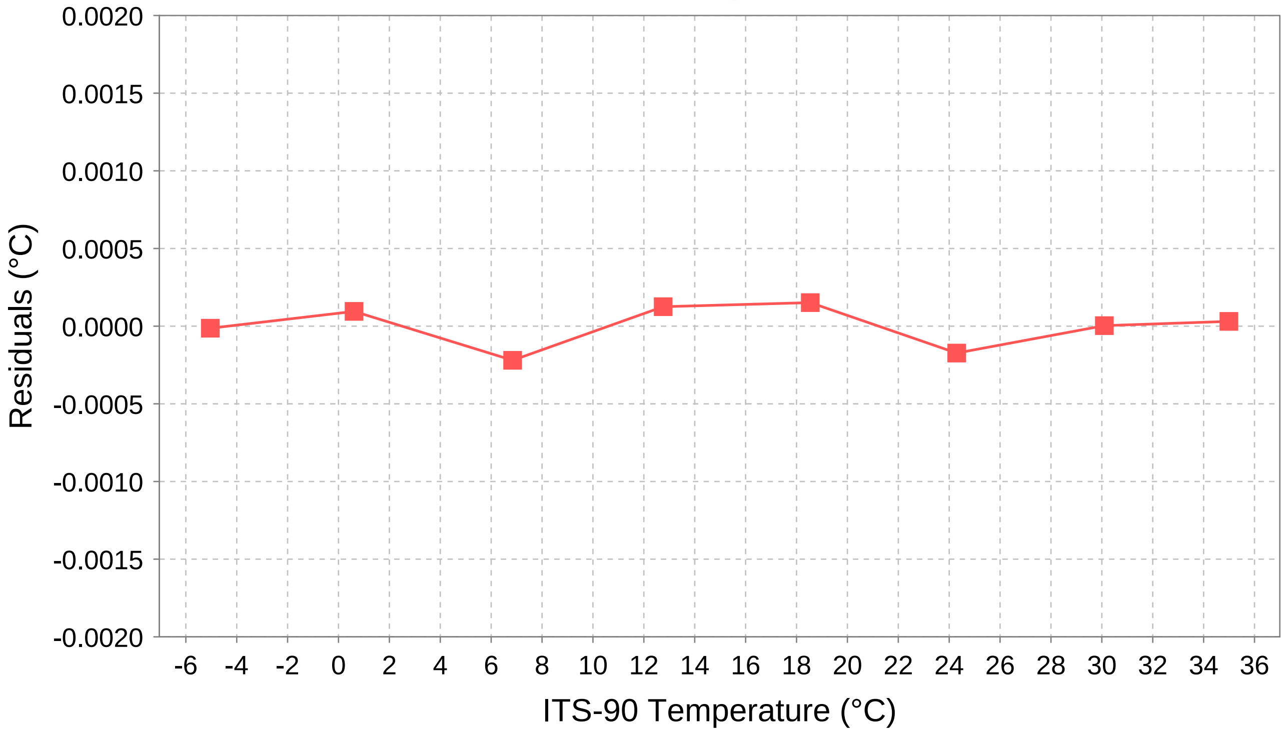
Temperature Calibration Certificate

Logger ID: RBRconcerto³ Serial No: 207642 Channel No: 2

Reference Temperature, ITS-90	Voltage ratio, V	Measured Temperature, ITS-90	Calibration error
-5.03738	0.809066	-5.03740	-0.00001
0.61233	0.759575	0.61242	0.00010
6.84396	0.698114	6.84374	-0.00022
12.76012	0.634821	12.76024	0.00013
18.54150	0.570482	18.54165	0.00015
24.29690	0.506246	24.29672	-0.00017
30.09958	0.443430	30.09958	0.00000
34.99299	0.393305	34.99302	0.00003

Coefficients	
C0:	3.3555604E-3
C1:	-255.52773E-6
C2:	2.389719E-6
C3:	-87.325716E-9

Residuals vs. Temperature



Calibration Date: 2021-06-04
Issue Date: 2021-06-07
Calibration ID: 47061

Operator: kmalorny

Approver: kmalorny

Pressure Calibration Certificate

RBRsolo³ D s/n: 207643
Instrument rating: 20 dbar s/n: M135739
Nominal accuracy: 0.05%FS (0.01 dbar)
Reference instrument: Mensor CPC6000 s/n: 612676

Applied pressure, P_{app} (dbar)	Voltage ratio, V	Measured pressure, P_c (dbar)	Calibration error (dbar)
10.096	0.139343	10.0955	-0.0008
12.000	0.162607	12.0018	0.0017
13.999	0.186948	13.9998	0.0004
16.001	0.211277	16.0002	-0.0003
18.000	0.235554	17.9994	-0.0005
20.000	0.259806	19.9997	-0.0004
22.000	0.284019	22.0000	-0.0001
24.000	0.308199	24.0003	0.0002
26.000	0.332342	26.0005	0.0005
28.000	0.356448	28.0004	0.0003
30.000	0.380514	29.9997	-0.0004

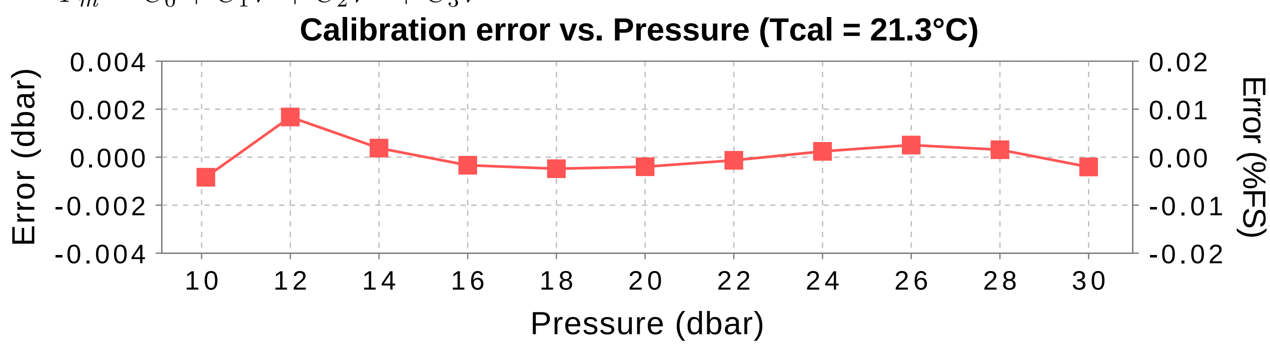
Coefficients

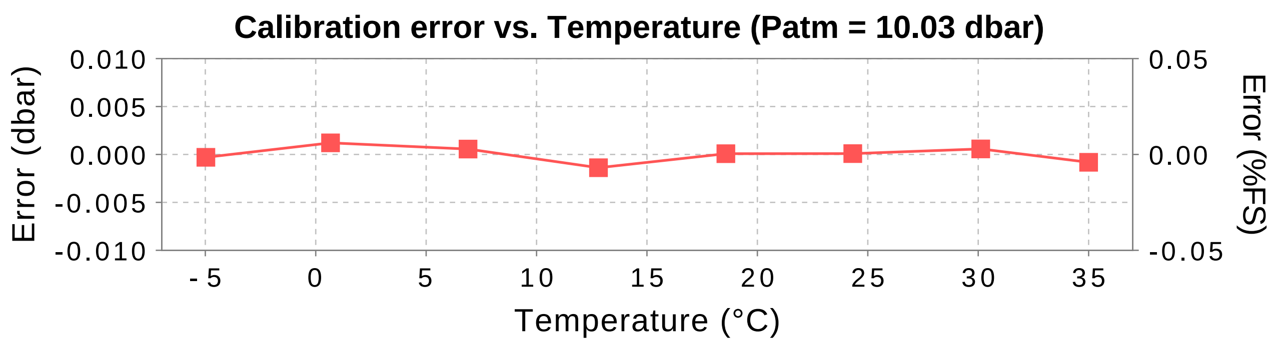
C0:	-665.38525E-3
C1:	81.00648
C2:	3.3388352
C3:	-965.59364E-3
X0:	10.0963
X1:	7.7618468E-3
X2:	78.86402E-6
X3:	572.53436E-9
X4:	293.02313E-6
X5:	21.342314

$$P_c = X_0 + \frac{P_m - X_0 - X_1(T - X_5) - X_2(T - X_5)^2 - X_3(T - X_5)^3}{1 + X_4(T - X_5)}$$

Head (mm) = 589

$$P_m = C_0 + C_1 V + C_2 V^2 + C_3 V^3$$





Calibration Date: 2021-06-09
Issue Date: 2021-06-10
File Name: 207643_20210610_1033P.rsk

Operator: afalicki

Approver: kmalorny

APPENDIX 9C

Tidal gauge Data Deliverable

(delivered electronically; this appendix is intentionally blank)