BACK RIVER PROJECT
Responses to Aquatic Baseline Synthesis Report Comments

October 21, 2020

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1. Responses to Comments

1.1 RESPONSE TO KITIKMEOT INUIT ASSOCIATION

KIA-ABSR-1: Support for Normal Range Calculations

Summary:

Additional data should be collected to support normal range calculations at all sites.

Detailed Review Comment

As noted in Table 2-8, improvements have been made over the years to analyze water quality data using sufficiently sensitive detection limits. Detection limits were notably improved in 2017 and 2018 in comparison to those in 2010-2015. Use of improved detection limits will help provide a more accurate characterization of the normal range of several key parameters. Key parameters that have notably improved detection limits in 2017 and 2018 as compared to earlier years include dissolved phosphorus, aluminum, cadmium (improvements from 2015 onward), mercury (also improved from 2015 onward), nickel, selenium, and silver.

The baseline characterization of Goose Lake and the Reference Lake in the open water season has benefited from these improved detection limits, but Propellor Lake was not sampled in either 2017 or 2018.

We also note that only one year of data has been collected within the Goose Lake Southeast Basin under ice; this is insufficient to provide a characterization of normal range in this area.

Recommendation/Request:

Sabina should begin implementing the water quality components of the AEMP to bolster the baseline dataset and improve the calculation of normal range at all sites. At the least, Sabina should implement the water quality components of the AEMP to collect at least one additional year of baseline data at all sites both under ice and in the open water season using the more sensitive detection limits from 2017 and 2018.

Sabina Response:

Sabina agrees with collecting another year of under-ice water quality to add to the baseline dataset to support normal range calculations and future Before-After Control-Impact (BACI) analysis. For the open-water season, there are sufficient data to support normal range calculations. Table 2-10 of the Aquatic Baseline Synthesis Report shows that there are at least 58 samples for the open-water season in Goose Lake, which is sufficient to calculate normal ranges. Additional water quality data will be collected from Propeller Lake during operations to augment the baseline dataset prior to the scheduled discharge of treated mine-influenced water from the pits to Goose Lake, expected at the end of operations/closure (see response to ECCC-ABSP-1).

KIA-ABSRP-2: Clarify Treatment of Non-detects

Summary:

Additional clarity is required regarding the treatment of censored water quality data.

Detailed Review Comment

Sabina notes that "water quality results for parameters analyzed using multiple DLs were screened and those associated with higher DLs were highlighted and not included in the compiled baseline dataset, with the exception of stations where only high DLs data were available". Exclusion of high DL censored data provides additional rationale as to why more baseline data using improved DLs is required (see KIA-TC1). However, it does not clarify how Sabina has treated censored water quality data used in the calculation of summary statistics.

Recommendation/Request:

Please clarify how Sabina will treat censored data used in the calculation of summary statistics to support normal range calculations as well as for future BACI statistical analysis.

Sabina Response:

Non-detect values were replaced with one half the detection limit when calculating summary statistics (Section 2.3.3.3 of the Aquatic Baseline Synthesis Report). This is consistent with the method for treating censored data in the Final Environmental Impact Statement. The same method will be used to address non-detect data when calculating normal ranges and for BACI analysis for the Aquatic Effects Management Plan (AEMP), as will be reflected in the forthcoming update to the AEMP design plan.

1.2 RESPONSE TO ENVIRONMENT AND CLIMATE CHANGE CANADA

ECCC-ABSP-1: Baseline Data Set

Detailed Review Comment

The baseline dataset for Propeller Lake is not sufficient to support normal range calculations to assess potential effects in Propeller Lake.

The report identifies that current water quality predictions suggest that a mine-related influence on Propeller Lake water quality is not expected until close to the end of operations/closure, and that additional baseline data would be collected prior to mine closure to supplement the existing dataset and support future baseline comparisons.

Recommendation/Request:

ECCC recommends that the Proponent identify water quality parameter thresholds for Goose Lake (near-field exposure) that would trigger additional baseline sampling in Propeller Lake (far-field exposure) prior the end of operations/closure to capture baseline data for Propeller Lake before it is affected by mine-related effluent in support of the BACI study design.

Sabina Response:

According to the updated Mine Plan (2020 Modification Package), discharge from the Umwelt Reservoir and Llama Tailings Facility to Goose Lake may start in Year 11 (i.e., late operations). This discharge has a potential to affect Goose Lake water quality and thus may affect Propeller Lake water quality. Based on this schedule, Sabina proposes to collect water quality data in Propeller Lake starting in Year 8, to accumulate at least three years of data before a potential mine-related influence on Propeller Lake water quality.

Note that the AEMP also states that water quality in Propeller Lake will be monitored annually upon the initiation of the dewatering discharge to Goose Lake, with the option to adjust the frequency after the Construction Phase (i.e., during phases with no treated mine-influenced discharge to Goose Lake) (Section 4.3.3 in Sabina 2017). Given that the updated mine plan specifies that the discharge of treated mine-influenced water is not expected to commence until Year 11, monitoring in Propeller Lake is expected to be suspended after the Construction Phase, and then re-initiated in Year 8, as stated above. This updated monitoring plan would result in recent water quality data being collected for an appropriate period of time, prior to Year 11, to support normal range calculations and provide baseline data for BACI analysis for Propeller Lake.

Reference:

Sabina Gold & Silver Corp (Sabina). 2017. Back River Project. Aquatic Effects Management Plan. October 2017.

ECCC-ABSP-2: Paired Data

Detailed Review Comment

Only one year of paired data are available for under-ice (April) water quality for Goose Lake and Reference B Lake.

Paired data is available for open-water water quality for Goose Lake and Reference B Lake. The BACI study design would be stronger with more than one year of paired data for under-ice baseline water quality.

Recommendation/Request:

ECCC recommends that additional under-ice data be collected prior to construction of the project following the same methods and procedures used in the 2018 sampling program.

Sabina Response:

Agreed. Sabina commits to collecting another year of under-ice water quality data for Goose Lake and Reference B Lake prior to the construction of the project.

ECCC-ABSP-3: Lake Trout Data Sample Sizes

Detailed Review Comment

Lake Trout data sample sizes are limited in supporting the calculation of a normal range for Lake Trout size and condition.

During the 2018 baseline fish health program, 11 Lake Trout were captured as bycatch and the sampling effort was biased towards the capture of small young-of-year (YOY) Lake Trout. Due to concerns about the long-term impacts of lethal sampling on large-bodied fish populations, lethal sampling of Lake Trout was not conducted in 2013 or 2018.

Recommendation/Request:

ECCC recommends that the Proponent identify how a more robust dataset to characterize baseline Lake Trout size and condition can be developed to support the BACI study design and the aquatic effects monitoring program design update.

Sabina Response:

The conclusions of the baseline dataset evaluation for Lake Trout were that the exposure and reference area sampling areas were compatible, and the baseline data were suitable for conducting a control-impact analysis for the fish health component (Section 5.5.2 of the Aquatic Baseline Synthesis Report). A before-after control-impact (BACI) statistical design was not proposed for the fish health component.

There are, however, insufficient data to support normal range calculations for Lake Trout at this time. Sabina has committed to initiating biological sampling (including fish) a year after the initiation of dewatering discharge (WT-ECCC-TC-9) and the Aquatic Effects Management Plan (AEMP) states that the fish health surveys would be conducted every three years in the exposure and reference lakes (Table 4.3-4 in Sabina 2017). Therefore, additional Lake Trout data will be collected during the fish health surveys, either opportunistically or targeted, as appropriate, to augment the baseline dataset for normal range calculations.

Reference:

Sabina Gold & Silver Corp (Sabina). 2017. Back River Project. Aquatic Effects Management Plan. October 2017.