Archived: Monday, November 8, 2021 2:14:28 PM
From: Valentine (IAAC/AEIC)
Sent: Tuesday, April 20, 2021 10:41:00 AM
To: Tara Oak
Cc: Mabrouk, Gehan (IAAC/AEIC)
Subject: NR Can-04. Valentine Gold Information Request.
Sensitivity: Normal

Hi Tara,
As per our call this morning, below is the IR from NRCan that needs your attention. It was inadvertently left from the package sent to you in February. My sincere apologies for the oversight.
As discussed, please feel free to give me a shout to discuss further.

ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Request for Information
NRCan-04	7.1.5 Project Setting and Baseline Conditions – Groundwater and Surface Water	Baseline Study Appendices 3, Attachment 3-D, Hydrogeology Baseline Report, Sections 3.2, 4.3. Chapter 6, Appendix 6A, Section 3.3, Appendix 2C Prefeasibility Geotechnical Report, Section 7.4	The EIS Guidelines state that the EIS will present information in sufficient detail to enable the identification of how the project could affect the Valued Components and the analysis of those effects. Hydraulic conductivity in the overburden was assessed through single well response tests. The majority of these tests were completed in wells that were screened across the bedrock-overburden interface. A review of these tests indicate increased hydraulic conductivity with increased proportion of the screen within the bedrock (Section 4.3 of BSA 3D). These results, combined with the noted lower rock quality designation within the upper 5-10m of bedrock, appear to support a conceptualization of an upper, more permeable bedrock zone within the top 5-10m. Within the geological and groundwater models, the hydrostratigraphy of the bedrock has been classified into upper (0-20m), intermediate (20-120m), and deep (120-370m) bedrock units. These divisions do not appear to reflect the hydraulic conductivity data or the rock quality designation data, all of which point to higher hydraulic conductivity in the upper 5-10m. As shown on Figure 1, Section 7.4, Appendix 2C Prefeasibility Geotechnical Report, the packer testing data, while sparse, appears to show a lower uniform hydraulic conductivity for the remaining depth for the Marathon Pit and an increased hydraulic conductivity at depths greater than 350 m for the Leprechaun Pit. Single well response testing within the bedrock (MW5, MW6, and MW8) should not be relied upon to characterize bedrock hydraulic conductivity. In MW5, groundwater elevations were only displaced by 10cm, and only two observation points were used in the analysis. At MW6, and MW8, the rising head tests (completed second) yield hydraulic conductivity estimates that were at least an order of magnitude higher than the falling head tests (completed first). These results may indicate continued development of	a. Update the geological and groundwater models to represent the observed hydrostratigraphy and measured hydraulic conductivity variations with depth. Implement variations in bedrock hydraulic conductivity with depth, only to the extent supported by hydraulic testing and rock quality designation. b. Reevaluate the single well response tests at MW5, MW6, and MW8 to determine if there is sufficient displacement and evaluate the potential for enhanced well development through the testing process. Update the conceptual model and parameterization as needed.

			these wells through testing. Results at these three wells may underestimate shallow bedrock hydraulic conductivity. Hydrostratigraphy implemented within the groundwater flow model is the main factor that controls the assessment of groundwater flow quantity and direction. Hydrostratigraphy should represent field observations to the extent possible. Failure to represent a conductive upper bedrock unit may result in an incorrect assessment of changes to surface water quantity and quality, which would be carried forward to the assessment of fish and fish habitat.	

Thanks,
Brent

Brent Keeping

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