

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
EPA	1	2.0, pg 1	The alternatives development process for the proposed Pebble Project (the project) considers a broad range of alternatives in sufficient detail to address both NEPA and CWA Section 404(b)(1) requirements.	We recommend providing additional explanation regarding the process for evaluating alternatives to comply with the CWA Section 404(b)(1) guidelines. We note that the current alternatives evaluation does not enable comparison of the alternatives for the purpose of compliance with the 404(b)(1) guidelines and to identify the potential least environmentally damaging practicable alternative (LEDPA) for 404 permitting purposes because, for example, there is insufficient information about how all practicable steps have been taken to avoid and minimize aquatic impacts. We understand that the 404(b)(1) guidelines analysis will be included in an appendix, and we request an opportunity to review and provide comments on that appendix prior to release of the Draft EIS.	Appendix B details the alternatives development process to identify a reasonable range of action alternatives for analysis in the EIS. The EIS analyzes each of these action alternatives carried forward, as required by NEPA. In addition to evaluating the Applicant's proposed project under NEPA, USACE will be evaluating the Applicant's permit application pursuant to Section 10 of the Rivers and Harbors Act (RHA) and Section 404 of the Clean Water Act (CWA). The Record of Decision (ROD) will rely on information provided by the Applicant and contained in the EIS, and in addition to the requirements under NEPA, it will include a 404(b)(1) analysis (40 CFR Part 230) and Public Interest Review (33 CFR Part 320). USACE's 404(b)(1) evaluation and Public Interest Review will be completed after the Final EIS.
EPA	2	2.2, pg 2	Alternatives Carried Forward for Detailed Analysis – General comment on identification of preferred alternative	We recommend that the Draft EIS note that the NEPA regulations require that agencies identify the preferred alternative in the DEIS if one exists and disclose whether the action agencies have identified that alternative and if not, why not. The three action alternatives proposed to be carried forward for detailed analysis combine various alternative project elements into three discrete alternative packages, and include variants to those alternatives. We note that this approach can be confusing to agency reviewers and members of the	According to USACE's NEPA implementation procedures, USACE cannot identify an agency-preferred alternative in the EIS. This has been added to Chapter 2-Alternatives. Chapter 2-Alternatives has been revised to better describe each action alternative and the variants analyzed for each action alternative at the beginning of Section 2.2, Alternatives Carried Forward for Detailed Analysis. This section explains that although a variant may be analyzed under a specific action alternative, the USACE's determination of the LEDPA in its final permit decision may include a

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				public, who may not understand that separate elements/variants can also be combined into a new alternative at the Final EIS or Record of Decision. In addition, we note that it can be difficult for decision makers to understand the environmental trade-offs of various elements when packaged in this way. We recommend that the Corps ensure that the Draft EIS clearly explains the process for packaging alternative elements/variants into complete alternatives and for ultimately selecting a preferred alternative, including explaining that the final preferred alternative could include a combination of the alternatives and variants analyzed in the EIS for the different project components. In addition, we recommend that the analysis of environmental consequences clearly analyze each project element separately, rather than summarizing impacts for an alternative as a whole (e.g., analyze the impacts of the downstream TSF compared to the proposed action, separate from consideration of impacts from North Access Road). This information will be critical to decision makers in alternative selection.	combination of components from the various alternatives and variants analyzed in the EIS. Chapter 4-Environmental Consequences sections analyze impacts by project component.
EPA	3	2.2.2, pg 6	“...employ approximately 850 to 2,000 personnel for operations and construction, respectively.”	We recommend clarifying that 2,000 personnel would be employed for 4 years of construction and 850 personnel would be employed for 20 years of operation. In addition, we recommend that the EIS clarify	Through construction the project would employ approximately 2000 people in the peak years of construction. The numbers would be lower for the first year until site works commence. The 850 represents an annual average number. The number

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				whether these numbers are annual or total estimates for each period.	would vary over time as the mining requirements change with in-pit activities. This has been clarified in Chapter 2-Alternatives.
EPA	4	2.2.2, pg 6	<p>“An 84-mile transportation...”</p> <p>“A 29-mile private two-lane...”</p> <p>“A 37-mile private...”</p> <p>“A 187-mile gas pipeline...”</p>	We recommend verifying the miles provided for each of these project components, as what is stated here differs slightly from the miles given in the updated project description on pages 1 and 2.	The dimensions in the EIS are generated from GIS data provided by PLP. The numbers are rounded up/down to the nearest whole number. Minor differences in the road lengths used in the EIS compared to what is presented in PLP's project description are likely a result of rounding.
EPA	5	2.2.2, pg 6, 7, and 12		We note that the tons of material to be mined and placed in the Tailings Storage Facility varies throughout the document and recommend confirming the correct quantity prior to the release of the DEIS.	Chapter 2-Alternatives has been checked for consistency. Pebble Limited Partnership (PLP) notes that while the project description states “storage of up to 50 million tons of PAG in the pyritic TSF,” the pyritic TSF as designed has the capacity to store additional waste if required. The 50 million tons refers to the expected amount of PAG waste and is not a pyritic TSF capacity limit.
EPA	6	2.2.2.1, pg 7	“Fine and coarse-grained soils would be stored southwest of the pit and north of the TSF embankments and would be used for reclamation during mine closure.”	We recommend clarifying how and where these soils/sediments would be stored and managed to ensure they are not mobilized over the 20-year period of the mine life. We also recommend that the EIS clarify whether these storage areas are the same as or different from those labeled as the growth media areas in Fig 2-3.	Soils and overburden would be stored in locations shown in the layouts as overburden stockpiles or growth media stockpiles. This has been clarified in Chapter 2-Alternatives. The stockpiles would have containment berms if needed, and would be shaped and seeded to promote stability and prevent erosion and sediment laden runoff through operations. Storm water from the overburden stockpiles would be managed as required by the State of Alaska.

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
EPA	7	2.2.2.1, pg 7	During this period, 1,300 million tons of mineralized rock and 150 million tons of waste rock and overburden would be mined	We note that the total here is 1.45 billion tons, whereas in other places the total is stated as 1.4 billion tons or 1.3 billion tons. We recommend verifying the correct amount and clarifying where values may be summing a subset of the material.	Chapter 2-Alternatives has been checked for consistency. A table has been added to Appendix K2 summarizing the proposed material to be mined.
EPA	8	2.2.2.1, pg 7	Non-potentially acid-generating (NPAG) waste rock would be used in construction of the tailings embankments.	We recommend that the EIS provide the criteria that will be used to distinguish NPAG and non-metal leaching (ML) waste from PAG and ML waste and discuss how the NPAG/PAG determinations will be made during active mining. These details are typically provided in EISs for mining projects and are necessary to evaluate the effectiveness of the NPAG/PAG separation and potential environmental impacts from tailings and waste management.	Chapter 2-Alternatives has been edited to provided examples of controls that could be used to distinguish NPAG and non-metal leaching (ML) waste from PAG and ML waste (e.g., visual inspection, blast hole sampling, and bench mapping). The selection of controls to be used would be made during detailed mine planning and design.
EPA	9	Fig 2-3		We recommend adding text to the document that explains what quarries are and why they are needed (Quarries A, B, C are shown in Fig 2-3, but are not mentioned anywhere in the text).	A new section has been added in Chapter 2-Alternatives for mine site material sources. It includes information on the three quarries (Quarry A, B and C) that would be developed in the mine project area to source rock for construction, operations and maintenance of mine-site embankments, roads, laydown pads, etc.
EPA	10	Fig 2-4		We recommend improving the digital simulation to better clarify which features are part of the mine vs. which are natural features (e.g., gray shading for lakes and mine components may be confusing to the readers of the EIS).	This schematic has been modified to better clarify which features are part of the mine vs. which are natural features. The scale encompasses all components shown in the mine site layout figure.

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				We also recommend expanding the scale of Fig 2-4 to encompass all components shown in Fig 2-3 (e.g., Quarry B is not included in Fig 2-4).	
EPA	11	2.2.2.1, pg 11	"Material would be stockpiled within the pit footprint, or in designated stockpiles, as appropriate."	We recommend providing additional detail regarding where mineralized material would be stockpiled, as well as showing the locations in Figure 2-3. Figure 2-3 indicates stockpile locations for overburden but does not show mineralized material stockpile locations.	Mineralized material would, if needed prior to completion of construction, be temporarily stored within the open pit footprint before going to the pyritic TSF or mill as appropriate. The location of those stockpiles in the pit would vary over time. This has been clarified in Chapter 2-Alternatives.
EPA	12	2.2.2.1, pg 11	In the grinding plant, it would be reduced to the consistency of very fine sand. The next step is froth flotation, in which the copper and molybdenum minerals are separated from the remaining material to produce concentrates.... See Figure 2-6 showing the process flow diagram.	We recommend that the EIS state here that water and chemicals (reagents) are added during mineral processing and refer to the table that provides the list of reagents that would be used. We recommend expanding Figure 2-6 to show points in the process where water and reagents are added. In addition, this figure shows that some gold will be extracted by gravity separation, but the text never mentions this process, nor does it say how it will be handled. We recommend that the gold extracted in the gravity separation process be accounted for in the description of handling of products leaving the mine site.	Descriptions of water and chemical (reagent) use and gold recovery and shipment have been added to Chapter 2-Alternatives. However, showing locations for reagent addition in the flow sheet would overcomplicate the figure and could be confusing to the layperson reviewing the EIS.
EPA	13	2.2.2.1, pg 11	¹ Bulk tailings are comprised of relatively inert, non-acid-generating fine-grained ground waste rock that remains after economic minerals and pyritic materials have been	We recommend revising the definitions to remove the term "waste rock" so as not to confuse tailings with waste rock that is extracted during mining. For example, the term "waste material" is often used instead of waste rock since tailings also contain process reagents	The footnote has been revised in Chapter 2-Alternatives.

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
			extracted through ore processing at the mine site. See also pyritic tailings. Pyritic tailings are comprised of potentially acid-generating fine-grained ground waste rock containing the naturally occurring mineral pyrite.	and water.	
EPA	14	2.2.2.1, pg 11	The TSFs would be designed to meet or exceed the standards of the updated 2017 Guidelines for Cooperation with the Alaska Dam Safety Program (ADSP) prepared by the Alaska Department of Natural Resources (ADNR).	<p>Further information is necessary to support this statement. We recommend that the DEIS provide a table that lists the ADSP standards that are being referred to in this sentence. For each standard that is applicable to the project, the EIS should provide information specific to the bulk TSF, pyritic TSF, and water management pond designs and operations that clearly demonstrate that they meet or exceed the state ADSP standards.</p> <p>In addition, given the size of the dams and importance of downstream aquatic resources, and for the bulk TSF, centerline dam construction methodology (which is not as stable as downstream construction), we recommend that: (1) a Failure Modes Effect Analysis (FMEA) or other type of formal risk assessment be conducted for the dam designs; and (2) the Corps require that the tailings dam designs be independently reviewed per 33 CFR 325.1. FMEA/risk assessment and independent review are</p>	<p>It is important to note that the ADSP document is a guideline, not a standard or regulation or requirement. ADSP's governance is a dam safety statute (Alaska Statute (AS) 46.17), and regulation (Article 3, 11 Alaska Administrative Code (AAC) 93). The ADSP guideline also provides a choice of recognized standards and procedures for use in embankment design. The guidelines lay out the process, qualifications, level of detail for study, modeling, and design, and expectations for permitting dams vs. being a list of standards. Therefore, there are no ADSP standards to list. However, general design criteria from page 38 of PLP's December 2018 updated project description (PLP 2018d) has been added to Chapter 2- Alternatives to address the need for additional high level detail on design requirements.</p> <p>It is misleading to say that centerline construction is not as stable as downstream construction. Vick (1990) states "the centerline raise method is a compromise between the upstream and</p>

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				<p>recommended best practices from both the Independent Expert Engineering investigation and Review Panel Report on Mount Polley Tailings Storage Facility Breach (2014) and the International Council on Mining and Metals Review of Tailings Management Guidelines and Recommendations for Improvement (Golder 2016) for evaluating safety and stability of tailings dams. Mitigation measures arising out of the risk assessment and independent reviews should be identified and required of the final designs and operating plans. We recommend that the FMEA/risk assessment and independent review occur now so that the results can be disclosed in the DEIS to support the Corps' hard look, as required by NEPA, at tailings dam stability and safety.</p>	<p>downstream methods in many aspects. As a result, it shares to a degree the respective advantages of the two methods while mitigating their disadvantages." EPA (1994) rephrases this and adds the following caution on downstream construction: "A major disadvantage of this method is the large volume of fill material required to raise the dam." Information provided by PLP confirms that centerline construction provides a similar factor of safety as downstream and reduces the TSF footprint. All Pebble dams would need to be designed, constructed and operated to at least the current state-of- practice as outlined in the ADSP guidelines, which also refer to national guidelines.</p> <p>An EIS-Phase FMEA workshop was held on Oct. 24 and 25, 2018 in accordance with risk assessment criteria. Reasonable embankment failure scenarios were developed. Associated volumes of release were then modeled and analyzed for impacts in the EIS. These are reported under separate covers.</p> <p>The current embankment designs are conceptual-level and have been third-party reviewed by Subject Matter Experts (SMEs) as part of the NEPA phase FMEA and EIS processes. Findings of these processes will be in the EIS and need to be considered in preliminary and detailed designs. Such reviews and subsequent mitigations have been conducted on TSF embankments in Alaska for decades before the cited 2015 (not 2014) and 2016</p>

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
					documents were written. During detailed design and as the project proceeds through the ADSP permit process, PLP has stated that it will engage an independent review panel. Additionally, the State of Alaska is certain to continue its practice of using independent SMEs to review the preliminary and detail designs, and to require continuance of the independent review panel during the construction of the embankment raises and operations of the TSFs.
EPA	15	2.2.2.1, pg 14	The main embankment of the bulk TSF would function as a permeable structure to maintain a depressed zone of saturation in the embankment, and tailings mass in proximity to the embankment.	We recommend that the EIS describe how the main embankment would be designed, constructed, and operated to maintain both permeability and stability. We also recommend that the document discuss whether 100% of the water flowing through the embankment would be captured and how it would be captured.	Chapter 2-Alternatives has been modified to describe how the main embankment would be designed, constructed, and operated to maintain both permeability and stability, with the intent of capturing 100% of the water flowing through the embankment. Additional discussion of effects and uncertainties around the effectiveness of the design are included in Chapter 4, Sections 4.17-Groundwater Hydrology and 4.18-Water and Sediment Quality.
EPA	16	2.2.2.1, pg 14	A basin underdrain system would be constructed at various locations throughout the bulk TSF basin to provide preferred drainage paths for seepage flows.	We recommend describing whether the underdrain system would be designed to capture 100% of the TSF seepage. We also recommend providing a figure that shows the number of underdrains and alignment of the underdrain system below the TSF. These details are necessary to evaluate effectiveness of the system and potential groundwater impacts.	This follows the response to Comment #15 above. Additional information is in PLP's December 2018 updated project description (PLP 2018d). The underdrains need to be sized and designed to capture 100% of TSF seepage. But the underdrain configurations, numbers and alignments cannot be provided now because they would be developed during preliminary and detailed designs, per ADSP guidelines, after the completion of more

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
					detailed geotechnical and geological investigations, and Quarry A observations, as suggested in the response to Comment #9.
EPA	17	2.2.2.1, pg 14	The pyritic TSF would be a fully lined facility.	We recommend that the EIS describe the type of liner that would be used (material and thickness) as well as the construction and waste rock and tailings placement techniques that would occur to ensure liner integrity.	<p>The EIS cannot describe the type, thickness and surfaces of the liner to be used because it is too early in the project for PLP to have made these decisions. It is important to understand that the “liner” is not just the barrier part of the “liner system.” Chapter 2-Alternatives has been modified to describe how a liner system consists of three parts: bedding material, barrier (e.g., geomembrane), and cover material. The barrier part of the pyritic TSF liner system would be a geomembrane. The geomembrane type (HDPE, LDPE, LLDPE, PVC, Hypalon, etc.), thickness (60 mil, 80 mil, etc.), surfaces (smooth vs. textured), and bedding and cover materials have been discussed at conceptual levels, but selections would be made during the preliminary and detailed designs per the ADSP guidelines and in accordance with the latest published data on geomembrane longevity in cold and wet climates, and specific data on the chemical compatibility of the different geomembrane types with the pyritic tailings and PAG waste rock.</p> <p>Placement of the waste rock on the geomembrane would be done in a similar way as used in placing ore onto heap leach pads that are widely used in the mining industry, and in placing protective rock over geomembranes worldwide in</p>

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
					<p>landfills and TSFs. Placement specifics and criteria would be in the installation specifications, CQA/QC manual, and Operations and Maintenance (O&M) manual per the ADSP guidelines. Placement specifics and criteria for future embankment raises would also be modified, if necessary, based on lessons learned from experience gained on previous raises.</p> <p>A current generic plan is when the geomembrane has been placed and welded, it would be covered with a layer of crushed material, specified to ensure the particles would not penetrate the geomembrane. The layer would be of adequate thickness so that equipment used to place it did not damage the geomembrane. Another layer could then be placed over the first layer if further protection from run-of-mine waste rock is needed. Specifics and criteria for future ongoing placement would be modified, as needed, based on lessons learned from past and ongoing operations experience.</p>
EPA	18	2.2.2.1, pg 18	The south Bulk TSF embankment would be constructed using the downstream construction method to facilitate lining of the upstream face	We recommend clarifying why this particular embankment would be lined and the others in the same TSF would not be.	This follows the response to Comment #15 above. Chapter 2-Alternatives has been modified to describe why the bulk TSF south embankment would be lined while the bulk TSF main embankment would not be lined. An objective of the bulk TSF is to operate the bulk TSF and main embankment as a flow-through facility for seepage control, and therefore to line the south embankment to minimize water seepage through the south embankment. Hence the TSF basin and

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
					main embankment would not be lined, while the south embankment would be lined.
EPA	19	2.2.2.1, pg 18	The embankments would be constructed using select borrow materials, and include a liner bedding layer, overlain by a liner, on the upstream slope and over the entire internal basin	We recommend that the EIS clarify whether the pyritic TSF will have a drainage system under the liner.	Chapter 2-Alternatives has been modified to describe that the pyritic TSF will have a drainage system under the liner system. The drainage system would consist of underdrains to collect seepage or flow under the liner system. The underdrains would need to be sized and designed to capture 100% of TSF seepage. But the underdrain configurations, numbers and alignments cannot be provided in the EIS, because they would be developed during preliminary and detailed designs per ADSP guidelines and following additional geotechnical and geological investigations that would be completed in the pyritic TSF site area.
EPA	20	2.2.2.1, pg 18	TSF embankments would be constructed in stages throughout the life of the project, with each stage providing the required capacity until the next stage is completed.	We recommend adding a table or figure that provides the rate of rise for the TSF dams.	A table or figure showing the rate of rise is not available and too premature to be included in the EIS. At best it would very approximate at this time because it would need to be resolved during the preliminary and detailed designs, and mine plan-of-operations development with flexibility for modifications during initial and ongoing TSF operations. PLP currently estimates that TSF embankment raises would need to be completed on an annual or bi-annual basis. The schedule would need to consider construction logistics and planning with other embankment raises, other mine use of construction equipment, and seasonal and climate considerations. PLP showed a concept-level graphic in the EIS-Phase FMEA workshop for the

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
					2012 main embankment design including the raise heights, but could not commit to its accuracy for the current design, and could not comment about the rates of rise for the centerline raises.
EPA	21	2.2.2.1, pg 18	It would be a fully lined facility and would be constructed using quarried rockfill materials. The embankment would be approximately	We recommend disclosing the type of liner that would be used under the water management pond.	<p>As discussed in the response to Comment #15 above, the EIS cannot describe the type, thickness and surfaces of the liner to be used because it is too early in the project for PLP to have made these decisions.</p> <p>The barrier part of the main WMP embankment and basin liner system is currently planned to be a geomembrane. However, the geomembrane type (HDPE, LDPE, LLDPE, PVC, Hypalon, etc.), thickness (60 mil, 80 mil, etc.), surfaces (smooth vs. texture), exposure (alternately inundated vs. not inundated), and bedding and cover materials have been discussed at conceptual levels, but selections would need to be made during the preliminary and detailed designs per ADSP guidelines, and in accordance with the latest published data on geomembrane longevity in cold and wet climates, and specific data on the chemical compatibility of the different geomembrane types with the water to be stored.</p> <p>The final design will also have filter zones in the embankment to prevent internal erosion of the embankments as outlined in the RFI 101 response.</p>
EPA	22	2.2.2.1, pg 11-18	General comment on description of tailings management and TSFs	The discussion on tailings management is missing several key elements, which we recommend be	Chapter 2-Alternatives has been modified to outline some key elements of the TSF management, including the

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				added to the description, including: (1) how dust and erosion of the TSF buttresses and beaches will be managed and mitigated; (2) the stability, seepage, and environmental monitoring that would occur to determine whether the dams are performing as designed, and actions that would be taken if they are not; and (3) the emergency action plans that would be developed and how notification would occur in the event of an emergency.	<p>embankments. However, specific details would be developed through the embankment preliminary and detailed design and construction preparation processes, and State permit process, specifically the ADNR Dam Safety permit process and ADEC Integrated Waste Management Plan approval.</p> <p>Embankments would be constructed of NPAG and non-ML rock. Therefore, runoff from the embankments would not need to be captured by the SCPs and could be managed as storm water. Any runoff that would enter the SCPs would become contact water and would need to be handled as such.</p> <p>Tailings would be discharged from spigot points along the TSF embankments and around parts of the TSF perimeters. Discharge points would be progressively moved from one spigot to the next to maintain a wetted surface and thereby reduce the potential for dust generation.</p> <p>Monitoring requirements and procedures will be described in an O&M manual. Emergency action plans will be described in an Emergency Action Plan (EAP). The O&M manual and EAP would be submitted to ADNR for issuance of TSF operations permits. A construction completion report and revised O&M manual and EAP would be provided to ADNR after each starter dam and raise would be completed for issuance of TSF operations permits.</p> <p>Seepage out of the TSFs would be monitored using piezometers that would</p>

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
					<p>be installed within the embankments and between the embankment and SCPs, and by monitoring wells located down-gradient of the SCPs. The piezometers would be used to monitor that the water levels within the embankments are below the levels needed to maintain embankment safety and integrity. The maximum allowed water levels (threshold levels) would be revised for each O&M manual update, and in accordance with the required factors of safety based on updated stability analyses.</p> <p>If a process water or contact water signature is detected in the monitoring wells, the pump back wells located below the SCP would be activated and the seepage would be pumped back to the appropriate SCP or main WMP.</p> <p>Stability monitoring would be performed by using data that would be obtained from instrumentation that would be strategically installed in the embankments, standard survey control points, three-dimensional LIDAR mapping, and similar techniques. Any slumping that may be detected would be mitigated by placing buttress material as needed. Any other unusual occurrences such as cracks, sinkholes, new vegetation, wet areas, etc., would be investigated and mitigated as necessary.</p> <p>EAPs would be prepared for all site embankments in accordance with ADSP guidelines with the objectives of:</p> <p>Protecting lives, property and environment if an emergency condition develops at an</p>

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
					<p>embankment</p> <p>Preparing mine owner, operator, and emergency management personnel for the emergency event, in advance</p> <p>Detailing the actions and measures to be taken by all parties responsible for responding to an emergency</p> <p>Facilitating the coordination and cooperation of the various emergency responders</p> <p>Notifications would utilize techniques such as:</p> <p>Sirens to warn site personnel and any recreation users that may be in the immediate area</p> <p>Telephone communications to appropriate authorities in potentially affected communities identified in the EAP</p> <p>Public service bulletins via radio or other means for more distal communities</p> <p>Helicopters to fly over and along the downstream reaches of the rivers</p> <p>Further details would be developed through the preliminary and detailed design and State permit processes, specifically the ADNR Dam Safety permit process and ADEC Integrated Waste Management Plan approval.</p>
EPA	23	2.2.2.1, pg 21	Table 2-2. Grinding Media, Reagents, and Miscellaneous Supplies	We recommend providing, in Table 2-2, the annual quantity of each of the mineral processing reagents that appear in Table 2-1 (e.g., as was done in for fuel and ammonium nitrate). We also note that “Grinding Media” does not appear in Table 2-1 and	These tables were combined and moved to Appendix K2. Estimates of annual quantities are included.

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				recommend that these materials be listed in both tables. In addition, please provide the estimated quantities of chemicals that would be used in the water treatment plants.	
EPA	24	2.2.2.1, pg 21		In the section for material management and supply, lubricants and diesel fuel are discussed as being stored in secondary containment. We recommend that the document also discuss that multiple chemicals to be used (at the main mine site for water treatment plants and processing and for the port WTP) also require secondary containment (and some will require freeze protection). It will be important for agency decision makers and the public to understand all of the specific chemicals that will be stored using secondary containment.	Chapter 2-Alternatives has been modified to clarify that secondary containment and heated storage would be provided for process and other reagents as appropriate. Secondary containment is further discussed in Section 4.27, Spill Risks. The supply chain would operate on a year-round basis. Therefore, the storage of large volumes of reagents for the winter season would not be required, unlike for the existing Red Dog Mine or the proposed Donlin Gold Mine.
EPA	25	2.2.2.1, pg 21	The project would develop a comprehensive water management plan that strategically discharges surplus treated water to downgradient streams in a manner that reduces the effect of stream flow fluctuations and minimizes impacts to fish habitat.	We recommend that the water management plan referred to in the text be included in the DEIS, and that Cooperating Agencies have an opportunity to review this plan prior to public release of the DEIS, to allow for evaluation of the effectiveness of the stream flow reduction and fish habitat impact minimization measures. Understanding the effectiveness of these measures is a key factor in evaluating impacts to groundwater, surface water, and aquatic resources. In addition, we recommend that the goal of water management be to	PLP has developed mine site management plans for operations (Knight Piésold 2018a) and closure (Knight Piésold 2018d) to support the NEPA analysis. These plans are available on the project website and are now cited in Chapter 2. The goal of the water management would be to manage discharges to minimize impacts to water flow and quality, as well as to minimize and mitigate impacts to fish habitat.

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				manage discharges to match the natural flow regime as much as possible, in addition to reducing the effect of stream flow fluctuations.	
EPA	26	2.2.2.1, pg 22	Prior to the operations WTPs being brought on-line, modular WTPs would be used to treat contact water that does not meet discharge requirements.	We recommend describing the water treatment processes that would be used prior to the operations plants being brought on-line, similar to the information disclosed regarding the operations water treatment plants.	Chapter 2-Alternatives has been modified to clarify modular construction WTPs would be operational at the mine site prior to the start of earthworks and would remain operational until the open pit and operations WTPs (WTP#1 and WTP#2) are commissioned. If required, it is anticipated that the treatment would need to address pH and elevated levels of dissolved metals. Treatment would utilize a high-density sludge (HDS) process with additional polishing steps if required. Treated water from the construction WTP would be discharged to the NFK drainage. Additional detail would be developed through the preliminary and detailed designs per the ADSP guidelines and in support of the State permitting requirements.
EPA	27	2.2.2.1, pg 23	Production Phase Water Treatment	We recommend providing the following additional information in order to evaluate the effectiveness of water treatment and discharge: design capacity of the mine area WTPs in comparison to expected and reasonable worst-case flows; additional detail regarding the “multiple independent treatment trains”; discharge (outfall) locations for each of the WTPs; and as mentioned in previous comments,	The Water Management section of Chapter 2-Alternatives has been modified to summarize the WTP operations during mine operations. Reference is made to the Operations Water Management Plan (Knight Piesold 2018a) and to RFI 106 response that includes an Operations Phase Water Treatment Plant Engineering memo (HDR 2019). Section 4.18, Water and Sediment Quality, and Appendix K4.18 provide discussion of the planned water treatment process, including design capacity, scalability of

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				more information on the discharge timing (seasonal or year-around; specifically, how flows will be distributed among the outfalls).	multiple treatment trains, outfall locations, and discharge strategy.
EPA	28	2.2.2.1, pg 23	The pyritic TSF and associated seepage collection ponds would be reclaimed, and surface water runoff from the area discharged to the downstream environment. The main WMP would be reclaimed, and surface water runoff from the area discharged to the downstream environment.	We recommend that the following be added to these two requirements: “once the runoff has been demonstrated to meet water quality criteria.” A similar statement is found on the next page as a requirement prior to discharge from the reclaimed bulk TSF	Edit made to Chapter 2-Alternatives as suggested.
EPA	29	2.2.2.1, pg 24		There is no discussion of waste tire disposal during operations, which are notably mentioned on page 2-2 (2-19) as a primary material. We suggest that the discussion in the Updated Project Plan be added here as well for clarity. The Updated Project Description discusses used or damaged parts (Section 3.7 on PDF page 52) as “Used tires and rubber products will be reused to the extent practicable. Additional used tires, along with other damaged parts and worn pipes, will be packaged and back-loaded into empty containers for shipment and disposal off site.”	The discussion of waste tire disposal from PLP’s December 2018 updated project description has been added to Chapter 2-Alternatives as suggested.
EPA	30	2.2.2.1, pg 24	Closure/Post-Closure Phase Water Management Plan	We recommend providing the following additional information related to closure/post-closure water treatment:	The Water Management section of Chapter 2-Alternatives has been modified to summarize the WTP operations during

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				Describe the type of water treatment that would occur at closure, as was done for the operations Water Treatment Plants; Closure WTP design capacity in comparison to predicted flows; Estimated quantities of WTP chemicals needed during closure; Discuss where WTP sludge would be disposed and estimated sludge quantities produced annually; and Describe closure WTP outfall location(s) and whether discharges would occur year-around, seasonally, or otherwise be timed.	closure and post-closure, including addressing the planned water treatment process, including design capacity, sludge disposal and outfall locations. Reference is made to the Closure Water Management Plan (Knight Piesold 2018a) and to the response to RFI 106 that includes a Mine Closure Water Treatment Plant Engineering memo (HDR 2019). WTP#2, and WTP#3/SCP WTP would be operated in coordination with the storage volumes in the Open Pit and SCP. Chemical quantities would be estimated during the preliminary and detailed mine designs, and finalized during final closure designs.
EPA	31	2.2.2.1, pg 24	"Water quality would be closely monitored, and changes and adjustments to the treatment process would be made as needed."	We recommend expanding on this point to explain how water quality will be monitored (how often, by whom) and how adjustments will be made.	The WTP would be constructed with instrumentation to monitor parameters of the influent and effluent water. In addition, the effluent would be sampled at regular intervals. WTP operators would evaluate these data and adjustments would be made to ensure that water discharge criteria stipulated in State permits are met. Specific details on compliance monitoring and a detailed monitoring plan would be developed during the State permitting process. This has been clarified in Chapter 2-Alternatives.
EPA	32	2.2.2.1, pg 21-23	General comment on water management description	We recommend providing the following additional information related to water management: Surface water diversions are cited as key BMPs to minimize contact water. Provide figures that show where the surface water diversions will be	Water diversion information is provided in Chapter 2 for operations and closure and is based on water diversion alignments described in the Operations Water Management Plan (Knight Piesold 2018a) and Closure Water Management Plan (Knight Piesold 2018b). Detailed

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				<p>located in relation to the mine site layout during construction, operations, and closure.</p> <p>Describe the location of each treated water APDES outfall and describe the outfall structure/diffuser.</p> <p>WTP sludges and residuals will be disposed in the pyritic tailings TSF. Discuss how much WTP sludge will be generated and how it will be disposed.</p>	<p>information on construction storm water management would be developed during the preliminary and detailed designs per the ADSP guidelines.</p> <p>Locations of each treated water APDES outfall are provided in the water management plan, HDR (August 17, 2018) report, R2 Resource Consultants (September 5, 2018) report, and Project Description (December 2018). The outfall concepts are described in the Knight Piesold (September 28, 2018) report, and will be finalized during the preliminary and final designs. In the Draft EIS, WTP discharge locations are depicted in Chapter 2, Alternatives, Figure 2-3; Section 4.16, Surface Water Quality, Figure 4.16-1; and Section 4.18, Water and Sediment Quality, Figure 4.18-1.</p> <p>Specific water treatment processes, including reject/sludge generation are discussed in Appendix K4.18. Sludge would be transferred to the pyritic TSF during operations, and ultimately placed in the open pit for subaqueous disposal during closure.</p>
EPA	33	2.2.2.1, pg 25	“Inert mine site materials, such as geomembrane material, piping, and pumps, would be drained and cleaned, as appropriate, and placed into a facility that would be permitted within the submerged waste rock dump in the pit or within the footprint of the reclaimed	In Section 6.1 (PDF page 77-78) of the Updated Project Description, there is discussion of disposal of inert materials from dismantling and removal of site mine features during physical reclamation being “disposed of in an on-site monofill that will be sited within the disturbed footprint, while others will be shipped off site for disposal as appropriate.”	Chapter 2-Alternatives has been updated to clarify the disposal plan for closure. At closure, inert mine site materials, such as geomembrane material, piping, and pumps, would be drained and cleaned, as appropriate, and either: 1) placed into the open pit with the PAG waste rock; or 2) disposed of in an on-site monofill that would be sited in the disturbed footprint of the mine site. Material that has residual value or is not suitable for on-site disposal

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
			pyritic tailings facility.” “Material that has residual value or is not suitable for onsite disposal would be hauled offsite for disposal (PLP 2018-RFI 055a).”	The Updated Project Description does not mention any disposal of these types of waste materials into the pit, but it is presented in RFI 055a. The RFI is dated prior to the Updated Project Description file. We suggest clarifying what materials would be disposed of in the pit at closure that could influence how the water is treated prior to release after closure.	would be hauled off site for disposal (PLP 2018-RFI 055a).
EPA	34	2.2.2.1, pg 25	Reclamation and closure of the project falls under the jurisdiction of the ADNR Division of Mining, Land, and Water, and the Alaska Department of Environmental Conservation.	The list of permits and approvals in Appendix N (Table 7-1) does not appear to include reclamation and closure. We recommend that the required permits and approvals for reclamation and closure be added to the table.	PLP’s December 2018 updated project description has the reclamation and closure components in Table 7-1. This updated project description will be included as Appendix N of the EIS.
EPA	35	Figure 2-10 and Figure 2-11	“habitat conditioning”	This term is not defined or explained in the text. We recommend that the EIS describe what it involves.	Habitat conditioning means the adjustment of a parameter such as temperature and dissolved oxygen if required. This has been defined in the WTP process schematic figures.
EPA	36	Figure 2-11	“Waste sludge to tailings storage facility”	We recommend clarifying whether this is the pyritic TSF or the bulk TSF.	The revised figure clarifies that waste sludge will be disposed in the pyritic TSF.
EPA	37	Figure 2-11		We recommend that it would be helpful to the reader if the line between the RO unit and the biological reactor was red instead of blue, to indicate that it is the RO reject being treated. We note that this is not described in the text of the chapter (but is in the Updated Project Description).	This figure (Draft EIS Figure 2-12) has been revised as suggested.

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
EPA	38	Figures 2-10 and 2-11		We recommend explaining in the EIS why the rejects from the RO are being treated differently at the two treatment plants, and how reject will be treated at the port.	Chapter 2-Alternatives has been modified to describe that the rejects from the open-pit WTP and the main WTP would be treated differently because the water quality going to the WTPs would be different so that different water treatments would be required. The port WTP is discussed under the subsection for the port. Reject and/or WTP solids from the port site would either be trucked to the mine site for disposal in the pyritic TSF or shipped offsite to a disposal facility. See RFI-087. This has been clarified in Chapter 2-Alternatives.
EPA	39	Pg 28	“Once the level of the pit lake has risen to about 890 feet in elevation, water would be pumped from the pit, treated as required, and discharged to the environment.”	We recommend that the EIS discuss the treatment steps for this process. We also recommend including a discussion of how the pit water would be managed to minimize its anticipated acidity and metal/metalloid load, which would minimize long-term treatment requirements.	Pit water would be managed to promote stratification to minimize long term water treatment requirements. RFI-021c addresses pit lake water quality. Water treatment processes are discussed in Appendix K4.18.
EPA	40	2.2.2.1, pg 25-28	General comment on mine site reclamation and closure	We recommend that the following additional information be provided. This information is typically included in mining EISs since reclamation and closure activities should be described in a sufficient level of detail to predict long-term environmental impacts: As discussed above, provide more details on closure water treatment (WTP process flowsheet, estimated design flow, discharge outfall location and discharge timing, WTP sludge management);	1) Details on WTP process flowsheets, estimated design flows, discharge outfall locations, discharge timing, and sludge management are provided in the Operations Water Management Plan (Knight Piesold 2018a) and the RFI-106 response that includes an Operations Phase Water Treatment Plant Engineering memo (HDR 2019). 2) The closure plan would be developed to meet or exceed the requirements of 11 AAC 97. The objectives of the plan would be to:

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				<p>List reclamation standards and objectives and describe the monitoring that would occur to demonstrate that objectives are met;</p> <p>Provide a reclamation schedule that describes when key reclamation actions would occur (e.g., timing for physical reclamation, tailings consolidation, pit filling, and discharge, etc.); and</p> <p>Most jurisdictions require a temporary closure plan that describe actions that would occur in the event the mine ceases operations prior to completion of mining. A temporary closure plan should be provided that describes how mine facilities would be closed in the event of pre-mature or temporary closure. This is particularly relevant for the TSFs, open pit, and for water management.</p>	<p>Provide for long term public safety at the mine site.</p> <p>Address post closure land use and development objectives established in consultation with landowners and residents.</p> <p>Stabilize and protect surficial soil materials from water and wind erosion.</p> <p>Stabilize steep slopes to provide rounded landforms and suitable seedbeds.</p> <p>Establish a productive vegetative community that addresses post mining land use and visual resources.</p> <p>Manage water to reduce contact with the disturbed areas and effectively manage and treat pit lake water.</p> <p>Minimize post closure impacts to downstream flows and habitat.</p> <p>Monitoring of the mine site would continue through the physical closure and on into the post-closure period. This would include monitoring the reestablishment of vegetation in reclaimed areas, stability of any remaining embankments, and site-wide ground and surface water quality.</p> <p>Further detail would be developed in support of State permitting and the Reclamation Plan Approval requirements.</p> <p>3) A reclamation schedule that describes when key reclamation actions would occur (e.g., timing for physical reclamation, tailings consolidation, pit filling, and discharge, etc.) is provided in the Closure Water Management Plan (Knight Piesold, 2018a). Appendix K2 presents a summary</p>

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
					<p>and schedule of the four project phases used to describe the project and assess impacts throughout the EIS (e.g., construction, operations, closure, and post-closure).</p> <p>4) In the event of temporary closure, the open pit, mill, TSFs, and other production-related facilities would be placed in care and maintenance. Water treatment and storm water management activities would continue through the temporary closure. Care and maintenance staff would continue all required monitoring and reporting activities. In the event of full premature closure, the basic steps would be the same as those outlined for the ultimate closure as detailed in the Closure Water Management Plan. Modifications might be required to address the process requirements for the long term water treatment from the pit. The pit lake would be maintained below the control level, but stratification would be dependent on the pit depth. Management of the surface runoff from the bulk TSF would be dependent on the elevation of the tailings surface. However, these should not significantly impact the long term closure plan.</p> <p>A temporary closure plan would be required as part of the preliminary and detailed design per ADSP guidelines. All design, construction and operations activities would need to be integrated with the closure requirements. Further detail would need to be developed in support of State permitting and the Reclamation Plan</p>

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
					Approval requirements, and Closure Cost Estimate and bonding requirements.
EPA	41	2.2.2.1, pg 29	Financial Assurance	As discussed in our scoping comments, we recommend that the DEIS disclose the estimated financial assurance amount. This information is necessary to assess the effectiveness of reclamation and closure activities, which is critical to the assessment of environmental consequences of the project at and beyond closure.	Chapter 2-Alternatives does not disclose the estimated financial assurance amount. The estimated financial assurance amount will be developed in support of State permitting and the Reclamation Plan Approval and Closure Cost Estimate and bonding. The effectiveness of the mine plan is not defined by how much it costs but by how the issues are understood and addressed. The estimated financial assurance amount is a function of the plan, the plan is not a function of the cost estimate.
EPA	42	2.2.2.2, pg 29	“...whether the streams are fish-bearing....88 culverts; of these, 35 are designated as fish passage culverts.”	We recommend that the EIS clarify whether this means any fish, or anadromous fish specifically, and provide data to support this statement. We note that only 35 of 88 crossed streams having fish seems very low.	This section in Chapter 2 has been revised to focus on what the applicant is proposing for crossing structures only. Information on waterbodies and fish presence is detailed in other sections of the EIS.
EPA	43	2.2.2.1	General comment on description of Alternative 1 - quarries	The description of the mine site does not discuss the quarries. We recommend that this information be added to section 2.2.2.1, similar to what was included for the material sites along the transportation corridor. Please provide the estimated size of the quarries (acres and depth), the amount of material that would be mined, testing that would occur, location of where the material will be placed, and how the quarries would be closed.	A new section has been added to Chapter 2-Alternatives with information on mine site material sources. Preliminary testing of quarried material with 6 boreholes was completed in 2018 and confirmed suitability of the material. As the material is quarried, its suitability would be confirmed by visual inspection, bench mapping, and blast hole testing. Quarry closure would have the same objectives and meet the requirements outlined in the response to EPA Comment 40 above. Detailed reclamation plans would be

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
					developed as part of State permitting.
EPA	44	2.2.2.2, pg 38	Culverts at streams with fish would be designed and sized for fish passage in accordance with ADOT&PF and Alaska Department of Fish and Game (ADF&G) standards.	We recommend that the EIS include a discussion or table that lists the specific standards referred to in this sentence.	These are typical standards that are widely available. This detail is not necessary to disclose the reasonably foreseeable significant impacts of the proposed project. Additionally, the requested information would not be essential to make a reasoned choice among alternatives. It has not been included in the Draft EIS.
EPA	45	2.2.2.2	A custom-designed ferry would transit Iliamna Lake between the north and south ferry terminals, carrying inbound supplies from Amakdedori port to the mine site, and returning with copper-gold and molybdenum concentrates, backhauled waste, and empty shipping containers.	We recommend that the document describe the method of personnel transport to and from the site.	A discussion of personnel transport, as described in RFI 027, has been added to Chapter 2-Alternatives.
EPA	46	2.2.2.2, pg 38	Bilge water would be pumped through oil/water separation equipment installed on the vessel, and then discharged back to Iliamna Lake.	The ferry would require coverage under EPA's Vessel General Permit for discharges such as bilge water. Please see https://www.epa.gov/npdes/vessels-vgp for the current requirements for various sized vessels.	This has been added to Appendix E – Laws, Permits, Approvals, and Consultations Required.
EPA	47	Table 2-3, pg 46		We recommend clarifying whether material usage for the Kokhanok spur road is included in the material site quantities estimates for the port access road or provide a separate listing in the table as was done for the	Appendix K2 provides detailed information on material sites for each alternative. A separate table is included for the Kokhanok East Ferry Terminal Variant.

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				Iliamna spur road.	
EPA	48		All material site tables	We recommend adding supporting information that discusses the methodology for choosing the sites for material source, including: location within the landscape, type and amount of wetland impacts, and individual location analysis for avoidance and minimization of impacts.	Material source sites were located as follows: 1) Minimize placement of material sites in WOUS, including wetlands. 2) Avoid sites of known environmental or cultural significance. 3) To optimize haul distances to locations where they would be utilized along the road corridor. 4) Suitability of the material for the required purpose – rock, gravel, etc. This information was added to Chapter 2-Alternatives.
EPA	49	2.2.2.2, pg 47	Water Extraction Sites section	We recommend that the document include information on where the water extraction sites are located (e.g., show on maps as done with material sites, or list drainages/specific water bodies in table).	Appendix K2 provides detailed information and figures showing water extraction sites for each alternative.
EPA	50		All water extraction tables	We recommend adding supporting information that discusses how the water withdrawals would impact downstream receiving water quality and quantity, if any impacts are anticipated, and discusses the identification process used to avoid and minimize water quality and quantity issues resulting from the withdrawals.	This comment appears to be specific to Chapter 4-Environmental Consequences) physical science sections. Physical science impacts are discussed in Chapter 4 physical science sections. All water withdrawals would be done in compliance with ROW lease, water use authorization, and Title 16 fish habitat permit requirements that specifically address requirements to avoid and minimize impacts to water quality, quantity, and fish habitat.
EPA	51	2.2.2.2, pg 48	“These camps would remain in place until the natural gas	We recommend that the EIS include an estimate for how long these camps	The camps would remain in place to support construction as outlined in the

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
			line construction is complete.”	would be in place, and the number of people they would be supporting.	construction schedule (RFI 037). This has been clarified in Chapter 2-Alternatives. Camp size details would be developed during preliminary and detail design and in support of State permit requirements.
EPA	52	2.2.2.3, pg 58	“Copper-gold concentrate would be transported from the mine site to Amakdedori port by truck...”	We recommend clarifying that ferry transport will also be needed to get concentrate to the port.	This has been clarified in Chapter 2-Alternatives as recommended.
EPA	53	2.2.2.3, pg 58	The empty containers would be cleaned of any residue on the outside while at the port, and then returned to the laydown pad	We recommend clarifying how this will be accomplished and if there is potential for contaminated wash water to be discharged.	The containers would be washed inside a closed building. The wash water would be recycled or, when needed, treated and released. There would be no direct discharge of wash water. Solids collected during the washing process would be returned to the mine site for disposal in the pyritic TSF. This has been clarified in Chapter 2-Alternatives.
EPA	54	2.2.2.3, pg 60	Port WTP	We recommend describing the WTP design capacity as compared to expected flows and describe the location of the WTP discharge outfall.	The current estimate for the capacity of the Amakdedori Port WTP is 100 gpm. The WTP capacity would be finalized during the preliminary detailed designs and in support of State permitting. Treated water would be released from a discharge point located at the end of the dock facility (RFI 087). This information has been added to Chapter 2.
EPA	55	2.2.2.3, pg 60	The treated water would be suitable for discharge.	Please clarify that any discharge needs to be authorized by an APDES permit.	Chapter 2-Alternatives has been edited to clarify that any discharge needs to be authorized by an APDES permit.
EPA	56	2.2.2.4, pg 60	<u>Natural Gas Pipeline</u>	We recommend clarifying whether the pipeline will be a common carrier and whether the four nearby villages have the ability to transport gas for their own	As required for the granting of both a State and Federal ROW, the pipeline would be open access, more specifically a contract carrier. PLP has committed to providing community access to the gas

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				use through the line.	line. This has been clarified in Chapter 2-Alternatives.
EPA	57	2.2.2.4, pg 60	Natural gas pipeline description	The description says the pipeline will be laid on the seafloor crossing the Inlet but also states that the pipeline crossing Iliamna Lake will be buried similar to Cook Inlet Crossing. Please provide clarification and additional detail regarding the method of pipeline installation for crossing of Cook Inlet and Iliamna Lake.	The pipeline would either be partially trenched, trenched, or placed on the surface and protected by alternate means depending on conditions such as water depth and sea/lake bed. This has been clarified in Chapter 2-Alternatives. Additional details will be available in support of ROW and CWA Section 404 permitting following the completion of marine surveys in 2019.
EPA	58	2.2.2.4, pg 60	The pipeline would come ashore at Amakdedori port,	We recommend clarifying whether horizontal directional drilling would be utilized for the pipeline to come onshore at the port. If HDD would not be used, we recommend discussing how it will be ensured that the pipeline would not be a navigational hazard to vessels using the port.	Chapter 2-Alternatives has been edited to specify that HDD or trenching would be used where the pipeline comes ashore at the port. PLP would determine if the port shore approach uses HDD or trenching following further field work in 2019. The pipeline would not be laid on the surface in shallow water where it would present a navigation hazard.
EPA	59		General comment on description of Alternative 1 - monitoring	The description of Alternative 1 mentions monitoring in several locations but does not provide any details. A monitoring plan is typically provided as part of a mine plan of operations to support EIS development and described in Chapter 2 of the EIS (since it is part of the project description). We recommend that a monitoring plan be included in the Alternative 1 description or provided in an appendix. The monitoring plan should include a sufficient level of detail to demonstrate that it can measure environmental effects and	Specific details on compliance monitoring and a detailed monitoring plan(s) will be developed during the State permitting process. For impact analysis, monitoring that would be required by standard permit conditions or BMPs such as groundwater monitoring around TSFs, blockage of culverts, erosion, and effluent water quality have been considered when assessing impacts in Chapter 4-Environmental Consequences.

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				trends. In addition, the monitoring plan should have an adaptive management component and describe changes that would be made to the project design or operations should impacts be different than predicted or if standards are exceeded. The monitoring plan should describe the process and environmental monitoring that would occur during construction, operations, and closure for all project components and include monitoring locations, parameters, frequency, and objectives. Please see our scoping comments related to monitoring.	
EPA	60	2.2.2.5, pg 66	“Concentrate would be stored at the port site during the winter months.”	It is not clear why concentrate would need to be stored at the port site. Please explain/clarify this in the EIS.	Chapter 2-Alternatives has been modified to describe that concentrate would need to be stored at the port site in winter. This is because although all the concentrate would be shipped to the port site during the summer months, it would be lightered out to the bulk carriers and shipped to market on a year round basis, so a winter supply of concentrate to be shipped would need to be stored at the port by the end of the previous summer. .
EPA	61	2.2.2.5, pg 66		Please clarify if this variant would also require increased storage of other supplies during winter months (e.g., fuel).	Chapter 2-Alternatives has been edited to clarify that the winter supply of fuel and reagents would need to be stored at the site.
EPA	62	2.2.2.6, pg 68	“A total of 8 waterbodies would be crossed.”	Please clarify if this refers to streams only, or if this also considers other waterbodies (ponds, wetlands).	The total number of waterbody crossings has been removed from Chapter 2-Alternatives. This information is more appropriate in Chapter 3-Affected Environment and Chapter 4-Environmental Consequences.

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
EPA	63	2.2.3, pg 73	Action Alternative 2 – North Road and Ferry	We recommend that the title of this alternative be revised to include mention of the downstream TSF, so that it is clear to agency decision makers and the public that the road and ferry are not the only changes that distinguish this alternative from Alternative 1.	The alternative name was changed to: Action Alternative 2 – North Road and Ferry with Downstream Dams.
EPA	64	2.2.3.3, pg 88	Any remaining dredged material and any material from maintenance dredging would be disposed of on-shore in a bermed facility on uplands west of the dock site	We recommend that this section also describe the APDES and any other permits that would be required for the discharge of the drainage from the on-shore dredge pile.	Sampling and testing would be performed during preliminary and detailed design (if this alternative is selected) to establish what treatment, if any, would be required. The drainage would be discharged to marine waters and would likely be treated as storm water, unless sampling indicates that treatment will be required. Chapter 2 has been edited to clarify that this discharge would be permitted and treated, as required to all meet applicable state and federal regulations.
EPA	65	2.2.3.5, pg 95	“...storage of concentrate would be needed during the winter months...”	It is not clear why concentrate would need to be stored along the transportation corridor. Please clarify.	As with the Alternative 1 Summer-Only Ferry Operations Variant, concentrate would need to be stored at or near the port site in winter so that it can be lightered out to the bulk carriers and shipped to market on a year round basis. Because there is limited space at the Alternative 2 Diamond Point port, the concentrate would be stored in a laydown area along the Williamsport-Pile Bay Road. This has been clarified in Chapter 2.
EPA	66	2.2.3.5, pg 95		We recommend that the EIS clarify if this variant would also require increased storage of other supplies	This has been clarified in Chapter 2- Alternatives.

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				during winter months (e.g., fuel).	
EPA	67	2.2.4.5, pg 104	Alternative 3 – Concentrate Pipeline Variant	We recommend that the description of this variant specifically disclose the reduction of truck traffic with use of the pipeline (number of truck as compared to Alternative 1).	This has been clarified in Chapter 2- Alternatives.
EPA	68	2.2.4.2, pg 105	Manual isolation and drain valves would be spaced at intervals no greater than 20 miles apart	It is unclear why manual isolation valves would be used for the concentrate pipeline, rather than automatic valves as would be used for the fuel lines. We are concerned that the longer response time associated with manual valves could lead to larger spills of concentrate or process water. Please provide additional detail on the isolation valves that would be used and the ability for timely response to a potential spill event.	Regulations do not specify a requirement for automated or manual valves. However, use of automatic valves has been added to Appendix M for evaluation as a mitigation measure.
EPA	69	2.2.4.2, pg 109	The water quality characteristics of the slurry filtrate water and port area stormwater streams are expected to exceed discharge criteria for pH and metals concentrations to marine waters.	We recommend that the requirements of 40 CFR 440 Subpart J be discussed in the EIS when putting forth this alternative. The slurry filtrate water is process water under these regulations, and as such, it cannot be discharged except under certain circumstances where process water is comingled with wastewater that is allowed to be discharged and only that allowable volume can be authorized.	Reference to EPA's Clean Water Act New Source Performance Standards Effluent Limitation Guidelines (ELGs) and RFI 066 were added to Chapter 2-Alternatives.
EPA	70		General	For all of the alternatives, we recommend including maps of the water extraction sites.	Appendix K2 provides detailed information and figures showing water extraction sites for each Alternative.
EPA	71	2.3	Alternatives Eliminated from Further Consideration – Request that additional	This section refers to Appendix B for the rationale for dismissal of options. The EPA reviewed a draft Appendix B	The dry stack and bulk TSF liner options were discussed in more detail with EPA

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
			alternatives be considered	<p>in September 2018 and submitted comments to the Corps on October 3, 2018. We also submitted follow-up comments related to the dry stack tailings option on October 24, 2018. We have not seen a revised version of Appendix B or a response to the comments that we have previously submitted. We participated in the October 24, 2018 Cooperating Agency meeting where the Corps and AECOM presented the alternatives proposed to be carried forward for detailed analysis in the EIS. However, the meeting did not include a substantive discussion of, or response to, comments that had been submitted. At the end of the Cooperating Agency meeting, we requested a follow-up meeting with the Corps and AECOM technical experts to discuss our outstanding concerns related to several of the tailings options. The meeting has yet to be scheduled.</p> <p>Based on the information presented in Section 2.3, and without a revised version of Appendix B that is responsive to our comments, we continue to have significant concerns about several aspects of the alternatives screening and range of mine site layout and tailings alternatives. For example:</p> <p>Mine site layout and TSF location alternatives - See our October 3, 2018 comments requesting additional discussion in the EIS to support the</p>	<p>on November 28, 2018.</p> <p>RFI 069 and RFI 098 evaluate the 35 TSF locations. USACE has evaluated these options and discussed in the revised Appendix B.</p> <p>The dry stack option is evaluated and eliminated in Appendix B, and EPA has agreed with its elimination.</p> <p>Additional evaluation of the lined bulk TSF option was conducted by AECOM and additionally, PLP provided a memo explaining why they proposed an unlined facility. USACE has considered EPA and PLP documentation on the lined bulk TSF option and has decided to eliminate it from detailed consideration in the EIS. It is documented in Appendix B.</p> <p>The outfall locations are evaluated as potential mitigation measures (see Appendix M).</p> <p>An additional throughput scenario of 115,000 tons per day was considered as requested in this comment.</p>

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				<p>basis for the proposed mine site layout design and lack of alternatives related to the mine site layout. This is particularly relevant for TSF siting options since Appendix N states that PLP considered more than 35 tailings disposal sites, yet Table 2-21 identified only one possible alternative location for the pyritic TSF. We again request that the Corps evaluate the TSF locations previously considered by PLP against the smaller mine plan – we recommend listing these locations in Appendix B (and showing them on maps) and assessing whether and which of the 35 alternative locations are reasonable and could result in reduced impacts. This information would better support the Corps' hard look at alternative TSF locations as required by NEPA.</p> <p>Dry stack tailings alternative (TSF-004) – Please see our October 24, 2018 comments on AECOM's analysis of the dry stack option. Absent a revised analysis of the dry stack option that is responsive to our comments, we continue to recommend that this option be considered as an alternative in the DEIS for the reasons discussed previously.</p> <p>TSF liner (TSF-015) – Please see our October 3, 2018 comments related to the bulk TSF liner option. We continue to recommend that a liner option be considered as an alternative for the bulk TSF as we have not been</p>	

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				<p>convinced that the TSF dam and impoundment could not be engineered accordingly. We understand that including a liner may result in the need for a revised (water-retaining) embankment design. Seepage from the bulk TSF is predicted to exceed water quality standards for some parameters. The proposed action requires long-term post-closure collection and treatment of seepage from the bulk TSF. No alternatives are proposed to minimize seepage or reliance on long-term management of seepage. No information has been provided to demonstrate that the proposed seepage control system for the TSF would collect all of the seepage, which could otherwise impact groundwater. Due to the potential for long-term groundwater impacts from uncollected seepage and the desire to reduce reliance on long term water management and treatment of TSF seepage, we continue to recommend that a liner be included. The Corps recently permitted the placement of a liner for the Donlin Gold Mine TSF, which is of similar size.</p> <p>Effluent outfall locations - It is not clear from the proposed project description that the outfall locations have been optimized to minimize impacts of dewatering. In fact, the project description does not describe the timing or quantities of water that would be discharged at each outfall.</p>	

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
				<p>Therefore, we continue to recommend that this information be provided and that alternative outfall locations be assessed. See our October 3, 2018 comments.</p> <p>Throughput scenarios - Only one option smaller than the proposed throughput of 180,000 tons per day was considered, and it was dismissed as not reasonable because it would not provide a reasonable return on investment. We recommend that mine sizes between 50,000 tpd and 180,000 tpd be assessed to determine if there are other smaller mine throughputs that could still be practicable while also resulting in reduced impacts. In addition, where indicators such as “positive net present value” or “reasonable return on investment” are being used to screen out alternatives, we recommend that this same information be provided for the proposed action. We also recommend providing more information that defines: (1) the thresholds for positive net present value and reasonable return on investment; (2) the net present value and return on investment for the proposed action; and (3) the estimated net present value and return on investment for options that are eliminated based on these factors.</p>	
EPA	72	2.3, pg 114	Others were not carried forward as options because they were more properly	The text of this section states that some of the options were carried forward as mitigating measures.	This section has been revised and the requested change is no longer applicable. The tables in this section were deleted

EPA Comments – Pebble Project Preliminary Draft EIS, Chapter 2 - Alternatives

Agency	Comment No.	Section, Paragraph, and Page #	Cooperating Agency Comment (and Purpose of Comment)	Proposed Resolution (Additions or Deletion of Text)	Response
			characterized as potential mitigating measures. Mitigation measures are addressed in Chapter 5, Mitigation. and Tables 2-12 through 2-23, Options Eliminated from Further Consideration	However, the tables do not identify that any of the options were carried forward. We recommend that the option descriptions be revised for those options that were carried forward as either mitigating measures or RFFAs (LAY-006).	because all of the information is contained in Appendix B. A summary of the options eliminated are discussed in Chapter 2-Alternatives with a reference to Appendix B for details. Mitigation is addressed in Chapter 5-Mitigation and Appendix M.