

State of Alaska Comments – Pebble Project Preliminary Draft EIS, Section 4.17 – 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 a discussion of 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 4.17	In section 4.17.2.1, it is stated that "the cone of depression would extend approx. 2,000 to 10,000 feet from the crest of the open pit depending on the hydraulic character of the affected aquifers". This is a large range in the hydrologic impact from mining the pit. However, I can not see where the larger value (10,000 ft) is presented in the Piteau 2018a report.	Please clarify the basis for the 2,000 to 10,000 ft range in the cone of depression. What model parameters have the greatest influence on the cone of depression calculation? Has the range in the cone of depression been incorporated into the streamflow reduction calculations?	Maps and text have been added to Section 4.17, Groundwater Hydrology, that provide further description of the range (from Piteau Associates 2018a). The boundary conditions that have the greatest influence on the cone of depression calculation are undergoing further analysis (PLP 2019-RFI 109). The range in cone of depression has been incorporated into streamflow reduction for UTC (Piteau Associates 2018a: Fig.6) and the text updated.