

EPA Comments – Pebble Project Preliminary Draft EIS, Appendix K3.18 - Water and Sediment Quality

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
EPA	1	Page K3.18-2, Table K3.18-1		We recommend including the basis for the sediment standards here rather than waiting until later in the document.	Addressed. Footnote added including basis for TEL and PEL.
EPA	2	Page K3.18-3, Table K3.18-1	Alkalinity $\mu\text{g/L} > = 20,000$	We recommend clarification regarding whether alkalinity is the same as Alkalinity as CaCO_3 that is listed further down in the table.	Alkalinity as CaCO_3 is distinct from total alkalinity. The word "total" has been added to alkalinity to help clarify that these are different.
EPA	3	Page K3.18-3, Table K3.18-1	Hardness (as CaCO_3)	We recommend clarifying that there is no criterion for hardness in the State of Alaska WQS.	Clarified in Table K3.18-1; footnote added specifying that there is no criterion for hardness in the State of Alaska Water Quality Standards.
EPA	4	Page K3.18-3, Table K3.18-1	Alkalinity as CaCO_3	If this is the same alkalinity as is referenced in the Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances, please clarify that this criterion is a minimum.	Clarified in Table K3.18-1. Updated to ≥ 20 .
EPA	5	Page K3.18-3, Table K3.18-1	Total ammonia as N	We recommend including the pH and temperature values used in the equation to calculate this criterion.	Addressed. Footnotes updated for Table K3.18-1 to include more information.
EPA	6	Page K3.18-3, Table K3.18-1	Comment related to temperature criterion	We recommend including the appropriate criterion for temperature in this table.	Temperature criteria has been added to Table K3.18-1.
EPA	7	Page K3.18-3, Table K3.18-1 Footnote	Water quality limits are based on the lowest 15th percentile hardness of the three proposed discharge locations.	We recommend clarifying the actual value (back calculating reveals at least three different values were used to determine the table values for the hardness-based criteria) and whether it is the 15th percentile of all the hardness measures or the lowest of the 15th percentile of each of the three data sets.	Footnotes have been updated to clarify. Three hardness values were used and the most stringent was included in the table.
EPA	8	Section K3.18.1.2, Page K3.18-4	discharge of non-domestic wastewater to groundwater	We recommend also including the discharge of domestic wastewater to groundwater in this sentence.	Addressed. Domestic wastewater was included.
EPA	9	Section K3.18.2,	These data were developed using	Per our comment on section 3.18.1.1, because the proposed action is for the	Statement added in text describing justification for use of a combined

EPA Comments – Pebble Project Preliminary Draft EIS, Appendix K3.18 - Water and Sediment Quality

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
		Page K3.18-5	representative overburden, rock cores, and metallurgical waste (tailings) samples from the Pebble east and west zones (PEZ and PWZ), and rock core samples from borings drilled in three proposed construction rock quarry areas	West zone, we recommend that the analysis include data from the West zone only. We also recommend clearly describing how the data used are representative of the project.	PEZ and WEZ dataset based on information provided in SRK (2018f).
EPA	10	Section K3.18.2, Page K3.18-5	Table K3.18-2	<p>The grouping of materials into just two general categories (tertiary and pre-tertiary) is overly broad. Instead, we recommend that further distinctions be made, such as sedimentary and volcanic origins as well as other information on the rock type. Such information is necessary to provide an understanding of the representativeness of the types of ore at the site in relation to the geochemical characterization of the materials.</p> <p>In SRK 2011a, there is a much more complete partitioning of the data into different rock types. We recommend following a similar approach here in showing that the samples collected are representative of the abundance of the different rock types.</p>	<p>Noted. Additional descriptive information on rock type beyond pre-Tertiary vs. Tertiary is not necessary for the purpose of presenting and evaluating the results of the geochemical testing program.</p> <p>Additional information on rock types is available in SRK (2011a).</p>
EPA	11	Section K3.18.2, Page K3.18-5	These data were developed using representative overburden, rock cores, and metallurgical waste (tailings) samples from the Pebble east and west zones (PEZ and PWZ), and rock core samples from	We recommend including a quantitative assessment showing that the samples are representative.	Addressed in text. Description was added regarding how samples were selected and determined to be a representative sample. Additionally, Figure K3.18-1 (Figure 11-2 in SRK 2011a) has been included and provides a visual of sample selection to ensure a representative sample was used.

EPA Comments – Pebble Project Preliminary Draft EIS, Appendix K3.18 - Water and Sediment Quality

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
			borings drilled in three proposed construction rock quarry areas.		
EPA	12	Section K3.18.2.1, Page K3.18-6	As of 2018, the program had included analysis of over 1,000 rock samples from the Pebble deposit, and 26 samples of overburden materials. In addition, almost 60 tailings samples comprised mostly of rougher, cleaner scavenger, pyritic, and gold plant tails, from test processing of ore composites have also been characterized.	As noted above, we recommend specifying whether these numbers include data from the East and West zones or only from the West zone. Per our comment on section 3.18.1.1, because the proposed action is for the West zone, we recommend that the analysis includes data from the West zone only.	Clarification that samples were collected from both the PEZ and PWZ has been added to the text. Justification for a combined dataset is provided based on SRK (2018f).
EPA	13	Section K3.18.2.1, Page K3.18-6	This included ABA using the modified Sobek et al. (1978) method on more than 1,000 rock samples collected from drill holes blanketing the proposed mine area	As noted above, we recommend specifying whether these numbers include data from the East and West zones or only from the West zone. Per our comment on section 3.18.1.1, because the proposed action is for the west zone, we recommend that the analysis only use data from the west zone. See recommended edits above	Addressed. Statement was included in the document highlighting that a combined PEZ and PWZ sample set was utilized citing SRK (2018f).
EPA	14	Section K3.18.2.1, Page K3.18-7	Humidity cell test data obtained for periods up to 8 years allow interpretation of long-term acid generation potential and neutralization rates as the rocks are oxidized and leached during wet and dry cycles	We recommend providing information in the DEIS on the minimum and average time periods under which the humidity cell tests were run, in addition to providing the maximum value of eight years, as it is likely that not all humidity cell tests were run for the entire time period.	The minimum test duration was 27 weeks (SRK 2011a). The average humidity cell test duration was about 3 years (PLP 2018a). Text has been updated to include this information.
EPA	15	Section K3.18.2.1, Page K3.18-7	Element release rates determined from kinetic tests were mainly a	The impact of pH on release rates is clearly shown; however, it is not clear that variations in the pH from a given sample	Noted. Based on PLP (2018a), release rates exhibited in kinetic tests did not correlate well to trace

EPA Comments – Pebble Project Preliminary Draft EIS, Appendix K3.18 - Water and Sediment Quality

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
			function of leachate pH rather than the concentration of elements in the samples.	were more important in determining the final concentrations than variations in the metal concentrations in the ore/waste/tailings samples. We recommend providing information explaining this or a reference to where this analysis is provided.	element content, and other parameters such as pH were observed to have a stronger influence for many metals. Text clarified with regard to conclusion and citation.
EPA	16	Section K3.18.2.2, Page K3.18-17	A total of 59 tailings samples from concurrent metallurgical process test runs have been geochemically characterized	As noted above, we recommend specifying whether these numbers include data from the East and West zones or only from the West zone. Per our comment on section 3.18.1.1, because the proposed action is for the west zone, we recommend that the analysis include data from the West zone only. In addition, we recommend that the DEIS disclose whether the tailings were produced using the current proposed mineral processing approach.	Addressed previously in text. Added statement clarifying that a combined PEZ and PWZ was used citing SRK (2018f). Text has been clarified as suggested.
EPA	17	Section K3.18.2.2, Page K3.18-19	Table K3.18-4	This table includes data from “Gold plant tails.” We recommend that a footnote to this entry describe what is meant by this since the current project description does not have a gold plant tailings waste stream. As noted above, we recommend that the DEIS clearly describe whether the tailings used for testing are representative of the tailings to be created and managed as part of the proposed project.	A footnote to Table K3.18-4 has been added to address "gold plant tails" and representativeness of data.
EPA	18	Section K3.18.3.1, Page K3.18-21	Table K3.18-5. The results demonstrate that the quarry rock is dominated by unmineralized granodiorite, which would be geochemically suitable for use as construction fill due to its low metal leaching	Table K3.18-5 provides information on the concentrations of some elements in the samples. However, no information is provided to show that these materials have low leaching rates, and we recommend including this information in the DEIS.	Text has been clarified and citation added.

EPA Comments – Pebble Project Preliminary Draft EIS, Appendix K3.18 - Water and Sediment Quality

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
			and ARD potential and is classified as non-PAG		
EPA	19	Section K3.18.3.1, Page K3.18-22	This section contains baseline surface water data for parts of the project area that would be most affected by project activities.	Please provide a description of how the selected locations are considered representative or not representative of the surface water characteristics of this area. We also recommend including a discussion of whether samples were collected during high flow or baseflow conditions and how that is expected to influence the results.	A discussion of sample location selection and representativeness has been added to text based on Schlumberger et al. (2011a).
EPA	20	Page K3.18-22, Table K3.18-6	Water Temperature (°C)	Above, the EPA recommended the inclusion of the temperature criterion in Table 3.18-1 so that exceedances of the criterion could be documented in this Table. We note that the most stringent temperature criterion listed in 18 AAC 70.021(b)(10) is 13 °C.	Temperature criteria has been added to Table K3.18-1. Temperature exceedances are bolded in this table.
EPA	21	Page K3.18-22, Table K3.18-6	Total Suspended Solids	We recommend that the document explain that there are no state WQS for TSS, as well as clarify the basis for any comparison to the observed values (exceedances are shown in Tables K.18-8).	Basis for TSS is the Effluent Limitation Guideline (ELG) and is highlighted in Table K3.18-1. Footnote added to Table K3.18-1 stating that there is no State WQS for TSS.
EPA	22	Page K3.18-23, Table K3.18-6	Alkalinity, Total	Please clarify whether Total Alkalinity is the same parameter as Alkalinity or Alkalinity as CaCO ₃ listed with criteria in Table K3.18-1. If not, please make sure that the DEIS clarifies the differences among the Alkalinity parameters.	Clarified. Revised Table K3.18-1 to read "Total Alkalinity" to avoid confusion.
EPA	23	Page K3.18-23, Table K3.18-6	Nitrate-Nitrite 229 0.031	We recommend that the DEIS explain why Table K3.18-1 lists separate criteria for these two parameters, yet in K3.18-6 the criteria are lumped together. We also recommend clarifying why a value of 1.21 in Table K3.18-7 is highlighted as an exceedance but a value of 3.94 in Table	Noted. PLP specified in RFI 111 that this is varied by field matrixes and in some cases which lab conducted the analysis. Addressed, formatting issue corrected. 1.21 was un-bolded in Table K3.18-7 because it is not an

EPA Comments – Pebble Project Preliminary Draft EIS, Appendix K3.18 - Water and Sediment Quality

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				K3.18-6 is not.	exceedance.
EPA	24	Page K3.18-24 and 25, Table K3.18-7		See water temperature, alkalinity, nitrate-nitrite, and TSS comments above for Table K3.18-6.	Temperature values compared to criteria and bolded as needed. Alkalinity and TSS addressed in Table K3.18-1 footnotes.
EPA	25	Page K3.18-25, Table K3.18-8		See water temperature, alkalinity, nitrate-nitrite, and TSS comments above for Table K3.18-6.	Temperature values compared to criteria and bolded as needed. Alkalinity and TSS addressed in Table K3.18-1 footnotes.
EPA	26	Page K3.18-28, Table K3.18-9		See water temperature, alkalinity, nitrate-nitrite, and TSS comments above for Table K3.18-6.	Temperature values compared to criteria and bolded as needed. Alkalinity and TSS addressed in Table K3.18-1 footnotes.
EPA	27	Page K3.18-30, Table K3.18-9	Cadmium 11 0 - 0 Cyanide, Total 11	We recommend rechecking the calculations for cadmium and cyanide since the mean is greater than the maximum.	Checked values. They are zero values as provided by PLP and outlined in Schlumberger et al. (2011a). Cadmium was not detected above the MDL or RDL detection limits in any circumstances. Mean values represent one half the MDL upper bound. Footnote added to table.
EPA	28	Page K3.18-31, Table K3.18-10		See water temperature, alkalinity, nitrate-nitrite, and TSS comments above for Table K3.18-6.	Temperature values were compared to criteria and bolded as needed. Alkalinity and TSS addressed in Table K3.18-1 footnotes.
EPA	29	Page K3.18-31, Table K3.18-11		We recommend clarifying whether the values shown as zeros or NA in this Table would actually be different if more decimal places were used, as the other values for the same parameter would indicate. If that is the case, we recommend going out to additional decimal places as needed in order to disclose the values.	Zeros are actual zero values in this table. Footnote added to clarify what zeros mean.

EPA Comments – Pebble Project Preliminary Draft EIS, Appendix K3.18 - Water and Sediment Quality

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
EPA	30	Page K3.18-33, Table K3.18-11		See water temperature, alkalinity, nitrate-nitrite, and TSS comments above for Table K3.18-6.	Temperature values compared to criteria and bolded as needed. Alkalinity and TSS addressed in Table K3.18-1 footnotes.
EPA	31	Page K3.18-34, Table K3.18-11	Copper 45 0.000198 - 0.00148 0.00268	We recommend rechecking the calculations for copper since the mean is greater than the maximum.	PLP specified in RFI 111 that this is an error. The correct max value is 0.026 mg/L. The correct median value is 0.00042 mg/L. Information corrected as appropriate.
EPA	32	Page K3.18-36, Table K3.18-12		We recommend that all tables use the same units of measure (this one uses µg/L while all others use mg/L) and further recommend that the units used be the same as which the WQS are expressed at 18 AAC 70.	Addressed. Units standardized to mg/L across all tables (except where noted) to improve ease of comparison for readers.
EPA	33	Page K3.18-36, Table K3.18-12		See water temperature, alkalinity, nitrate-nitrite, and TSS comments above for Table K3.18-6.	Temperature values compared to criteria and bolded as needed. Alkalinity and TSS addressed in Table K3.18-1 footnotes.
EPA	34	Page K3.18-40, Table K3.18-12		The row for DOC in this Table is all blanks. We recommend that the DEIS clarify whether DOC was supposed to be measured but was not, or correct if this is an error.	DOC data was not collected and not provided by PLP; no indication that it was supposed to be measured but was not. It was a hidden column in the provided excels spreadsheet. DOC row has been removed to avoid confusion.
EPA	35	Section K3.18.4, Page K3.18-45	The following baseline groundwater data tables are provided in this appendix	We recommend providing a map of the sample locations or a reference to where the map can be found, and a description of how the selected locations are considered representative or not representative of the groundwater characteristics of this area.	Reference to documents showing sample locations have been added to text.
EPA	36	Section K3.18.5, Page K3.18-54	The following baseline groundwater data tables are provided in this	Based on our review, it appears that the text here should say sediment rather than groundwater. In addition, we recommend	Addressed; typo corrected. A discussion of sample location selection and representativeness

EPA Comments – Pebble Project Preliminary Draft EIS, Appendix K3.18 - Water and Sediment Quality

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
			appendix	that the DEIS provide a description of how the selected locations are considered representative or not representative of the waterbodies of this area.	has been added to text based on Schlumberger et al. (2011a).