State of Alaska Comments – Pebble Project Preliminary Draft EIS

Section 3.17 and K.3.17 - Groundwater Hydrology

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
DNR/DMLW/WATER-Alaska Hydrologic Survey	1	Sec 3.17 and 4.17	The groundwater MODFLOW model referred to in in Appendix 8.1J describes the model structure (layers in overburden, aquitards, and deep aquifers), the domain, and the calibration process (simulated vs observed GW levels from 2004-2007) but the GW model is not validated with a new dataset (e.g. data that is not used in the calibration step). Additionally, a sensitivity analysis must be performed to understand how model parameters affect model output. These results will be particularly important	Conduct a validation analysis for the groundwater model by comparing modelled and observed piezometer levels for data collected post 2007 (outside the calibration period). Conduct a sensitivity analysis to understand the sensitivity of model results to model parameters. These additional modelling steps will provide greater understanding of the mining impacts on the groundwater systems, including pit dewatering as well as the impacts to groundwater-surface water interactions and flows.	PLP is currently evaluating data collected since 2007 to determine if it constitutes a new hydrologic data set. If the data do not represent anything new (e.g., they are repetitive examples of seasonal highs and lows without changes in annual averages), then it would not represent a "new" data set suitable for a validation exercise. This topic is undergoing further analysis. The Monte Carlo analysis that was performed is a type of sensitivity analysis, and an evaluation of it has been included in the DEIS. The model sensitivity analysis is undergoing further analysis (PLP 2019-RFI 109).
DNR/DMLW/WATER-Alaska Hydrologic Survey	2	Sec 3.17 and K3.17	In section 3.17.1.4, it is stated that "Bedrock hydraulic conductivity generally decreases with depth" and Figs 3.17-13 and 3.17-14 are cited as results to support this statement. However, Figs 3.17-13 and 3.17-14 show a similar range of hydraulic conductivity with depth. Packer testing of the bedrock (Fig 3.17-13) shows a range of K from 1 x 10-7 to 1 x 10-5, a similar range that is observed in the shallow aquifer systems.	Provide evidence to support the claim that hydraulic conductivity (K) decreases with depth. This decreasing K with depth concept is also a rationale for the dominance of local groundwater systems and a lack of regional groundwater system. Provide further evidence that regional groundwater systems do not exist.	Additional information has been added to the DEIS on the topic of the characterization of hydraulic conductivity with depth. Text has been revised to note that regional groundwater flow systems are expected to exist.