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November 30, 2020

Shannon Allerston
Regulatory Specialist
Mackenzie Valley Land and Water Board
4922 – 48th Street
7th Floor YK Centre Mall
P.O. Box 2130, Yellowknife, NT X1A 2P6

Re: Giant Mine Remediation Project Response to MVLWB Comments on September Monthly Surveillance Network Program (SNP) Report for MV2007L8-0031

Dear Ms. Allerston

The Giant Mine Remediation Project (GMRP) is pleased to submit responses to the Mackenzie Valley Land and Water Board staff comments dated November 13, 2020 on the GMRP September 2020 SNP report.

If you have any questions or comments, or require additional information, please contact the undersigned by email at Andrea.Markey@canada.ca or by phone at 867-445-6267.

Sincerely,

Andrea Markey

Andrea Markey
Environmental Scientist
Giant Mine Remediation Project

Encl.

Table 1 GMRP Responses to MVLWB Staff Comments on September 2020 SNP Report
Table 2 Revised Comparison to Effluent Quality Criteria September 2020



Table 1 GMRP Responses to MVLWB Staff Comments on September 2020 SNP Report

Topic	MVLWB Staff Comment	Recommendation	GMRP Response
Table D - EQC Comparison: MAC Calculation	Board staff note that additional monitoring data beyond the required weekly sampling was provided for SNP 43-1. In addition, a monthly average was calculated and compared to the Maximum Average Concentration. While the extra monitoring data are appreciated, the GMRP is reminded that the Maximum Average Concentration is defined in Part A of the Licence as "the concentration of a parameter that cannot be exceeded by the running average of any four consecutive analytical results, collected in accordance with the sampling and analysis requirements specified in the Surveillance Network Program (SNP)." The monthly average is not equivalent to the Maximum Average Concentration because it consists of more than four consecutive samples. GMRP can adjust the running average calculation to encompass the additional data or clearly indicate the individual weekly compliance samples used in the running average calculation. Board staff note that the concentrations of all samples are well below any EQC and non-compliance as a result of EQC exceedances is not an issue; however, correct calculation of MAC values is required.	Could GMRP please provide an updated table for SNP43-1 that provides the running average of any four consecutive analytical results as required by Licence MV2007L2-0031.	Please see revised Table D, presented here as Table 2. The Maximum Average Calculation was calculated using the weekly sample presented.
Table D - Hold Time Exceedances	Board staff note a number of hold time exceedances. For example, eleven out of thirteen samples from SNP 43-1 are identified as having exceeded the recommended hold time for nitrate, which is a regulated parameter in the water licence. Similar hold time issues are identified in relation to surface water and groundwater samples. This appears to be an ongoing problem that requires corrective action to mitigate this issue from continuing.	Could GMRP please explain the corrective action(s) being taken to minimize ongoing hold time exceedances for future sampling events.	The sample hold time for Nitrate is three (3) days. GMRP delivers water samples to a local environmental laboratory on the day of sample collection to the greatest extent practicable. The provision of laboratory testing services that meet the GMRP requirements is not available in Yellowknife. As such, the laboratory transports the samples to Vancouver for analysis. This approach is consistent with best management practices and in response to the lack of local capacity. Due to the duration of sample transit to Vancouver, the frequency of hold times exceedance increases with the site's relative remoteness, availability of transport services provider, weather and government-issued travel restrictions, which further amplified them via the reduction of flights out of Yellowknife. However, GMRP implements a tiered approach to quality assurance/quality control (QA/QC), which includes field-level QA/QC procedures to maintain the samples' integrity from collection to transport to the laboratory. The GMRP continues to work with the laboratory to mitigate hold time exceedance issues to the greatest extent possible.
Table E - Turbidity Values	There are a number of occurrences of turbidity being reported as 0 NTU, which seems suspect given the nature of this water management system (i.e., unlined polishing pond, natural creek) and reportable concentrations of total suspended solids and laboratory-measured turbidity from the same sample.	Could GMRP please confirm the procedures for validating field-based parameters.	GMRP implements a tiered approach to quality assurance/quality control (QA/QC), including field-level QA/QC procedures related to the field data validation and equipment verification and maintenance. These procedures are consistent with the SOP, industry-accepted standards and best management practices. GMRP calibrates water-quality field equipment daily and weekly, and according to the equipment manufacturer's specifications. The GMRP continues to troubleshoot field-based turbidity values.
Table D - Footnote	Table D includes a footnote re: bold font indicating the most stringent guidelines. Board staff would like to clarify that EQC are different than guidelines as EQC must be met to be in compliance with the water licence. Maximum Grab Concentration is applicable to any individual sample regardless of whether it is a grab or autosampler composite sample. Maximum Average Concentration is applicable to the running average of four consecutive samples.	GMRP should confirm comparison to EQC is done appropriately in future reports.	GMRP acknowledges this distinction. Please see revised Table D, presented here as Table 2.
Tables - Formatting	Board staff appreciate that the data were provided in electronic (Excel) format. It would be helpful if future reports could format the pdf version of tables to include the list of parameters and EQC (where applicable) on all pages for multi-page tables to help facilitate the review. Board staff note that Table H has an issue with overlapping table title and column header and Table C has an issue with the footnote re: stations not being scheduled for sampling being cut off.	For future reporting, GMRP should adjust the table formatting in the pdf file as well as verify information is complete.	GMRP acknowledges this request and will implement for future reporting.
Table D and E - Hold Time Discrepancy	There appears to be a discrepancy between Tables D and E regarding hold times related to TSS. Table D includes a footnote for TSS for 2 September 2020 that hold time was exceeded due to delayed transit from Yellowknife. Table E includes a footnote for this sample/parameter and states it was a delay related to a demand on the lab at the time of sample receipt. Table E also indicates that TSS in the sample from 3 September 2020 experienced the same hold time exceedance for the same reason, but this hold time exceedance is not indicated in Table D.	Could GMRP please confirm the correct information for hold time exceedances between Tables D and E as well as provide information regarding any corrective actions being implemented with the laboratory to mitigate hold time exceedances for future sampling events.	This comment relates to SNP43-1 samples from September 2 and 3, 2020, presented in Table D (EQC Comparison) and Table E (Summary of SNP Analytical Results). Samples collected on September 2 and 3, 2020, did not meet the sample hold time for TSS due to the laboratory's capacity upon sample receipt. GMRP erroneously applied the footnote indicating that the transit time caused the hold time exceedance. GMRP delivers water samples to a local environmental laboratory on the day of sample collection to the greatest extent practicable. The provision of laboratory testing services that meet the GMRP requirements is not available in Yellowknife. As such, the laboratory transports the samples to Vancouver for analysis. This approach is consistent with best management practices and in response to the lack of local capacity. Due to the duration of sample transit to Vancouver, the frequency of hold times exceedance increases with the site's remoteness, availability of transport services provider, weather and government-issued travel restrictions, which further amplified them via the reduction of flights out of Yellowknife. However, GMRP implements a tiered approach to quality assurance/quality control (QA/QC), including field-level QA/QC procedures to maintain the samples' integrity from collection to transport to the laboratory. The GMRP continues to work with the laboratory to mitigate hold time exceedance issues to the greatest extent possible.
Table E - Petroleum Hydrocarbon Detection Limit Variability	The detection limits for PHCs are variable, but this is not reflected in the detection limit column. For example, the detection limit for the C6-C50 fraction is listed as 0.4 mg/L but varies from 0.4 to 0.53 mg/L, and the detection limits for the C16-C34 and C34-C50 fractions vary slightly from 0.25 to 0.30 mg/L. Board staff note that all samples were below respective detection limits, but the reason(s) for the variation in detection limits is not provided, which is inconsistent with the remainder of the table.	Could GMRP please explain the reason(s) for the petroleum hydrocarbon detection limit variability.	GMRP notes the detection limit column should have reflected the variable detection limits for PHCs as provided by the laboratory.
Table A	Board staff note that the dash (-) is defined as "Not Applicable, Data not available, Data invalid or Not calculated". These all mean very different things and can have potential implications on compliance. More clearly defining these four terms in a manner that facilitates reviewers understanding of the reason for the lack of data would be helpful.	Could GMRP please clarify which term is relevant to specific data.	GMRP acknowledges this distinction and will implement for future reporting.
Tables - Units	The units reported in Tables E and H for temperature are missing the degrees (°) (i.e., they are reported just as "Celsius").	Future reporting should correct the temperature units.	GMRP acknowledges and will implement for future reporting.
Quality Control Samples	According to the SOP, an equipment rinsate sample is to be collected with all groundwater programs. Results for this sample are not provided.	Could GMRP please confirm whether an equipment rinsate QC sample was collected during the groundwater sampling, and either provide these results or an explanation why this was omitted.	There was no equipment rinsate blank in September 2020. However, GMRP implements a tiered approach to quality assurance/quality control (QA/QC), including field-level QA/QC procedures related to the sample integrity, field data validation and equipment decontamination. These procedures are consistent with the SOP, industry-accepted standards and best management practices. Field procedures included the following: 1. Cleaning the water-quality meter by triple rinsing it with deionized water before and after each use and between sampling stations. 2. Cleaning the water-level meter by spraying it with a laboratory-grade detergent solution and triple rinsing it with deionized water before and after each use and between sampling stations. 3. Rinsing the multi-port sampling equipment by spraying it with a 5% nitric acid solution and triple rinsing it with deionized water after each use and between sampling stations. 4. Verifying adequate cleaning by measuring the rinsate water's specific conductivity to be equal to or less than 5 µS/cm. 5. Transporting field equipment between sampling stations on their storage containers.
Data Validation	Board staff note that most tables include a footnote stating that the results are draft and potentially subject to change pending final data validation. Board staff note that it would be helpful if any changes that occur be identified or summarized in the Annual Report.	GMRP should consider including a summary of any SNP data changes in the Annual Report.	GMRP acknowledges this recommendation.

