



THE STATE
of **ALASKA**

GOVERNOR MICHAEL J. DUNLEAVY

Department of Natural Resources

OFFICE OF PROJECT MANAGEMENT & PERMITTING

Po Box 111030
Juneau, Alaska 99811-1030
Main: 907.465.6849
Email: kyle.moselle@alaska.gov

June 28, 2019

Shane McCoy
Program Manager
US Army Corps of Engineers
645 G St.
Suite 100-921
Anchorage, AK 99501
Submitted via email to Shane McCoy at drafteis@comments.pebbleprojecteis.com

Dear Mr. McCoy,

The Office of Project Management and Permitting (OPMP) has coordinated with the Alaska Departments of Natural Resources (DNR), Environmental Conservation (DEC), Fish and Game (ADF&G), Transportation and Public Facilities (DOT&PF), Health and Social Services (DHSS), Labor and Workforce Development (DOL), and Commerce, Community and Economic Development (DCCED) to review the Pebble Project Draft Environmental Impact Statement (DEIS) published by the U.S. Army Corps of Engineers (USACE)¹. The State of Alaska's consolidated comments are enclosed for your consideration in preparing the Final EIS (FEIS) and your Record of Decision (ROD).

Thank you for inviting the State of Alaska (State) to participate as a cooperating agency in the federal environmental review process for the proposed Pebble Mine. Although much of the information the State has provided the USACE previously has been incorporated into the DEIS, further work is necessary to ensure potential effects to the human environment from each alternative are adequately evaluated and described in the FEIS. The State review team will participate fully in the technical working group meetings the USACE has scheduled with the cooperating agencies following close of the public comment period on the DEIS.

Please contact me if you have any questions regarding the enclosed comments and to organize follow-up meetings, as necessary, with the State review team.

Sincerely,

A handwritten signature in black ink that reads "Kyle W. Moselle".

Kyle Moselle
Associate Director

Enclosure: Consolidated State of Alaska Comments (MS Excel file)

Cc: Corri Feige, Commissioner, ADNR
Doug Vincent-Lang, Commissioner, ADF&G
Jason Brune, Commissioner, ADEC
Kip Knudson, Director State and Federal Relations, Office of the Governor

¹ Notice of Availability published in the Federal Register (Vol. 84, No. 41, Friday, March 1, 2019)

**Pebble Project: DEIS Review
State of Alaska Consolidated Comments Table**

Department/Division	Document Name	Section/Fig./Table	Page #	Comment/Issue	Recommendation/Action
ADF&G/Habitat/SPCS	Chapter 2 Alternatives 2.2.2.4	2.2.2.4		Drilling mud containment is straightforward for Horizontal Directional Drilling (HDD) operations under streams since the bore begins and ends aboveground. It is unclear how total containment and proper disposal can take place for HDD operations where one end begins aboveground and the other end comes out underwater.	EIS should describe how pressurized drilling muds will be contained for HDD operations into Cook Inlet or into Lake Iliamna. If drilling muds cannot be totally contained, then the EIS should describe the contents of these fluids, amounts that will be discharged into these waterbodies and describe any related effects on the environment.
ADF&G/Habitat/SPCS	Chapter 2 Alternatives 2.2.2.4	2.2.2.4		The DEIS indicates that the pipeline will either be trenched or use HDD to transition out of the western shore of Cook Inlet.	The EIS should go into further detail on specifics of nearshore pipeline trenching and installation activities as the pipeline transitions onshore in tidally influenced areas of Cook Inlet in order to better assess potential impacts.
ADF&G/Habitat/SPCS	Chapter 2 Alternatives 2.2.2.4	2.2.2.4		The DEIS indicates that the pipeline will either be trenched or use HDD to transition into or out of Lake Iliamna.	Since trenching is a described option, the EIS should describe in further detail how the pipeline would be trenched and installed in order to better assess potential impacts.
ADF&G/Habitat/SPCS	Chapter 2 Alternatives 2.2.2.4	2.2.2.4	page 2-75	DEIS indicates that the applicant would only need a 30-foot temporary construction area to install the pipeline in Cook Inlet and Lake Iliamna yet in other sections the DEIS indicates a 150-foot ROW for pipeline construction.	Since trenching is being proposed as a possible pipeline onshore transition in the tidally influenced western portion of Cook Inlet and Lake Iliamna, suggest clarifying if this transition could be accomplished in a 30-foot construction area or if a larger construction area would be necessary for these transitional areas.
ADF&G/Habitat/SPCS	Chapter 2 Alternatives 2.2.2.4	2.2.2.4	page 2-78	DEIS states "Material sites and extraction sites for road and pipeline construction are discussed above." Yet they are not.	EIS should describe material sites and water extraction sites for pipeline construction in order to better assess potential impacts
ADF&G/Habitat/SPCS	Section 4.14 Soils	4.14.2.3- Transportation Corridor-Erosion	page 4.14- 11-13	Section only describes construction induced erosion due to access road construction, material sites and terminal facilities.	Section should also describe construction induced erosion from all aspects of pipeline installation and operations including open-cut stream crossings, trenching in Cook Inlet and Lake Iliamna, exposed trench spoils, overland flow interception of pipeline trench and overburden, pipeline hydrostatic testing water disposal and potential frost heaving post construction. In addition, EIS should describe methods on preventing, minimizing and mitigating erosion for Alternatives 1, 2 and 3 in order to fully assess potential impacts.
ADF&G/Habitat/SPCS	Section 4.14 Soils			Section 4.14_Soils does not adequately describe methods on preventing, minimizing and mitigating erosion for Alternatives 1, 2 and 3.	EIS should describe methods on preventing, minimizing and mitigating erosion for Alternatives 1, 2 and 3 in order to fully assess potential impacts.
ADF&G/Habitat/SPCS	Section 4.14 Soils	4.14.2.4 Natural Gas Pipeline	page 4.14- 13	Section only describes effects on soils from pipeline infrastructure on the eastern side of Cook Inlet.	EIS should also describe the effects on soils from the rest of the proposed natural gas pipeline installation and operations on the west side of Cook Inlet and within Cook Inlet itself.
ADF&G/Habitat/SPCS	Section 4.14 Soils	4.14.3.4 Natural Gas Pipeline	page 4.14- 20	Section indicates BMPs would be used to address erosion and stormwater runoff but does not describe sources of pipeline induced erosion.	Section for Alternative 2 should also describe construction induced erosion from all aspects of pipeline installation and operations including open-cut stream crossings, marine crossing of Cottonwood Bay, exposed trench spoils, overland flow interception of pipeline trench and overburden, pipeline hydrostatic testing water disposal and potential frost heaving post construction.
ADF&G/Habitat/SPCS	Section 4.16-Surface Water Hydrology	4.16.3.2 Transportation Corridor	page 4.16- 26	Section identifies waterbody crossings in the transportation corridor including the natural gas pipeline but only addresses erosion from road culverts and bridges.	Section should also address erosion and potential changes in surface hydrology and erosion from pipeline installation.

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ADF&G/Habitat/SPCS	Section 4.16-Surface Water Hydrology	4.16.3.2 Transportation Corridor-Surface Extraction	page 4.16-30	Last paragraph on page states that "Permit compliance (ADF&G Habitat Permits) <u>would avoid the potential for impacts</u> from water withdrawal at streams."	ADF&G Habitat Biologists must balance many factors before issuing Title 16 Fish Habitat Permits and sometimes impacts are still unavoidable. Suggest changing text to "Permit compliance (ADF&G Habitat Permits) <u>would avoid or minimize</u> the potential for impacts from water withdrawal at streams."
ADF&G/Habitat/SPCS	Section 4.16-Surface Water Hydrology	4.16.3.5 Marine Water-Kenai Peninsula to Kamishak Bay	page 4.16-34	Section states that suspended sediment concentrations from either trenching or HDD would not be larger than the maximum concentrations that would occur under severe storm conditions.	This statement is not supported by any citation. If claim is to be made, EIS should estimate and quantify the localized sedimentation likely to be encountered from both trenching and HDD and compare it to storm suspended sedimentation data and cite the source.
ADF&G/Habitat/SPCS	Section 4.16-Surface Water Hydrology	4.16.3.5 Iliamna Lake	page 4.16-35	Section states that pipeline construction at the north and south ferry terminal would only cause short-term suspended sedimentation limited to the immediate vicinity of the construction and would only persist for a few days. DEIS does not go into specifics on either nearshore trenching nor HDD into Lake Iliamna yet describes specifics on impacts.	EIS should describe in much greater detail both proposed trenching and HDD activities so impacts can be properly evaluated.
ADF&G/Habitat/SPCS	Section 4.16-Surface Water Hydrology	4.16.3.5 Pipeline	page 4.16-35	Section describes the impacts for a frac-out of drilling muds from HDD stream crossings but does not address how drilling muds would be contained and disposed for HDD operations where one end begins aboveground and the other end comes out underwater. EIS should describe how pressurized drilling muds will be contained for HDD operations into Cook Inlet or into Lake Iliamna.	EIS should describe impacts of HDD operations into Cook Inlet and Iliamna Lake. If drilling muds cannot be contained, then the EIS should describe the contents of these fluids, including possible frac-out additives, and amounts that will be discharged into these waterbodies and describe any related effects on the environment.
ADF&G/Habitat/SPCS	Section 4.16-Surface Water Hydrology	4.16.3.5 Pipeline	page 4.16-36	First sentence of page states "Typically, geotechnical investigations would be conducted at HDD stream crossings to evaluate the risk of frac-out during drilling at each crossing."	Standalone sentence/paragraph does not offer any commitments to doing any Geotech work nor avoiding HDD activities where a frac out risk is high. If Geotech work is not available for impact analysis prior to the issuance of an EIS, then a commitment should be made to do Geotech work at HDD sites and avoid areas that have a high risk of frac-out.
ADF&G/Habitat/SPCS	Section 4.18 Water and Sediment Quality	4.18.3.4 Natural Gas Pipeline Corridor-Surface Water Quality	page 4.18-25	Section states "The magnitude, extent, duration, and likelihood of impacts to surface water quality within the natural gas pipeline corridor would be associated with installation of the pipeline at water crossings and the use of local water sources for hydrostatic testing."	The magnitude (extent) of surface water quality impacts from the natural gas pipeline would be associated with more than just these two aspects of pipeline construction. The EIS should identify and evaluate all potential impacts on surface water quality including: trenching and HDD into Cook Inlet and Lake Iliamna, interception of overland surface flows by the pipeline ditch, monitoring and mitigation until the disturbed areas have been stabilized, release of hydrostatic waters into fish bearing waterbodies, erosion and sedimentation from exposed trench spoils and frost heaving.
ADF&G/Habitat/SPCS	Section 4.18 Water and Sediment Quality	4.18.3.4 Natural Gas Pipeline Corridor-Surface Water Quality	page 4.18-25	Section states "Impacts (pipeline) at material sites and stream crossings would be the same as those described above for the transportation corridor."	Stream crossing impacts will be very different for many aspects of pipeline construction such as from HDD or open cut trenching that are not needed for road construction. Also, it is unclear why "material site" impacts are included in pipeline section. Consider re-wording this sentence in the pipeline section.
ADF&G/Habitat/SPCS	Section 4.23 Wildlife Values			Section does not address the potential behavioral changes nor physical disturbance to wildlife movement due to pipeline stringing.	Section should address the effects on wildlife movements due to pipeline stringing both for prolonged periods of time and length.

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ADF&G/Habitat/SPCS	Section 4.23 Wildlife Values			Section does not address the potential injury, entrapment and disruption of wildlife movement due to excessive and prolonged open ditches from pipeline construction.	EIS should address the potential wildlife impacts of open pipeline ditches and describe applicant's plan to minimize animal entrapment as well as potential barriers to animal movement.
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	4.24.2.1, Natural Gas Pipeline	page 4.24-7	"The magnitude and extent of impacts from project construction, operations, and closure of the natural gas pipeline would have a footprint of 40 acres, of which 6 acres are wetlands or other waters." This statement ignores downstream effects from currents in the case of streams, wind driven currents (Lake Iliamna) and tidal currents in Cook Inlet.	Extent of impacts from pipeline construction will not be limited to just the footprint of project construction and will be carried in some instances a significant distance from the point of disturbance. Consider re-wording.
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	4.24.2.2, Fish Displacement, Injury, and Mortality	page 4.24-8	Section states "The magnitude of direct impacts from installation of bridges, culverts, and the natural gas pipeline would be that mortality of fish could occur from construction activities at stream crossings and the ferry terminals." Vague statement that does not address the direct impacts of displacement or injury to fish as the section title suggests. It does not even address the direct impacts of fish mortality except by stating that they "could" occur.	This section should describe the potential causes of fish displacement, injury or mortality for all aspects of the transportation corridor and pipeline construction to all fish species and life stage consistent with the title of the section. Examples of causes of displacement, injury and mortality include sedimentation from trenching, improper use of BMPs, inadequate bank restoration and stabilization, channelization of backfilled trench, and HDD frac-out. Additional examples of impacts include direct mortality to eggs (both directly from trenching, blasting and piledriving as well as blocking the O2 intake from filling in interstitial spaces in stream gravel from sedimentation) and displacement and mortality of adults and juveniles from blasting, piledriving, and sedimentation.
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	4.24.2.2, Fish Displacement, Injury, and Mortality	page 4.24-8	Section states "The magnitude of impacts from fish entrainment or impingement at screens during pumping would be potential direct mortality or injury. The duration of impacts would be that fish passage may be temporarily impeded during construction."	Confusing statement that acknowledges that fish may be killed or injured from pumping operations but that the duration of the impacts would only be a temporary impedance during construction. Clearly if fish are injured or killed the impacts to the fish would be more than just impedance during construction. Suggest re-wording.
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	4.24.2.2, Fish Displacement, Injury, and Mortality	page 4.24-9	Section states "The capture/relocation program would be conducted according to established ADF&G practices, and permit stipulations could include seasonal restrictions on instream activities to reduce or avoid impacts during species critical life stages (e.g., spawning and egg development periods)."	The EIS should describe the applicant's capture/relocation program and indicate when, where, and under what conditions it would be necessary in order to better evaluate the direct impacts to fish from the transportation corridor construction activities. Further, simply stating that ADF&G "could" implement permit stipulations to reduce or avoid impacts does not provide an adequate description of what the likely impacts to fish will be nor the steps the applicant will take to avoid, minimize or mitigate these impacts.
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	4.24.2.2, Fish Displacement, Injury, and Mortality	page 4.24-9	Last paragraph in "Bridge, Culvert, and Natural Gas Pipeline Installation" section combines ADF&G water pump screen criteria and HDD frac-out impacts.	These are two separate and unrelated topics and should be separated out. Consider rewording.
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	4.24.2.2, Iliamna Lake Pipeline	page 4.24-9	Section states "The magnitude of impacts is such that these activities would displace 1.3 acres of substrate material along with the associated organisms".	Magnitude (extent) of impacts would not be limited to just the footprint of the pipeline during construction. EIS should describe the impacts from nearshore trenching and resulting turbidity and sedimentation that will likely be dispersed from wind driven currents.

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ADF&G/Habitat/SPCS	Section 4.24 Fish Values	4.24.2.2, Iliamna Lake Pipeline	page 4.24-9	Section only describes effects of Iliamna Lake pipeline on benthic organism displacement and sockeye salmon disturbance.	Section should describe potential effects on all species of fish in Lake Iliamna from pipeline construction, including turbidity from trenching.
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	4.24.2.2, Natural Gas Pipeline	page 4.24-11	Section only describes effects of the pipeline in Cook Inlet.	Consider rewording section title to "Cook Inlet Pipeline" instead of "Natural Gas Pipeline" to be consistent with previous "Iliamna Lake Pipeline" section.
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	4.24.2.2, Natural Gas Pipeline	page 4.24-11	Section only describes effects of the pipeline in Cook Inlet to Weathervane scallops from the laying of pipe and benthic fauna mortality from the placement of anchors.	Section should describe potential impacts to all marine fish and benthic fauna and from all aspects of the installation of the natural gas pipeline, including the impacts from trenching in the nearshore zone.
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	4.24.2.3,-Stream Flow- Natural Gas Pipeline	page 4.24-16	Section states "The magnitude and extent of potential impacts to groundwater and surface water during pipeline construction would involve interception of shallow groundwater and surface water during trenching activities, which would be captured and locally flow along the trench backfill."	Clearly the magnitude (extent) of potential impacts to surface water is not limited to just the capture of flow along the trench backfill. EIS should describe all of the potential impacts to surface flow from the installation of the natural gas pipeline including sedimentation and erosion from open cut stream pipeline stream crossings. Section should also describe the potential effects on fish consistent with the Chapter title (Fish Values).
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	4.24.2.4, Stream Productivity-Iliamna Lake Pipeline	page 4.24-18	Section states "HDD would be used to install the natural gas pipeline segments from the lakeshore into waters deep enough to avoid navigational hazards, then laid and secured on the lake bottom."	Other sections indicate that either HDD or trenching would be used to install the natural gas pipeline into Iliamna Lake. EIS should evaluate and describe the impacts to fish of both methods in this section.
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	4.24.2.4, Stream Productivity-Cook Inlet Natural Gas Pipeline	page 4.24-19	Section only discusses the impact on weathervane scallops in northern Kamishak Bay.	Section should describe the impacts of all fish species and benthic organisms as a result of the natural gas pipeline.
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	Section 4.24.2.6 Fish Migration-Access Roads and Pipeline	page 4.24-22	Section only indicates that fish passage may be disrupted during bridge construction.	Section should identify all potential impacts to fish passage from pipeline construction including construction induced turbidity, culvert installation and open ditch stream crossings as well as the duration of the disruption.
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	Section 4.24.2.6 Natural Gas Pipeline	page 4.24-23	Section only describes impacts on the migration of macroinvertebrates in Cook Inlet.	Suggest renaming section 4.24.2.6 to "Cook Inlet Pipeline" instead of "Natural Gas Pipeline" to be consistent with previous sections such as "Iliamna Lake Pipeline".
ADF&G/Habitat/SPCS	Section 4.24 Fish Values	Section 4.24.2.7 Water Temperature and Quality	page 4.24-23	Section only addresses effect of water temperature and quality on fish from the construction and operation of the mine.	Section should also address the potential effects from the transportation corridor including the natural gas pipeline construction and operations.
ADF&G/Habitat	DEIS	Overall		While the DEIS does attempt to describe direct impacts to fish and fish habitat, it minimizes or ignores indirect, long-term impacts on downstream resources and habitat.	DEIS should consider and describe all potential impacts, including indirect impacts, to downstream resources and habitat.
ADF&G/Habitat	DEIS	Overall		Wildlife crossings are not included in mitigation.	Wildlife crossings under or over the Transportation Corridor road could mitigate impacts to wildlife movement.

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ADF&G/Habitat	DEIS	Overall		<p>DEIS states in multiple places that there will be no measurable impacts to salmon populations, but the limited baseline studies may not have captured the true salmon populations of these systems. Long-term population levels in these streams or the watershed's true production potential vary over time and space. A watershed acts as a system with fish production moving between tributaries over time. Stream reaches in a watershed may experience low production for long-periods of time alternating with periods of high productivity. The aggregate of the system as a complete and undisturbed watershed should be considered as being impacted when individual tributaries are removed or impacted that lower the potential production of the watershed as a whole.</p>	<p>Limited baseline studies make the production potential in these streams uncertain and therefore the actual salmon populations in these streams may not be precise enough to determine if measurable impacts are occurring to the system. For example, in 2008 the chinook salmon count in the North Fork Kuktuli was 434 fish and in 2005 it was 2,889 fish. More surveys would undoubtedly demonstrate even more variability. DEIS should acknowledge the uncertainty of salmon production from, and population of, these streams as they contribute to the overall aggregate production in the system.</p>
ADF&G/Habitat	DEIS	Overall		<p>In multiple places the DEIS states that impacts will last through the life of the project and then assigns the duration as long term. The DEIS criteria for permanent duration apply if recovery takes greater than 20 years. If impacts last through the life of the project then they will certainly be lasting for more than 20 years (construction = 4 years, operation = 20 years, post-closure = 20 years) and should be categorized as permanent.</p>	<p>The DEIS should further define/clarify how impacts are categorized and explain why certain impacts are listed as long-term instead of permanent. Currently, it appears a number of the impacts would more accurately be described as permanent (lasting longer than 20 years).</p>
ADF&G/Habitat		Overall		<p>Uncertainty exists in the long-term predictions of acid generation from geologic materials found in mining environments. Evaluation of Environmental Impact Statements from 25 mines performed by Kuipers and others (2006) showed 15 of 25 mines (60%) exceeded surface water quality standards for metals and pH after permitting. Of 56 mines evaluated by Skousen and others (2002) 11% did not conform to the expected results based on NP:AP ratios, including four sites with ratios > 2: these sites eventually produced acidic drainage. The standard protocols for evaluating geologic materials for their ability to produce AMD are generally agreed upon within the scientific community, yet uncertainty remains in the ability of scientists and engineers to predict the ultimate drainage quality years in the future, as many complex variables influence acid generation and neutralization. There is inherent uncertainty involved with distinguishing PAG from NPAG waste and combined with less than 100% testing, short-term testing, human error, and potential breakdown in controls during operations, there is potential for PAG waste to be mischaracterized or misplaced and used in road fill, embankments, or other areas where it will be exposed to the elements with the potential to release acid and metals into the aquatic environment. This may be localized (e.g., used as fill around a culvert at a stream crossing) or widespread (e.g., along a road that parallels a stream) and it may take years to begin producing acid and having impacts to the aquatic environment</p>	<p>The DEIS should consider and describe the potential impacts from mischaracterization and/or misplacement of PAG rock on aquatic resources, including what corrective measure could be taken, for example, if it is later determined that PAG is included in the tailing embankments or a quarry is found to contain PAG or produces acid years in the future. Historically, small changes in contaminants, sediment, turbidity, stream-flow, and pH have resulted in decreases in salmon populations and macroinvertebrates (Hughes, 1985).</p>

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ADF&G/Habitat		Overall		Risks and potential impacts on surface water resources are incompletely described in the DEIS. Direct and indirect impacts to surface waters from groundwater reductions, diversions, water treatment releases, and other mine operations are discussed under normal operating conditions, but not under compromised conditions. The proposed project relies on a complex water management system, with a network of controls and point releases (infiltration chambers) to mitigate the reduced streamflows created by the project. The system is subject to unplanned failures including human error, pump failures, uncertainty, miscalculations, frozen pipes, or other disruptions/breakdowns. A temporary breakdown of this system and disruption of point releases could have significant impacts to fish populations. For example, an upset to the system in December, even for 24-hours, could mean the desiccation and freezing of incubating eggs as well as strand juvenile fish during the critical overwintering period. For example, a new \$120 million water treatment facility at a British Columbia coal mine was recently constructed to remove selenium but instead released a more toxic form of the element. This was unforeseen/unplanned, fish kills resulted, and the plant has been offline for years now while the challenges are resolved with water quality exceedances ongoing.	DEIS acknowledges that water balance predictions may be subject to significant uncertainty and adaptive water management strategies during operations would include the ability to provide expansion of the WTP. Pebble is proposing a costly and complex multistage water treatment process which is unproven on the scale proposed and in this type of setting (e.g., high volumes of water, sub-arctic environment, sensitive receiving environment). Potential impacts to aquatic resources from compromises, miscalculations, or upsets to the water management system and point releases on aquatic resources and fish need to be described. This is an example where risks are minimized based on assumptions which may not be valid.
ADF&G/Habitat			p. 3.24-15, Table 3.24-3	Table 3.24-3 is incomplete.	Two of the three tributaries listed in the table should have sockeye salmon spawning added to the Species/Life stage column. The tributaries listed as "trib to Gibraltar River" contained spawning sockeye salmon during a site visit in August 2018. This information was provided to PLP by ADF&G on September 19, 2018. It should also be noted that only about half of the streams along the transportation corridor have been surveyed and the number of anadromous streams may increase when surveys are completed.
ADF&G/Habitat		Sec. 3.24.1.3 Aquatic Invertebrates	3.24-29	The DEIS states that locations for macroinvertebrate and periphyton studies were selected to characterize conditions in the project area, but no macroinvertebrate or periphyton samples were collected anywhere along the transportation corridor. The DEIS states that sampling was conducted at only two sites for the Transportation Corridor because a relatively small portion of the corridor would be in Cook Inlet drainages, but other drainages (e.g., Iliamna Lake) that include the majority of the transportation corridor are not described in this section.	The DEIS should more accurately state that macroinvertebrate and periphyton data have not been collected in the vicinity of the project's transportation corridor (see Figure 3.24-6). The USACE Comment Response Matrix received by ADF&G states that "Macroinvertebrate baseline data is unavailable for the Action Alternative 1", and the DEIS should also accurately state as much. This is especially applicable to the segment of the transportation corridor south of Iliamna Lake.
ADF&G/Habitat		4.1	Table 4.1-1	The list of RFFAs is incomplete. The Knutson Creek hydroelectric project (Pedro Bay) has been in the planning stages for years and is currently developing material for permit applications.	The Knutson Creek hydroelectric project should be considered as an RFFA.

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ADF&G/Habitat		4.16-23	4.16.3.1	The DEIS minimizes or does not fully describe potential impacts from erosion on aquatic resources during the closure phases and beyond. The DEIS simply states that surface disturbance during rehabilitation may increase erosion for a limited time. Tundra and stream habitat take years or decades to recover from disturbance and the mine site could contribute sedimentation to the streams due to erosion from recovering habitat for the duration of rehabilitation.	The DEIS should fully describe the potential impacts to stream habitat from increased erosion during closure before tundra and riparian habitat has fully recovered.
ADF&G/Habitat		4.24.2.1	4.24-2	Habitat loss at the mine site is listed as long-term, lasting throughout the life of the project. Recovery lasting greater than 20 years is considered permanent. If impacts last the life of the project they will certainly last more than 20 years. Impacts begin before operations (4 years), operations last 20 years, and recovery will take many years after operations and some recovery will not begin until after post-closure phases.	Impacts lasting the life of the project should be considered permanent since recovery will take an unknown number of years after operations (>20 years).
ADF&G/Habitat		4.24.2.1	4.24-3	The DEIS states that 1.4 miles of stream channel (NFK - Tributary 1.190) will be converted to reservoir habitat (seepage collection pond). It would be more accurate to state that the stream channel habitat is being removed.	The DEIS should state that 1.4 miles of stream habitat will be removed in NFK - Tributary 1.19.
ADF&G/Habitat		4.24.2.1	4.24-5	The DEIS states that, "No aquatic habitat would be directly lost in the UTC..." - Multiple road crossings with culverts are proposed in the UTC drainage, requiring fill placement in the streams and removing habitat, especially where cuts or deep valleys require larger road prisms. Wetlands with connections to streams will be filled and covered. For example, at Stream Crossing 520, where the Iliamna Spur Road crosses a braided, anadromous stream, riparian wetlands and side channels are proposed for fill placement approximately 700 feet long and 100 feet wide. This will result in direct loss of some side channel and riparian wetland channel habitat, which is important fish habitat, especially during high water. Downstream from this crossing where the Mine Access Road crosses (Stream Crossing 414 and 413) the same anadromous and braided stream, fill (approx. 200 feet long by 100 feet wide) will be placed directly in riparian and side-channel habitat.	The DEIS should correctly state that some aquatic habitat will be directly lost in the UTC.
ADF&G/Habitat		4.24.2.1	4.24-5	The DEIS states that "Changes in riparian wetlands would likely not be detectable downstream from the mine site." No rationale or explanation are provided to support this statement.	The DEIS acknowledges that water balance predictions may be subject to significant uncertainty, streamflows will be altered, water temperature will change, floodplain connectivity will be impacted, headwater functions will be lost, erosion could increase, groundwater flow will be altered, and stream productivity and riparian vegetation will be impacted. All of this seem contrary to the statement that changes in riparian wetlands would likely not be detectable. The DEIS should provide support for this statement or otherwise reconcile differences with statements in other sections.

Department/Division	Document Name	Section/Fig./Table	Page #	Comment/Issue	Recommendation/Action
ADF&G/Habitat		4.24.2.1	4.24-5	Habitat impacts from the Transportation Corridor are understated from a magnitude, extent, and duration perspective. Only temporary disturbance and impacts during construction are considered. Roads can have long-term and lasting impacts on streams and riparian habitat that will last the life of the road at a minimum. Some crossings will require large amounts of fill with a wide road prism across flood plains, side channels, and off-channel habitat. These large amounts of fill will very likely contribute sediment to the streams over the life of the road. The roads will change runoff characteristics and alter channel morphology. Pollutants from accumulated debris and runoff and accidental releases will be discharged into streams. Roads can affect drainage, change the hydrograph and intercept subsurface flows. Some of the proposed culverts are 200 feet in length and even if designed for fish passage, culverts of this length can cause migration delays or be partial barriers to some fish. Culverts can fail or become blocked for periods of time before maintenance can be performed.	The roads will have impacts on aquatic and riparian habitat and stream productivity for the life of their existence and therefore the duration should be permanent and not only during construction. Other watersheds with fill placement in riparian areas and in side channels should be considered also.
ADF&G/Habitat		4.24.2.1	4.24-6	The duration of impacts from the Transportation Corridor are listed as long term. Impacts from the road will begin 4 years before operations (starting with pioneer road), last for 20 years during operations, and at least 20 more years during post-closure. The DEIS does not explicitly state that the road will be removed and the habitat rehabilitated.	Impacts from the Transportation Corridor will last more than 20 years and should be considered permanent.
ADF&G/Habitat		4.24.2.3	4.24-12	The duration of streamflow reductions are considered long term, beginning during project construction, and would continue through operations and post-closure. Impacts lasting more than 20 years should be considered permanent based on the categories listed in the DEIS.	The duration of streamflow reductions and the impacts to aquatic resources and fish should be considered permanent.
ADF&G/Habitat		Sec. 4.24 Natural Gas Pipeline subsection	4.24-23	In Section 4.24, subsection Natural Gas Pipeline, it is stated that ADF&G permit conditions would likely stipulate timing windows for construction to avoid impacting migrating anadromous fish in Cook Inlet.	ADF&G does not have any regulatory authority to set timing windows in the marine environment.
ADF&G/Habitat		4.24.2.3	4.24-16	The DEIS states that construction activities in anadromous waters would occur from May 15 to June 15 in accordance with ADF&G criteria. ADF&G does not have specific, statewide criteria or a set period of dates that work will occur in anadromous waters. Rather, streams are considered individually, or regionally, with consideration for the life history of fish populations in the area and fish species present in the stream. The outmigration of smolt in the Bristol Bay region peaks in late May and would be a primary consideration for in-stream timing windows.	The dates of in water work for anadromous waters should not be stated as May 15-June 15 in the DEIS. An appropriate inwater work window will be determined and stipulated during ADF&G's Title 16 permitting process, which has not yet started.

Department/Division	Document Name	Section/Fig./Table	Page #	Comment/Issue	Recommendation/Action
ADF&G/Habitat		4.24.2.6	4.24-22	<p>Potential impacts to fish migration from ferry terminal operations are not fully described. Ferry operations could delay adult sockeye salmon migration, especially near the mouth of Upper Talarik Creek where fish would stage prior to entering the river. Ferry terminal construction and operations could potentially delay fish migration into spawning streams; increased turbidity, noise, vessel traffic, small diesel/oil releases, and/or an altered shoreline could delay fish because of the physical disturbance or changes to the scent of the area are some examples that could contribute to delayed migration and potentially reduced spawning success.</p>	<p>The DEIS should describe the potential impacts to migrating salmon and the timing of spawning near the ferry terminals due to standard operations and unplanned events.</p>
ADF&G/Habitat		Sec. 4.24.2.7	4.24-23	<p>In the NFK it is predicted that the average winter water temperature will increase by 2.8°C downstream of the water discharge location for ½ mile (could be as high as 3.6°C). This increase will continue further downstream, but to a lesser degree. The DEIS concludes that with this increase the stream temperature will be well below the ADEC threshold and would not be expected to impact incubating eggs. Small (1-5°C) changes in water temperature may have consequential effects on fish. Under conditions found in the NFK an increase of even 1°C or 2°C will shorten hatching for most salmonid fishes by about 80-100 days (Weber-Scannell, 1991). An increase of nearly 3°C would shorten the time to hatching even further. The 10 miles of river downstream of the mine has the highest concentration of coho salmon spawning habitat in the NFK according to the DEIS. Fry emergence in this reach could change from April/May to late Jan/Feb with the proposed increases to water temperatures in the winter. This could have a very significant impact on fry survival and reach production since it is not known if sufficient invertebrate food sources would yet be available. Fry will be foraging for food under low light conditions and may be more susceptible to icing conditions. Additionally, warmer water shortens alevin development time and increases energy requirements for growth and development. Alevin reared at higher temperatures can resorb body tissue during the final stages of alevin development if their yolk sac is depleted too quickly affecting overall fitness and survival.</p>	<p>There is an abundance of peer reviewed literature available regarding the effects of temperature changes on salmonids that could be used to help inform the conclusions stated in the DEIS. Significant negative impacts to eggs can occur from changes in water temperature even if water quality standards are not exceeded. The conclusion that altered temperatures will not impact incubating eggs is based on limited criteria and is in error considering other factors. This same comment applies to the other watersheds as well where changes are also expected to occur but to a lesser degree. This comment was submitted during the pre-draft review but was inadequately addressed by not considering the impacts from early emergence during winter conditions.</p>

Department/Division	Document Name	Section/Fig./Table	Page #	Comment/Issue	Recommendation/Action
ADF&G/Habitat		Sec. 4.24	4.24-31 and other pages in this section	The impacts of lost productivity from tributaries disconnected from their mainstems is minimized and Table 4.24-4 does not list any downstream impacts from lost headwater production or other watershed impacts from the mine site. Especially in the NFK, the lost production from headwater streams covered by the TSF and the WMP could potentially have significant downstream impacts on rearing salmon, especially coho salmon fry emerging from spawning grounds immediately downstream of the WTP. These headwater tributaries contribute nutrients and macroinvertebrates directly to a mainstem reach documented as having the heaviest spawning by coho salmon in the NFK. Freshly emerging coho fry will depend on the nutrients and macroinvertebrates from these tributaries in the early critical stages of their life. Additionally, these tributaries likely provide refugia for rearing salmon during periods of high water in the mainstem and the loss of that refugia should be considered.	The EIS should consider the impacts of lost headwater function and an altered landscape, which will have cascading trophic impacts to downstream habitat. Downstream impacts from the lost production of headwater areas, altered landscape, changes to groundwater inflow, and other alterations in the watershed should be included with long-term, compounding impacts.
ADF&G/Habitat		Sec. 4.24	4.24-31 and other pages in this section	Sedimentation and turbidity impacts from the mine site are only considered during construction. Table 4.24-4 lists sedimentation and turbidity impacts from the mine site as temporary and only during construction. Even with BMPs and collection ponds in place, mine site facilities (including mine roads) will still produce sediment and increase turbidity in streams. Some mine facility roads are located downstream of the sediment collection ponds. All roads and landscape changes have some effect on streams. In Section 4.18 the DEIS concludes that APDES permit violations (including turbidity) are expected as part of normal operations. However, permit violations and WQC exceedances are not addressed as impacts to water quality or aquatic organisms. Turbidity impacts beyond construction are not considered.	The impacts from unplanned events and permit violations at the mine site like operational upsets, inadequate maintenance, breakdowns, unusual climatic conditions, improper BMPs, or human error, should be considered in the DEIS. These impacts will be present throughout the life of the mine and turbidity in streams should be expected through the operational phase and beyond (especially during decommissioning) of a large mine. No BMPs or operational controls are 100% all of the time yet the DEIS presumes that is the case. APDES permit violations and WQC exceedances during all phases of the project should be considered. Rates of exceedances from existing mines could be used as a guide.
ADF&G/Habitat		4.24.2.4 and 4.24.5	p. 4.24-18, Table 4.24-4, p. 4.32-32, and others	Table 4.24-4 has multiple discrepancies with what is stated in the related sections. For example, in the table, under Transportation Corridor, Stream Productivity, it is stated there will be <u>temporary</u> impacts to stream productivity during bridge and culvert installation, with no mention of impacts to stream productivity during operations or post-closure. In Section 4.24.2.4, Stream Productivity, Transportation Corridor, it is stated that impacts from the road could result in increased erosion and stream sedimentation altering productivity and road fill would impact riparian vegetation and floodplain connectivity reducing terrestrial inputs and downstream productivity. It further states that the duration of the impact would be for the life of the project (permanent).	The table and the text should agree with each other and the impacts on stream productivity from the construction and operation of the road corridor should be considered permanent.

Department/Division	Document Name	Section/Fig./Table	Page #	Comment/Issue	Recommendation/Action
ADF&G/Habitat		4.27.4.3	4.27-37	When discussing potential impacts from spilled concentrate, under Acid Generation, the DEIS states that 'concentrate released to the land could oxidize and produce sulfuric acid, however, acid generations will take years and generated acid will be diluted by precipitation and surface water recharge.' This statement is not referenced, and no evidence is provided that demonstrates the environment can dilute and eliminate the impacts from acid generation. In fact, multiple studies show the opposite, that long-term acid generation and release into the aquatic environment have detrimental effects on fish and aquatic organisms. Small increases in contaminants, sediment, and turbidity have resulted in decreases in salmon and macroinvertebrates (Maret et al., 2003).	The DEIS should describe the potential impacts from long-term releases of small amounts of acid and metals to the aquatic environment.
ADF&G/Habitat		Sec. 4.27.4.7	4.27-42, 4.27-49 and more	Impacts from concentrate spills to aquatic environments are not fully described. The DEIS acknowledges that most concentrate to streams will not be recovered. Concentrate spills are left to flush out of the system in these scenarios where they are assumed to deposit as deltaic deposits in Iliamna Lake. Large amounts of acid generating concentrate at the mouth of a stream could deter fish in the future from migrating into that stream. The lake experiences large fluctuations in water levels and these sediments will be exposed to the air annually, which could produce acid and increase metals potentially causing the stream to have a different smell unfamiliar to fish populations.	The DEIS should consider the potential impacts from PAG, metal-laden sediment at the delta (mouth) of tributary streams, that is annually exposed to open air, on migrating salmon populations.
ADF&G/Habitat		Sec. 4.27.4.7	4.27-47 and 4.27-55	Potential effects to fish from a concentrate spill into an enclosed waterbody are minimized and not fully described. The DEIS contends that impacts will be low magnitude, with temporary duration, and have no population-level impacts. Temporary is defined as recovery in days to weeks. The distance of downstream impacts from the truck concentrate spill are not described, but the pipeline concentrate scenario (which is a smaller spill by volume) states that elevated turbidity will extend several miles. A concentrate spill to waters containing salmon spawning habitat could have impacts for many years and could affect the salmon population of a given stream. The DEIS acknowledges that most concentrate to streams will not be recovered. Incubating eggs in gravels are very sensitive and sedimentation, pH changes, and metals could eliminate productive incubation and emergence for miles of spawning habitat. Attempting to remove this sediment will likely cause an equal degree of impacts. Macroinvertebrate populations could also experience large impacts.	The DEIS should fully describe the potential impacts from a concentrate spill into a waterbody, especially on fish. Suffocation by metal laden sediment of incubating eggs could have impacts lasting more than one year and could have population level impacts on a tributary stream, even if salmon production from spawning habitat were lost for only one year. Impacts should be anticipated to have a higher magnitude and duration and salmon populations could be impacted, especially in smaller tributaries.

Department/Division	Document Name	Section/Fig./Table	Page #	Comment/Issue	Recommendation/Action
ADF&G/Habitat		Sec. 4.27.4.7	4.27-47 and 4.27-55	Spill scenarios are contradictory to each other or assume best case scenario. In the concentrate spill from a tanker, the DEIS states that no measurable impacts would occur on fish and aquatic invertebrates, if spilled concentrate is promptly removed from the impacted waterbody. The scenario minimizes potential impacts to resources based on this assumption that the concentrate is removed. In the concentrate spill from a pipeline rupture the recovery of concentrate is considered difficult to impossible, because it would be difficult to determine which sediment is concentrate and which is natural; dredging may not be justified because it could be more damaging, and concentrate suspended in water would be impossible to recover.	The DEIS should be consistent with assumptions in spill scenarios and not minimize impacts with unrealistic spill response. One concentrate spill to water scenario assumes the concentrate would be recoverable and the other assumes recovery wouldn't be feasible and the concentrate would be left to naturally flush out of the system. Recovery of concentrate in streams will be difficult to impossible and if it covered spawning habitat could eliminate production from a tributary stream.
ADF&G/Habitat		Sec. 4.27.6	4.27-67	A large release of sediment laden water to a waterbody would erode streambanks, destroy riparian vegetation, and could cause channel evulsion. The effects from large, unplanned releases (e.g., pyritic tailings release) on stream productivity are minimized without consideration for long-term habitat losses from erosion and sedimentation. It could take decades for streambanks to stabilize and the impacts from chronic erosion and sedimentation will occur for tens of miles downstream. For the most part, the DEIS only considers localized and short-term impacts from a large-scale flooding event, such as an unplanned tailings release (with high sediment loads and increased erosive potential).	The DEIS should consider the long-term population and production impacts from chronic sedimentation due to destabilized banks caused by a large, unnatural flood event. Recovery could potentially take decades.
ADF&G/Habitat		4.27.6	4.27-68	The DEIS makes assumptions that downplay impacts, or assume no affect when potential impacts are uncertain. For example, the DEIS states that, ' <i>sub-lethal impacts (from a pyritic tailings release) on fish is <u>unknown</u>, especially because these sub-lethal impacts, would occur at the longer time frame beyond a week.</i> ' Further uncertainties (e.g., " <i>WQC exceedances for metals would be for an unknown length of time and an unknown distance</i> ") are listed. The DEIS then concludes that long-term persistent population-level impacts to fish would not occur. If long-term sub-lethal impacts to fish from chronic exposure to metals in the Kuktuli are unknown, how can the conclusion be reached that no population-level impacts would occur? Low-levels of cadmium can affect all life stages of salmon but emerging fry and developing eggs are especially sensitive.	The DEIS should objectively consider uncertainties from an unplanned release, for example, elevated levels of cadmium that could persist in stream sediments for decades and potentially affect stream productivity and salmon development and populations. Spill response usually does not go as planned and recovery objectives are rarely met.
ADF&G/Habitat		4.27.7	4.27-113	The TSF relies on an underdrain system to provide drainage paths for seepage flows and ultimately water treatment. The DEIS doe not fully consider the potential impacts from failures to this system which could cause contact water and TSF seepage to enter the aquatic environment.	The DEIS should consider potential impacts from a failure to the TSF basin underdrain system. Drainage systems are prone to failure which could cause the release of contaminated water to the environment. Drainage pipelines are susceptible to freezing, crushing, plugging, and breaks, causing overflow.

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ADF&G/Habitat		Sec. 3.27.7.9	4.27-123	The impacts from bioaccumulation of metals released to the environment is minimized and not completely described. Bioaccumulation is only considered under the contact water release scenario and only for mercury. Metal-laden sediments that are not recovered would persist for many years in the aquatic environment and be available for uptake for decades. Cadmium is acutely lethal to aquatic organisms (including salmon) and chronically detrimental, with very low concentrations reducing growth, metabolism, and development. It is an endocrine disruptor that can bioaccumulate with negative health effects on humans. The pyritic tailings release scenario describes cadmium levels exceeding water quality criteria all the way to the mouth of the Nushagak River. Emerging fry are especially sensitive to cadmium and a release in late spring/early summer could have population level impacts.	Bioaccumulation of metals should be considered under all scenarios, especially the bulk and pyritic tailings release scenarios. Bioaccumulation of metals other than mercury metals, especially cadmium, should be considered in the analysis. The potential impacts to aquatic organisms from acute and chronic exposure to elevated cadmium levels should be considered, including corollary human impacts such as the closure of fisheries and health effects of eating fish with bioaccumulated metals and long-term prey reductions from depressed macroinvertebrate populations.
ADF&G/Habitat		Appendix M		About 50 acres of riverine habitat will be impacted by fill placement. The DEIS does not describe mitigation to offset these impacts and a determination of the adequacy of mitigation could not be made. The DEIS states that overall, Chinook and coho spawning habitat would decrease throughout the NFK and SFK drainages.	The DEIS should list specific mitigation measures proposed to offset impacts. How will lost spawning habitat be mitigated?

References

Hughes, R. 1985. Use of watershed characteristics to select control streams for estimating effects of metal mining wastes on extensively disturbed streams. *Environmental Management* 9 (3): 253-262

Maret, T., D. Cain, D. MacCoy, and T. Short. 2003. Response of benthic invertebrate assemblages to metal exposure and bioaccumulation associated with hard-rock mining in northwestern streams, USA. *Journal of the North American Benthological Society* 22(4):598-620.

Weber-Scannell, P. K. 1991. Influence of Temperature on Freshwater Fishes: A Literature Review with Emphasis on Species in Alaska. Technical Report No. 91-1. Fairbanks: ADF&G, Division of Habitat. 47 pp.

Kuipers, J.R., Maest, A.S., MacHardy, K.A., and Lawson, G. 2006. Comparison of Predicted and Actual Water Quality at Hardrock Mines: The reliability of predictions in Environmental Impact Statements.

Skousen, J. G., and P.F. Ziemkiewicz (1996). "Acid Mine Drainage Control and Treatment." Second Edition. Morgantown, W.V., West Virginia University and the National Mine Land Reclamation Center.

**Pebble Project: DEIS Review
State of Alaska Consolidated Comments Table**

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ADF&G/Comm Fish/Bristol Bay	Alternatives	2.2.3.2	93	Where is the Pile Bay Ferry Terminal located in relation to the mouth of Iliamna River, Pile River, and Lonesome Bay Beach?	Describe the actual distance.
ADF&G/Comm Fish/Bristol Bay	Alternatives	2.2.2.6	80	Where is the East Kokhanok Ferry Terminal located in relation to the mouths of anadromous streams in Intricate Bay? On Figure 2-1 it appears to be less than 1 mile of Nick N. Creek.	Describe the actual distance.
ADF&G/Comm Fish/Bristol Bay	Alternatives	2.2.3 and Fig. K2-2a	2-92 and K2-16	How close is the Eagle Bay Ferry Terminal to Eagle Bay creeks and Eagle Bay Island? It should be noted that these are sockeye salmon spawning areas.	Describe the actual distance.
ADF&G/Comm. Fish/Homer	Chapter 3: Affected Environment	3.6.2	3.6-25	It is incorrect that the Kamishak fishery has been closed since 2013 – it was closed in 2013 and 2014 and then reopened in 2015; the fishery closed again in 2018 (there was no effort in 2017) due to low abundance and biomass.	For the most recent published information, please reference the 2018 Scallop SAFE Report: https://www.npfmc.org/safe-stock-assessment-and-fishery-evaluation-reports/ , Table 4-8.
ADF&G/Comm. Fish/Homer	Chapter 3: Affected Environment	3.6.2.3	3.6-24	There is no mention of the Tanner crab and red king crab fisheries that are located within this area.	Revise section to include additional fisheries and provide historical harvest levels and the potential to impact stocks that are currently closed to fishing, but could be opened in the future. See the following for additional information: Rumble, J., Wessel, M., Russ, E., Goldman, K. Gustafson, R. and Chris Russ, 2014. Cook Inlet and Prince William Sound Report for Tanner and King Crab fisheries through 2014, Fisheries Management Report No. 14-08. Alaska Department of Fish and Game.
ADF&G/Comm. Fish/Homer	Chapter 3: Affected Environment	3.24.1.2	3.24-26	There are many fish species missing from the section describing species found in the Cook Inlet Portion of the Natural Gas Pipeline Corridor. ADF&G and NMFS bottom trawl surveys have occurred within the affected area for decades and have documented many species than are mentioned	Update section with most comprehensive species accounts. See following comment regarding the need for baseline studies.
ADF&G/Comm. Fish/Homer	Chapter 3: Affected Environment	3.24.1.2	3.24-26	Species List is incomplete.	Provide a more comprehensive species list
ADF&G/Comm. Fish/Homer	Chapter 3: Affected Environment	3.24.1.2	3.24-26	Amakdedori Environmental Studies lack enough detail at this point to analyze for biological impact.	Evidence needs to be provided that the results of the Amakdedori Environmental Baseline Studies are biologically and statistically meaningful.
ADF&G/Comm. Fish/Homer	Chapter 3: Affected Environment	3.24.1.2	3.24-27	Results from the Pacific herring spawn deposition study needs more data than just what was conducted in 2018. For a comprehensive understanding of the biomass include more ADF&G historical data for quantifying herring spawn.	Rewrite section and include historical herring spawn data.
ADF&G/Comm. Fish/Homer	Chapter 3: Affected Environment	3.24.1.4	3.24-33	The Fish Tissue Trace Element Analysis appears incomplete. There are no sample sizes presented and no variance estimates. There were very few sampling sites for these studies and there were no control sites.	More sampling should be done to develop a fish tissue contaminant baseline. Broader spatial coverage within and outside of the affected area, control sites, and replicate sampling all need to be completed. Additionally, more fish species need to be included especially those that are consumed by humans. Consideration should be given to where fish feed at different trophic levels to address bioaccumulation.

Department/Division/Section	Document Name	Section/Fig./Table	Page #	Comment/Issue	Recommendation/Action
ADF&G/Comm. Fish/Homer	Chapter 3: Affected Environment	3.24.1.4	3.24-33	There was no fish tissue trace element sampling for the Alternative 1 Transportation Corridor.	Baseline fish tissue trace element studies should be completed for Alternative 1 Transportation Corridor following suggestions above.
ADF&G/Comm. Fish/Homer	Chapter 3: Affected Environment	3.24.2	3.24-34	There was no fish tissue trace element sampling for the Alternatives 2 and 3 Transportation Corridor.	Baseline fish tissue trace element studies should be completed for Alternatives 2 and 3 Transportation Corridor following suggestions above.
ADF&G/Comm. Fish/Homer	Chapter 3: Affected Environment	3.24.2	3.24-34	There was no fish tissue trace element sampling for resident freshwater and anadromous fish in the freshwaters or in marine waters for the Diamond Point port in Alternatives 2 and 3.	Baseline fish tissue trace element studies should be completed for Alternatives 2 and 3 Diamond Point port following suggestions above.
ADF&G/Comm. Fish/Homer	Chapter 4: Environmental Consequences	4.6	4.6-2	Other real potential changes to productivity would include heavy metal contamination of water bodies. Copper contamination may reduce homing ability and thus salmon's ability to make it to spawning grounds. Tissue contamination (fish and invertebrates like weathervane scallops) may exceed safe human consumption levels and thus reduce the sale of product.	Include heavy metal contamination as a source of loss of productivity and tissue contamination as a reduction in marketability
ADF&G/Comm. Fish/Homer	Chapter 4: Environmental Consequences	4.6	4.6-2	Need to consider Tanner and red king crab fisheries in Kamishak Bay. There will potentially be some level of direct mortality to Tanner crab, and other commercial and non-commercial fauna from the burial of the gas pipeline. Though Tanner crab fisheries are currently closed due to low stock abundance, the likelihood this will reopen is great given the proposed longevity of the project.	Reword ((e.g., the Kamishak Bay scallop beds or the recovery of Pacific herring and Tanner and red king crab populations).
ADF&G/Comm. Fish/Homer	Chapter 4: Environmental Consequences	4.6.6	4.6-16	It is suggested that fishermen and all the businesses that support them, can just move to other areas and " <i>select substitute experiences</i> ". If the Pebble development forces them to move to another area, and then the other exploration and development projects that are listed in the RFFAs do the same, the options for fishing get more and more reduced and the "takings" becomes much larger.	The reduction in fishing opportunities needs to be quantified in this section.
ADF&G/Comm. Fish/Homer	Chapter 4: Environmental Consequences	4.6.5	Table 4.6-1	The following comments were not addressed in the agency review. Table 4.6.1 includes references to impacts to commercial fisheries that could be associated with various project components. The Pipeline route section of the table suggests there will be no conflicts with commercial fisheries, regardless of the route selected, because the salmon fishery occurs in the top 30 feet of the water column. That may be true for drift gillnet gear in UCI, but not seine gear in LCI, which can contact the bottom in depths <95'. It also states that on-bottom groundfish fisheries (e.g., longline, pot) can avoid conflicts by not setting gear near the pipeline. However, the applicant has not conducted baseline studies to characterize the shellfish/groundfish resources that are present along the proposed gas line route(s). It is therefore difficult to effectively judge the potential impact to these resources or the users who target them.	Include potential impacts to the purse seine (salmon and herring) fisheries in Lower Cook Inlet that may occur from the pipeline. Recommend applicant include baseline studies necessary to characterize shellfish/groundfish resources along the pipeline routes so agencies can effectively evaluate potential impacts to those resources or users. Specify why LCI commercial fisheries in the Amakdedori area, as well as Iliamna and Iniskin bays will not be impacted if this project is developed.

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ADF&G/Comm. Fish/Homer	Chapter 4: Environmental Consequences	4.24.2.1	4.24-3	There is no baseline data for the natural gas pipeline route.	Baseline studies to characterize habitats and marine fauna along the proposed or alternate Natural Gas pipeline corridors should be completed and provided for review before conclusions about potential impacts can be made.
ADF&G/Comm. Fish/Homer	Chapter 4: Environmental Consequences	4.24.2.2	4.24-3-6	There is no consideration for how potential gas leaks pertaining to the gas pipeline across Cook Inlet and Iliamna Lake would impact fish populations.	Additional baseline environmental studies associated with the gas pipeline portion of this project should be conducted or included. This is not addressed the section 4.27, Spill Risk.
ADF&G/Comm. Fish/Homer	Chapter 4: Environmental Consequences	4.24.3.2	4.24-29	Fish Migration. The proposed dock would extend out into Iliamna Bay and Cottonwood Bay. Construction (e.g. sheet pile driving) could disrupt the migration of returning salmon.	Construction timing should consider adult salmon migration timing.
ADF&G/Comm. Fish/Homer	Chapter 4: Environmental Consequences	4.24.6	4.24-37	In the Cumulative Effects section, the RFFA's that are considered for exploration and development under the DEIS are examined. Under the Alternative 1, the Pebble Mine Expanded Development Scenario is discussed. The stated potential impacts and habitat losses would be significantly larger. Of particular concern for Kamishak Bay would be in addition to the Amakdedori Port there would be an Iniskin Bay Port (presumably Diamond Point) and the associated infrastructure associated with the transportation corridors including concentrate and diesel fuel pipelines. There would be construction and operation of a deep-water port in Iniskin Bay which would involve extensive dredging and impacts to local aquatic resources.	Consideration of the cumulative effects by inclusion of the RFFA's is recommended. USACE should consider the proposed additions to PLP's development when including the mine buildout in it's review of the DEIS. By inclusion, the DEIS should estimate effects (e.g. habitat loss, loss in fish productivity, risk, etc.).
ADF&G/Comm Fish/Bristol Bay	Spill Risk	4.27	31-32	Two questions regarding Iliamna Lake Ferry Release. 1) What kind of spill response can be expected if the lake is ice covered? 2) Does or will Chadux oil response group have resources for oil response located on Iliamna Lake?	Incorporate more detail in the DEIS regarding a spill response effort in Iliamna Lake, particularly in winter when ice covered or when rotten ice present.
ADF&G/Comm Fish/Bristol Bay	Spill Risk	4.27	36	What are in-water recovery efforts?	Provide more detail in the DEIS regarding in-water recover efforts that can be expected.
ADF&G/Comm. Fish/Homer	Chapter 4: Environmental Consequences	4.27.4.6	4.27-40	While PLP proposes mitigation measure to reduce the likelihood of the release of fugitive dust during the emptying of container into the bulk carrier hold (PLP 2018-RFI 045; PLP 2018c), there was no modeling was done for this. It would be beneficial for PLP to acquire the necessary meteorological data to be able to model the effects of fugitive dust releases during the lightering operations. The cumulative impact of even frequent "minor" dust spills during loading operations at lightering sites could be harmful to the marine environment.	Recommend that the applicant collect necessary baseline data weather data including wind speed, temperature, sea state and atmospheric pressure, for the proposed Amakdedori Port and lightering locations. Develop mitigation metrics base on these data to minimize the release of fugitive dust.
ADF&G/Comm Fish/Bristol Bay	Spill Risk	4.27	43 and 47	Likelihood of a spill from a truck is high (1 every 2.5 years), spill response in flowing waters is "impossible/impractical" and "No measurable impacts via metals toxicity would occur on fish and aquatic invertebrates, if spilled concentrate is promptly removed from the impacted waterbody."	Reconcile these contradictory statements in the DEIS. The high likelihood of a spill combined with the difficulty with cleanup, doesn't seem to support the conclusion in the DEIS that there would be no measurable impacts.

Department/Division/Section	Document Name	Section/Fig./Table	Page #	Comment/Issue	Recommendation/Action
ADF&G/Comm Fish/Bristol Bay	Spill Risk	4.27	47	This scenario assumes that spilled concentrate would be promptly removed and that the waterbody would have sufficient volume to flush the system. It also does not provide references or support on metal toxicity, acid generation rates, or the water volume needed to dilute 80,000 pound of copper-gold concentrate.	Provide analysis of the scenario if concentrate is spilled into a smaller flowing stream and the concentrate is not removed because it would be impossible or impractical. Provide references or descriptions on metal toxicity, acid generation rates, and the volume of water needed to dilute to levels that are non-toxic for fish and aquatic organisms.
ADF&G/Comm Fish/Bristol Bay	Spill Risk	4.27	49	"Depending on the timing and magnitude of a rollover and spill event, the event could result in the smothering of salmon eggs and reduced feeding success within a limited geographic area. Because salmon impacts are anticipated to be of low magnitude, in a localized area, and of a limited duration with no population-level impacts, the study expects similarly limited effects on commercial salmon harvest values."	This document downplays the risk to salmon from a spill event in multiple places. It is recognized that recovery of concentrate from flowing waters is "impossible/impractical", however, the analysis continually assumes that the concentrate would be quickly contained and therefore concludes that there would be "no population level impacts." Based on the lack of description for recovery of concentrates from flowing water, it seems that if a truck rolled over into a creek and spilled 80,000 pound of concentrate (e.g. the upstream crossing on Upper Talarik Creek) then there would be a population level impact on the Upper Talarik Creek population due to the processes already described (e.g. smothered eggs). Provide analysis of impacts based on realistic expectations of cleanup success for a worst case scenario so that the full range of risks to resources can be evaluated.
ADF&G/Comm Fish/Bristol Bay	Spill Risk	4.27	56	"Any reduction in the value of the fishery is expected to be extremely limited under this scenario, given the presumption of cleanup or spill incorporation into the bedload."	This scenario assumes that there would not be successful cleanup as described on page 51. The impacts should not be evaluated based on the "presumption of cleanup" because that is not the scenario being analyzed. This same comment applies to the Commercial and Recreational Fishing section and the Subsistence section.
ADF&G/Comm Fish/Bristol Bay	Spill Risk	4.27	109	"Therefore, long-term persistent population level impacts to fish would not occur."	This section describes many ways in which this scenario would impact fish and aquatic invertebrates and acknowledges that population level impacts are uncertain, then makes definitive statement that long term impact would not occur. This statement is unsupported by the presented information. Impacts to fish and aquatic invertebrates from TSS, which would range from 470 to 12,000 times of the maximum WQC of 20 mg/L for a distance of 230 miles, are ignored in this analysis. While the impacts are uncertain the potential for population level impacts are likely high in this scenario and could negatively impact salmon production for many years.
ADF&G/Comm Fish/Bristol Bay	Spill Risk	4.27	111	"Under this scenario, the productivity of the Nushagak, Wood, Snake, and Nuyakuk rivers would not be affected."	Delete Nushagak from this sentence. The analysis does not demonstrate that the Nushagak River salmon production would not be impacted.

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ADF&G/Comm. Fish/Homer	Chapter 5: Mitigation	Table 5.2	5-8	Given that even small quantities of copper can have adverse effects on homing salmon, a more complete analysis of the possible quantities and spatial extent of fugitive dust (especially quantifying copper) over the watershed and marine waters of Kamishak Bay under normal operations and from accidental releases is recommended.	A Fugitive Dust Control Pane needs be included in the DEIS.
ADF&G/Comm. Fish/Homer	Chapter 5: Mitigation	Table 5.2	5-9	PLP's proposed mitigation plan states that "The project would propose fish habitat mitigation measures to enhance or create new habitat outside of the immediate project footprint." PLP acknowledges that there will be direct loss of habitat in the headwaters of the mine site (section 4-24), though the acreage and miles of stream do not include losses due to spills, failures, cumulative impacts, or those from RFFAs (see above comments). PLP proposed offsite compensatory mitigation since the habitat losses due to the project will be larger than that available for restoration, enhancement, and preservation within the watershed (page 5-25). All salmon rivers and streams have a carrying capacity limited by among other factors the amount of spawning and/or rearing habitat. Loss of spawning or rearing habitat therefore reduces carrying capacity. Salmon have evolved over thousands of years in the Bristol Bay watershed to take advantage of a range freshwater habitat and in doing so retain high levels of within stock genetic diversity. Headwater streams such as those within the mine site make the majority of the cumulative stream length. Salmon returning to these streams are an essential component of the genetic portfolio of the larger salmon populations. Offsite mitigation fails to replace the loss of genetic diversity to salmon stocks from the loss of habitat.	Require that compensatory mitigation occur within the affected area and not the more broadly defined watershed areas as proposed by PLP (i.e.: HUC 8, HUC 6, and HUC 4)

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ADF&G- Sport Fish	Pebble DEIS	General Comment	General Comment	There are numerous minor issues regarding how sport fish and sport fisheries have been handled throughout the Pebble DEIS. The significance of the sport fisheries in the area, particularly in the Nushagak River and Lower Talarik Creek, has not been made particularly clear. Although, these drainages are not within the mine footprint, there is potential for both drainages to be impacted by the proposed mine. The Nushagak River supports one of the largest and most consistent Chinook salmon runs in the state and a large associated sport fishery. Additionally, although overall sport fishing effort in Lower Talarik Creek is comparatively low, it is a very well-known and renowned rainbow trout sport fishery, as evidenced by the successful effort to create the Lower Talarik Creek Special Use Area. Finally, the Pebble DEIS should clearly state that Bristol Bay salmon and resident species populations are currently comprised entirely of wild fish (i.e. no stocking or enhancement).	
ADF&G - Sport Fish	Chapter 3 Affected Environment	Sec 3.5	3.5-4	Lack of background on why and how the Lower Talarik Creek Special Use Area was created.	Add background as it will be informative and should be included in the Final EIS.
ADF&G - Sport Fish	Chapter 3 Affected Environment	Sec 3.5	3.5-7	Lower Talarik Creek and Kaktuli River should be included on the list of rivers that support sport fishing, as they may also be impacted by the proposed mine.	Add Lower Talarik Creek and Kaktuli River to the list.
ADF&G - Sport Fish	Chapter 3 Affected Environment	Sec 3.5	3.5-8	A permit system is not used for guides - it is a registration.	Change permit to registration.
ADF&G - Sport Fish	Chapter 3 Affected Environment	Sec 3.5	3.5-8	Not sure why the Newhalen is singled out for a description of effort. Additionally, while effort has decreased most years from historical numbers, it has recently been relatively stable with some higher effort years mixed in - effort in the Newhalen is heavily based on run strength and can be variable.	Consider deleting.
ADF&G - Sport Fish	Chapter 3 Affected Environment	Sec 3.5	3.5-11	There are also "clusters" of lodges in the Wood River and Tikchik lake systems.	Add Wood River and Tikchik lake systems.
ADF&G - Sport Fish	Chapter 3 Affected Environment	Sec 3.24/Table 3.24-4	3.24-19	Adult migration for Chinook salmon should include June.	Add June to Chinook adult migration in periodicity table.
ADF&G - Sport Fish	Chapter 3 Affected Environment	Sec 3.24/Table 3.24-4	3.24-20	Spawning for Dolly Varden should include October.	Add October to Dolly Varden spawning in periodicity table.
ADF&G - Sport Fish	Chapter 3 Affected Environment	Sec 3.6	3.26-28	Mulchatna River is in Area T (not S as stated in document).	Change to Area T.

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ADF&G - Sport Fish	Chapter 3 Affected Environment	Sec 3.6	3.26-28	It seems a summary of Nushagak effort would be appropriate in the text of the area T description.	Add Nushagak effort summary.
ADF&G - Sport Fish	Chapter 3 Affected Environment	Sec 3.6	3.26-29	The Nushagak River should be included as a water body in the Statewide Harvest Survey that could be impacted.	Add Nushagak River to list.
ADF&G- Sport Fish/ISFP	Pebble DEIS	General Comment	General Comment	The Pebble Project Environmental Baseline Document 2004 through 2008 referenced in the DEIS describes that instream flow habitat studies were completed using the Instream Flow Incremental Methodology (IFIM). The underpinning philosophy of the IFIM process dictates stakeholder engagement and incremental problem solving which would indicate technical working groups. Although an instream flow technical working group was initiated by PLP in 2008 -2009 , the working groups were disbanded prior to completion of the effort. Therefore, key elements of agency consultation were limited or did not occur. This included study design formulation and modification, transect selection/placement and weighting criteria, habitat suitability criteria development, data aggregation, and model calibration/simulations. In addition, due to the dissolution of the technical working group process, dialogue between agencies and consultants did not occur as would be expect on a large development project.	
ADF&G- Sport Fish/ISFP	Pebble DEIS	General Comment	General Comment	Pebble Project Instream Flow Technical Report 2018 Instream Flow Studies in the Upper North Fork Kaktuli River April 11, 2019 is not included or referenced in the Pebble DEIS, however it was cited in the USACE's response to the last round of cooperating agency comments. The study plan was not developed under guidance or review of ADF&G. We were unaware that field data collection occurred in 2018 and received the study results late in our review. There was a limited description of why only two field visits were chosen, which occurred during similar flow levels so that only one data calibration point is available for analysis of study results. In this report Habitat Suitability Curves (HSCs) are only provided in table format which is not suitable for agency interpretation. HSCs should also be provided in graphical format.	
ADF&G- Sport Fish/ISFP	Pebble DEIS	General Comment	General Comment	Technical Memorandum Streamflow Change Resulting from Development of Proposed Pebble Mine by Arctic Hydrologic Consultants should be summarized or referenced in the DEIS. This technical memorandum, which is on the USACE's Pebble Project website, contains a valuable detailed summary of the magnitude of change in streamflow that are not included in the DEIS.	Please summarize and reference the Technical Memorandum Streamflow Change Resulting from Development of Proposed Pebble Mine by Arctic Hydrologic Consultants in the FEIS.

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ADF&G- Sport Fish/ISFP	Pebble DEIS	General Comment	General Comment	Streams in the project area and off channel habitats are important fish habitat that should to be maintained, avoiding adverse flow conditions (e.g. extreme high or low flows). It is unclear how discharges in receiving water bodies will be monitored to ensure compliance with permitting requirements. Section 4.24-12 describes "Treated water in excess of process requirements will be released to the environment at three points downstream of the mine footprint, one each in the NFK River, SFK River, and UT Creek watersheds". Among other inflow impact issues, ADF&G is concerned that surplus flows released during traditionally naturally low flow periods (e.g. winter months) will disrupt ecological processes downstream of the mine site. Additionally, more work is needed to determine if multiple discharge points are needed, as one discharge point may be preferable.	
ADF&G- Sport Fish/ISFP	Pebble DEIS	General Comment	General Comment	Overall, it appears most elements of an instream flow assessment were completed, except for the following items: <ul style="list-style-type: none"> • Better description of habitat suitability criteria development and selections. The descriptions were limited, and we could not find graphs of the selected criteria • We could not find any information on an effective spawning habitat analysis; and • The methods used to aggregate study results from three different watersheds and study efforts was difficult to follow and comprehend. 	
ADF&G- Sport Fish/ISFP	Chapter 3 Affected Environment	Sec. 3.16	3.16-9	Figure 3.16-2 does not "depict all gaging station locations in the three watersheds" as stated in text. This was also pointed out during the last CA review.	Replace with correct figure reference (Figure 3.16-4)
ADF&G- Sport Fish/ISFP	Chapter 3 Affected Environment	Sec. 3.16	3.16-9	Figure 3.16-3 does not "provide a focused view of gaging station with regard to the mine site" as stated in text. This was also pointed out during the last CA review.	Replace with correct figure reference (Figure 3.16-5)

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ADFG/DWC/Region IV	Chapter 3 Affected Environment	3.24	14 - 18	Suggest, "It is our concern that the bears that use the sanctuary that we manage for viewing at McNeil may leave and return with altered behavioral patterns.	We recommend the DEIS disclose these data limitations and consider additional ways to evaluate the potential impacts to caribou from the proposed project. The limitations of the data need to be clearly recognized and not interpreted or extrapolated beyond what the data was collected and intended for.
ADFG/DWC/Region IV	Chapter 3 Affected Environment	3.24-14	14	The most recent population estimate for the Mulchatna herd is incorrectly reported as 26,275 (2014).	Population estimate should be 27,242 (2016)
ADFG/DWC/Region IV	Chapter 3 Affected Environment	3.23-15 & Figure 3.23-5	15	Mulchatna caribou herd seasonal range maps depicts density of caribou in calving areas based on 29 years of telemetry data that is being interpreted out of context and doesn't note the limitations of the data.	This figure is important and should better reflect the limited nature of the telemetry data that was used to depict the calving areas.
ADFG/DWC/Region IV	Chapter 3 Affected Environment	3.24-15	15	The word "majority" is used in several locations in the DEIS, and in the context of being dismissive regarding the importance of the mine site to caribou. "Currently the mine does not appear to be used by the majority of the Mulchatna herd for calving"....	Word choice is misleading and should be changed. The use of majority here seems to be an arbitrary benchmark suggesting to the reader that less than the majority equates to lower importance of the mine site to caribou. Rangeland and calving habitat impacts at the mine site and other affected areas need to be analyzed based on the value of the range and possible use of that range in the future.
ADFG/DWC/Region IV	Chapter 3 Affected Environment	3.23-15 & Figure 3.23-7	15, 18	On page 3.23-15, middle paragraph, last sentence, references figure 3.23-7 that depicts density of caribou in calving areas based on radio telemetry data...again, this figure is important. The radio collar data that has been collected from Mulchatna caribou studies was not based on studies that expressly looked at habitat use, and specifically habitat use of the Pebble mine site. Rather the purpose of most of the radio collaring efforts was to have focal animals on the air, that we could then use to locate caribou during survey and inventory studies (i.e. photo census, captures, parturition surveys, and fall composition surveys).	This figure is important and should better reflect the limited nature of the telemetry data that was used to depict the calving areas. Inadequately addressed from previous comment period; Should have to footnote their range maps or at least incorporate a section within the document that explicitly deals with this data limitation issue rather than just a subtle sentence that many people would not even see or realize the implications.
ADFG/DWC/Region IV	Chapter 4 Environmental Consequences	4.23	7	29 years of telemetry data that suggests caribou use of the Pebble area is limited during calving etc. and their range maps for calving etc. without ever again mentioning the potential bias of the collars representing these core groups which are not likely representative of the range of the herd as a whole or when population is at higher levels and expands range.	The radio collar data that has been collected from Mulchatna caribou studies was not based on studies that expressly looked at habitat use, and specifically habitat use of the Pebble mine site. Rather the purpose of most of the radio collaring efforts was to have focal animals on the air, that we could then use to locate caribou during survey and inventory studies (i.e. photo census, captures, parturition surveys, and fall composition surveys). This issue was inadequately addressed since the previous comment period. Limitations of the data need to be more clearly presented and explained so as not to mislead the reader.
ADFG/DWC/Region IV	Chapter 3 Affected Environment	Figure 3.23.5 & 3.23	16, 31	These figures show the seasonal range maps of the Mulchatna herd, that are based on the radio telemetry data but the data is being interpreted out of context.	These are important figures that should be qualified by a footnote or some reference to inform the reader of the limited scope of the telemetry data.

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ADFG/DWC/Region IV	Chapter 3 Affected Environment	3.23	15	The radio collar data that has been collected from Mulchatna caribou studies was not based on studies that expressly looked at habitat use, let alone habitat use of the Pebble mine site. Rather the purpose of most of the radio collaring efforts was to have focal animals on the air, that we could then use to locate caribou during survey and inventory studies (i.e., photo census, captures, parturition surveys, and fall composition surveys).	Identify and qualify the limitations of the data and do not extrapolate beyond how the data was intended to be used
ADFG/DWC/Region IV	Chapter 4 Environmental Consequences	4.23	16	Another reference to 29 years of telemetry data that should be qualified	Identify and qualify the limitations of the data and do not extrapolate beyond how the data was intended to be used
ADFG/DWC/Region IV	Chapter 4 Environmental Consequences	4.23-23 Caribou	23	There is acknowledgement in this section that caribou may shift back to the mine site at some period in the future. This appears to be in response to our previous comment where we pointed this out. However, it is a very subtle mention, and should probably occur early on in the document. This is very similar to the telemetry data issue and fails to recognize that caribou are highly mobile and their range changes with density of animals, snow pack, forage availability, etc. For example the main calving areas has changed dramatically in the last five years and historical data that shows how the range of the Mulchatna herd has changed over time, so emphasizing the nature of caribou herds should be more pronounced in this document.	This should be clarified perhaps in its own paragraph early on in this document. Suggest on page 3.24-14 that caribou may shift back to the mine site at some period in the future to due a number of reasons stated.
ADFG/DWC/Region IV	Chapter 4 Environmental Consequences	4.23	23	Although the mine site does not appear to be used for calving currently...not sure in this case if the data being used is the telemetry data or ABR surveys	Please clarify data source.
ADFG/DWC/Region IV	Chapter 2 Alternatives	2.2.3.2 Transportation Corridor	2-96	Material sites (up to 422 acres) could represent a substantial loss of wildlife habitat if not reclaimed appropriately.	If Material Sites are established by excavating the sides of hills, we recommend a natural contour be established rather than a high wall on one or more sides. If these sites are more like dug pits that are expected to fill with water, we recommend they be contoured to form emergent wetlands along the edges rather than deep steep sided pits.
ADFG/DWC/Region IV	Chapter 2 Alternatives	2.2.4.2 Transportation Corridor	2-111	Material sites (up to 717 acres) could represent a substantial loss of wildlife habitat if not reclaimed appropriately.	If Material Sites are established by excavating the sides of hills, we recommend a natural contour be established rather than a high wall on one or more sides. If these sites are more like dug pits that are expected to fill with water, we recommend they be contoured to form emergent wetlands along the edges rather than deep steep sided pits.

Department/Division	Document Name	Section/Fig./Table	Page #	Comment/Issue	Recommendation/Action
ADFG/DWC/Region IV	Chapter 3 Affected Environment	Figure 3.23-8	20	The den survey was flown in conditions of no snow or mottled snow. Bear dens are quite difficult to detect without snow and tracks (which can point the way to den sites), even from a helicopter. The 35 dens observed on the 50 km road corridor from Iliamna Lake to the coast represents a minimum number and does not adequately represent the higher density of dens in areas of steep terrain and higher elevation.	Acknowledge that due to poor timing and difficult sightability during this survey(s), the resulting estimate is conservative and should be seen as a minimum. This is used as a model input and has limitations.
ADFG/DWC/Region IV	Chapter 3 Affected Environment	3.23/4.23		Information on brown bear occupancy, abundance, denning and movement is very limited and likely inadequate to assess conservation concerns for brown bears.	Recognize the limitations of the data and don't interpret or extrapolate beyond what it says.
ADFG/DWC/Region IV	Chapter 3 Affected Environment	3.23/4.23		Concerned with impacts to denning areas, disturbance and other road impacts (e.g. roadkilled bears, susceptibility, impeded movements) that would occur outside the sanctuary.	Densities of bear dens in this area is high and proposed road is in close proximity to refuge. Can existing roads be used?
ADFG/DWC/Region IV				Providing access to locals only for hunting and fishing along the road corridor was stated as a means to limit activity, but how would that be enforced? How will residents identify themselves as local?	Clarify how local access is going to be enforced and who is going to enforce.
ADFG/DWC/Region IV	Chapter 3 Affected Environment	3.3		While recreational hunting and fishing were addressed, the guiding and lodging industries were largely ignored. Transportation corridors and ferry terminals will permanently end pristine hunting and fishing opportunities for guides within sight or hearing distance of the developments.	Suggest performing additional analysis on the impact to guiding and lodging.
ADFG/DWC/Region IV	Chapter 3 Affected Environment	3.23-52	52	States caribou "rarely" occur along the northern shore of Iliamna Lake. This data has limitations in describing the range of MCH because radio collars invariably are put out near the core of the groups year after year. Thus, the collars track these core groups and are not likely representative of the range of the herd as a whole or when population is at higher levels and expands range. The radio collar data that has been collected from Mulchatna caribou studies was not based on studies that expressly looked at habitat use, let alone habitat use of the Pebble mine site. Rather the purpose of most of the radio collaring efforts was to have focal animals on the air, that we could then use to locate caribou during survey and inventory studies (i.e. photo census, captures, parturition surveys, and fall composition surveys).	The use of this data should be qualified and data limitations clearly stated.
ADFG/DWC/Region IV	Chapter 4 Environmental Consequences	4.23-16	16	Another reference to 29 years of data that should be qualified.	The use of this data should be qualified recognizing the limitations.
ADFG/DWC/Region IV	Chapter 3 Affected Environment	Figure 3.23-6	6	Confusion over map and legend; not sure the legend is correct. Some polygons appear to represent groups of caribou of 70-100K, and 30-70K?	Verify and clarify that the legend and polygons are correct.

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ADFG/DWC/TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values		The DEIS does not adequately address what measures will be used to minimize potential impacts to raptors.	Recommendations for how to avoid disturbing raptor nests should be followed, and species-specific buffer zones and temporal restrictions should be established based on empirical research (e.g. Richardson and Miller 1997).
ADFG/DWC/TED	Chapter 4 Environmental Consequences	Section 4.12 Transportation and Navigation		The DEIS does not adequately address what measures will be used to minimize vehicular collisions with wildlife.	Include measures to minimize vehicular collisions with wildlife on proposed roads and better describe measures to minimize access to anthropogenic food sources for all wildlife.
ADFG/DWC/TED	Chapter 4 Environmental Consequences	Section 4.23.2.1 Birds/Section 3.23		<p>Marine birds- Lower Cook Inlet has multiple important Bird Areas (IBA's) that support large numbers of breeding seabirds, including three species of cormorant, Common Murres, Pigeon Guillemots, Glaucous-winged Gulls, Tufted Puffins, Horned Puffins. The two puffin species are currently in decline and are SGCN in the state of Alaska (ADFG 2015, Warnock 2017). The inlet also provides year-round habitat for murrelets, hosting 4% of the world's population of Marbled Murrelets and 5-9% of Kittlitz's Murrelets. Marbled and Kittlitz's Murrelets are also SGCN and populations have recently stabilized from historical declines (Warnock 2017). Historical surveys indicate that in addition to the above-mentioned birds, Common Murres, Black-legged Kittiwakes, Red-necked Phalaropes, and Sooty Shearwaters use marine habitats at the proposed port site (Alternative 1 – Kamishak Bay) and pipeline corridor. Marine birds may be directly affected by construction and operation activities at the port and gas pipeline corridor via disturbance by vessels, habitat loss, and collisions with vessels. During summer pipeline construction, birds may be displaced from their foraging grounds by vessel traffic, causing evasive flight behavior and increased energy expenditure (Schwemmer et al. 2007, Agness et al. 2013). Low-flying aircraft supporting construction activities at the port (5-10 flights per week) pose an additional threat; flight paths will be positioned over the water and therefore may result in collisions and/or scattering of seabirds using nearshore waters. Additional mortalities may occur if migrating seabirds collide with lights, powerlines, and other structures associated with the port. The presence of diesel fuel barges traversing lower Cook Inlet increases the risk of a spill into the marine environment. Such a spill could harm seabirds through the ingestion of toxic oil, oiling of feathers causing reduced thermoregulation and locomotion, and contamination of the prey base.</p>	<p>Despite the known importance of the area to seabirds and recent surveys of the proposed area by ABR, the DEIS does not provide adequate detail on the birds that were detected during these surveys. A table showing how many individuals of each species were detected during 2018 surveys would be helpful. Furthermore, Figure 3.23-10 should be updated to better depict breeding colonies and bird densities. Iliamna Bay (Alternatives 2/3) and the adjacent Iniskin Bay host the highest densities of wintering birds in western Cook Inlet. Iliamna Bay is particularly important for over-wintering seabirds; tens of thousands of Surf and White-winged Scoters use the bay each fall. The bay also hosts several seabird nesting colonies including Common Eiders, Double-crested Cormorants, Pelagic Cormorants, Black Oystercatchers, Glaucous-winged Gulls, Pigeon Guillemots, Horned Puffins, and Tufted Puffins. Additionally, measures to avoid or minimize the above mentioned threats should be included in the DEIS.</p>

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ADFG/DWC/Region II	Executive Summary	Section 3 Affected Environment	All	This section is currently missing any review of impacts to wildlife.	Identify how each alternative will impact wildlife resources. For example, all alternatives that propose the north road option and eliminate the South Ferry Terminal/ Amakdedori Port/ road will have a lower impact on brown bears as roads will be removed from known denning areas and travel corridors to McNeil State Game Refuge and Katmai National Park and Preserve, 2) alternatives that increase road traffic rates are likely to increase roadkill levels of terrestrial wildlife, 3)alternatives that eliminate the South Ferry Terminal/Amakdedori Port/road will reduce the chance of food conditioned bears showing up at the adjacent bear viewing areas and causing human wildlife conflicts.
ADFG/DWC/Region II	Executive Summary	Section 2	Pg. 8.	There is currently no discussion in the document about landfill construction requirements and methods that will be used to minimize wildlife conflicts. The document currently states "A landfill and incinerator would be constructed and operated at the mine site for domestic waste handling".	Include methods to minimize wildlife conflicts during construction.
				<p>The Pebble Mine site currently supports high densities of nesting raptors due to structural features providing nest sites and abundant prey resources. Raptor species detected at the 2004-2005 mine survey area (mine site and surrounding area, 246-293 km²) and transportation corridor (4.8 km buffer around proposed road) include several species of greatest conservation need (SGCN) listed in Alaska's Wildlife Action Plan including Golden Eagles, Bald Eagles, Rough-legged Hawks, Peregrine Falcons, Gyrfalcons, Northern Harriers, and Short-eared Owls (ADFG 2015). The mine is likely to impact raptors through a number of different pathways including disturbance, habitat loss, vehicle collisions, reduced prey abundance, and anthropogenic food subsidies resulting in increased numbers of competitors such as red foxes. The response of the raptor community to disturbance is likely to vary by species. For example, Rough-legged Hawks are very sensitive and will flush in response to human presence at great distances (T. Booms, personal communication). Repeated disturbance of sensitive raptor species may result in nest abandonment. Adjacent territories are likely saturated and opportunities for displaced raptors to find unoccupied territories would be minimal.</p>	Recommendations for how to avoid disturbing raptor nests should be followed, and species-specific buffer zones and temporal restrictions should be established based on empirical research (e.g. Richardson and Miller 1997).

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				<p>Surveys of shorebirds during migration were not conducted for the DEIS, so the abundance and species composition of shorebirds using intertidal areas of Kamishak and Iliamna Bays is unknown. A total of 28 landbird and 14 shorebird species were detected at the Pebble Mine site, many of which are SGCN (e.g. Gray-cheeked Thrush, Blackpoll Warbler, American Golden-Plover, Whimbrel, Hudsonian Godwit, Surf-bird, and Short-billed Dowitcher). Additional SGCN detected in the transportation corridor include the Olive-sided Flycatcher, Black-backed Woodpecker, Varied Thrush, Rusty Blackbird, and Solitary Sandpiper. Olive-sided Flycatchers, Blackpoll Warblers, and Rusty Blackbirds have been in steep decline across their range and the mine and associated transportation corridors could result in removal or fragmentation of important breeding habitat for these species. Cook Inlet supports large numbers of migrating shorebirds, many of which are known to forage on the mudflats of Kamishak (Alternative 1 port site) and Iliamna Bays (Alternative 2 port site) during spring migration. A large proportion of the Pacific Flyway population of Western Sandpipers (20-47%) and Dunlin (11-21%) congregate in the bays of Lower Cook Inlet (Gill and Tibbits 1999). Rock Sandpipers over-winter in Cook Inlet and forage in the mudflats of western Cook Inlet year-round. Potential impacts of the construction and operation of Pebble Mine to landbirds and shorebirds include habitat loss, disturbance, increased nest predation by ravens and red foxes, vehicle collisions, collisions with lights and other infrastructure, and contamination of food resources via oil spills. Ground and shrub-foraging species such as Willow Ptarmigan will be most susceptible to vehicle collisions. Migrating birds will be most vulnerable to collisions with tall infrastructure. Furthermore, night-time lighting of the mine site 24 hours a day, 365 days a year may also pose a risk to migrating birds by interfering with their ability to navigate by the stars.</p>	<p>Spring and winter surveys of shorebirds are recommended to fully understand how the proposed mine and transportation corridor will affect shorebird populations. Measures to reduce the chance of collisions include modifying roadside vegetation and reducing traffic speeds (Gunsen et al. 2011) and should be considered. Reduced night-time lighting should be considered to minimize interference with bird migration during the spring and fall. To reduce the chance of subsidizing red fox and raven populations at the mine site, care should be taken to minimize access to anthropogenic food sources, and bear-proof dumpsters should be designed to also exclude smaller wildlife.</p>
ADFG/DWC/Region II	Chapter 4 Environmental Consequences	Table 4.23-3	Pg. 4.23-39	The table does not discuss the impact of the proposed road between the South Ferry Terminal and the Amakdedori Port to denning bears.	Include impact of the proposed road between the South Ferry Terminal and the Amakdedori Port to denning bears.
ADFG/DWC/TED	Chapter 3 - Affected Environment	3.25 - Threatened and Endangered Species	3.25-1	Analysis area: "[t]he EIS analysis area for TES includes all marine components of the project in Cook Inlet plus a surrounding buffer." The buffers, which range from 33 feet to 11.3 miles, do not change among the alternatives.	Consider developing specific boundaries for the EIS analysis areas for Alternatives 2 and 3 as each alternative has unique geographic, geological and environmental features. Many species that occur in the project area are quite mobile and most (except sea otters) travel extensively in the Inlet. Impacts due to increased vessel traffic, pollution, oil spills, ongoing sedimentation of benthic habitat, and other impacts will not be limited solely to the construction period. For comparison, a BiOp done by BOEM/BSEE for Cook Inlet Lease Sale 244, to the north of the Amakdedori port area, evaluated impacts to the same list of species across a project area that extended well beyond the active project footprint

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ADFG/DWC/TED	Appendices G & H	Appendices G & H	3.25-1, footnote 1	"The radial distances for TES were determined based on direct and indirect impacts, and the justification for the distances is defined in Appendices G and H."	Appendix G and H are incomplete and conclusions are contain inaccuracies, such as labeling the Western DPS of Steller sea lion and the Cook Inlet "Stock" (should be DPS) of beluga whale as Threatened, when both are listed as Endangered (see page 7). The logic behind conclusions in these appendices is also unclear. For example, the BiOp for the Harvest Alaska LLC Cook Inlet Pipeline Cross-Inlet Extension Project, located in upper Cook Inlet, NMFS found that the project would "adversely affect" listed species, even the Mexico DPS of humpback whales, which would rarely be found in the project area. In contrast, the draft EA overall finding for all TES species is "likely to adversely affect," but the finding for each individual threat to species is "no effect," which does not seem to be a supported conclusion.
ADFG/DWC/TED	Appendix G USFWS Biological Assessment	4.2 Steller's eider		Throughout Appendix G the DEIS discounts possible impacts of construction at the Amakdedori Port site to Steller's eiders, because construction would only occur during the summer, whereas Steller's eiders are only expected to be present during the winter.	As noted on pages 3.25-10 and 3.25-12, ADF&G biologists identified Kamishak Bay as a molting location for Stellers eiders, based on birds fitted with telemetry transmitters and followed from 2004 to 2006. Rosenberg et al. (2016) noted that approximately 20% of the birds used the bay, "which had not been previously described as a molt location." Appendix G should acknowledge the information in Section 3.25 and consider impacts to Steller's eiders and describe methods of minimizing impacts during molting for late summer/early fall near the shore and reefs near Douglas River in Kamishak Bay. For example, as an avoidance/minimization method, construction activities that may deter the eiders from using the area for molting should be halted from August through October .
ADFG/DWC/TED	Appendix G USFWS Biological Assessment	Section 6		Section 6 of Appendix G discusses multiple mitigation measures to avoid or limit impacts to sea otter critical habitat (e.g., sediment control) and to mitigate for noise impacts to sea otters and other marine mammals (e.g., a "Marine Mammal Monitoring and Mitigation Plan (4MP)"). Although substantial detail is provided regarding this plan, neither of these measures appear in Table 5.2 of the DEIS, "Applicant's Proposed Mitigation Incorporated into the Project." The only mitigation measure for TES mentioned in Table 5.2 is "Tug and barge speeds in sea otter critical habitat would be controlled to minimize the potential for impacts with sea otters."	It is unclear on which measures will be formally implemented. Please clarify. Suggest reviewing previous BiOps as they may serve as good examples of mitigation that could be included to avoid or minimize impacts to listed species. In particular, the BiOp for Lease Sale 244, just to the north of the Amakdedori Port portion of the Pebble project area, contains a fairly comprehensive list of mitigation measures to protect marine mammals.
ADFG/DWC/TED	Appendix H NMFS Biological Assessment	Section 5.3.1	23	The last sentence has a spelling error.	The last sentence should be corrected: "all anchor chains and cable will be taut [not taught]"
ADFG/DWC/TED	Chapter 3 Affected Environment	Section 3.25.1.4	3.25-6	The last sentence at the bottom of page 3.25-6 reads "[t]he Eastern DPS (listed as federally threatened) consists of sea lions breeding ..."	Listing status of Eastern DPS requires correction. The Eastern DPS was delisted by NMFS in 2013.
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Introduction	1	Activities of the proposed project that could affect the listed species include: noise from construction vessel propulsion, pile driving, and placement of fill.	Add comma to text, "Activities of the proposed project that could affect the listed species include: noise from construction, vessel propulsion, pile driving, and placement of fill..."

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ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 5.1 Disturbance	14	The first paragraph notes potential impacts to sea otters and Steller's eiders from construction but does not mention impacts from long term operation of the mine.	The BA should consider impacts from operation of the mine, not just impacts from construction. For example -disturbance from construction and operation of Amakdedori Port... and vessel maneuvering associated with construction and operation , construction and operation vessel strike of sea otters- especially pups and ill adults, eider collision with structures...and foraging habitat (and prey) loss from the Amakdedori Port causeway and wharf construction and operation .
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 5.1 Disturbance	14	The BA states that disturbance concerns are limited to sea otters, as Steller's eiders are absent from the Action Area during the summer construction season and there are no records for short-tailed albatrosses in the Action Area. However, text on pages 3.25-10 and 3.25-12 acknowledges ADF&G biologists identified Kamishak Bay as a molting location for Stellers eiders (Rosenburg et al. 2016).	The BA should consider the year-round operation of the Amakdedori Port (the lightening of vessels, bulk carriers, and barges) and resultant disturbances to Steller's eiders. The BA should also consider that construction during the summer will cause disturbances during critical life periods for NMFS management marine mammals (i.e. harbor seal pupping and molting seasons, May-Oct 1).
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 5.1.3. Chronic Disturbance	16	Long-term anthropogenic impacts and chronic disturbance which will occur to ESA species during the operation of the mine, including the maintenance dredging activities of the Amakdedori Port channel and vessel activity (the lightening of vessels, bulk carriers, and barges), are not adequately addressed in the DEIS.	Please address long-term anthropogenic impacts and chronic disturbances on ESA listed species during entire construction, operation and closure of the mine and associated activities.
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 5.1.4 Relevance to the Pebble Project	17	Long-term anthropogenic impacts and chronic disturbance which will occur to ESA species during the operation of the mine, including the maintenance dredging activities of the Amakdedori Port channel and vessel activity (the lightening of vessels, bulk carriers, and barges), are not adequately addressed in the DEIS.	Please address long-term anthropogenic impacts and chronic disturbances on ESA listed species during entire construction, operation and closure of the mine and associated activities.
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 5.2	17	The DEIS uses mortality data collected by the Marine Wildlife Veterinary Care and Research Center in California which compares anthropogenic mortality to natural mortality.	It would be preferable to find and use a study of anthropogenic mortality in a marine environment, more closely related to proposed site and activity.
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 5.2	17	The text states "A foraging mother would probably be aware of a slow approaching vessel soon enough to suspend feeding and retrieve her pup away from the vessel pathway" but does not cite a source for this claim.	Please provide citation for this claim, otherwise suggest removing it from the BA.
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 5.2.1	18	The text states that for Steller's eiders, collision is not a risk during summer construction periods, as eiders are not present. However, this fails to acknowledge that collision is a risk year-round due to operation of the Amakdedori Port.	The year-round operation of the Amakdedori Port (the lightening of vessels, bulk carriers, and barges) should be included in the assessment of vessel strike risks and therefore vessel-Steller eider collisions should be accounted for.
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 5.3.1	19	Text does not comprehensively address the ways sea otters can be exposed to oil. Instead it states that oil sheen settles on the bottom sediment, allowing the oil to get on the fur of an otter feeding on the bottom.	Update text to note that sea otters can be exposed to oil by (1) ingestion, (2) inhalation, and (3) dermal absorption. The first contact with oil spills, where injury to sea otters occurs, is from oil floating on the surface. (Davis 2012). Correct the definition of oil sheen and how otters may get in contact with oil.

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ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 5.3.1	19	The text states that construction would not occur when eiders are present (November–April), and the amount of petroleum that could potentially be spilled during construction activities would be very small (a few gallons at most), and unlikely to lead to impairment of local sea otters.	Add impacts to Steller's eiders and remove "a few gallons at most". The year-round operation of the Amakdedori Port (the lightering of vessels, bulk carriers, and barges) should be considered during incidental spills; therefore-Steller's eiders should be accounted for in the DEIS and the number of gallons needs to be adjusted.
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 5.4 Effects to Foraging Habitat and Prey	19	The text states that approximately 10.7 acres (4.3 hectares) of benthic feeding habitat will be buried during the earthen causeway and wharf construction. This represents a very small fraction (<1 percent) of the approximately 580,000 acres (235,000 hectares) comprising Kamishak Bay.	This section only includes the buried habitat during the causeway and wharf construction. The habitat lost due to regular channel dredging maintenance and the area where vessels will be lightered should also be considered in the assessment.
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 6 Avoidance and Minimization	20	Only the construction phase of the mine is included.	Direct effects during the operation, closure and post-closure of the mine should be included.
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 7 Direct Effects	25	Only the construction phase of the mine is included.	Direct effects during the operation, closure and post-closure of the mine should be included.
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 7.1.4 Effects to Critical Habitat	26	There is great potential to adversely affect sea otter critical habitat when considering it will be within and adjacent to the operation and dredging of the Amakdedori Port. The number of vessels and activity in Kamishak Bay will alter this critical habitat in this area.	The determination for the project is May Affect northern sea otter critical habitat. The "Not Likely to Adversely Affect" should be removed.
ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Sections 7.2.1 Disturbance, 7.2.2 Vessel/Structure Collision, 7.2.3 Incidental Spill, 7.2.4 Effects to Critical Habitat. 7.3. Short-tailed Albatross	27	The Biological Assessment (BA) that the DEIS is based on fails to analyze the long-term anthropogenic impacts to ESA species from operations.	The BA and DEIS need to be updated to include analysis of operational impacts on Short tailed albatross. No determinations can be assigned until the operation of the Amakdedori Port and increased shipping traffic in Cook Inlet, is assessed. The BA and DEIS should include analysis of the long-term anthropogenic impacts from year-round operation of the mine and facilities on ESA species. Long term impacts that need to be considered include: operation of the ports, vessel activity (the lightering of vessels, bulk carriers, and barges), and any maintenance dredging activities.

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ADFG/DWC/MM & TED	Appendix G USFWS Biological Assessment	Section 8 Indirect Effects	28	Other indirect effects should be evaluated.	<p>Other indirect effects to consider:</p> <ul style="list-style-type: none"> -Increased air traffic utilizing the permanent port site airstrip and impacts to listed species for >20 years (construction, mine operation). -Increased vessel traffic within Kamishak Bay and in the Gulf of Alaska and impacts to listed species for >20 years (construction, mine operation). -Disruption of habitat during the dredging to a -20 feet MLLW of Amakdedori Port and required maintenance including moving what isn't used in dock construction on an onshore fill. -Increased human presence in the area will alter the landscape (increases in marine debris; illegal hunting/shooting wildlife; recreational activities; marine species entanglement in anchor lines/mooring buoys/mooring at lightering location/marine debris generated by the project).
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Table 2: NMFS-listed species occurring within the project Action Area	7	<p>The text states the status of the Beluga Whale and Stellar sea lion is threatened, however the current status is endangered. https://www.fisheries.noaa.gov/alaska/endangered-species-conservation/endangered-threatened-and-candidate-species-alaska</p>	<p>Correct status as follows: Beluga Whale <i>Delphinapterus leucas</i> Threatened Endangered Cook Inlet Stock Steller sea lion <i>Eumetopias jubatus</i> Threatened Endangered Western DPS</p>

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ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4 Status of Endangered Species	8	The following text is not accurate: "On September 8, 2016, NMFS publish a rule, effective October 11, 2016, stating that ESA protection for the Hawaii DPS (Central North Pacific stock) is no longer warranted, while the Mexico DPS (California/Oregon/Washington stock) was down-listed to threatened status. The small Western North Pacific DPS (Western North Pacific stock) remains endangered. There is no designated critical habitat, but a recovery plan was finalized in 1991."	Suggest updating text by referring to National Marine Fisheries Service, Alaska Region, Occurrence of Endangered Species Act (ESA) Listed Humpback Whales off Alaska revised December 12, 2016. On September 8, 2016, NMFS published a final decision changing the status of humpback whales under the ESA (81 FR 62259), effective October 11, 2016. Previously, humpback whales were listed under the ESA as an endangered species worldwide. In the 2016 decision, NMFS recognized the existence of 14 DPSs, classified four of those as endangered and one as threatened, and determined that the remaining nine DPSs do not warrant protection under the ESA. Three DPSs of humpback whales occur in waters off the coast of Alaska: the Western North Pacific DPS, which is an endangered species under the ESA, the Mexico DPS, which is a threatened species, and Hawaii DPS, which is not protected under the ESA. Whales from these three DPSs overlap to some extent on feeding grounds off Alaska. The NMFS will designate critical habitat for the humpback whale and finalized boundaries by 2020 ¹ . The timeline for designation of CH for humpbacks was established in a Settlement Agreement, dated 8/24/18: "1. On or before June 28, 2019, NMFS shall submit to the Federal Register for publication a proposed determination concerning the designation of critical habitat for the Western North Pacific, Mexico, and Central America DPSs of humpback whale;" 2. On or before June 30, 2020, to the extent NMFS has published a proposed rule to designate critical habitat, NMFS shall submit to the Federal Register for publication a final determination concerning the designation of critical habitat for the Western North Pacific, Mexico, and Central America DPSs of humpback whale;" STIPULATED SETTLEMENT AGREEMENT AND PROPOSED ORDER Ctr. for Biological Diversity., et al. v. Nat'l Marine Fisheries Serv. and Ross, Case No. 3:18-cv-01628-EDL
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.1.3 Species Use of the Action Area	10	Humpback Whales	Include Cook Inlet in the Diamond Point Port alternative. This area could see an increase in shipping traffic if the mine is permitted. Impacts from vessel strikes and displacement should be included.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.2.3 Species Use of the Action Area	12	Fin Whales	Include Cook Inlet in the Diamond Point Port alternative. This area could see an increase in shipping traffic if the mine is permitted. Impacts from vessel strikes and displacement should be included.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.3 Beluga Whale	12	The following number of individuals and the citation is incorrect "The current abundance estimate (based on the 2016 survey) for the Cook Inlet stock of beluga whale is 327 individuals (Muto et al. 2018). Since 2006, the population has continued to decline at a rate of about 0.5 percent annually (Muto et al. 2018)".	The 2016 estimate was not yet available in Muto et al. 2018. The final number for 2016 surveys was 328 whales. Suggest revising text as follows: "The current abundance estimate (based on the 2016 survey) for the Cook Inlet stock of beluga whale is 327 328 individuals (Muto et al. 2018). Since 2006, the population has continued to decline at a rate of about 0.5 percent annually." https://www.fisheries.noaa.gov/species/beluga-whale (accessed 4.21.19)

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ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.3 Beluga Whale	12	The follow text is incorrect- "Prior to the decline, this DPS was believed to range throughout Cook Inlet and occasionally into Prince William Sound and Yakutat (Nemeth et al. 2007)."	Remove incorrect text. There is no evidence of interaction between Cook Inlet belugas and belugas found in other areas of the Gulf of Alaska, including the Yakutat Bay area and Prince William Sound. (NMFS 2016).
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.3 Beluga Whale	13	The following text is incorrect, because as stated it indicates that Area 1 is the extent of beluga whale summer habitat - "Critical Habitat Area 1 (Figure 12) reflects this summer distribution."	Suggested replacement text: Critical Habitat Area 1 represents the high use areas in the summer where large groups of belugas congregate, and areas which are important to reproduction and foraging activities. Generally, CI belugas spend the ice-free months in the upper Inlet (often at discrete high-use areas), then expand their distribution south and into more offshore waters of the middle Inlet in winter (Hobbs et al. 2005), although they may be found throughout the Inlet at any time of year (NMFS 2016).
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.3 Beluga Whale	12	As written, the following text suggests there are no whales using lower Cook Inlet which is inaccurate -"Historically, beluga whales were recorded in lower Cook Inlet during June and July, but only three whales have been sighted in the lower inlet during NMFS summer biannual aerial surveys since 1996 (Sheldon et al. 2017)." The draft BA in Appendix H states (page 7) that "The threatened [sic] Cook Inlet beluga whale summers in upper Cook Inlet with a portion of the population wintering in lower Cook Inlet venturing as far south as Kamishak Bay."	Suggested revised text: Historically, beluga whales were recorded in lower Cook Inlet during June and July, but only three whales have been sighted in the lower inlet during NMFS summer biannual aerial surveys since 1996 (Sheldon et al. 2017) until 2012 when a group of at least seven belugas was observed headed toward West Foreland on 31 May. However, Castellote et al. (2016) obtained information on the seasonal distribution and foraging behavior of belugas in Cook Inlet through passive acoustic monitoring of beluga social calls and echolocation activity at 3 locations in lower Cook Inlet (Homer, Tuxedni Bay, and Kenai River); belugas were detect in all locations except at Homer Spit (the most southern site monitored).
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.3 Beluga Whale	13	Issue with the following text- "Some whales may also winter in and near Kachemak Bay. However, beluga whale tagging studies conducted from 1999 to 2003 found that only a few whales explored waters as far south as Chinitna Bay (Hobbs et al. 2005). Kamishak Bay may no longer be important to beluga whales regardless of season. "	The bolded/strike through next needs to be removed. Concluding Kamishak Bay may no longer be important to beluga whales based on the 1999-2003 tagging study is over-reaching and omitting more recent findings. Based on scientific data Kamishak Bay was designated as a Critical Habitat for the Cook Inlet beluga whale in 2011. (Federal Register). The nearshore area of Kamishak Bay was included as Critical Habitat for Cook Inlet beluga whales as an area important for conservation and recovery.

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ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.3 Beluga Whale	14	Issue with the following text- "Only occasionally are these whales observed in the lower Cook Inlet, and there have been no sightings of beluga whales within Kamishak Bay within recent years (Rugh et al. 2010, Sheldon et al. 2017)."	Suggested revised text: Historically, beluga whales were recorded in lower Cook Inlet during June and July, but only three whales have been sighted in the lower inlet during NMFS summer biannual aerial surveys since 1996 (Sheldon et al. 2017) until 2012 when a group of at least seven belugas was observed headed toward West Foreland on 31 May. However, Castellote et al. (2016) obtained information on the seasonal distribution and foraging behavior of belugas in Cook Inlet through passive acoustic monitoring of beluga social calls and echolocation activity at 3 locations in lower Cook Inlet (Homer, Tuxedni Bay, and Kenai River); belugas were detected in all locations except at Homer Spit (the most southern site monitored).
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.3 Beluga Whale	14	Issue with the following text - "A portion of the Action Area (Kamishak Bay) falls within Designated Critical Habitat Area 2, or portions of Cook Inlet where beluga whales typically occur during the fall and winter. although, as mentioned above, beluga whale use of Area 2 habitat as far south as the Action Area has not occurred in recent years (Rugh et al. 2010, Sheldon et al. 2017). "	The bolded/strike through text should be removed. Concluding Kamishak Bay may no longer be important to beluga whales based on the 1999-2003 tagging study is over-reaching and omitting more recent findings. Based on scientific data Kamishak Bay was designated as a Critical Habitat for the Cook Inlet beluga whale in 2011. (Federal Register). The nearshore area of Kamishak Bay was included as Critical Habitat for Cook Inlet beluga whales as an area important for conservation and recovery.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.3 Beluga Whale	15	Issue with the following text - "The potential effect the proposed project might have on these PCEs is difficult to discern given the current lack of beluga whale use in the Action Area, and the construction activity occurring during the summer months when beluga whale populations are concentrated in northern Cook Inlet."	Revise or remove this text. There isn't any scientific basis for this conclusion which downplays the impact to an endangered species if the project is permitted and constructed. Based on scientific data Kamishak Bay was designated as a Critical Habitat for the Cook Inlet beluga whale in 2011. (Federal Register). Further, only the construction activity is considered; the year-round disturbance for >20 years in Kamishak bay as a result of port operations (including dredging and airstrip activity) needs to be considered. Additionally, Cook Inlet beluga whales may use lower Cook Inlet year-round though it is less concentrated spring and summer use. Portions of Kamishak Bay were included as Critical Habitat due to its role as probable fall feeding area (Federal Register) which may be important for the recovery of the species.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.4 Steller Sea Lion	16	Table 3: Distances of Steller sea lion rookeries and haulout sites to the Action area lists 3 locations: Usahgat Island, Sud Island, Nagahut Rocks. It is unclear why these 3 Steller sea lion locations were chosen as there are closer locations to the project area. In order of distance they include: Shaw, Cape Douglas, Ushagat, Latax Rocks, Sud Island, Flat Island, West Amatuli, Elizabeth/Cape Elizabeth, Sugarloaf, Nagahut Rocks, Perl Rocks, Perl.	Text and analysis should be updated accordingly.

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ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.4 Steller Sea Lion	17	Incorrect text- "There are no major haulouts within Cook Inlet, although NMFS may soon recognize Shaw Island on the eastern edge of Kamishak Bay as a major haulout site , as 70 sea lions were recorded near there in 2016 during beluga whale surveys conducted by NMFS (Shelden et al. 2017)."	Shaw Island is included as one of the Steller sea lion haulout and rookery locations in the U.S. (Fritz et al. 2015). Please update with current information.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.4 Steller Sea Lion	17	Issue with text- "Given the number of years of survey (1993-2016) conducted by NMFS in Cook Inlet, relatively low numbers of Steller sea lions have been recorded in Cook Inlet and most south of the Action Area (Figure 14). However, ABR did record several sea lions within Kamishak Bay during incidental surveys conducted in 2018 (Figure 15), and their seasonal presence in the Action Area might be higher than the limited survey data suggest."	This text does not accurately depict the number of Steller sea lions present in the Action Area. Steller sea lions have been seen in Kamishak Bay incidentally during Cook Inlet beluga whale aerial surveys. Incorporate incidental Steller sea lion sighting data in Kamishak Bay during Cook Inlet beluga whale surveys (1993-2012, 2014, 2016). See https://www.fisheries.noaa.gov/alaska/cook-inlet-beluga-aerial-surveys
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 5 Consequences of Proposed Action	18	Text refers only to disturbance from construction of the Amakdedori Port.	Revise text as disturbance from construction , dredging, and operation of the Amakdedori Port, including aircraft should be considered.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 5 Consequences of Proposed Action	19	Issue with text - "PLP's planned pipeline construction, port construction, and vessel traffic will have some limited, additive effect to the overall anthropogenic noise budget."	Revise text and analysis. Anthropogenic noise is currently limited in the Action Area; the project will -increase anthropogenic noise. Include port construction/operation/dredging, and vessel traffic in list of additive effects to the overall anthropogenic noise budget.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 5.1.2 Masking	20	Issue with bolded text - "The extent of masking associated with PLP's marine program is a function of the duration a noise source is within hearing proximity of a marine mammal, and the additive noise from PLP's activity to overall anthropogenic noise levels in lower Cook Inlet. Working with killer whales, Crystal et al. (2011) found masking effects from vessels are eliminated at speeds less than 10 knots (kt) (18.5 km/hr). Whether this would apply also to other odontocetes such as harbor porpoises is unknown. "	Remove bold text, suggested substitute text: Foreny et al. 2017 indicates harbor porpoises use echolocation for foraging, navigation, communication, and spatial orientation and are highly sensitive to a wide variety of anthropogenic sounds and have been documented to avoid areas with vessel traffic.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 5.1.2 Masking	20	Issue with text - "Given the ability for pinnipeds to hear well in noisy backgrounds (Southall et al. 2000), combined with the short duration of exposure from a moving vessel, masking concerns due to vessel noise are not particularly significant for these marine mammals."	Provide citation for conclusion that vessel noise is not particularly significant. Erbe et al. 2014 indicates animals with the least hearing sensitivity below 20 kHz (Steller sea lions and Pacific white-sided dolphins) are expected to perceive the least amount of acoustic energy. Animals with better hearing sensitivity at low-to-mid frequencies (50–300 Hz) experience the most ship noise (baleen whales and true (phocid) seals). Harbor seals (phocids) are in high numbers in the Action Area.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 5.1.3 Chronic Disturbance	20, 21	Issue with text - "Finally, NMFS has recently published that harassment associated with construction vessel noise (83 FR 7655) is discountable."	Provide reference, the citation for 83 FR 7655 is not included in Ch 9 references. Also, it is unclear for what project NMFS made the determination that harassment associated with construction vessel noise is discountable.

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ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 5.1.3 Chronic Disturbance	21	The following text only addresses construction - "PLP's construction (e.g., pile driving) will have some additive effect to the overall anthropogenic noise budget, especially since there is limited anthropogenic noise within Kamishak Bay to begin with (as compared to other locations in Cook Inlet)."	Suggested revision: PLP's construction (e.g., pile driving) and port activities (e.g., dredging and aircraft use) will have some additive effect to the overall anthropogenic noise budget, especially since there is limited anthropogenic noise within Kamishak Bay to begin with (as compared to other locations in Cook Inlet).
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 5.1.4. Relevance to the Pebble Project	21	Issue with the following text- "Intermittent noise from pile driving will occur over 90 days during port construction. The impacts are limited to a radius of a 11.3 mi (18.2 km) and will not occur in the winter when beluga whales are potentially present. Impacts would be temporary for a small number of humpback whales, fin whales, and Steller's sea lions, and will be mitigated by monitoring shut down safety zones to avoid Level A injury take (see Section 6.2).	Only the construction activity is considered for port activities; the year-round disturbance > 20 years in Kamishak bay as a result of the Amakdedori Port operations (including dredging and airstrip activity) needs to be considered. Text should be revised accordingly.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 5.2 Vessel Strikes	21	Only Alaska ship strikes from 1978 to 2011 are considered.	Obtain current ship strike information.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 5.5 Effects of Prey	25	Only the construction activity is considered for port activities.	The year-round disturbance over >20 year in Kamishak bay as a result of the Amakdedori Port operations (including dredging) needs to be considered.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 6 Avoidance and Minimization	26	Only the construction activity is considered for port activities.	The year-round disturbance over >20 year in Kamishak bay as a result of the Amakdedori Port operations (including dredging) needs to be considered.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 7 Direct Effects	31-35	Only the construction activity is considered for port activities	The year-round disturbance over >20 year in Kamishak bay as a result of the Amakdedori Port operations (including dredging) needs to be considered for all direct effects.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 7.1.3 Entanglement	31	Issue with the following text- "None of the proposed anchoring systems involves rope, which is the primary cause of marine mammal entanglement. The exact risk of entanglement is unknown but is considered discountable given no rope will be used. Therefore, the determination is No Effect."	Citation for conclusion should be provided. Additionally, assessment and conclusion should be updates as the NOAA Fisheries West Coast Region includes cable and chains along with rope as entanglement risks to large whales. https://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/entanglement_faq.html (accessed 4.21.19)

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ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 4.1.3/Figure 9	32	Issue with the following text - "Humpback whales are not found in shallow-water harbors (Amakdedori Port) where incidental spills are most likely to occur."	Suggest revising based on the following information or removing the current text. Humpback whales have been observed in Kamishak Bay incidental to Cook Inlet beluga whale aerial surveys. Additionally, on page 10 in App H section 4.1.3 humpback whales are included within the Action Area. Also Figure 9 of Appendix H, the NMFS Biological Assessment, shows a humpback sighting very close to shore in the same depth contour as the proposed port, as well as six sightings in shallow water around Augustine Island, about 10 miles offshore from the port. Humpback whales were also reported by FOMR staff offshore of Amakdedori in 2018.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 7.2.3 Entanglement	32	Issue with the text -"The risk of fin whale entanglement in construction anchor chains or cables is the same discountable risk as mentioned for humpback whales in Section 7.1.3. Therefore, the determination is No Effect."	Citation for conclusion should be provided. Additionally, assessment and conclusion should be updates as the NOAA Fisheries West Coast Region includes cable and chains along with rope as entanglement risks to large whales. https://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/entanglement_faq.html (accessed 4.21.19)
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 7.3.5 Effects on Critical Habitat	34	Issue with the finding - "No Effect for Cook Inlet beluga whale critical habitat".	Suggest revising text and analysis. A "No Effect" finding is not justified with 3 of 5 primary constituent elements being altered within Critical Habitat.
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 8 Indirect Effects	39	Other indirect effects should be evaluated.	Other indirect effects to consider: <ul style="list-style-type: none"> -Increased air traffic utilizing the permanent port site airstrip and impacts to listed species for >20 years (construction, mine operation). -Increased vessel traffic within Kamishak Bay and in the Gulf of Alaska and impacts to listed species for >20 years (construction, mine operation). -Disruption of habitat during the dredging to a -20 feet MLLW of Amakdedori Port and required maintenance including moving what isn't used in dock construction on an onshore fill. -Increased human presence in the area will alter the landscape (increases in marine debris; illegal hunting/shooting wildlife; recreational activities; marine species entanglement in anchor lines/mooring buoys/mooring at lightering location/marine debris generated by the project).
ADFG/DWC/MM & TED	Appendix H NMFS Biological Assessment	Section 10 Determination of Effects Summary	38	Previous comments noted issues with the analysis and conclusions in Table 4.	The analysis and conclusions summarized in Table 4 should be reassessed based on ADF&G comments on this document.

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ADFG/DWC/MM & TED	Executive summary	Executive summary	67	Issue with the following text - Marine Diesel Spill "Diesel could spread southward to the shores of Shuyak and Afognak islands (north of Kodiak Island) and /or Cape Douglas, depending on sea conditions, and could be washed on shore. Impacts to surface and groundwater on shore would be unlikely. Impacts to onshore wetlands would be unlikely; impacts to terrestrial wildlife would be minimal. Impacts to marine mammals would be of low likelihood and temporary; individuals or groups could potentially be injured or die, but population-level effects are unlikely. "	Provide basis for stating impacts to marine mammals would be of low likelihood and temporary. There are pinniped haulouts in the area described which would be impacted by a spill. Also stating impacts would be low and temporary and in the same line stating individuals or groups could be injured or die is contradictory. The next paragraph down mentions "Potential impacts from a marine diesel spill to Threatened and Endangered Species (TES) could be of high magnitude, depending on the species and the fate of the spilled fuel." Several of these ESA species are marine mammals and could see population-level effects. Suggest these conclusions be reanalyzed and the section text revised.
ADFG/DWC/MM & TED	Executive summary	Executive summary	68	Issue with the following text in the ED that refers to 3.5.4 Natural Gas Release "Impacts from a potential release of natural gas from the proposed pipeline would be limited to short-term air quality degradation and limited release of greenhouse gases (GHG) . Due to the remote nature of the pipeline, no health and safety impacts would be expected."	What is basis for concluding natural gas leak releases would be short-term? Define short-term. A natural gas pipeline leak near Nikiski, Alaska could not be repaired for months (Dec 2016-April 13, 2017). What is the basis for stating there would be no health and safety impacts?
ADFG/DWC/MM & TED	Chapter 3 Affected Environment	Section 3.25 Threatened and Endangered Species	3.25-4	Relevant citation not included in text about Habitat Use and Distribution (Cook Inlet beluga whales).	Add recent acoustic study results. Castellote et al. (2016) obtained information on the seasonal distribution and foraging behavior of belugas in Cook Inlet through passive acoustic monitoring of beluga social calls and echolocation activity at 3 locations in lower Cook Inlet (Homer, Tuxedni Bay, and Kenai River); belugas were detected in all locations except at Homer Spit (the most southern site monitored).
ADFG/DWC/MM & TED	Chapter 3 Affected Environment	Section 3.25 Threatened and Endangered Species	3.25-8	Typo with text- 'Approximately 40 percent of sea otters' daily activity foraging , and they primarily feed on benthic invertebrates, including mussels, crabs, urchins, sea cucumbers, and clams."	Word missing between bold text-"is".
ADFG/DWC/MM & TED	Chapter 3 Affected Environment	Section 3.25 Threatened and Endangered Species	3.25-13	Issue with Beluga whale section	Suggest Including any reports of beluga whales in the area of Alternative 2 which have occurred since 2011.

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ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-4	Issue with the following text in bold- "Birds may experience a wide range of impacts from noise sources within the mine site, transportation corridor, at the ferry terminals, at the port, and the natural gas compressor station on the Kenai Peninsula. In terms of duration, some of the noise sources would occur over the short term, (such as noise from construction of the mine facilities, installation of the natural gas pipeline, blasting in the road bed and material sites, and aircraft noise at Amakdedori port, among others), while others would occur during operations (blasting in the pit), and some for the life of the project (vehicle/equipment noise). "	Suggested addition of text: "...while others would occur during operations (blasting in the pit), and some for the life of the project (vehicle/equipment/vessel noise)."
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-25	Issue with bolded text- " Injury and mortality of marine mammals would not be anticipated to be factors as a result of any of the components of the project , because vessels would be traveling at slow speeds across Iliamna Lake, and less than 10 knots when transiting between the port and lightering locations. In addition, other mitigation measures to prevent vessel strikes are discussed in Chapter 5, Mitigation and Monitoring."	It is inaccurate to state that the potential of injury and mortality of marine mammals is not anticipated for any component of the project. Separation of mom/pup harbor seal pairs due to disturbances is possible. Entanglement in mooring lines or other lines in the water (or marine debris generated from the project) is also anticipated. Additionally, chapter 5 on mitigation offers little in the way of marine mammal mitigation measures. Suggest revisiting assessment and text.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-26	Issue with bolded text -"Anticipated sources of noise include vessels used during installation of the natural gas pipeline in Iliamna Lake and Cook Inlet; anchor handling operations associated with natural gas pipeline construction; construction noise associated with the Amakdedori port and ferry terminals on Iliamna Lake; vessels used in the transportation corridor across Iliamna Lake, which includes the need to break ice during mining operations; and aircraft during construction, and to a lesser extent, operations at Amakdedori port. "	The Amakdedori Port if is of equal concern for the generation of noise as the other project components. Suggest revising text by removing "...to a lesser extent...".
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-26	Issue with the following text- "The duration of time that marine mammals may be exposed to underwater sound would be short term, and lasting only during pipeline installation, dredging, and construction activities, and from vessel traffic during mine operations. " Duration of time may not be short time when you consider underwater sound generated by port activities which will go on for the duration of the project.	Revise text and analysis. Port activities (e.g. lightering, loading/offloading vessels) will generate underwater noise and will not be short term like construction, as the port will be operational for the life of the project. The increased activity of mine staff in Kamishak Bay and surrounding areas may also have impacts to area wildlife.

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ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-27	Suggest addition to the following text to include marine mammals that are hauled-out on land. "The physical presence of low-flying aircraft can disturb marine mammals, particularly individuals resting on the sea surface (reviewed in BOEM 2012). Observations made from low-altitude aerial surveys report that the behavioral responses of marine mammals are highly variable, ranging from no observable reaction to diving or rapid changes in swimming speed or direction (Smultea et al. 2008). Helicopter traffic may result in temporary behavioral responses."	Revise text to include bolded text- "The physical presence of low-flying aircraft can disturb marine mammals, particularly individuals resting on the sea surface (reviewed in BOEM 2012) or hauled-out on land (Greig and Allen, Kucey 2005, Born et al 1999) . Observations made from low-altitude aerial surveys report that the behavioral responses of marine mammals are highly variable, ranging from no observable reaction to diving or rapid changes in swimming speed or direction (Smultea et al. 2008). Helicopter traffic may result in temporary behavioral responses."
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-27	Issue with the following text as it is unsupported - "Because there is existing oil and gas infrastructure in Cook Inlet, as well as numerous shipping routes and large amounts of vessel traffic, it is unlikely that the addition of physical presence as part of this project would change marine mammals' behavioral patterns."	Remove or revise text and analysis. Provide research which supports the statement that the physical presence of this project would not change the behavior of marine mammals, or remove it. A large body of literature shows that multiple anthropogenic stressors can impact the welfare of marine mammals. Pinnipeds physiologically require a certain amount of time hauled out to meet their resting needs (Brasseur et al. 1996). They can experience chronic stress if vessel traffic or other anthropogenic disturbances causes them to flush into the water (Cates and Acevedo-Gutierrez 2017) particularly during pupping in cold locations where they endure thermal stress (Jansen et al. 2010).
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-27	The following text is not supported by the reference provided. "However, in Alaska specifically, harbor seals are documented to tolerate fishing vessels with no discernable reactions, and habituation is common (Johnson et al. 1989)."	Provide reference for the statement. Johnson et al. 1989 does not support this statement.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-27	The following text is not supported- "Cook Inlet has historical and current high use from fishing- and tourism-related vessel traffic, and the incremental addition of vessels associated with the project would be unlikely to result in increased impacts to marine mammals. Likewise, there is a high level of use of Iliamna Lake by recreational and subsistence watercraft."	Provide information that supports the statement that the physical presence of this project would not result in increased impacts to marine mammals of marine mammals.
ADFG/DWC/MM	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-27	The following text is not supported- "Therefore, although long term, occurring throughout the life of the project, impacts would not be expected to have a detrimental effect on harbor seals."	Provide information that supports the statement that the physical presence of this project would not change the behavior of marine mammals.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-28	Issue with bolded text -"The duration that marine mammals may be exposed to vessel presence would be short term, occurring during pipeline installation and construction activities, but would result in a long-term increase in physical presence from the operations of the ferry across Iliamna Lake, lasting though operation of the mine until closure. "	Revise bolded text for clarity, as it does not read well.

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ADFG/DWC/MM	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-28	The following statement in bold is not supported. "However, vessels associated with activities would have a transitory presence in any specific location with a limited effect on marine mammals, because marine mammals typically avoid known high-vessel areas. The magnitude of impacts would be limited to brief behavioral responses such as reducing surface time, diving, and swimming away. "	Provide information that supports the statement that the physical presence of this project would not change the behavior of marine mammals.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-28	Issue with the following text - "The duration that marine mammals may be exposed to aircraft presence would be temporary, because aircraft support would be expected to be intermittent and of short duration (2 years); only during construction of the port access road. The extent would primarily include the area around Amakdedori port, and any other locations where aircraft, including helicopters, may occur. Based on the short duration of potential exposure to aircraft-related noise and visual disturbance, effects on marine mammals would be limited to brief behavioral responses (such as diving, swimming away, reducing surfacing time). "	Suggest removing the bolded text or revise text and analysis. As currently writing, the text minimizes the impacts aircraft use could have on individuals especially to pinnipeds during the pupping and molting season. Construction is schedule for summer months which is during the sensitive time for harbor seals. Kamishak Bay is an important area for harbor seal molting and pupping based on the size of the concentration areas.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-29	"Small" should be defined in the following text -"In terms of magnitude and extent, development of onshore support facilities might displace a small number of harbor seals near the Amakdedori port and the south ferry terminal site (in Iliamna Lake and Kamishak Bay). These impacts, which would be limited to the immediate vicinity of the facilities and short term in nature, would not be expected to affect local populations of harbor seals, because the animals are highly mobile and feed near river mouths. "	Define small number of harbor seals and on what basis are impacts short-term.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-29	Issue with the bolded strikethrough text. "Potential effects from seafloor disturbance would be expected to limit the foraging quality of the disturbed area during construction. The duration that marine mammals may be exposed to habitat alteration from construction would be temporary, because habitat alteration activities would be of short duration, and possibly for a few years afterward in some locations. The duration that marine mammals may be exposed to habitat loss from development of Amakdedori port and the south ferry terminal would be permanent. Impacts would be likely due to loss of foraging habitat."	Remove bolded strike through text or clarify which components it's referring to. The last sentence indicates habitat loss is permanent; it is not necessary to state habitat loss during construction is temporary when referring to lost habitat at the ports or ferry terminal referred to in following sentence.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-39	Table 4.23-3, Injury and mortality, transportation corridor- doesn't mention the potential to separate mom/pup pairs (harbor seals and sea otters) which can lead to abandonment and death (to the pup).	Disturbances have the potential to separate mom/pup pairs (harbor seals and sea otters) which can lead to abandonment and death (to the pup). This should be included in the table.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-40	Table 4.23-3, Injury and mortality, port -doesn't mention the potential to separate mom/pup pairs (harbor seals and sea otters) which can lead to abandonment and death (to the pup).	Disturbances have the potential to separate mom/pup pairs (harbor seals and sea otters) which can lead to abandonment and death (to the pup). This should be included in the table.

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ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-44	Text in bold is not supported and conclusion isn't explained clearly. "Noise generated during construction and operations may temporarily disturb some marine mammals, causing them to leave or avoid the area. Such effects would likely be short term , and would not be expected to result in population level effects."	Remove bold text or add a citation and reasoning for not considering that impacts could be permanent.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.23 Wildlife Values	4.23-44	Text in bold should be backed up with a citation. "Because of this frequent vessel activity in Cook Inlet, some marine mammals in the area may be at least partially habituated to vessel presence and noise , and impacts from vessel traffic from the project would add incremental effects to marine mammals."	Remove bold text or add supportive reasoning. Please cite basis for this statement or scientific evidence marine mammals in Cook Inlet are habituated to vessel presence and noise.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.27 Spill Risk	4.27-110, 4.27-125	No direct impacts to marine mammals are anticipated, because metal concentrations would be diluted to within water quality standards on reaching Nushagak Bay and beyond.	Suggest including beluga whales for direct impacts in Nushagak River. In April 2019 an ADF&G biologist reported seeing hundreds of beluga whales ~18 miles up the Nushagak from Dillingham. It was suspected they were feeding on herring and/or out-migrating salmon smolts. Belugas are known to move up rivers in Bristol Bay during April to consume rainbow smelt and out-migrating salmon (Citta et al. 2016)
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-1	Action Area for Diamond Point port alternative should be expanded.	Include Cook Inlet in the Action Area for the Diamond Point Port alternative, as there will be an increase in shipping traffic if the mine is permitted. Impacts from vessel strikes and displacement should be included.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-1	Update the following text - "Beluga whales are generally observed north of the analysis area during summer months; therefore, noise during the summer construction of Amakdedori port would only be expected to impact the few animals that may be in the construction area at that time."	Cook Inlet beluga whales may use lower Cook Inlet year-round though it is less concentrated spring and summer use. Portions of Kamishak Bay were included as Critical Habitat due to its role as a probable fall feeding area (Federal Register) which may be important for the recovery of the species. Recommend updating the text accordingly.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25--2	Underwater and Airborne Noise doesn't adequately address year round disturbance from port operations.	The year-round operations disturbance >20 year in Kamishak bay as a result of the Amakdedori Port operations (including dredging and airstrip activity) needs to be considered in further detail. Suggest expanding text accordingly.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-5	The following text is appropriate and should be included in many other sections of the DEIS, as pointed out in earlier comments. "The extent of the impacts would be limited to the analysis area, and the duration would be long term lasting from construction through the life of the project."	This is the detail lacking in many other sections of the DEIS. All relevant sections of the DEIS should acknowledge the duration of impacts would be long terms, lasting from construction through the life of the project.

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ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-6	The following bolded text is not supported- " Additionally, vessels associated with activities would have a transitory presence in any specific location, as do beluga whales, so they would likely have a limited effect on beluga whales. Based on the short duration of potential exposure to vessel-related noise and visual disturbance at any given location when vessels and whales are present, it is expected that effects on Cook Inlet beluga whales would be limited to brief behavioral responses, such as reducing surface time and diving."	Provide citation for bold text.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-6	The following text is not supported -"Based on the short duration of potential exposure to vessel- or aircraft-related noise and visual disturbance, it is expected that any effects on Cook Inlet beluga whales would be limited to brief behavioral responses such as reducing surface time and diving. Vessel and aircraft presence concurrent with the presence of beluga whales would be short-lived, and only temporary effects on Cook Inlet beluga whales are expected."	Provide citation for this assessment.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-6	Several typos in the following text- "When vessels are transiting nearshore areas, speeds would be decreased, and standard marine mammal disturbance guidelines would be followed to avoid vessel strikes (which would be outlined a Wildlife Management Plan , developed by PLP if the project were to be permitted; see Chapter 5, Mitigation, for additional information on mitigation measures). While encounters between beluga whales and project vessels could occur. An encounter would be defined as observing an animal from the vessel but not making contact. Lethal vessel strikes are not expected because vessels would be transiting and lightering locations the port at slow speeds (less than 10 knots) that improve ability to avoid marine mammals."	Correct typos: When vessels are transiting nearshore areas, speeds would be decreased, and standard marine mammal disturbance guidelines would be followed to avoid vessel strikes (which would be outlined in a Wildlife Management Plan, developed by PLP if the project were to be permitted; see Chapter 5, Mitigation, for additional information on mitigation measures). While encounters between beluga whales and project vessels could occur. An encounter would be defined as observing an animal from the vessel but not making contact. Lethal vessel strikes are not expected because vessels would be transiting and lightering locations in the port at slow speeds (less than 10 knots) that improve ability to avoid marine mammals.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-6	The following citation does not seem to be appropriate to support the statement. "There is no indication that strikes would become a major source of injury or mortality in the analysis area (NMFS 2017a)."	Correct the citation. Clarification is needed for this assessment provided by the citation NMFS. 2017a. Endangered Species Act—Section 7 Consultation Biological Opinion. Consultation No. SER-2015-15985. Juneau, AK. How is this relevant the Action Area for the Pebble project? The document, SER-2015-15985, is for an assessment with the Southeast Regional Office (Florida, USA) on the continued Authorization of the Fishery Management Plan (FMP) for Coastal Migratory Pelagic (CMP) Resources in the Atlantic and Gulf of Mexico under the Magnuson-Stevens Fishery Management and Conservation Act (MSFMCA).

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ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-7	The following statement is not supported -"The port is not expected to impede anadromous fish from using Amakdedori Creek, because fish already have multiple rocky reefs, shoals, and other areas to negotiate before entering the creek."	Structures such as the solid fill causeway and jettys have been shown to have significant effects on fish migrations and movements. Without detailed analysis of fish movement patterns, water circulation in the area and water velocities and flow around the structures a determination that the port would not impede fish passage is premature. This could also have significant impacts on marine mammals. The statement needs to be supported or revised.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-8	Text only addresses construction and not the life of the mine, which includes port operations. "Table 4.25-2: Summary of Key Issues for TES Physical presence of vessels and aircraft (primarily during construction) may temporarily displace marine TES. Wintering Steller's eiders may swim, dive, or fly away from approaching vessels and aircraft."	Suggest addition of text in bold- "Physical presence of vessels and aircraft (primarily during construction however throughout the life of the project) may displace marine TES. Wintering Steller's eiders may swim, dive, or fly away from approaching vessels and aircraft." Also, provide citation for this conclusion.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-8	Low potential for TES to collide with port infrastructure (including lights on the causeway and lighted navigation buoys) and vessels."	Remove bolded strikethrough "low". With less than 400 Cook Inlet beluga whales a "low" number of collisions could have population level impacts. The Recovery Plan for the Cook Inlet beluga whale (NMFS 2016) includes ship strikes as an anthropogenic source of injury or mortality. While ship strikes have not been a confirmed source of Cook Inlet (CI) beluga mortality, a CI beluga washed ashore dead in September 2007 with "wide, blunt trauma along the right side of the thorax" that could be the result of ship strike trauma. In October 2012, a necropsy of another CI beluga carcass indicated the most likely cause of death was "blunt trauma such as would occur with a strike with the hull of the boat" (NMFS AKR, unpub. data). Scarring consistent with propeller injuries has also been documented among CI belugas (LGL 2009; McGuire et al. 2011). Further scar analysis would be required to estimate vessel size, and it would be difficult to determine whether the scars resulted from commercial, private, or research vessel interactions.
ADFG/DWC/MM & TED	Appendix N Project Description	Section 1.4.2 Amakdedori Port and Lightering Locations	last page	The following text requires clarification- "Dredging is no longer proposed for the Amakdedori port and concentrate would be lightered into deep water using barges for loading onto anchored bulk carriers. (December 2017)"	Please clarify how Amakdedori port can be constructed and operated without dredging.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-8	Issue with the following text- "Habitat changes None, the lightering locations are outside of critical habitat for all TES."	Statement is inaccurate and should be corrected. Habitat for TES species exists outside of the areas designated as Critical Habitat Areas. Changes will likely occur to habitat occupied by TES. The lightering locations may be outside CHA's however they are within TES species habitat and the DEIS should identify this and account for impacts.

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ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-8	The following text doesn't acknowledge the vessel traffic that will occur throughout the life of the project -"Physical presence of vessels and aircraft (primarily during construction) may temporarily displace marine TES."	Suggest adding the bolded text-Physical presence of vessels and aircraft (primarily during construction however throughout the life of the project) may temporarily displace marine TES. Wintering Steller's eiders may swim, dive, or fly away from approaching vessels and aircraft.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-8	Low potential for collision for all TES. (Lightering Locations)	Remove bolded strikethrough "low".
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-8	Low potential for TES to collide with vessels during construction. (Natural Gas Pipeline)	Remove bolded strikethrough "low".
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-9	Habitat changes. Alternatives 1, 2, and 3-disagree with statement of "temporary disturbance".	Remove "Temporary disturbance". (1) It is unknown whether the effects will be temporary or permanent for the multi-year construction activity. (2) Operations will occur for >20 years and should be included in the assessment. Include Steller's eider in the assessment for operation of the mine if permitted.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-8	Issue with the following - Footnote 1 to Permanent Impacts: There are no acreages of temporary impacts associated with construction of Amakdedori port, because any construction equipment outside of the permanent footprint would not impact the benthic marine environment.	Suggest revising statement and analysis. Stating that construction equipment outside the permanent footprint would not impact the benthic marine environment, makes little sense. Presumably any equipment outside the footprint would create a disturbance to the benthic marine environment. Additionally, how will the port depth be maintained with the currents and water flow change around the pilings creating sand/mud drifts?
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-9	Lower Cook Inlet has a high volume of vessel traffic, especially during the summer months when humpback whales are present. Incremental additional noise from the anticipated few vessels associated with the project per day would not add to the existing levels of noise.	Clarify Lower Cook Inlet vessel activity areas. High volumes likely do occur in the eastern and central portion, however, vessel traffic in the western portion and Kamishak Bay is low. Additionally, the project vessels will be on site and operating for nearly a week at a time during each visit. Even a few vessels per day over >20 years would add to the existing levels of noise in this portion of lower Cook Inlet and especially in Kamishak Bay where there does not appear to be significant vessel activity at present.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-10	Issue with the following text -"Pile-driving noise may exceed injury thresholds as defined by NMFS. Underwater sound levels from pile driving vary with size and type of piles, as well as the size and type of hammer, and would be further analyzed in ESA consultation and MMPA consultation (if required). "	This project has the potential to take both ESA animals and marine mammals protected under the MMPA; this project would need to go under an ESA consultation and MMPA incidental harassment authorization (recommend striking "if required").
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-10	Issue with the following text -" Any potential impacts on humpback whale behavior would occur in the analysis area , and would not result in population-level effects. However, in terms of likelihood, the impacts would be certain to occur if the project is permitted and the port and pipeline are constructed."	Revise sentence and conclusion as it doesn't make sense. Additionally, analysis and summary needs to be revised to incorporate project impacts from increase in shipping traffic, vessel strikes and habitat displacement.

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ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-12	Issue with citation used in the following text - "However, humpback whales rarely feed on benthic fauna, and they are not expected to be impacted by changes in the benthic environment (NMFS 2017a)."	Clarification is needed for this citation NMFS. 2017a. Endangered Species Act—Section 7 Consultation Biological Opinion. Consultation No. SER-2015-15985. Juneau, AK.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-12	As noted in multiple other places, the duration of impacts doesn't not include the operational life of the port, and focuses only on construction. "The duration of impacts would be short term, occurring only during construction. The magnitude and duration of potential effects from seafloor disturbance would be a reduction in the foraging quality of the disturbed area for a short time during construction."	Only the construction activity is considered for port activities; the year-round operational disturbance for >20 years in Kamishak bay as a result of the Amakdedori Port operations (including future dredging) needs to be considered for all direct effects. Suggest correcting text.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-14	The following text needs revision - "However, because there are no rookeries near project components and most haul-outs are in designated critical habitat far south of the analysis area , these effects are not expected."	Revise the statement for haul-out locations. Most of the haulout areas for Steller sea lions in Alaska are NOT in the designated critical habitat area south of the analysis area (AFSC 2019)
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-14	Text in sub-section 4.25.2.4 Steller sea lion Underwater and Airborne Noise does not include the operational life of the port, and focuses only on construction.	Only the construction activity is considered; the year-round disturbance over >20 year in Kamishak bay as a result of the Amakdedori Port operations or Diamond Point (including dredging) needs to be considered for all direct effects. Revise section accordingly.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-15	Issue with citation used- "If any responses of Steller sea lions associated with aircraft were to occur, they are likely to be short-lived, and therefore are not expected to cause more than a temporary disturbance to Steller sea lions (NMFS 2017a)."	Suggest rechecking the NMFS 2017a reference.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-16	The following text is incorrect -"To date, the USFWS has not documented and is not aware of any evidence that serious injury, death, or stranding of sea otters can occur from exposure to industry noise (USFWS 2016b).	Remove text as the conclusion is incorrect. USFWS 2016b referred to airgun noise during oil and gas exploration, not impacts from the mining industry. The text from USFWS 2016b follows: "To date, there is no evidence that serious injury, death, or stranding of sea otters can occur from exposure to airgun pulses, even in the case of large airgun arrays. As a result, the Service does not expect any sea otters to incur serious injury (Level A harassment) or mortality in Cook Inlet or strand as a result of the proposed activities."
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-16	The following text focuses only on construction and doesn't include the operation life of the port -"Any disturbance to sea otters from underwater noise associated with the project construction would be expected to be temporary and occur only in the immediate vicinity of project activities."	Only the construction activity is considered; the year-round operational disturbances for >20 years in Kamishak bay as a result of the Amakdedori Port or Diamond Point Port(including dredging) needs to be considered for all direct effects. Suggest revising text accordingly.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-16	Typo in the following text -"The magnitude of impact of the airborne noise of the heavy equipment sea otters rafting in the immediate vicinity of construction could be a temporary disturbance and departure from the area."	Correct typo- see bolded text for missing word. The magnitude of impact of the airborne noise of the heavy equipment to sea otters rafting in the immediate vicinity of construction could be a temporary disturbance and departure from the area.

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ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-17	Typo in the following text -"The extent of potential impact from underwater or airborne noise on sea otters would be limited the analysis area, and would not result in population-level effects when mitigation measures, detailed in the biological assessment (Appendix G), and measures from the consultation process are implemented."	Correct typo- see bolded text for missing word. The extent of potential impact from underwater or airborne noise on sea otters would be limited to the analysis area, and would not result in population-level effects when mitigation measures, detailed in the biological assessment (Appendix G), and measures from the consultation process are implemented.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-17	Issue with the accuracy of the following text-"Although the western side of Kamishak Bay has a high density of sea otters, they are fairly tolerant of vessel noise and would likely habituate to the regular presence of vessels at these locations."	Studies have indicated both sexes of sea otters in Alaska avoid areas of heavy boat traffic (Garshelis and Garshelis 1984). Additionally, the west side of Kamishak Bay has very few vessels normally; so this increased use would be less tolerable and a larger impact. Suggest updating text accordingly.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-18	Issues with the clarity and accuracy of the following text- "If impacts to behavior occur at all, these effects would be expected to be short term, limited to the immediate area of the port, and would have no population-level impact. The duration of time that sea otters may be exposed to physical presence of vessel and aircraft would be temporary, because such disturbance is expected to be intermittent, and of short duration. Based on the short duration of potential exposure to physical presence at any given location, it is expected that effects on sea otters would be limited to brief behavioral responses. These impacts would be expected to occur if the project is permitted and the port and pipeline are constructed."	Revise text and summary. The information in the paragraphs above this summary in Chapter 4 details what can happen to sea otters if the project is permitted. Using qualitative descriptions such as short term, no population-level impacts, temporary, intermittent, short duration, and brief distract from the content of this chapter and do not accurately depict impacts.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-18	The following text has a typo- "Vessel Collisions - The extent of non-lethal encounters between project vessels and sea lions would range from the Amakdedori port to lightering locations, with the greatest potential for vessel encounters at the alternative lightering location west of Augustine Island due to higher sea otter densities there, compared to around the port."	Correct typo-see bolded text. The extent of non-lethal encounters between project vessels and sea lions sea otters would range from the Amakdedori port to lightering locations, with the greatest potential for vessel encounters at the alternative lightering location west of Augustine Island due to higher sea otter densities there, compared to around the port.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-18	Habitat changes - The magnitude of project impacts would be low because sea otters may easily disperse to unaffected habitat nearby.	Suggest removing bolded strike through text. Removing habitat from a threatened species under the Endangered Species Act in an area designated as Critical Habitat for the survival of the species is not a low impact.
ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-19	The following text needs clarification -"Bottom-contact stages of construction, the permanent placement of a causeway, and construction of the natural gas pipeline have potential to temporarily adversely affect critical habitat. All northern sea otter critical habitat primary constituent elements (discussed in detail in Section 3.25, Threatened and Endangered Species) could be directly affected."	Please define 'temporary'.

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ADFG/DWC/MM & TED	Chapter 4 Environmental Consequences	Section 4.25 Threatened and Endangered Species	4.25-28	Disagree with the following text- "Cook Inlet beluga whale- The likelihood of cumulative impacts is low, because beluga whales do not commonly occur in the analysis area."	If the Cook Inlet beluga whale recovered, the analysis area would potentially be utilized by beluga whales and thus the cumulative impacts may not be low.
ADFG/DWC/REFUGES	Chapter 2 Alternatives	Section 2.2.2	2-8 through 85	Action Alternative 1-Applicants Proposed Alternative. The south road corridor, Amakdedori port and ferry terminals may present conflicts with current management of the McNeil River Sanctuary and Refuge. It is our concern that bears managed for viewing at McNeil Sanctuary may leave the sanctuary and return with altered behavioral patterns .	Alternative 1 is carried forward, in order to minimize the possibility of altered bear behavior, we would encourage construction and operations be conducted with the least amount of impact on wildlife, including appropriate protocols such as waste disposal.
ADFG/DWC/REFUGES	Chapter 3 Affected Environment	Section 3.23 - Wildlife Values		Surveys conducted for identification of bears along coastal sedge flats and salmon streams may not have been sufficient to accurately capture brown bear use of area sedge flats and salmon streams. Particularly in the Amakdedori port area. Brown bear use of the Amakdedori Port site may be much higher than indicated considering use in the adjoining area, previous ADF&G observations and the number of den sites that were found adjoining the port site. While the sedge flat surveys were conducted in May and July, brown bear use of coastal sedge flats in this area is typically highest in June as sedge species reach peak protein levels. And run timing of salmon resources in Amakdedori Creek suggest that sockeye run timing (and thus brown bear use) is likely highest during the last half of July, while surveys were done on 14-15 July 2018.	Additional surveys conducted at peak times (e.g. June surveys of sedge flats, late July surveys of Amakdedori Creek) may more thoroughly capture brown bear use of the project area, particularly the Amakdedori port component. Use of existing data and limitations of the data should be included in the text when describing brown bear use of the area.
ADFG/DWC/REFUGES	Chapter 4 Environmental Consequences	Section 4.5 - recreation Section 4.23 - wildlife values	4.5-4	Suggest " may require more data"	Although there are ADF&G regulations regarding the harvest of fish and wildlife in the project area, the department supports the appropriate use of company operational authority to manage and restrict employee and contractor activities regarding fishing, hunting, and trapping in the project area. It is recommended that the project managers also work with the local residents to manage access and the potential increased harvest of fish and wildlife due to the additional access provided by the roads and infrastructure development associated with the proposed project

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ADFG/DWC/REFUGES	Chapter 4 Environmental Consequences	Section 4.23 - Wildlife Values	4.23-5	Issues with the following text- "A temporary threshold shift in hearing can last from seconds to days depending on the intensity and duration of the noise, with the shift occurring from approximately 93 dBA to 110 dBA for continuous noise. The ability of a bird's call to be heard can be masked by noise at a variety of levels above the ambient dBA (Dooling and Popper 2007). Therefore, understanding the level of noise produced by various project components is necessary to determine buffer thresholds to avoid physical damage to birds' hearing."	This sentence and reference regarding bird call masking appears to be out of place in this discussion of avian hearing loss. The impacts from project noise masking bird calls does need to be included in analysis but this reference and further discussion on the impacts of masking calls may be better in the next paragraph. Suggest revising text accordingly.
ADFG/DWC/REFUGES	Chapter 2 Alternatives	Figure 2-28	2-62	Amakdedori port airstrip is now noted as a permanent airstrip in text, but still labeled temporary on drawings.	The project purpose and need, project plans and impact analysis may need to be updated to describe the need and additional impacts for a permanent airstrip, as opposed to the impact minimization of a temporary airstrip.
ADFG/DWC/REFUGES	Chapter 3 - Affected Environment	Section 3.5.1.1 State Lands	3.5-1	Following discussion of bear viewing activities in McNeil River SGS and SGR text notes: "The McNeil River State Game Refuge and Sanctuary were established for the purpose of preserving wildlife habitats and unique brown bear concentrations. "	Update text and analysis. This statement only points to one of the statutory purposes of the sanctuary and refuge. The Sanctuary was, among other things, primarily established to provide permanent protection to brown bear and their habitat, manage human uses consistent with that goal, and to maintain the unique bear viewing opportunities in the sanctuary and provide for viewing opportunities in the refuge.
ADFG/DWC/REFUGES	Chapter 3 Affected Environment	Section 3.5.2.1 Recreational Opportunities	3.5-10	Following discussion of bear viewing activities in McNeil River SGS and SGR text notes:" McNeil State Game Refuge and Sanctuary was designated a wildlife sanctuary in 1967 to protect the world's largest concentration of wild brown bears".	Update text and analysis. This statement only points to one of the statutory purposes of the sanctuary and refuge. The Sanctuary was, among other things, primarily established to provide permanent protection to brown bear and their habitat, manage human uses consistent with that goal, and to maintain the unique bear viewing opportunities in the sanctuary and provide for viewing opportunities in the refuge.
ADFG/DWC/REFUGES	Chapter 3 Affected Environment	Section 3.5.2.1 Recreational Opportunities	3.5-8	Analysis of recreation impacts from transportation corridor appears flawed or incomplete. In discussion of recreational impacts to hunting, fishing and other recreational activities the analysis concludes that "...effect would be long-term and certain..." and "Magnitude of impacts would be medium due to the limited amount of truck traffic and number of recreationalists impacted."	Suggest revising and completing the analysis. If impact increases, mitigation measures should be employed.
ADFG/DWC/REFUGES	Chapter 3 Affected Environment	Section 3.23 - Wildlife Values		Suggested revision of the following text "...which included all of Iliamna Lake (which overlaps with the transportation and natural gas pipeline corridors)."	Revise text description "...which included all of Iliamna Lake (which overlaps a portion of with the transportation and natural gas pipeline corridors)."

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ADFG/DWC/REFUGES	Chapter 3 Affected Environment	Section 3.23 - Wildlife Values	3.23 - 19 and Figure 3.23 - 12	<p>"...Brown bear density estimates from the bear population survey in May 2009 ranged from 47.7 to 58.3 brown bears per 386 square miles (Becker 2010)."</p> <p>"...estimated that in GMU 9A, the brown bear density was 150 bears per 386 square miles..."</p> <p>Several dens were found from Gibraltar Lake west to Iliamna Lake, and the remaining were clustered near Cook Inlet north of Amakdedori Creek (Figure 3.23-12). Surveys documented a concentration of brown bear dens on each side of the port access road and around Amakdedori port (Figure 3.23-12). Several of the dens were close to the port access road, with the closest approximately 300 feet north of the road (ABR 2018p). Results indicated that bear dens were located at lower elevations, steeper slopes, higher topographic positional indices, higher ruggedness, more north and west-facing aspects, and more often in shrubs (ABR 2018p). This indicates that bears in the Iliamna area are more likely to den in shrubby areas with steep slopes. A model was created to estimate density using the relative probability of detecting a bear den based on resource selection function analysis. The model predicted that the 151-square-mile survey area had an estimated density of 164 dens per 386 square miles (ABR 2018p).</p>	<p>Recommend more conclusive research on bear use be conducted and complete the section. The environmental consequences section on brown bear notes significant bear den resources in the southern road corridor and Amakdedori Port area. As well as high densities of brown bear. It also makes note of bear use on streams and the coast in these areas from the available surveys. Yet the section does not include or make any conclusionary statements regarding the magnitude, duration or extent of these impacts to brown bear. Based on the population and den density calculations there is a considerable disparity between the number of dens which are calculated at 1-3 times the bear population estimates (depending on which pop estimate is used) for the area. Regardless of any survey or modelling issues, given what is presented, it is apparent that the road corridor goes through high quality denning habitat and may need to be relocated</p>

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Pebble Project: DEIS Review
State of Alaska Consolidated Comments Table

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ADF&G- Subsistence	Pebble DEIS	Chapter 4: Environmental Consequences, Table 4.4-1: Summary of Key Issues for Environmental Justice, Alternative 1 and Variants,	Page 4.4-14 and 4.4-15	Table states that access impacts are not “high or adverse because of access to alternate subsistence resource harvest areas.” It is unclear what additional resources (fuel, time, transportation modes, personnel) would be needed for a subsistence user to go elsewhere to harvest. In the same section, under Alternatives 2 and 3 and their variances, “the transportation corridor and ferry would cause more disruption of access to subsistence resource areas for residents...” calls to question the degree to which subsistence users would experience new hurdles to hunting, fishing and gathering.	Conducting comprehensive surveys (as described in the accompanying general comments) would provide additional clarity in determining the extent of potential impacts on subsistence related transportation.
ADF&G- Subsistence	Pebble DEIS	General Comment	General Comment	Under Section 4.9 Subsistence, the Pebble Project DEIS states, “The magnitude of impact from the project depends on the past and current level of subsistence use that would be impacted, the extent to which opportunities to harvest and experiences are altered, as well as the ability of subsistence users to relocate to another area with similar harvest opportunities and experiences.” Data cited throughout the DEIS, including Section K 3.9- Subsistence, are from 2004 and 2005. It is likely that changes in subsistence activities have occurred over the past fourteen to fifteen years (see ADF&G Division of Subsistence Technical Paper No. 302, available online at www.adfg.alaska.gov/techpap/tp302.pdf). Current comprehensive subsistence household harvest surveys addressing subsistence uses are needed for the communities of Nondalton, Port Alsworth, Iliamna, Newhalen, Pedro Bay, Igiugig and Kokhanok, at a minimum. The subsistence communities of Seldovia, Port Graham, and Nanwalek may be affected by shipping traffic through their use of Cook Inlet for shellfish and marine mammal harvest. Conducting comprehensive surveys for these communities prior to any planned development and then periodically throughout the life of the proposed Pebble Project is strongly recommended to document change over time and assess how subsistence users are impacted.	Additional subsistence uses research is needed on comprehensive subsistence harvest survey data used to inform plan as proposed

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ADF&G- Subsistence	Pebble DEIS	General Comment	General Comment	<p>While more recent research was done in 2016 and 2018, it was focused on Iliamna Lake seal ecology and the Mulchatna Caribou Herd (MCH), respectively. These studies lack the extensive data derived from comprehensive subsistence harvest surveys. Additionally, in the abstract of ADF&G Division of Subsistence Technical Paper No. 416 Integrating Local Traditional Knowledge and Subsistence Use Patterns with Aerial Surveys to Improve Scientific and Local Understanding of the Iliamna Lake Seals, (available online at www.adfg.alaska.gov/techpap/TP%20416.pdf) reports that interviews with local residents were concerned about the management of the seal population in the lake and advocated for additional research. It is unclear from the Pebble Project DEIS what impacts the various activities would have, especially the ice breaker, ferry ports, and route may have on the Iliamna Lake seal population and related subsistence uses. As found in ADF&G Division of Subsistence Technical Paper No. 441, the annual pattern of the MCH's scattered and concentrated areas and related subsistence hunting areas include the proposed Pebble Project area. Impacts of the proposed project on the caribou herd, fall, winter and spring subsistence hunting, and subsistence uses require additional study (available online at www.adfg.alaska.gov/techpap/TP441.pdf) . Caribou movements may also experience impacts that will require additional study, especially since the MCH travels over ice across Lake Iliamna.</p>	Additional subsistence uses research is needed on comprehensive subsistence harvest survey data used to inform plan as proposed
ADF&G- Subsistence	Pebble DEIS	General Comment	General Comment	<p>While biological research is not the purview of the ADF&G Division of Subsistence, given the extensive list of fish, game, and vegetation used by local residents for subsistence that may be impacted by the project, it is recommend that this proposed project include additional research to provide baseline and longitudinal study on species identified in the DEIS and by the ADF&G Divisions of Wildlife Conservation, Sport Fish, and Commercial Fisheries, in addition to vegetative studies by the State of Alaska Department of Natural Resources or another entity on plants gathered for subsistence. For example, the DEIS reports that ferry-caused seal strikes will "not have a population level effect." Given the small population of Lake Iliamna seals, their use of Seal Island II and the coastline surrounding Kokhanok, the concerns by local subsistence users mentioned above may need further research. Another example from the DEIS, "Subsistence users also may avoid harvesting waterfowl because of concerns about birds becoming contaminated from landing on and using open water at mine site facilities", illuminates the need to study waterfowl health in the area over time.</p>	

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ADF&G- Subsistence	Pebble DEIS	General Comment	General Comment	Key Issues for Subsistence, as outlined under the DEIS Section 4.9- Subsistence, identifies issues without identifying possible mitigation and makes assumptions that may need further consideration. For example, under 4.9.2.3 Changes in Competition for Resources, the DEIS does not fully address the potential increase of non-local Alaska state residents gaining access to hunting and fishing in the area, with a potential increase on pressure on fish and game populations in the area. Page 4.9-8 of this section states that Pebble Project employees will not have access to hunting and fishing and that non-resident sport hunting would be prohibited. It is unclear how Pebble Limited Partnership will ensure that personnel and contractors will follow the guidelines regarding no off-duty hunting and fishing, and what legal vehicles exist to enforce these guidelines. Additionally, the DEIS states that competition for subsistence resources would decrease after closure because of a reduction of non-local employees in the area, however this is a confusing conclusion given that the guideline regarding no off-duty hunting and fishing from project personnel and contractors should have been in place. There is also potential that the increased access created by the project may increase resource competition over time by non-local resident hunters.	
ADF&G- Subsistence	Pebble DEIS	General Comment	General Comment	In 2006, research found that subsistence users have reported increased hunting competition and pressure on the Mulchatna Caribou Herd (Technical Paper No. 302); this may be further impacted with the building and operation of the project. Additionally, caribou migration patterns are influenced by changes in the overall size of the herd (Technical Paper No. 441); this may impact hunting pressure on the herd and the ability of subsistence users to have success in harvesting Mulchatna caribou.	
ADF&G- Subsistence	Pebble DEIS	General Comment	General Comment	Throughout the subsistence-related sections of the DEIS, there are statements that need additional clarification and data, including potential and or perceived impacts on waterfowl or the idea that subsistence hunters can easily hunt elsewhere if wildlife is impacted. Additionally, it is unclear how this project will impact subsistence uses over the long term. The DEIS questions the balance between time spent engaging in subsistence activities, including the teaching of the next generation, and time spent working at the Pebble Project for those who are hired long term. Additional longitudinal research is needed to fully understand the impacts and mitigation strategies of the project on Alaska's subsistence users and subsistence uses of the resources in the area.	

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DEC/ Commissioner's Office	Draft EIS Executive Summary	Acronyms		ADEC and ADNR do not appear on the list of acronyms	ADEC and ADNR should be added to the acronym list
DEC/ Division of Water, Wastewater Discharge Authorization Program	Draft EIS Executive Summary	1.1	1	Paragraph one on this page discusses the Corp of Engineer's regulatory authority on this project. The paragraph fails to mention a key State authority that must be met. The proposed activity authorized by a Corp 404 permit may result in discharge of pollutants to waters of the U.S. located in the State of Alaska and a state issued water quality certification required under Section 401 of the Clean Water Act. Any conditions imposed by the State of Alaska become conditions of the federal permit. The Corp's 404 permit does not become effective until the state issued water quality certification is finalized.	This important regulatory requirement needs to be mentioned in the executive summary. The antidegradation analysis should be included as the Corp of Engineers analyzes a range of alternatives to ensure that a wide range of management options are considered, consistent with applicable law.
DEC/ Spill Prevention and Response Division	Draft EIS Executive Summary	2	5	NEPA regulations at Title 40, Chapter 5, Part 1502.14 dealing with Alternatives states that "this section is the heart of the environmental impact statement. Based on the information and analysis presented in the sections of the Affected Environment (§1502.15) and the Environmental Consequences (§1502.16), it should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmakers and the public." This reviewer could not find a clear, concise comparison of the primary and alternative development options that sharply defines the issues or provides a clear basis for choice among options as dictated by law. This section would be clearer if you provided clear citations to Chapter 2, Alternatives and Appendix B, Alternatives Development Process. Otherwise the reader does not know where to find additional details.	Revise paragraph two on the this page to provide a citation to Chapter 2 and Appendix B.
DEC/ Division of Water, Wastewater Discharge Authorization Program	Draft EIS Executive Summary	3.3.1.2: General Comment		Section 3.3.1.2 in the Executive Summary indicates that there is a potential conflict with the pipeline HDD project near Anchor Point. Please note that under AKG315200 - Oil and Gas Exploration, Development, and Production in State Waters in Cook Inlet General Permit the discharge cannot "preclude or limit established processing activities or commercial, sport, personal use, or subsistence fish and shellfish harvesting" as noted in the regulations at 18 AAC 70.250(b)(3), approved by the EPA in 2003.	Revise paragraph two on the this page to provide a citation to Chapter 2 and Appendix B.
DEC/ Commissioner's Office	Draft EIS Executive Summary	3.2.1.3	37	This section purports to cover water and sediment quality. Groundwater and sediment samples are discussed, but there is no discussion of surface water samples.	Please include a discussion of surface water samples.

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DEC/ Commissioner's Office	Draft EIS Executive Summary	3.2.2.3	43	Paragraph one on this page includes a discussion of temperature effects. It discusses the amount of change, but does not provide the actual temperatures anticipated to occur, or discuss whether temperatures will exceed regulatory standards or exceed site-specific requirements needed to preserve normal species diversity or prevent the appearance of nuisance organisms as required by ADEC regulations at 18 AAC 70.020(b)(10).	Please provide the range of temperatures that are anticipated to occur or provide a citation to Chapter 3, Section 3.20 and Chapter 4 where the information can be found in the EIS document. Please discuss whether temperature effects will exceed regulatory standards.
DEC/ Commissioner's Office	Draft EIS Executive Summary	3.2.2.3	44	Paragraph three and four on this page notes that "The Pebble Mine expanded development project would impact approximately three times the area proposed under Action Alternative 1, with an expansion into the UTC watershed that Action Alternative 1 generally minimizes. The magnitude of cumulative impacts to water and sediment quality would generally be increased discharges of treated effluent that would be expected to meet permit limits, but the duration of effects would be increased to approximately 98 years." There are other discussions on pages 31, 33 and other pages regarding the "expanded development scenario", but no explanation of how and why it is being discussed as a reasonably foreseeable future action, but not being discussed as an alternative.	It is not clear why the "expanded development project" or "expanded development scenario" is included in this discussion. There do not appear to be detailed discussion of the expanded scenario in Chapter 2, Alternatives or K2.0 Alternatives. Please cite to Chapter 3 discussions of cumulative effects, so the reader can understand the details better.
DEC/Water Division, Wastewater Discharge Authorization Program	Draft EIS Executive Summary	3.4.2	64	Action Alternative 2 and Variants states "Fragmentation would indirectly impact 462 acres of wetlands and other waters..." It is unclear why fragmentation is discussed for this option but not for other options.	Review the document and add fragmentation to the other alternatives as roads, etc. would create fragmentation and should be discussed in all alternatives.
DEC/ Commissioner's Office	Draft EIS Executive Summary	3.5.2	66	Paragraph four in this section notes that " <i>Based on the historical data, as well as these design and operational features, spills of diesel, concentrate, and reagents from the proposed ferry were determined to be so improbable as to have negligible risk, and were therefore eliminated as scenarios for impact analysis in the EIS.</i> " There is no reference to a screening report or a citation to where this information can be found. There did not appear to be a discussion of this scenario in Appendix B: Alternatives Development.	Provide additional details on alternatives screening or provide a citation to where that information can be found in the EIS document. Low probability, high consequence spills should be discussed.
DEC/ Spill Prevention and Response Division	Draft EIS Executive Summary	3.5.3	67	The "Road Corridor Diesel Spill" and "Marine Diesel Spill" scenarios discussed on this page do not provide information on the proposed volume of diesel spilled. The executive summary should provide sufficient information for the reader to gain a complete understanding of the issues addressed in the body of the EIS. This information is lacking.	Please add information on the volume of diesel spilled to this page or refer the reader to page 66 of the executive summary.

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DEC/ Spill Prevention and Response Division	Draft EIS Executive Summary	3.5.4	68	Paragraph one in this section notes that " <i>Impacts from a potential release of natural gas from the proposed pipeline would be limited to short-term air quality degradation and limited release of greenhouse gases (GHG).</i> " This statement appears to conflict with information released in March 2017 by the federal Pipeline and Hazardous Materials Safety Administration (PHMSA) regarding Hilcorp's natural gas pipeline leak, which noted that their leaking pipeline posed a risk to public safety, property or the environment.	In PHMSA's March 2017 letter they noted concerns from the National Marine Fisheries Service (NMFS) regarding the potential effects of the natural gas discharge on marine mammals, including the critically endangered Cook Inlet beluga whales. Please explain why these impacts were not discussed or why the proposed natural gas pipeline would not be subject to leaks such as those experienced by Hilcorp.
DEC/ Spill Prevention and Response Division	Draft EIS Executive Summary	3.5.5	68	Paragraph two in this section discusses two different hypothetical scenarios for a gold-copper concentrate release, one due to a truck rollover and another due to a spill of concentrate slurry from a concentrate pipeline. The final paragraphs on this page discuss the impacts from a spill of concentrate into flowing water, but it is not clear whether the spill being discussed is from the truck rollover or the pipeline slurry spill. The impacts discussed on the following page is predicated on a specific scenario, so it is important to clarify this information.	Please explain which spill scenario is being described when a spill of concentrate is released into flowing water.
DEC/ Spill Prevention and Response Division	Draft EIS Executive Summary	3.5.6	69	Paragraph one in this section notes that " <i>Any spill of chemical reagents would therefore likely be contained, and not released to the environment, so that full analysis of environmental impacts was determined to be unnecessary in the EIS.</i> " Recent EISs have discussed similar low probability, high consequence spills.	It is not clear what will happen if the likely containment of chemical reagents does not occur. Please address the impacts of chemical reagent spills.
DEC/ Commissioner's Office	Draft EIS Executive Summary	3.5.7	69	Paragraph two in this section discusses the physical impacts of tailings release scenarios. It presumes that spilled tailings are recovered and the small amount of tailings left would be unlikely to have any measurable effect. This conclusion is predicated on the spilled tailings being recovered, but elsewhere in the document the statement is made that tailings would be recovered <u>where practicable</u> . This section does not discuss the impacts when tailings are not fully recovered.	Please provide a discussion of the impacts when tailings are not fully recovered, or provide a citation to Section 4.27.6 where impacts from a tailings release is discussed in greater detail.
DEC/ Commissioner's Office	Chapter 2: Alternatives	2.2.2.3	2-66	Paragraph three on this page notes that a beachhead would be established for access, consisting of a " <i>temporary camp, environmental protection features, the permanent port site airstrip, and service facilities.</i> " It is not clear what environmental protection features are being used at this site.	Please explain what environmental protection features are being constructed at this site or provide a citation to a section of the document where this information is discussed in more detail.
DEC/ Commissioner's Office	Chapter 2: Alternatives	2.2.2.3	2-69	Paragraph one on this page notes that " <i>Incoming supplies such as equipment, reagents, and fuel would be barged to Amakdedori Port, and then transported by truck and ferry to the mine site.</i> " Since this section follows the section describing temporary facilities, it is not clear if these supplies would be barged before or after the port is constructed.	Please clarify if these supplies will be barged before or after the port is constructed.

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DEC/ Commissioner's Office	Chapter 2: Alternatives	2.2.4.5	2-117	Paragraph four on this page discusses filtered discharges from the concentrate pipeline and notes that " <i>The filtered water would be discharged through an outfall pipe into surrounding marine waters. All discharge water would meet appropriate marine discharge criteria. RFI 066 presents PLP's position that the US Environmental Protection Agency's (EPA's) CWA New Source Performance Standards Effluent Limitation Guidelines do not prohibit the discharge of the concentrate filtrate at the port site.</i> " It is not clear how the statement can be made that "all discharge water would meet appropriate marine discharge criteria" when the sentence that follows appears to say that there may be a question as to whether the discharges meet the appropriate marine discharge criteria.	Please clarify that this discharge would require an APDES permit and must meet Alaska's water quality standards. It is not clear from the statement made if the proposed discharges meet the applicable marine discharge criteria or if this issue remains undecided.
DEC/ Commissioner's Office	Appendix K: Section 4.10 Health and Safety		K4.10-26	Paragraph one, bullet three on this page discusses mitigation measures that would be used to control dust generation at the mine site and along the transportation corridor. It further notes that "PLP has committed to development of a fugitive dust control plan (FDCP) for mitigation and control of project activity related fugitive dust and wind erosion." It is unclear how a commitment by the project applicant to develop a fugitive dust control plan may be considered mitigation for purposes of the 404 permit or NEPA analysis. According to Forty Most Asked Questions Concerning CEQ's NEPA Regulations #19b, "The probability of the mitigation measures being implemented must also be discussed, to ensure that the environmental effects of the proposed action are fairly assessed." .	Please consider providing a written fugitive dust plan so that the reader and decision makers will understand the details.
DEC/ Commissioner's Office	Appendix K: Section 4.10 Health and Safety		K4.10-27	Paragraph three on this page discusses deposition of hazardous air pollutant metals onto soil. Paragraph four proposes that estimated concentrations of arsenic in the future would be expected to have negligible cancer risk and hazard compared to baseline conditions (increased concentration in the future would be indistinguishable from the cancer and noncancer risk associated with the baseline concentration). The paragraph further cites to the fact that the natural occurrence of elevated arsenic concentrations in soils is acknowledged in ADEC Technical Memorandum, Arsenic in Soil, dated March 2009. The citation of this memorandum may be misleading, since that memorandum has been superseded by an August 2018 technical memorandum " <i>Guidance on Evaluating Naturally Occurring Metals at Contaminated Sites</i> ". This 2018 memorandum specifically differentiates between naturally occurring arsenic and arsenic from anthropogenic sources.	The discussion should make it clear that if arsenic from anthropogenic sources exists, then sampling is required and those results need to be compared with the screening level and if the concentrations exceed the background level, those concentrations must be included in a cumulative risk evaluation. Please update the reference to delete the 2009 memo and replace it with the August 2018 technical memorandum.
DEC/ Commissioner's Office	Appendix K: Section 4.10 Health and Safety		K4.10-29	Paragraph four on this page discusses transportation corridor minor releases to surface waterbodies, according to the heading, but only appears to discuss freshwater sediment contamination and marine sediment contamination. Impacts to the waterbodies themselves is not discussed.	Please discuss the impacts to freshwater and marine waterbodies due to minor releases from the transportation corridor or change the heading.

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DEC/ Commissioner's Office	Appendix K: Section 4.10 Health and Safety		K4.10-30	Paragraph two on this page discusses the estimated sediment HAP concentrations at the end of the mine site operations. Similar to the discussion on page K4.10-27 this discussion proposes that the estimated concentrations of arsenic at the end of the mine life would not be expected to impact the health of the affected communities through direct exposure relative to the baseline conditions. This discussion appears to oversimplify the determination.	The discussion should make it clear that if arsenic from anthropogenic sources exists, then sampling is required and those results need to be compared with the screening level and if the concentrations exceed the background level, those concentrations must be included in a cumulative risk evaluation.
DEC/ Commissioner's Office	Appendix K: Section 4.10 Health and Safety		K4.10-30 thru 31	Paragraph four on this page and the next page discuss mine site fugitive dust deposition to groundwater. The first paragraph on page 31 notes "The closest potentially affected communities to the mine site are Iliamna, Newhalen, and Nondalton, each of which is approximately 17 miles away." It is not clear how mine site fugitive dust will impact existing drinking water protection areas. See http://dec.alaska.gov/eh/dw/dwp/protection-areas-map/	Please explain how mine site fugitive dust will impact existing drinking water protection areas and that health based standards will be met.
DEC/ Commissioner's Office	Appendix K: Section 4.10 Health and Safety	Table K4.10- 8	K4.10-37	The table on this page has a column titled "Impact Rating" and each entry has one or two diamonds, but no explanation of what the diamonds mean.	Please explain the meaning of the diamonds on this table by providing a footnote that refers the reader to Table K4.10-2 on page K4.10-3
DEC/ Commissioner's Office	Appendix K: Section 4.10 Health and Safety	Table K4.10- 9	K4.10-41	The table on this page has a column titled "Impact Rating" and each entry has one or two diamonds, but no explanation of what the diamonds mean.	Please explain the meaning of the diamonds on this table by providing a footnote that refers the reader to Table K4.10-2 on page K4.10-3
DEC/ Commissioner's Office	Appendix K: Section 4.10 Health and Safety	Table K4.10- 10	K4.10-45	The table on this page has a column titled "Impact Rating" and each entry has one or two diamonds, but no explanation of what the diamonds mean.	Please explain the meaning of the diamonds on this table by providing a footnote that refers the reader to Table K4.10-2 on page K4.10-3
DEC/ Commissioner's Office	Appendix K: Section 4.10 Health and Safety	Table K4.10- 11	K4.10-47	The table on this page has a column titled "Impact Rating" and each entry has one or two diamonds, but no explanation of what the diamonds mean.	Please explain the meaning of the diamonds on this table by providing a footnote that refers the reader to Table K4.10-2 on page K4.10-3
DEC/ Commissioner's Office	Appendix K: Section 4.10 Health and Safety	Table K4.10- 12	K4.10-50	The table on this page has a column titled "Impact Rating" and each entry has one or two diamonds, but no explanation of what the diamonds mean.	Please explain the meaning of the diamonds on this table by providing a footnote that refers the reader to Table K4.10-2 on page K4.10-3
DEC/ Commissioner's Office	Appendix K: Section 4.10 Health and Safety	Table K4.10- 13	K4.10-53	The table on this page has a column titled "Impact Rating" and each entry has one or two diamonds, but no explanation of what the diamonds mean.	Please explain the meaning of the diamonds on this table by providing a footnote that refers the reader to Table K4.10-2 on page K4.10-3
DEC/ Commissioner's Office	Appendix K: Section 4.10 Health and Safety	Table K4.10- 14	K4.10-56	The table on this page has a column titled "Impact Rating" and each entry has one or two diamonds, but no explanation of what the diamonds mean.	Please explain the meaning of the diamonds on this table by providing a footnote that refers the reader to Table K4.10-2 on page K4.10-3

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DEC/ Division of Water, Wastewater Discharge Authorization Program	Chapter 3: Affected Environment	General		Please note that inadvertent releases of drilling fluids and cuttings associated with horizontal directional drilling (HDD) under streams wetlands, and lakes can impact fish habitat. It is not clear whether HDD stream crossings will impact fish habitat. The public and decision makers need to be able to evaluate the potential impacts of pipeline crossings.	The department recommends identifying all HDD locations and evaluating whether fish habitat could be impacted, so the EIS note the limitations on pipeline routings.
DEC/ Division of Water, Wastewater Discharge Authorization Program	Chapter 3: Affected Environment	General		The department's Statewide Oil and Gas Pipeline General Permit does not cover discharges to marine water for horizontal directional drilling (HDD). The department is currently in the process of reissuing General Permit AKG315200 - Oil and Gas Exploration, Development and Production in State Waters in Cook Inlet that includes discharges from HDD boreholes into marine waters of Cook Inlet.	The DEIS should be updated as a appropriate to include this information, as it is critical to the 404 permit.
DEC/ Division of Water, Water Quality Standards	Chapter 3: Affected Environment	3.17	3.17-8	Placement of the TSF seepage collection point on top of a gravel/gravelly sand matrix rather than atop a clay/mud layer is problematic as there is noted potential for seepage and groundwater intrusion due to liner failure (see 4.16). It seems that seepage will be harder to determine and monitor for under this scenario, rather than having a semi-permeable layer below the TSF and then monitoring for lateral flow.	Please include additional information regarding how the collection pond location was determined, how natural geology/ geomorphology was incorporated into the design, and additional information on the number and location of monitoring wells or other monitoring that will be used to ensure that all seepage would be captured.
DEC/ Division of Water, Water Quality Standards	Chapter 3: Affected Environment	3.18.1.2	3.18-8	Paragraph two on this page states that 34% of all surface water samples failed to be in the established water quality standards pH range of 6.5 - 8.5. This could become more problematic with the addition of non-intercepted pit/tailings water or non-point source runoff generated by transportation corridors. It is not clear whether the data being used represents instantaneous results or is a daily mean/max/min value.	Please include additional information regarding how the assessment duration was established. (e.g., instantaneous or daily mean/max/min) of continuous monitoring values.
DEC/ Division of Water, Water Quality Standards	Chapter 3: Affected Environment	3.18	3.18-10	Paragraph three on this page makes multiple references to trace element exceedance, but does not reference whether these are individual grab-sample results or an average of multiple event collection efforts (e.g. 4-day average), chronic or acute exceedances, how the exceedance was determined (e.g., methodology) or degree of actual risk to aquatic life.	Please provide additional clarification on which water quality standards are being used (current state standards or recommended federal standards), magnitude, duration, and frequency values for these standards, and how the sample was determined to be meeting or exceeding state criteria.
DEC/ Air Quality Division	Chapter 3: Affected Environment	3.20.1.3	3.20-6	The final paragraph on this page notes that "When comparing the current visibility at either monitoring station to the estimated natural visibility conditions, both the haziest and clearest days are higher than natural background conditions."	Please add data on natural background visibility conditions to Table 3.20-3.
DEC/ Air Quality Division	Chapter 3: Affected Environment	3.20.1.3	3.20-7	This pages notes that "The effects of acidification through sulfur deposition are not prevalent in Alaska due to lack of sources; and as a result, nitrogen is often the main contributor of acidification in Alaska, if it occurs." This statement may conflict with the levels for wet deposition in Table 3.20-4. Referencing appropriate data to support this statement would be informative.	Please explain. This could be address by adding the natural background concentrations to the documents, as noted above.

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DEC/ Air Quality Division	Chapter 3: Affected Environment	3.20.1.3	3.20-7	Paragraph three on this page notes that "However, given that both SO2 and NOX emissions contribute to both visibility impairment and deposition, and knowing that visibility degradation in Denali National Park is slightly worse than Tuxedni, it is expected that deposition measurements in Denali National Park are conservatively representative of Tuxedni and the analysis area." This statement is questionable due to the lack of a defined fugitive dust control plan.	If fugitive dust control will be considered a mitigation measure, please provide a written plan, including information regarding which agency would be responsible for compliance and enforcement.
DEC/ Air Quality Division	Chapter 4: Environmental Consequences	4.4.2.3	4.4-8	Paragraph three, bullet one on this page discusses Air Exposure Pathways. The final sentence in bullet one states " <i>In addition, with implementation of dust mitigation measures, the potential localized and near-field air quality fugitive dust impacts from the project would be further reduced.</i> " As discussed above, the promise of creating a fugitive plan does not provide mitigation of impacts, so it is not clear how this statement can be true.	If fugitive dust control will be considered a mitigation measure, please provide a written plan, including information regarding which agency would be responsible for compliance and enforcement.
DEC/ Air Quality Division	Chapter 4: Environmental Consequences	4.4.2.3	4.4-9	Paragraphs three and four on this page discuss water exposure pathways. Paragraph four discusses the potential impact to community drinking water wells north of the mine site. There is no discussion of impacts to drinking water protection areas. http://dec.alaska.gov/eh/dw/dwp/protection-areas-map/	Please include a discussion of impacts to drinking water protection areas, not just existing wells.
DEC/ Air Quality Division	Chapter 4: Environmental Consequences	4.9.2.1	4.9-3	Paragraph three on this page discusses the impact of fugitive dust in the roadway corridor and notes that " <i>implementation of dust suppression and enforcement of slow speed limits at all stream crossings would minimize dust-related impacts to aquatic ecosystems.</i> " It is not clear from this discussion which agency would be responsible for dust suppression and enforcement of slow speed limits at all stream crossings.	Please discuss compliance and enforcement of fugitive dust suppression and speed limits in order for the reader to understand how this could be considered a mitigation measure that would minimize impacts.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.9.2.1	4.9-4	Paragraph two on this page notes that " <i>The pit lake at the mine site would fill during the decades after mine closure. This would introduce a new standing waterbody, and concern about contamination of waterfowl was expressed during scoping. While there would be exceedances of water quality standards for specific metals, during closure, exposure of wildlife and birds from potential contaminant exposure would be limited and short-term.</i> " This conclusion appears to be supported by statements that the pit lake would not support habitat that is attractive to many species of waterfowl and shorebird. This appears to conflict with historical bird deaths at the Berkeley Pit in Butte, Montana. That pit would be considered similar to the pit in questions, but apparently was attractive to the waterfowl in question, resulting in injury and death.	Please provide additional information that would support the conclusion that the pit lake would not be attractive to waterfowl and that the potential contaminant exposure would be limited and short-term.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.10.7.2	4.10-14	Paragraph five on this page proposes that direct exposure of the affected communities to hazardous materials may not be noticeably altered by the expansion scenario as long as the cumulative magnitude of all emissions and releases to air, soil and water continue to be less than the appropriate screening levels for human health. It further notes that " <i>It would be expected that mitigation measures would be used to minimize or mitigate exposure.</i> " Both of these conclusions are predicated on future actions. As noted earlier with the fugitive dust plan, more detail must be provided to support these conclusions or provide a citation to where the information is available.	Please provide additional information that would support the conclusion that cumulative emissions and releases would be less than the appropriate screening levels and additional information on actual mitigation measure that will reduce impacts, not promises of future mitigation efforts.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.12.2.3	4.12-7	Paragraph three on this page discusses the environmental hazards (winds and reefs) regarding the use of the Amakdedori Port. It is not clear why this information was not provided in the section describing lightering for the Amakdedori Port, since these conditions would impact the safety of the lightering operations and the risk of spills.	Please add the information on winds and reefs in this paragraph to the discussion of lightering in Chapter 2, Section 2.2.2.3.
DEC/Spill Prevention and Response Division	Chapter 4: Environmental Consequences	4.15.2.3	4.15-11	Second sentence states " <i>The port would be designed to an appropriate seismic design code (Knight Piesold, 2013).</i> " The referenced report was located and reviewed. Please note that this report is still in DRAFT form even though the report later states the " <i>revised seismic hazard maps for Alaska have been published more recently by the USGS (Wesson et al., 2007)</i> "; and " <i>the peak ground accelerations presented in this report for the probabilistic hazard analysis have not been revised to account for the recent revision.</i> "	Please update the basis for risk analysis pertaining to earthquakes using current information (updated in 2015).
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.16	4.16-8	General comment: The text on this page notes that the water balance predictions are subject to "significant uncertainty" and this makes it likely that the wastewater treatment plant could have to discharge more water than anticipated in the groundwater modeling. This has the potential to eliminate much of the natural variability present in the current system and potentially affect the biota present. Alaska regulations at 18 AAC 70.020 requires consideration of the impact on growth and propagation of fish, shellfish, other aquatic life, and wildlife.	Please provide additional information pertaining to natural variability in the flow regime and the potential consequences if variability is removed from the system due to production needs and storage capacity, including the effect on aquatic life.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.16	4.16-9	General comment: The discussion of streamflow does not provide flow information to compare with water quality data (e.g., sample results during low/high streamflow conditions), which makes it difficult to determine what the critical conditions for aquatic life may be. Alaska regulations at 18 AAC 70.020 requires consideration of the impact on growth and propagation of fish, shellfish, other aquatic life, and wildlife.	Please provide additional information on the relationship between water sample results/stream flow/seasonal conditions.

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DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-4	Paragraph one on this page mentions that " <i>Some or all of the stormwater discharges may require authorization from the Alaska Department of Environmental Conservation (ADEC) under the Alaska Pollutant Discharge Elimination System (APDES) Mine Site General Permit for stormwater.</i> The is the incorrect name for the permit. Please note that it appears correctly on page 4.18-7	Please refer to the Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity, Permit Number AKR06000.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-4	Paragraph two on this page discusses Water Treatment during Operations. The text notes that supplemental heating could be necessary during cooler periods to achieve minimum temperature levels for biological selenium removal to be effective. It is not clear how it will affect the temperature of the discharge or if the supplemental heating will impact aquatic resources.	Please provide additional information regarding the potential risk to aquatic resources should supplemental heating be required.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-4	Discussions on this page specifically notes two water treatment plants (WTP#1 and WTP#2), but there are also references to three water treatment plants on the site plans (North, East, South).	Please revise the text and map(s) to accurately label the three plants and discharge locations, even if these may change based on operator-specific conditions. Provide additional labeling in all figures and clarity in the text regarding the timing of when each will be constructed, key roles in the project, and additional geotechnical information regarding the point of discharge (size, depth, mitigation technology proposed (e.g., diffuser)).
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-4	Discussions on this page regarding discharges for water treatment plants are unclear. It is unclear where the outfall discharge locations will be for all WTP Discharges (North, East, and South). Of particular concern is the discharge for WTP Discharge South, as it appears to be discharging either into Frying Plan Lake or very near to it.	Please provide additional clarification as to the discharge locations and the potential receiving waters that might be impacted.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-4	The discussion at the bottom of this page notes that " <i>Based on an independent review of the WTP source terms and processes (Appendix K4.18; AECOM 2018i), discharge water from both WTPs is currently expected to meet ADEC criteria.</i> " It is further noted in discussions on page 4.18-7 that " <i>For constituents that exceed criteria in background surface water and groundwater (see Section 3.18, Water and Sediment Quality, and Appendix K3.18), there are currently no plans to incorporate site-specific background levels of constituents into discharge limits (ADEC 2018-RFI 064a).</i> " Such statements are predicated on the willingness of a potential permittee to meet current water quality standards (WQS) without consideration of those currently recommended by EPA and that the state will be required to adopt, the degree of treatment that would be required to meet state/federal WQS, and the willingness of a permittee to engage in a rulemaking effort to develop site-specific criteria.	Please consider striking or modifying this statement to clarify that a potential permittee may choose to seek site-specific criteria per 18 AAC 70 rather than implement the required water quality treatment technology to meet existing criteria.

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DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-4 and 4.18- 5	The last paragraph on this page notes that " <i>there is some concern that salt and selenium could build up over time in the pyritic TSF, which has the potential to lead to increased total dissolved solids (TDS) concentrations that would require treatment in the main WTP. This may require further investigation as design progresses, and/or a long-term adaptive management strategy.</i> " It is not clear what the salts are comprised of and their anticipated solubilities. It is also not clear how the salts and selenium are going to be prevented from re-mobilizing and entering the system within the pyritic TSF if water quality conditions change.	Please explain what the salts are comprised of and their anticipated solubilities. Please describe how salt and selenium are going to be prevented from re-mobilizing and entering the system within the pyritic TSF if water quality conditions change. Please also outline what would happen at closure when the tailings are re-located and submerged in the main pit. Please consider additional studies (modeling and laboratory testing) to determine the composition of the salts, their corresponding solubilities, and the potential for remobilization within the pyritic TSF, transfer to the open pit at closure, and at final closure when the deposited sub-aqueously into the open pit.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-4	General comment: Much of the assessment work conducted appears to be using current state water quality standards rather than those that are required by states to adopt under Clean Water Act Section 304(a). This includes pollutants such as acrolein, aluminum, ammonia, cadmium, carbaryl, copper, diazinon, nonylphenol, selenium, and the majority of pollutants with human health criteria. Use of the criteria other than those recognized by the EPA will not utilize the most recent advances in science behind determining risk to aquatic life. Regardless of Alaska's progress in the adoption process, and EPA's approval of those adopted standards, it would be prudent to anticipate the adoption of the federal standards given the length of time for the NEPA and permitting process. While it is not unusual for a certain amount of time to pass between publication of EPA-updated 304(a) criteria in the federal register and adoption by states, the project should consider the most stringent federally-applicable assessment methodology. In addition, recognition of the federal standards would allow the permittee to accurately determine the degree of treatment that would be required to operate a wastewater treatment plant (WTP) in perpetuity.	Since copper is a 304(a) pollutant, Alaska is expected to adopt its use when deriving water quality criteria for water quality assessments and pollutants prior to issuing discharge permits (EPA 2014 8-3). The EPA's 2007 aquatic life freshwater quality criteria for copper is based on the Biotic Ligand Model (BLM). This BLM is a metal bioavailability model that uses receiving water body characteristics and monitoring data to develop site-specific water quality criteria. Without application of the BLM for copper, the criteria used in this document may under-represent the existing toxicity present and any assimilative capacity that various waters would have if seepage/non-point sources of pollutants were introduced into various waters. Please analyze using the most stringent federal standards and methodology to improve regulatory certainty.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-4	General comment: It appears that little to no water quality or habitat data has been provided specific to Frying Pan Lake. Also, the text of the document does not clearly state whether discharge from the southern most wastewater treatment plant (WTP-3?) discharges directly into Frying Pan Lake.	Please provide water quality data specific to Frying Pan Lake and clarify the location of the specific discharge point of the southern most wastewater treatment plant.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.18.3.1	4.18-8	Paragraph one on this page notes that discharges from the open pit water treatment plant (WTP) is currently subject to an engineering analysis. It should be further noted that in addition to a reclamation and closure plan, this discharge would be subject to an APDES permit.	Please note that the post-closure discharges from the open pit WTP would be subject to an APDES permit.

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DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-10	Paragraph two on this page notes that "A water surplus is anticipated during operations under normal and wetter than normal climactic condition." According to Section 4.16, page 4.16-8 note that "In reviewing the water balance estimates, it should be noted that predictions may be subject to significant uncertainty, due in part to uncertainty associated with the input from the groundwater module.(See Section 4.17, Groundwater Hydrology and Appendix K4.17)." It is not clear how the mine operations will ensure that downstream flow does not experience significant fluctuations (>10%) when groundwater modeling is anticipated to be biased low and that more discharges than currently anticipated will be required. Section 4.16 notes that around 22-28cfs would be lost due to mine operations, but <u>up to 29 cfs</u> would ultimately be available. Those general assertions do not answer the question of whether the downstream flow will experience significant fluctuations.	Please provide additional information pertaining to groundwater/surface water interactions/flow modeling/ and the potential risks to aquatic life. Additionally, please explain what specific actions or mitigation measures would be taken to ensure that increased or decreased flow would not result in an adverse impact to aquatic life.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.18.3.1	4.18-11	Bullet one at the top of this page discusses changes in water temperature due to discharges. It only discusses the amount of change but does not discuss whether temperatures will exceed regulatory standards or exceed site-specific requirements needed to preserve normal species diversity or prevent the appearance of nuisance organisms as required by ADEC regulations at 18 AAC 70.020(b)(10).	Discuss whether temperature effects will exceed regulatory standards.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-11	Paragraph one on this page discusses the effect of treated water discharges on spatial trends. It notes that "The magnitude of changes in water condition that occur at each discharge point would also be expected to be diluted through natural flow over a relatively short distance, and to return to background, or near-background conditions." This text could be interpreted as allowing for a mixing zone to be available for this project. It should be noted that mixing zones are not allowed in anadromous waters under 18 AAC 70.240.	Please clarify text and make sure that the reader understands the fact that all discharges will be subject to water quality standards-based effluent limits.

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DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-11	Paragraph two on this page discusses the effects from deposition of fugitive dust and notes that " <i>the calculations indicate an expected increase in the concentration of metals in surface water as a result of dust deposition, ranging from 0.1 to 0.7 percent, which would not result in exceedances of the most stringent water quality criteria.</i> " It not clear how these calculations were made, as results elsewhere appear to conflict with this conclusion. Pullen Creek, Alaska currently has a Total Maximum Daily Load (TMDL) for metals (cadmium, copper, lead, and zinc). The source of the pollutant is attributed to fugitive dust from historic mining related activities. Such concerns are not limited to historic mines, as multiple current mines are revising their best management practices (BMPs) or taking active measures to address water quality issues associated with fugitive dust. There should be additional consideration of how "higher than anticipated" discharges of mineral-rich groundwater combined with higher than anticipated impacts from fugitive dust could contribute to water quality/sediment quality impacts.	Please provide additional analysis of the risk from fugitive dust to surface waters, including the potential of metal concentrations in the water column and sediment contributing to increased toxicity to aquatic life based on available models (e.g., biotic ligand model (BLM)). Information should also be provided regarding how the cumulative effects of permitted air emissions and the higher than anticipated impacts of fugitive dust could increase concentrations of pollutants in surface waters and the additional risk of toxicity to aquatic life.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.18.3.1	4.18-11	Paragraph two on this page discusses the effects from deposition of fugitive dust and notes that PLP is developing a plan for mitigation purposes.	If fugitive dust control is to be considered a mitigation measure, the applicant must provide a written plan, including information regarding which agency would be responsible for compliance and enforcement. Promising to develop a plan does not qualify as mitigation.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.18.3.1	4.18-13	Paragraph three on this page summarizes mine site effects on surface water quality. The final sentence notes " <i>The magnitude of temperature effects ranging from about -1 to 3.6 °C would occur up to 0.5 to 3 miles downstream of the mine site.</i> " This sentence only discusses the amount of change but does not discuss whether temperatures will exceed regulatory standards or exceed site-specific requirements needed to preserve normal species diversity or prevent the appearance of nuisance organisms as required by ADEC regulations at 18 AAC 70.020(b)(10).	Discuss whether temperature effects will exceed regulatory standards.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-15	Paragraph two on this page discusses the effects from water management pond (WMP) leakage. It notes that " <i>Water in these ponds is anticipated to contain total dissolved solids (TDS), sulfate, and number of metals exceeding discharge water quality criteria. Pond water leaking through the pond liners would be intercepted by underdrain systems included in the design of those facilities, and subsequently pumped back to the respective WMP; however, in terms of impacts, some water could bypass the underdrain system and seep into underlying shallow groundwater.</i> " Without intervention, this water would be expected to mix with groundwater and discharge into the North Fork Kaktuli River watershed. It is not clear what the extent of these impact would be.	Please describe how leakage/seepage from the surface ponds could increase the toxicity in surface waters to aquatic life and how long any elevated toxicity would take to occur. Please also describe how such a risk would be determined during operations and what measures would be taken to mitigate the risk.

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DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-15	Paragraph three on this page further discusses the effects from water management pond (WMP) leakage. It notes that " <i>Based on the current mine plan, it is possible that gaps exist along the main WMP embankment that would allow potentially affected groundwater to flow through areas where wells are limited.</i> " This would imply that should monitoring demonstrate liner leakage, interception wells would be required to recycle shallow groundwater back to the main WMP. It is not clear if the resolution in the existing hydrogeological modeling is sufficient to calculate the impacts of liner leakage in these areas. There is also little discussion about the risk this liner leakage poses to aquatic resources.	Please provide additional information on the potential for liner leakage to impact aquatic life due to groundwater/surface water pollution. Please also provide additional information regarding potential mitigation measures should it be determined that increased toxicity is occurring.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-17	Paragraph one on this page discusses impacts to groundwater levels following pit lake closure. It notes " <i>To maintain the 890 feet amsl management level, the maximum anticipated flow through the WTP is estimated to be approximately 1,300 gallons per minute or 2.9cfs, although this rate could be higher than predicted under the current groundwater model based on model uncertainties.</i> " The groundwater mobility question is a significant issue that needs to be addressed in a more comprehensive manner. It is not clear from the discussion what the degree of uncertainty is in the groundwater modeling. There are numerous assumptions that the pit capture component will work according to the models, which the author admits has an undefined degree of uncertainty associated with it.	Please provide additional information regarding the potential risk to aquatic resources should the groundwater modeling assumptions be flawed.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-18	Paragraph two on the this page summarizes the effects on mine site groundwater quality. It notes " <i>In terms of duration, groundwater quality beneath the NFK west and NFK east drainages in the immediate vicinity of the mine site would be impacted during operations, but would be expected to improve in the decades after mine closure.</i> " This assertion that the groundwater quality would improve in the NFK drainages over time appears to conflict with the previous text in this section which suggests degradation or uncertainty. In addition, potential remedies to groundwater impacts and whether they would be practical are not discussed.	Please provide information in support of the conclusion that groundwater quality will improve over time and discuss potential remedies if groundwater quality does not improve.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.18.3.1	4.18-17	Paragraph four on this page discusses effects on drinking water wells. The final sentence in the paragraph notes " <i>Therefore, groundwater that would be potentially affected by mine site facilities would not be expected to affect drinking water sources used by on-site workers. Similarly, no effect would be expected on drinking water wells outside of the mine site area.</i> " It is not clear from this statement if groundwater is protected as a current and future potential drinking water source.	Please explain if groundwater is being protected as a current and future potential drinking water source.

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DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-18	There is a concern that the module water management pond WMP will not have the capacity to treat groundwater with high mineral content prior to discharge into the SFK catchment in the time period before a permanent WMP is being constructed and capacity demonstrated.	The EIS should further explore the potential phasing or similar project modification efforts to allow for environmental controls (e.g., water treatment plant) to be constructed prior to large scale operation.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.1	4.18-18	The section on this page that discusses Substrate/Sediment Quality notes that <i>"the downstream sediment supply to the North Fork Koktuli River would be cut off, depleting the natural supply of sediment to downstream gravels, and potentially affecting aquatic habitats (see Section 4.24, Fish Values). A decrease in water flow from fill placement would also lower the natural level of coarse sediment transport, potentially allowing more fine particles to accumulate within the streambed. These impacts of placement of fill would be permanent, and certain to occur if the project is permitted and constructed."</i> This statement appears to conflict with the Clean Water Act and would appear to be a violation of the water quality standards sediment criteria.	Please provide additional information regarding the potential for changes in sediment supply to negatively affect water quality and aquatic life as required by 18 AAC 70.020.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.18.3.2	4.18-20	Based on the discussion in paragraph two of the surface water quality discussion, it appears that minimal geological investigations have occurred along the proposed road corridor(s) and additional investigations may be warranted to ensure that potentially acid generating (PAG) rock is not widespread in the region. Incorporating PAG rock into the road materials could create additional water quality impacts. In addition, there is minimal information on the potential for leaching of constituents, including metals, from non-PAG rocks which could also impact water quality.	Please provide additional information pertaining to the potential for PAG rock in the transportation corridor and the potential for metals leaching in the transportation corridor that could impact water quality.
DEC/ Office of the Commissioner	Chapter 4: Environmental Consequences	4.18.3.2	4.18-22	Paragraph one on this page discusses placement of fill material in the transportation corridor. It is not clear from the discussion whether there is naturally occurring asbestos in the material proposed as fill material.	Please confirm that fill material for the transportation corridor would not contain naturally occurring asbestos. If the substance may appear in rock source materials, please explain how water quality and air quality impacts would be mitigated.

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DEC/ Air Quality Division	Chapter 4: Environmental Consequences	4.20		Chapter 4.20 discusses air quality and contains emission calculation summaries and references Appendix K4.20 Air Quality, which in turn further discusses the impacts of the project. Appendix K4.20 then refers to PLP 2018-RFI 007, where the actual calculation and emission factors can be found. The Mobile and nonroad emissions estimates used in assessing air quality impacts in PLP 2018-RFI 007 are not based on the current EPA-approved estimation models. The mobile emissions analysis must be completely redone to use the correct model or emissions factors. Appendix A-2 references 40 CFR Part 1039 Tier F. Please note this is a standard, not an "in-use" emission factor for the specific piece of equipment expected to be used. It should also be noted that the reference table 6.1.1, AP42, Vol 2, is retired and should not be used for calculating emissions for a new project. These calculations also assume the use of ultra low sulfur diesel (ULSD), but there is no discussion regarding the use of ULSD in the air quality section. The EPA has a number of statements on their web pages that expressly states that Vol 2 should not be used. Please also note that 40 CFR Part 89, Tier 3 may also not be a correct emission factor reference. In addition, all on-road and off-road mobile emissions are required to use the MOVES model, which isn't referenced at all within the document.	Please use the correct models and emission factors and revise the summaries. Please discuss the use of ULSD in the air quality section.
DEC/ Air Quality Division, Air Permitting Program	Chapter 4: Environmental Consequences	4.20	General	General comment: The Project proposes a natural gas pipeline for gas-fired power plant and mill at the mine site, so it would appear that natural gas in sufficient quantity is planned to be available. However no additional use of natural gas is proposed: ore-concentrate ferries on Lake Iliamna; gas-fired reciprocating engines at most stationary source locations; any other use considered under a "good neighbor-best practices" policy.	The use of natural gas and especially LNG is growing worldwide as an effort to be better stewards of our natural resources and air emissions in general becomes more stringent. While not legally required, the Applicant could propose additional applications or uses of cleaner burning natural gas instead of liquid fossil fuels.
DEC/ Air Quality Division	Appendix K4.20	K4.20.1.1 Table 40.20- 1	KA. 20-2	The listed value for the Alaska Ambient Air Quality Standard (AAAQS) for annual PM2.5 is incorrect.	Please correct the value for the annual PM2.5 AAAQS to read: 12.0µg/m3.
DEC/ Air Quality Division	Appendix K4.20	K4.20.2.1 Tables K4.20-4, K4.20-5 and Figures K4.20-3, K4.20-4	KA.20-8 thru KA.20- 10	The table values are not consistent and the two figures appear to be the same (duplicated). It appears that the Maximum Project-Only Predicted Concentration columns should have consistent values in Tables K4.20-4 and K4.20-5. However the PM2.5 24 hour values differ (3.2 and 8, respectively) and the PM10 annual values differ (0.5 and 1.4, respectively). In addition, the maximum values for PM2.5 annual (1.4) in Table K4.20-5 does not seem to match any of the values in the two figures. The maximum value for 24 hour PM2.5 in Table K4.20-4 (3.2) also does not appear to match the outputs in the figures. In addition the two figures K4.20-3 and -4 appear to be identical. It is not clear why they are duplicated.	This section should be reviewed for consistency to ensure the data presented is correct.

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DEC/ Air Quality Division, Air Permitting Program	Appendix K4.20	K4.20.2.2	K4.20-12	Paragraph 2 suggests that demonstration of compliance with the AAAQS/Increment for the mine site, evaluated alone, implies that the transportation corridor (also evaluated alone) would not cause or contribute to a violation of the AAAQS/Increment due to its lower emissions. This is not a representative approach. The transportation corridor has different emission units, ambient air boundary configuration (if any boundary at all), etc. Therefore comparing the mine site to the corridor is "apples and oranges". Also, the two components are geographically adjacent and will emit pollution contemporaneously, resulting in overlapping impacts. Analyzing both components in isolation will underestimate the cumulative ambient air impacts and is not an appropriate approach.	Conduct a new ambient air quality analysis that includes all sources in the project area that emit pollutants concurrently; or, if already performed, revise this paragraph to better describe the approach.
DEC/ Air Quality Division, Air Permitting Program	Appendix K4.20	K4.20.2.3	K4.20-12	If the Amakdedori Port operations will emit air pollution at the same time as the other project components, an approach that does not include other sources of emissions in the modeling domain is not a valid representation of the impacts, for the reasons stated above in regard to the transportation corridor.	Conduct a new ambient air quality analysis that includes all sources in the project area that emit pollutants concurrently; or, if already performed, revise this paragraph to better describe the approach.
DEC/ Air Quality Division, Air Permitting Program	Appendix K4.20	K4.20.2.3	K4.20-12	Similar to the approach to the other component phases, considering the construction of the pipeline corridor impacts in isolation of other emission sources of air pollution that operate concurrently is not an appropriate approach, and will underestimate the cumulative ambient air impacts.	Conduct a new ambient air quality analysis that includes all sources in the project area that emit pollutants concurrently; or, if already performed, revise this paragraph to better describe the approach.
DEC/ Air Quality Division	Chapter 4: Environmental Consequences	4.20	4.20-1 thru 4.20-6	Given the concerns about the emission estimation methods for mobile and non-road equipment listed in the comments above, the emission summaries may not accurately reflect air quality emissions from the proposed project.	Emission summaries and conclusions should be revised as needed to reflect updated emission estimates using appropriate estimation techniques and emission factors.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.20.1	4.20-1	The description of emission sources outlined in the bullets at the bottom of the page does not include a description of how rock crushers and mine mill operations are categorized in the three categories outlined.	Please explain which category would include rock crushers and mine mill operations.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.20.1	4.20-2	Bullet one on this page discusses the duration of impacts to air quality. Sub-bullet one notes that " <i>the air quality impacts would only remain while the project's activity is ongoing, returning to the baseline conditions once the activity is complete; this would be short-term is occurring only during construction...</i> " It is not clear how four years of construction activity can be considered "short-term" in the context of air emissions.	Please explain how four years can be considered "short-term" or change the characterization to "medium-term" to reflect the duration of the air emissions.
DEC/ Air Quality Division, Air Permitting Program	Chapter 4: Environmental Consequences	4.20.3.1	4.20-4	The paragraph discussing construction on this page uses 500 hours as the maximum allowable hours per year for emergency fire pumps. 500 hours is an EPA figure used to calculate Potential to Emit (PTE) and is not an operating hour limitation. Emergency units can operate to the maximum extent needed	Please revise the discussion to simply focus on 500 hours as a PTE estimate, nothing more. The ability to estimate actual emergency use data may be gathered from similar sources and facilities.

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DEC/ Air Quality Division, Air Permitting Program	Chapter 4: Environmental Consequences	4.20.3.1	4.20-6	The paragraph at the top of this page discusses emissions inventory to include "back-up generator". EPA no longer uses this term, a unit is either prime power/normal source or an emergency source. Emergency sources have different PTE calculations based on assumed limitations.	Please remove all references to "backup" generator; a unit is either normal-source prime power or an emergency unit. Each type of the two have differing air quality applicable requirements.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.20.1	4.20-7	Paragraph three on this page discusses air emissions related to project closure. The paragraph notes " <i>If near-field impacts were to occur, they would be minimal in magnitude, localized in extent, and of short-term duration, occurring while closure activities are ongoing.</i> " It is not clear how twenty years of closure activity can be considered short-term.	Please explain how twenty years can be considered "short-term" or change the characterization to "medium-term" to reflect the duration of the air emissions.
DEC/ Air Quality Division	Chapter 4: Environmental Consequences	4.20	4.20-10	The conclusion to the "Construction" section on this page refers to a "return to baseline conditions". It is not clear what "baseline conditions" are. Once construction is complete, the construction emissions would end, but this may not mean that emissions will return to "baseline", since operation of the constructed facility would continue along with other air emission impacts (transportation, operations) presumably above "baseline".	This conclusion should be reworded to reflect the end of the construction phase emissions without suggesting a "return to baseline" or provide a definition of baseline that will provide more clarity.
DEC/ Air Quality Division	Chapter 4: Environmental Consequences	4.20	4.20-10	A fugitive dust control plan from road traffic is not discussed in this section regarding the operations phase of the road corridor. A statement is made " <i>once construction is complete, air quality would return to baseline conditions.</i> " This is not true of any unpaved road in continual operation.	Fugitive dust from unpaved roads is of grave concern, especially considering wind conditions near the construction zone. A robust fugitive dust control plan is needed.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.20.3.2	4.20-11	Paragraph one on this pages discusses air emissions during mine operations. The paragraph notes " <i>As discussed in the mine site impact analysis, air quality near-field and far-field impacts would be minimal in magnitude, localized in extent and short-term in duration, only occurring during the activity.</i> " It is not clear how twenty years of operations activity can be considered short-term.	Please explain how twenty years can be considered "short-term" or change the characterization to "medium-term" to reflect the duration of the air emissions.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.20.3.2	4.20-11	Paragraph two on this page discusses air emissions during the closure/post-closure period. The paragraph notes " <i>If near-field impacts did occur, they would be minimal in magnitude, localized in extent, and of short-term duration, only occurring during closure/post-closure activities.</i> " It is not clear how twenty-plus years of closure/post closure activity can be considered short-term.	Please explain how twenty-plus years can be considered "short-term" or change the characterization to "medium-term" to reflect the duration of the air emissions.
DEC/ Air Quality Division	Chapter 4: Environmental Consequences	4.20	4.20-12	The conclusion to the "Construction" section on this page refers to a "return to baseline conditions". It is not clear what "baseline conditions" are. Once construction is complete, the construction emissions would end, but this may not mean that emissions will return to "baseline", since operation of the constructed facility would continue along with other air emission impacts (transportation, operations) presumably above "baseline".	This conclusion should be reworded to reflect the end of the construction phase emissions without suggesting a "return to baseline" or provide a definition of baseline that will provide more clarity.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.20.3.3	4.20-12	Paragraph three on this page discusses air emissions related to construction of the Amakdedori Port. The paragraph states " <i>Based on that similarity, the magnitude, extent and duration of air quality impacts would be minimal, localized, and short-term, only occurring during construction activities.</i> " It is not clear how four years of construction activity can be considered short-term.	Please explain how four years can be considered "short-term" or change the characterization to "medium-term" to reflect the duration of the air emissions.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.20.3.3	4.20-14	Paragraph one on this page discusses the near-field impacts from port operation emissions. The paragraph states " <i>Near-field air quality impacts from port operations emissions have been demonstrated to be in compliance with modeled AAAQS and PSD Class II Increments.</i> " This sentence appears to be misleading as modeling cannot directly demonstrate compliance.	You may want to consider re-writing the sentence to read " <i>Near-field air quality impacts from port operations have been <u>modeled</u> to be in compliance with AAAQS and PSD Class II Increments.</i> "
DEC/ Air Quality Division, Air Permitting Program	Chapter 4: Environmental Consequences	4.20	4.20-15	The conclusion to the "Construction" section on this page refers to a "return to baseline conditions". It is not clear what "baseline conditions" are. Once construction is complete, the construction emissions would end, but this may not mean that emissions will return to "baseline", since operation of the constructed facility would continue along with other air emission impacts (transportation, operations) presumably above "baseline".	This conclusion should be reworded to reflect the end of the construction phase emissions without suggesting a "return to baseline" or provide a definition of baseline that will provide more clarity.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.20.3.3	4.20-17	Paragraph one on this page discusses the near-field impacts from the compressor station. The paragraph states " <i>Near-field air quality impacts from the compressor station have been demonstrated to be in compliance with AAAQS and PDS Class II increments.</i> " This sentence appears to be misleading as modeling cannot directly demonstrate compliance.	You may want to consider re-writing the sentence to read " <i>Near-field air quality impacts from the compressor station have been <u>modeled</u> to be in compliance with AAAQS and PSD Class II Increments .</i> "
DEC/ Air Quality Division	Chapter 4: Environmental Consequences	4.20.3.5	4.20-18	The summer-only variant on this page proposes storing an additional 6-months of ore concentrate on-site and contends there will be no additional impact from fugitive dust. This is not a defensible argument considering the increased size of ore concentrate stockpiles and known wind/weather conditions at the mine site. Storing additional 6-months of ore concentrates at the mine site implies significant additional road traffic throughout the shipping season to get the additional ore containers to the port. It is also not clear if the ore concentrate stockpiles will be covered to prevent fugitive dust. More road traffic implies more fugitive road dust generation.	An enhanced fugitive road dust control plan is needed for this variant and is not provided. If ore concentrate is stockpiled for 6 months, please explain how fugitive dust will be controlled on these stockpiles.
DEC/ Air Quality Division	Chapter 4: Environmental Consequences	4.20.7 Table 4.20-10	4.20-21 thru 23	In several places in this table under construction and operations phases there are statements "Impacts would return to baseline conditions once the construction/mine operation was complete". This is imprecise as there will be air impacts above baseline presumably until site closure is complete.	This section should be re-worded in a manner to reflect the end of construction/operational phase emissions without suggesting a "return to baseline" or ensure that baseline is defined within the chapter for clarity.
DEC/ Air Quality Division, Air Permitting Program	RFI 0009 (document referred to in EIS)	Kenai compressor station	22-23	It does not appear that the analysis for the Kenai compressor station included impacts from off-site sources, such as the nearby Bluecrest Cosmopolitan facility.	Please address impacts of off-site sources in updated modeling, or address the issue of overlapping concentration gradients qualitatively.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/ Air Quality Division, Air Permitting Program	RFI 0009 (document referred to in EIS)	Kenai compressor station	22	Text on this page states that modeling analysis was performed "consistent with ADEC minor air quality permitting requirements". Please note that ADEC Air Permits Program has not evaluated or approved PLP's modeling analysis for use in support of permitting. This statement may imply endorsement or pre-approval of the modeling by ADEC.	Clarify that the modeling is consistent with ADEC requirements in the author's judgment, and that it has not been reviewed or approved by ADEC.
DEC/ Air Quality Division, Air Permitting Program	Chapter 4: Environmental Consequences	4.20, Chapter K4.20, RFI009	General	Section 4.20 does not disclose the potential air quality impacts of mobile source NOx emissions -- up to 4,321 tpy for the mine site during the operations phase; by far the largest potential source of NOx emissions during the construction and several other phases. The supporting modeling analysis focuses solely on sources regulated under Title I of the clean air act, and therefore only addresses the NOx impacts of the much smaller (in this case) emissions from stationary and fugitive sources. However, the potential NOx impacts from mobile sources may significantly affect the air quality and should be addressed	Please provide additional analysis that addresses the potential impacts to air quality from mobile source NOx emissions.
DEC/ Air Quality Division, Air Permitting Program	Appendix K4.20	K4.20.1.1	K4.20-2	Text on this page states that " <i>Evaluation of PSD Class I increments are not included, because it is anticipated that the closest Federal Class I areas are too far from the project to be impacted by the project.</i> " It should be noted that in other areas the EPA has interpreted the "may affect" clause to include all sources within 100km, and some large facilities beyond 100km , from a Class I areas. The proposed project is approximately 130km from Tuxedni National Wildlife Refuge (distance between the two closest boundaries), a Class I area, and will potentially be a large source of emissions. Therefore, the project may impact air quality in a Class I area.	Please perform a Class I increment analysis, or address the issue of potential impacts more explicitly (if appropriate).
DEC/ Air Quality Division, Air Permitting Program	Appendix K4.20	K4.20.1.2	K4.20-3 and 4	The distance between the project area and the nearest Class I area is approximately 130 km. As stated above, the NOx impacts of the project may be understated due to the omission of mobile source emissions. Therefore, a criteria pollutant impact analysis may be warranted.	Perform Class I Increment analysis, or address the issue of potential impacts more explicitly (if appropriate).
DEC/ Air Quality Division, Air Permitting Program	Appendix K4.20	K4.20.2.1; K4.20.2.3; K4.20.2.4	K4.20-7; K4.20- 12; K4.20-14	Text on these pages states that modeling analysis was performed "consistent with ADEC minor air quality permitting requirements". Please note that ADEC Air Permits Program has not evaluated or approved PLP's modeling analysis for use in support of permitting. This statement may imply endorsement or pre-approval of the modeling by ADEC.	Clarify that the modeling is consistent with ADEC requirements in the author's judgment, and that it has not been reviewed or approved by ADEC.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.20.6	4.20-21	Paragraph one on this page discusses the impact of climate change on the project. Sentence one notes that " <i>it is projected that the project area will see an overall increase in temperatures, with an increase in precipitation during the winter months, and a slight decrease of precipitation during the summer months.</i> " It is not clear what is meant by an increase in precipitation during the winter months. Precipitation covers both snow and rain. Does this mean an increase in the water equivalent of overall precipitation or is it meant to imply that there will be an increase in rainfall during the winter months?	Please explain what is meant by an increase in precipitation during the winter months.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.20.8	4.20-24	Paragraph one on this page discusses cumulative effects on air quality from this project. It is not clear why there is no discussion of the cumulative impacts of the transportation, mine and port operations happening at the same time and the impacts those operations have on air quality.	Please provide a discussion of the cumulative impacts of the three project components.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.24.2.3	4.24 -12	Paragraph five on this page notes that " <i>Treated water releases from mine site facilities would be optimized to benefit priority species and life stages for each month and stream.</i> " This appears to imply that water treatment plant discharge timing will try to simulate natural flow patterns. It is not clear from the discussion if there is a plan for using remote sensing or continuous flow monitoring data to correlate discharge with optimum stream flow. It is also not clear how this discharge timing system would operate.	Please provide additional information regarding the timing of water discharge and efforts to simulate natural flow patterns, as well as the potential risk to aquatic life should natural flow patterns be altered. This information should include the timeframe during which adverse impacts would occur, the specific means of measuring adverse impacts, and proposed mitigation measures.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.24.2.5	4.24 -20	Paragraph four on this page discusses mine site turbidity and sedimentation. It is not clear what modeling of stormwater generation has occurred so that treatment can be appropriately sized within the proposed footprint to accommodate the predicted treatment need. A snow management plan is not referenced and snow piles can be a source of turbidity in the spring. Similarly, there is no mention of snow management plans for the transportation corridors.	Please provide additional information on the magnitude of stormwater generation assumed at the mine site and how treatment systems will be accommodated within the existing footprint. Please also provide additional information pertaining to the maintenance of the transportation corridor and the potential impacts to aquatic life from snow management. Please include specific monitoring that would occur to identify and mitigate negative impacts to aquatic life.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.24.2.7	4.24 -23	Paragraph three on this page notes that " <i>In each year of the study, the daily maximum water temperature in the NFK immediately upstream of the mine site exceeded the 20 °C criteria on about 28 percent of all instantaneous readings during the summer months. The lower temperature thresholds for migration and rearing (15 °C) were exceeded on 78 percent of summer readings; and the spawning and egg incubation criteria (13 °C) were exceeded on 89 percent of summer readings.</i> " It is not clear what time period and duration was used to come to this conclusion, since timing of the measurements is critical. Further discussion on page 4.24-24 noted that " <i>Although the water temperature regimes in the project area frequently exceeded the ADEC criteria during the 2004-2009 sampling period, adult and juvenile salmon and resident trout remained abundant.</i> " This appears to imply that the temperature of the discharge water would not affect the spawning and rearing process since the discharge temperature would be >2.5C different than ambient. The project applicant would not be allowed a mixing zone and it would be expected that temperature increases would not create a situation in which fish are attracted to the end of the pipe - essentially becoming a nuisance condition.	Please provide additional information on the metrics used in temperature measurement, the rationale for their use, and potential risk of increased temperature to aquatic life from temperature modifications. Such information should be provided on a geographic scale to determine which stream reaches would see increased risk and temporal periods in which risk would be increased/decreased as a result of TMP discharge and mine operation.
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.24.6	4.24 -37	Paragraph three on this page notes that " <i>At the mine site, an additional 35 miles of anadromous stream habitat would be lost in the SFK and UTC watersheds, including the entire footprint of Frying Pan Lake, which would be inundated by the south collection pond, affecting sockeye, coho, chum, and potentially Chinook salmon.</i> " It does not appear that the role of Frying Plan Lake on existing or future fish populations has been adequately addressed. If this lake serves as a refugia for existing stocks, it would be problematic to suggest modifications, much less complete removal.	Please provide additional information on the geomorphology of Frying Plan Lake, the specific role of the lake including salmonid habitat, the potential for the lake to act as temperature refugia for anadromous species, the relationship with stream flow, and the affect on anadromous species populations should this habitat be lost due to mine expansion.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.1.2	4.27-3	Paragraph three on this page discusses water use/drinking water. The second sentence in the paragraph states " <i>No downstream communities have been documented as using surface water from the waterways described herein as a drinking water source (ADEC 2018).</i> " It is not clear why this paragraph does not discuss whether private users are using surface waters as a drinking water source.	Please provide a discussion of whether private users are using surface waters as a drinking water source. Please also note that the surface waters still need to be protected for drinking water use.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/Spill Prevention and Response Division	Chapter 4: Environmental Consequences	4.27.1.2	4.27-5	<p>This section provides significant details about an Owl Ridge risk assessment (Owl Ridge, 2018c) and an AECOM (AECOM, 2018n) risk assessment to explain the basis for various spill scenarios. 18 AAC 75.425(1) prescribes content to be included in response action plans, to include spill scenarios. Further, spill scenarios are developed by determining and planning to clean up the response planning standard within 72 hours as dictated by regulation. For example, the response planning standard for tank farms in Alaska require response plans for the full capacity of the largest tank at the facility. It appears that federal response planning standards are being used here, which are less stringent than Alaska's spill response standards. Scenarios and responses that meet the federal response planning standards are insufficient to meet Alaska's planning standards in this regard since they do not account for seasonality or many other factors, such as ice coverage or temporal benchmarks for immediate response actions. The assertion that the risk of marine tanker vessel spills would be "<i>between 42,000 and 420,000 gallons is 2.5×10^{-4} per year</i>" is not supported by actual spill rate data in Alaska. The same paragraph goes on to state, "<i>This equates to an average recurrence rate of 4,000 years, or a probability of occurrences of 0.62 percent in 25 years, or 1.9 percent in 78 years,</i>" which also contrasts with spill rate data for similar facilities in Alaska.</p>	<p>Please revise spill response scenarios to include required components described in 18 AAC 75.425(1). Revised scenarios should include appropriate response planning standard volumes described in 18 AAC 75.432 - 442.</p>
DEC/Spill Prevention and Response Division	Chapter 4: Environmental Consequences	4.27.2.1	4.27-5	<p>Paragraph seven on this page states "<i>For spills in marine waters, evaporation and dispersion are the dominant weathering processes. Over 90 percent of diesel from a small spill (less than 5,000 gallons) will evaporate or naturally disperse within hours to days of a spill; therefore, oil from such small spills is generally not recoverable (NOAA, (2018)).</i>" This statement appears to be taken out of context and is over simplified. Experience in Alaska shows that various habitats and environmental conditions may cause spilled diesel fuel to linger for weeks to months in the environment. Spilled fuel that reaches hypoxic groundwater conditions has been shown to linger for up to decades in Alaska. This page also notes that diesel fuel will pool in snow, suggesting that this would make cleanup easier. Yet, diesel may also act as an antifreeze and melt ice and snow before entering soil and other environments.</p>	<p>The description of fate and behavior for spilled diesel does not accurately reflect environmental damages that can occur as the result of these spills. Species found within the intertidal areas such as clams or bivalves are not mentioned except as forage species. Please include a broader and more representative analysis of diesel fuel fate and effects in environmentally relevant conditions for Alaska.</p>

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/Spill Prevention and Response Division	Chapter 4: Environmental Consequences	4.27.2.1	4.27-5	Paragraph seven on this page further discusses spill scenarios where diesel spills would evaporate and disperse after four days or after a maximum of 10 to 20 days. This appears to imply that this would be acceptable. As noted earlier, Alaska's spill response standards are more stringent than federal standards. Alaska regulations at 18 AAC 75.432(a)(1) states that the responsible party should " <i>contain or control and clean up within 72 hours that portion of the response planning standard volume that enters open water</i> "; and 18 AAC 75.432(2) states " <i>contain or control within 72 , and clean up within shortest possible time consistent with minimizing damage to the environmental, that portion of the response planning standard volume that enters a receiving environment other than open water.</i> "	Please review Alaska regulations at 18 AAC 75.432 to determine the response planning standard for the scenarios and revise the spill response scenarios to show how those standards would be met.
DEC/Spill Prevention and Response Division	Chapter 4: Environmental Consequences	4.27.2.5	4.27-10	The section states " <i>significant diesel spills from the Iliamna Lake ferry and tank farm were ruled out as not realistic probabilities of occurrence and were not selected for impacts analysis.</i> " This statement conflicts with Alaska spill response planning standard requirements for fuel handling operations, described in 18 AAC 75.425, and 18 AAC 75.432.	Please revise response planning scenarios to show how the standards outlined in 18 AAC 75.425 and 18 AAC 75.442 will be met.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.2.5	4.27-11	Paragraphs three and four on this page discuss a potential diesel spill during the winter. Both appear to downplay the likelihood of diesel permeating soil surfaces or dispersing in frozen water bodies during frozen conditions. These conclusions conflict with the department's recent experience with diesel spills from a March 16, 2018 tanker truck rollover on the Richardson Highway. These statements also conflict with discussions in paragraph two on page 4.27-12.	Please rewrite these paragraphs to acknowledge the risk of diesel spills in the winter impacting the environment.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.2.5	4.27-13	Paragraph nine on this page discusses the potential impacts of a diesel spill during the winter. This discussion appears to downplay the likelihood of diesel permeating soil surfaces or dispersing in frozen water bodies during frozen conditions. These conclusions conflict with the department's recent experience with a diesel spill from a March 16, 2018 tanker truck rollovers on the Richardson Highway. These statements also conflict with discussions in paragraph two on page 4.27-12.	Please rewrite these paragraphs to acknowledge the risk of diesel spills in the winter impacting the environment.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.2.5	4.27-14	Paragraph two on this page discusses the use of in situ burning as a spill response strategy and appears to downplay the impacts to air quality. Please note that the department has Alaska-specific in situ burning guidelines that should be followed, including determining the impact on local populations.	Please note that in situ burning will need to meet the department's in situ burning guidelines at https://dec.alaska.gov/media/8436/in-situ-burning.pdf
DEC/Spill Prevention and Response Division	Chapter 4: Environmental Consequences	4.27.2.5	4.27-19	Paragraph three on this page discusses spill trajectory modeling for a diesel spill. The discussion switches to a discussion of oil spills partway through the discussion.	Please be consistent and discuss the <u>diesel</u> spill.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/Spill Prevention and Response Division	Chapter 4: Environmental Consequences	4.27.2.5	4.27-19	Paragraph four on this page states " <i>Other oil products (such as bunker, lube oil, hydraulic fluid) are used in much smaller volumes by marine vessels, and are not being analyzed.</i> " This sentence is misleading. Spill response scenarios should account for all types of fuels and lubricants on a vessel. Bunker fuel, lube oil, and hydraulic oils respond differently than diesel.	ADEC records and accounts for all types of fuels on vessels when it grounds, spills, or sinks and can be located at ADEC's website (http://dec.alaska.gov/spar/ppr/spill-information/response/). Please remove the sentence quoted and include these products in the spill analysis.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.2.5	4.27-18	Paragraph five on this page discusses spill response involving a barge. The discussion states that spill response times are unknown and that spill response efforts could be delayed by adverse environmental conditions. This appears to conflict with Alaska Statutes and regulations which require spill response within very specific deadlines and a discussion of how adverse conditions will be addressed. This paragraph also switches back and forth between describing <u>oil</u> spill response and <u>diesel</u> spill response.	Please note in the discussion that department statutes and regulation require spill response to meet specific deadlines found at AS 46.04 and 18 AAC 75. Please be consistent and discuss the <u>diesel</u> spill. Please explain how spill response activities will meet these standards.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.3.2	4.27-33	Paragraphs one and two in this section discuss the environmental impacts of a potential natural gas leak from the proposed submarine pipeline. These paragraphs appear to downplay the impacts to the environment. This appears to conflict with the Pipeline and Hazardous Materials Administration's March 3, 2017 <i>Notice of Proposed Safety Order</i> issued to Hilcorp Alaska LLC concerning a leaking gas pipeline in Cook Inlet.	Please discuss the impacts to the environment in more detail in light of what has been learned regarding the environmental impacts of the Hilcorp pipeline leak in Cook Inlet.
DEC/Spill Prevention and Response Division	Chapter 4: Environmental Consequences	4.27.3.2	4.27-33	The last paragraph on this page states " <i>Due to its buoyancy, natural gas does not accumulate in water, and would not have an impact on water quality.</i> " This misrepresents actual experience where portions of natural gas dissolve into the water column, and the smallest bubbles ($\leq 70\mu\text{m}$) may stay suspended within the water column. The book, "Environmental Impact of the offshore oil and gas industry" by Stanislav Patin, PhD (published in 2001) describes the gas behavior in water in more detail. Patin, in Chapter 5, states the following: "A catastrophic pipeline failure would result in the sudden release of a large volume of natural gas from the pipeline that would likely result in displacing sediment immediately in the vicinity of the release. Studies of large-scale natural gas releases suggest that methane and its derivatives can stay in the marine environment for a long period of time and spread over distances greater than 1,500 feet from the release location (Patin, 2001). Marine fish in the Sea of Asov, Russia, developed significant pathological changes after an accidental large-scale release of natural gas from a gas well. Marine fish experienced impaired movement coordination, weakened muscle tone, damaged cell membranes, disturbed blood formation, and other anomalies typical of acute poisoning (Patin, 2001). Similar observations were made at a large-scale accidental release of natural gas from wells in the Gulf of Mexico (Patin, 2001)."	Scientific research describes methane fate and effects when released into aquatic environments. These findings contradict assertions in this DEIS. Update this section with information from Patin (2001) or similar studies, noting the fate and effects of methane in the environment.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.4.5	4.27-39	The last paragraph on this page discusses spill response capacity and notes that PLP would have a spill response plan in place that would address spills of ore concentrate and other hazardous materials. This appears to conflict with the title of the section header "Existing Response Capacity". A spill response plan that will be developed in the future cannot be considered "existing response capacity."	Please clarify that the promised spill response plan would not qualify as "existing response capacity." Please summarize what a spill response plan would include.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.4.7	4.27-42	Paragraph three on this page discusses a concentrate spill from a truck rollover. The discussion offers historical spill data from transport of ore concentrate on the haul road used by the Red Dog Mine. It is not clear from the discussion whether the truck -related spills involved a truck hauling three trailers as is proposed for the Pebble Mine project.	Please clarify whether the Red Dog Haul Road data involves trucks hauling three trailers. If not, please explain how the probability of a spill is still valid in this context.
DEC/ Spill Prevention and Response Division	Chapter 4: Environmental Consequences	4.27.4.7	4.27-42	Paragraphs five through seven on this page discuss response to spills of concentrate and other hazardous materials. Paragraph two states " <i>If the spill were to occur on dry land, the concentrate would simply accumulate on the roadside. Recovery efforts would be straightforward.....</i> " It is not clear how recovery efforts would be straightforward if there was any wind that spread fugitive dust from the concentrate spill.	Please clarify how the concentrate spill response would be handled in adverse environmental conditions such as high winds, heavy rain, or when the roadside is covered in snow.
DEC/ Spill Prevention and Response Division	Chapter 4: Environmental Consequences	4.27.4.7	4.27-43	Paragraph six on this page discusses concentrate spilled onto soils. The paragraph states that " <i>Historical data from Red Dog Mine show that most concentrate spills that impact land only and do not enter surface water have a nearly 100 percent recovery (ADEC 2018h).</i> " It is not clear how this conclusion was reached by querying the department's spills database. Prior studies have identified that spills prior to 1995 are not included in the DEC database and a number of lead and zinc concentrate spills occurred prior to 1995. See https://dec.alaska.gov/media/15455/rev-workplan.pdf	Please explain how the conclusion was reached that concentrate spills have nearly 100 percent recovery at the Red Dog Mine.
DEC/ Air Quality Division	Chapter 4: Environmental Consequences	4.27.4.7	4.27-45	Paragraphs one and two on this page discuss the impacts of concentrate spills and fugitive dust on air quality. Paragraph two notes " <i>Concentrations of particulate matter could temporarily exceed the NAAQS concentrations; but over time, the air quality would return to pre-activity levels at the completion of the activity. The extent of impacts would be limited to discrete portions of the project area, where the spill took place.</i> " This statement appears to conflict with the department's experience with concentrate spills and fugitive dust at the Red Dog Mine and Delong Mountain Transportation System road, given that concentrate transport will not be "temporary" in any sense.	Please explain how the conclusion was reached that the impacts would be temporary and limited to discrete areas in the project area.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.4.7	4.27-54	Paragraphs one on this page discusses the impacts of concentrate spills and fugitive dust on air quality. Paragraph two notes " <i>Concentrations of particulate matter could temporarily exceed the NAAQS concentrations; but over time, the air quality would return to pre-activity levels at the completion of the activity. The extent of impacts would be limited to discrete portions of the project area, where the spill took place.</i> " This statement appears to conflict with the department's experience with concentrate spills and fugitive dust at the Red Dog Mine and Delong Mountain Transportation System road, given that concentrate transport will not be "temporary" in any sense.	Please explain how the conclusion was reached that the impacts would be temporary and limited to discrete areas in the project area.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.5.3	4.27-62	The last paragraph on this page discusses spill response capacity and notes that PLP would have a spill response plan in place that would address spills of ore concentrate and other hazardous materials. This appears to conflict with the title of the section header "Existing Response Capacity". A spill response plan that will be developed in the future cannot be considered "existing response capacity." If there are gaps in response capacity, coverage of those gaps would need to be planned for and new plans created for the project.	Please clarify that the promised spill response plan would not qualify as "existing response capacity."
DEC/ Division of Water, Water Quality Standards	Chapter 4: Environmental Consequences	4.27.5.3	4.27-104	The last two paragraphs on this page discuss groundwater quality and the impacts from contamination by pyritic supernatant fluid. Paragraph one notes that " <i>Elevated metals in groundwater close to the release site could exceed ADEC groundwater cleanup levels. No measurable impacts to groundwater would be expected beyond several miles downstream of the mine site.</i> " It is not clear what is being said by this statement. If there are impacts to groundwater, they must be addressed. In the Donlin EIS Chapter 3.7, Water Quality, the mitigation discussions on pages 3.7-208 through 3.7-211 discuss a wide variety of monitoring and mitigation measures under consideration to ensure that groundwater resource are protected. It is also not clear why these mitigation and monitoring discussions are missing from this document.	Please include discussions of groundwater monitoring and mitigation measures.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.7.6	4.27-115	This section appears to discuss existing response capacity in the event of a failure of the bulk tailing storage facility (TSF). It discusses the requirement for an Emergency Action Plan (EAP), but goes on to note that " <i>Recovery of spilled contact water once it enters the NFK would not be possible.</i> " This appears to conflict with the title of the section header "Existing Response Capacity". If no response capacity exists it should be stated clearly that there is no existing response capacity. If there are gaps in response capacity, coverage of those gaps would need to be planned for and new plans created for the project. It is also not clear if the impacts and response capacity would differ if the spill of contact water occurred during the winter months versus the summer months.	Please state the situation clearly if there is no existing response capacity. Please discuss if there would be a difference in response capacity and impacts between a contact water spill during the winter and summer months.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.7.9	4.27-119	Paragraph one in this section discusses metals contamination in soils. The final sentence notes that " <i>Where metals in soils exceed ADEC soil cleanup level guidelines, soil could be excavated to the extent practicable and the impacted habitats could be restored.</i> " This section does not discuss what would happen if the soil is not fully excavated and the impacted habitats are not fully restored.	Please provide a discussion of the impacts when contaminated soils are not fully recovered.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.7.9	4.27-120	Paragraph six on this page discusses groundwater quality and the potential for contamination with elevated levels of metals from a release of untreated contact water. The section further notes that " <i>Metals present in the released contact water could potentially permeate through soils and sediments into shallow groundwater during the months-long release. However, due to the strong dilution of surface water and groundwater that would occur, it is likely that metals would be diluted to below ADEC groundwater cleanup levels. Measurable impacts to groundwater quality are not likely from this scenario.</i> " This does not discuss what would happen if the metals are not diluted to below ADEC groundwater cleanup levels. The Environmental Consequences section of an EIS is important because it is predicting effects. These predictions are based on (1) assumptions used in the effects analysis (2) the data used and the quality of the data, (3) the methods and models used and (4) a discussion of the cause-effect logic. These statements do not appear to take that approach. General statements about environmental effects and cumulative effects are not considered adequate. see <i>Neighbors of Cuddy Mountain v. U.S. Forest Service, 137 F.3d 1372, 1379 (9th Cir. 1998)</i>	Please provide a discussion of the assumptions, data, methods and models and the cause-effect logic used to reach these conclusion that metals would be diluted to below ADEC groundwater cleanup levels. Please provide a discussion of the impacts when contaminated groundwater levels exceed ADEC groundwater cleanup levels.
DEC/ Commissioner's Office	Chapter 4: Environmental Consequences	4.27.8.2	4.27-127 and 128	This section discusses the reasonably foreseeable impacts of spills. Paragraphs three and four on page 4.27-127 discuss the potential impacts from the "Pebble Mine Expanded Development Scenario" alternative. Page 4.27-128 further notes that " <i>In summary, the cumulative effects of unintentional releases associated with Pebble Mine expansion would be similar to those discussed previously in this section, but potentially involve larger volumes over a slightly larger geographic area.</i> " It is not clear how the potential impacts can summarized without discussing quantities or magnitudes of potential impacts.	Please provide additional details on spill quantities and magnitudes of impacts so that cause-effect relationships and interpretation of impacts are consistent with good science.
DEC/ Commissioner's Office	Chapter 5: Mitigation	5.2.1.1	5-3	This section discusses permitting for large mine projects in Alaska. Information on the ADEC Certificate of Reasonable Assurance is an integral part of the Corp 404 permit process and that information is missing from this section. Summary information on ADEC APDES permits should also be added to this section.	Please include a discussion of the ADEC Certificate of Reasonable Assurance (401 Cert) and APDES permits to this section.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/ Division of Water, Water Quality Standards	Chapter 5: Mitigation	Table 5-2	General	This table discusses proposed mitigation measures that the applicant has incorporated into the project. It is not clear which agency will be responsible for compliance and enforcement of these mitigation measures. According to Forty Most Asked Questions Concerning CEQ's NEPA Regulations #19b, The probability of the mitigation measures being implemented must also be discussed, to ensure that the environmental effects of the proposed action are fairly assessed.	Please discuss which agency will be responsible for compliance and enforcement of these mitigation measures so the reader can determine the probability of the mitigation measures being implemented.
DEC/ Commissioner's Office	Chapter 5: Mitigation	Table 5-2	5-8	Item three on this page discusses a Fugitive Dust Control Plan (FDCP) as a propose mitigation measure. It is not clear how the promise of future development of a plan can be considered mitigation. This type of "paper mitigation" does not solve the environmental problems disclosed in the NEPA document. According to Forty Most Asked Questions Concerning CEQ's NEPA Regulations #19b, The probability of the mitigation measures being implemented must also be discussed, to ensure that the environmental effects of the proposed action are fairly assessed. As this statement does not provide actual mitigation and also does not make clear what agency would be responsible for compliance and enforcement, it cannot be considered mitigation.	If fugitive dust control will be considered a mitigation measure, please provide a written plan, including information regarding which agency would be responsible for compliance and enforcement.
DEC/ Commissioner's Office	Chapter 7: Cooperating Agencies and Preparers	Table 7-1		It is not clear why federal agencies have multiple representatives listed, but state agencies only have one.	Please list state agency reviewers.
DEC/Division of Water Wastewater Discharge Authorization Program	Appendix E	E1.2		In general, the DEIS lacks specificity and understanding of the available permitting mechanisms for the Clean Water Act under the Alaska Pollutant Discharge Elimination System (APDES) Program. While Section E1.2 correctly identifies the ability to obtain stormwater coverage under the Alaska Construction Stormwater Permit, it fails to acknowledge requirements for a host of other discharges associated with construction and operation. Without an adequate understanding of these permits, the applicant, decision makers and the public may not be able to foresee conflicts that could be avoided otherwise or cause project delays during implementation. It should be noted that the department's two general permits specifically address issues specific to the construction and operation of gas pipelines for the Pebble Project.	Please review the general permits issued by the department's ADPES program and summarize that regulatory authority in the EIS. General permits provide streamlined permitting procedures, but also offer regulatory consistency.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/Environmental Health Division, Solid Waste Program	Appendix N	3.7	46-47	Solid waste disposal will require construction and closure design for landfills that meet the requirements of Alaska regulations at 18 AAC 60. In order to determine the impact of solid waste disposal on the environment and public health, the DEIS should include a detailed list of disposal locations for the various types of waste. This list, along with a final plan for construction and closure of these landfills will also be required for the Integrated Solid Waste Management Permit (ISWMP), which is a joint effort between the Department of Environmental Conservation and the Department of Natural Resources.	The department recommends reviewing the general permit issued by the Solid Waste program and summarizing that regulatory authority in the EIS. General permits can offer streamlined permitting procedures, but also offer regulatory consistency.
DEC/Environmental Health Division, Solid Waste Program	Appendix N	3.7.8	47	The solid waste incinerator noted here should be included in the application for the Title V Air Quality Permit, as the Environmental Protection Agency (EPA) is currently reviewing previously adopted Commercial/Industrial Solid Waste Incinerator (CISWI) regulations which may apply to the facility. Compliance with these regulations has been difficult for other facilities, so an alternative waste disposal option that does not include incineration should be considered.	Please consider an alternative waste disposal option if it appears that waste incineration will not be able to meet the EPA requirements.
DEC/Environmental Health Division, Solid Waste Program	Appendix N	3.7.9	48	It is not clear from the information provided whether the sludge from water treatment will meet the disposal requirements of Alaska regulations at 18 AAC 60.	Please provide additional information on the disposal of water treatment sludge meeting solid waste disposal requirements.
DEC/Environmental Health Division, Solid Waste Program	Appendix N	3.9	50	It is not clear from the information provided that the solid waste management at the Amakdedori Port will meeting the requirements of Alaska regulations at 18 AAC 60.	Please provide additional information on solid waste management at the Amakdedori Port.
DEC/Environmental Health Division, Solid Waste Program	Appendix N	6	71-73	The department's Solid Waste Program has concerns regarding final disposal of the potentially acid generating (PAG) and metal leaching (ML) waste in the open pit lake. While the understanding of the mitigation of PAG is clear, the impacts of additional metals (Al, As, Cd, Cu, Fe, Hg, Mn,Mo, Ni, Pb, Sb, Se and Zn, and others) have not been clearly addressed.	Please address metal leaching waste in the pit lake and explain the potential impacts.
DEC/Environmental Health Division, Solid Waste Program	Appendix N	6.1	72	Details on the closure of the on-site monofill need to be included in the discussion on this page.	Discuss closure of the on-site monofill when discussing closure and reclamation.
DEC/Environmental Health Division, Solid Waste Program	Appendix N	6.1	72	It is not clear if the reclamation and closure plan for the bulk tailings includes detailed static and seismic stability analyses.	Please provide static and seismic stability analysis for the bulk tailings reclamation and closure.
DEC/ Division of Water, Water Quality Standards	Appendix N		73	The first paragraph on this page discusses post-closure management of the pit lake. It notes " <i>The pit lake is expected to stratify during the closure period with surface waters retaining a neutral to slightly basic pH over time.</i> " It is not clear how this conclusion was reached.	Please explain what modeling has been done to make this conclusion. Also, please address the scenario and mitigation measures needed if the pit lake does not stratify and in fact turns over.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/ Division of Water, Wastewater Discharge Authorization Program	GENERAL COMMENT			General comment: The DEIS lacks sufficient details regarding the impacts and mitigation of construction and operation of a large scale natural gas pipeline under Alaska's environmental permitting authority. The State of Alaska has authority over discharges to freshwater and land for domestic wastewater, inadvertent releases from horizontal directional drilling (HDD), gravel pit dewatering, excavation dewatering, hydrostatic test water, construction stormwater, and mobile spill response. The Department of Environmental Conservation's Wastewater Discharge Authorization Program has issued a general permit AKG320000 - Statewide Oil and Gas Pipelines that provides holistic coverage for wastewater discharges from pipeline construction and operations.	The department recommends integrating the Alaska Pollutant Discharge Elimination System (APDES) permit requirements into the applicable DEIS sections that relate to protecting land and water resources during construction and operation of the pipeline.
DEC/ Division of Water, Water Quality Standards	Supplemental Environmental Baseline Document: 9.1 Surface Water Quality (March 2018)	9.0.8	9-3	The final paragraph on this page notes that " <i>The results of the surface water and groundwater sampling were compared with the most stringent benchmark water quality criteria based primarily on Alaska Department of Environmental Conservation's water quality criteria (ADEC, 2008) and EPA's National Recommended Water Quality Criteria (EPA, 2009a, see EBD 2012, Tables 9.02 and 9.03).</i> " This baseline report provides little information regarding the metrics used to establish benchmark criteria, potential toxicity to aquatic life in ambient water, and the assimilative capacity of a waterbody to mitigate discharge effluent and non-point pollution before aquatic life would be threatened in a substantive manner.	If this baseline document is going to be cited as a source for conclusions in the EIS, please provide additional clarification on which water quality criteria are being used (current state standards or recommended federal standards), the magnitude, duration and frequency values of those standards, and how the sample was determined to be meeting or exceeding state water quality criteria. Please also provide a rationale for the use of state versus federally-recommended criteria, as well as the potential to increase toxicity to aquatic life in receiving waters as a result of mining effluent combined with potential nonpoint source pollutants.
DEC/ Division of Water, Water Quality Standards	Supplemental Environmental Baseline Document: 9.1 Surface Water Quality (March 2018)	9.1.4	9.1-2	General Comment: It is not clear why arsenic and selenium sampling was discontinued in 2009 at multiple sampling locations, when these pollutants are likely to be present in concentrations that could potentially affect aquatic life.	Please provide additional information specific to arsenic and selenium monitoring in the project area and how discontinuing sampling was justified.
DEC/ Division of Water, Water Quality Standards	Supplemental Environmental Baseline Document: 9.1 Surface Water Quality (March 2018)	9.1.4	9.1-2	General comment: It is not clear why the project proponent did not collect data on dissolved organic carbon (DOC) for all waters. Current science clearly indicates that dissolved organic carbon is a mitigating factor in regards to the bioavailability of metals.	Please provide additional information pertaining to the collection of water quality data and the metrics used for comparison if site specific DOC data is to be used as representative of the entire project area.
DEC/ Division of Water, Water Quality Standards	Supplemental Environmental Baseline Document: 9.1 Surface Water Quality (March 2018)	9.1.6.3	9.1-8	General comment: If this report is being used to support conclusions in the EIS regarding temporal trend analysis, the description of conventional pollutants (e.g., pH, and temperature) and total/dissolved trace elements generally would be better represented with summary tables of some form rather than text and references to various appendices. In addition, there is virtually no discussion about the potential relationship between analytes and stream flow/potential groundwater influence.	Please revise, modify or summarize the data in the report to more clearly provide the data. Also, please revise, modify or summarize the report to more accurately depict the relationship between flow characteristics and potential toxicity to aquatic life due to increased concentration of pollutants.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/ Division of Water, Water Quality Standards	Supplemental Environmental Baseline Document: 9.1 Surface Water Quality (March 2018)	9.1.6.3	9.1-6 thru 9.1- 12	It does not appear that samples were collected and analyzed for methyl mercury (MeHg). The EPA updated the nationally recommended criteria for human health to include the application of methyl mercury criteria in 2001.	If this report is being used to support conclusions in the EIS, it would be helpful to identify other data that included methyl mercury. Also, the discussion of that data should also include an explanation that there are discrepancies between the federally-recommended criteria for the protection of human health and those currently adopted by Alaska and used in state permitting practices.
DEC/ Division of Water, Water Quality Standards	Supplemental Environmental Baseline Document: 9.1 Surface Water Quality (March 2018)	9.1.6.3	9.1-4	The water quality criteria in this report are based on the 2008 version of the department's <i>Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances</i> . It is not clear whether the aquatic life water quality criteria for copper has been updated. The EPA's approved use of the biotic ligand model (BLM) in 2007, to predict lethal and nonlethal effects to aquatic life, but it is not clear from the report whether the biotic ligand model was considered in the sampling and analysis.	If this report is being used to support conclusions in the EIS, it would be helpful to explain whether the EPA's 2007 aquatic life water quality criteria for copper was considered in the sampling and analysis. Also, the discussion of that data should include an explanation that there are discrepancies between the federally-recommended criteria for the protection of human health and those currently adopted by Alaska and used in state permitting practices. The department is considering the development of guidance pertaining to the BLM in upcoming Triennial Review cycles.
DEC/ Division of Water, Water Quality Standards	Supplemental Environmental Baseline Document: 9.1 Surface Water Quality (March 2018)	9.1.6.3	9.1-6 thru 9.1- 12	It does not appear that samples were collected and analyzed for methyl mercury (MeHg). The EPA updated the nationally recommended criteria for human health to include the application of methyl mercury criteria in 2001.	If this report is being used to support conclusions in the EIS, it would be helpful to identify other data that included methyl mercury. Also, the discussion of that data should include an explanation that there are discrepancies between the federally-recommended criteria for the protection of human health and those currently adopted by Alaska and used in state permitting practices.
DEC/ Division of Water, Water Quality Standards	Supplemental Environmental Baseline Document: 9.1 Surface Water Quality (March 2018)	9.1.6.3	9.1-7	The water quality criteria in this report are based on the 2008 version of the department's <i>Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances</i> . It is not clear whether the aquatic life water quality criteria for ammonia has been updated. The text did not describe any consideration of the 2013 federal update to the ammonia criteria during the assessment or any work to determine whether freshwater mussels (the most sensitive species under certain conditions) are present or absent. This information could affect the assessment of the degree of risk present to aquatic life.	If this report is being used to support conclusions in the EIS, it would be helpful to explain whether the EPA's 2013 aquatic life water quality criteria for ammonia was considered in the sampling and analysis. Also, the discussion should include information regarding the metrics used for assessment and potential risk to aquatic life (e.g., freshwater mussels) as a result of ammonia discharges.
DEC/ Division of Water, Water Quality Standards	Supplemental Environmental Baseline Document: 9.1 Surface Water Quality (March 2018)	9.1.7.2	9.1-16	Paragraph three on this page notes that " <i>In all cases, pH was below the minimum criteria, indicating locations with acidic water occur in the South Fork Kaktuli River throughout the year.</i> " This appears to conflict with the statement in Section 9.1.7.1 which states " <i>The mean pH (6.63) is very close to neutral (pH 7) in the South Fork Kaktuli River.</i> "	If this report is being used to support conclusions in the EIS, there will need to be clarifications regarding the measurement of pH and the conclusions regarding the toxicity of certain pH levels.

Department/ Division/Section	Document Name	Section/Fig. /Table	Page #	Comment/Issue	Recommendation/Action
DEC/ Division of Water, Water Quality Standards	Supplemental Environmental Baseline Document: 9.1 Surface Water Quality (March 2018)	9.1.7.2	9.1-19	The discussion on this page notes that the median pH was 6.65, but prior discussion noted a level of 6.63.	If this report is being used to support conclusions in the EIS, there will need to be consistency regarding the pH values cited.
DEC/ Division of Water, Water Quality Standards	Supplemental Environmental Baseline Document: 9.1 Surface Water Quality (March 2018)	9.1	Table 9.1 -24 (PDF page 123)	The data in this table does not indicate a time and date when the samples exceeded water quality criteria, so the reader cannot determine how the exceedance compares with data on streamflow or other influencing characteristics.	If this report is being used to support conclusions in the EIS, please provide additional documentation regarding the timing of collection of water quality data in table form that would allow for comparison of applicable water quality criteria, sample results and flow characteristics.

**Pebble Project: DEIS Review
State of Alaska Consolidated Comments Table**

Department/ Division/Section	Document Name	Section/Fig./ Table	Page #	Comment/Issue	Recommendation/Action
DNR/DMLW/ Mining	Appendix E	Appendix E: Laws, Permits, Approvals & Consultation Required	E-18	The Legal Authority Section is missing the relevant Statutes for Upland Mining Leases (AS 38.05.205) & Millsite Leases (AS 38.05.255)	Please include these state statute references in the Appendix E.
DNR/DMLW/ Mining	Appendix E	Appendix E: Laws, Permits, Approvals & Consultation Required	E-18	The Mining License is issued by the Department of Revenue, not DNR.	Please correct this reference.
DNR/DMLW/ Mining	Appendix E	Appendix E: Laws, Permits, Approvals & Consultation Required	E-18	Upland Mining Leases are not mentioned in this section but PLP lists them as a required authorization on Page 78 of Appendix N.	Please include these state statute references in the Appendix E.
DNR/DMLW/ SCRO		General		<p>The DNR Division of Mining, Land and Water, Southcentral Regional Land Office wishes to note that it may require applications from the Pebble Limited Partnership or associated contractors for authorization of project activities and/or facilities where proposed for location on State owned, DNR-DMLW managed lands. It is likely that easements, leases, and permits will be required for various aspects of the project.</p> <p>As there have been no applications received by the Southcentral Regional Land Office, commenting on specific details of the proposed project could be deemed predecisional. Issues and concerns will be evaluated and addressed with each application and subsequent adjudication process.</p>	
DNR/DMLW/ Water/Dam Safety		General		The Pebble DEIS describes large dams at the proposed mine for two tailings storage facilities and a large geomembrane-lined water dam. A number of smaller dams and reservoirs such as seepage collection ponds are indicated but not described. The DEIS includes descriptions and design criteria from various engineering analyses and risk assessments. These facilities are subject to regulation by ADNR under AS 46.17 and Article 3 of 11 AAC 93. ADNR will evaluate these facilities after the respective applications for state authorizations required under 11 AAC 93.171 are received.	

**Pebble Project: DEIS Review
State of Alaska Consolidated Comments Table**

Department/ Division/Section	Document Name	Section/ Fig./Table	Page #	Comment/Issue	Recommendation/Action
DNR/DOG/SPCS	all			Expanded Development Scenario	The references to the Expanded Development Scenario in all documents are insufficient for an EIS review. There are no maps and the few details presented are incomplete. The impression is that these actions are being considered and would be used to authorize the expansion 20 years from now. Either the expansion should be presented as an alternative and clearly defined and researched, or it should be clearly stated that the expansion would need an additional review.
DNR/DOG/SPCS	4.16 Surface Water	4.16.7.2	4.16-46	Pebble Mine Expanded Development Scenario	This is the first place the expansion is better defined. If this scenario is intended to be reviewed as part of this EIS, it should be discussed in more detail throughout, from project description, through all sections, with impacts to resources more clearly called out. The expansion is not included in the Chapter 2 Alternatives text.
DNR/DOG/SPCS	Executive Summary	3.1.2.3 Cumulative Effects	31	Expanded Development Scenario	Is introduced in this document on page 31 - well past the alternatives and project descriptions, tucked into the cumulative impacts to subsistence. This is the first reference to a diesel pipeline, and simply says "A new deep-water port and condensate and diesel pipelines would be constructed" with no explanation of why these additions are needed rather than relying on the port and fuel pipelines already constructed for the project.
DNR/DOG/SPCS	4.22 Wetlands	Table 4.22-12	4.22-39	estimates of acreage for potential development expansion (Alt 1, column 2)	It is not clear from this table or other sections of the EIS what is included in the acreage calculations for the estimated expansion footprint (diesel fuel pipeline, concentrate pipeline, port footprint). A diesel line would require additional land disturbance for spill response locations and valves at waterbody crossings, which are not necessary for natural gas pipelines. Additionally, it is not clear why an additional compressor station would be needed at Amakdedori port in addition to the diesel pipeline to a new Iniskin Bay port.
	4.22 Wetlands	Table 4.22-12	4.22-39	estimates of acreage for potential development expansion (Alt 2, column 2)	No acreages are listed in this column, unlike remainder of the table. Update to include information.
DNR/DOG/SPCS	4.22 Wetlands	4.22.9.4	4.22-41	"... a diesel pipeline from the mine site to Iniskin Bay would be constructed as discussed under cumulative effects for Alternative 1."	The additional pipelines, road, and facilities proposed as part of expanded mine development are NOT discussed under the cumulative effects of Alternative 1. These developments require additional land uses, impact additional resources, and require additional authorizations beyond the Alternative 1 proposed plan. Among other things, spill risks exist for a diesel pipeline that require different designs and protections from natural gas pipelines.
DNR/DOG/SPCS	4.17 Groundwater	4.17.7.2	4.17-27	"The effects of the project on groundwater..."	If a diesel pipeline is constructed for the expanded mine development, the EIS will need to include the risk of spilled fuel into shallow groundwater and waterbodies.

Department/ Division/Section	Document Name	Section/ Fig./Table	Page #	Comment/Issue	Recommendation/Action
DNR/DOG/SPCS	Ch 1 Purpose and Need	1.2 Applic. Description	page 1-1	"...an 187-mile gas pipeline..."	Most of the EIS, including project description (Appendix N), describes a 188-mile pipeline.
DNR/DOG/SPCS	Ch 2 Alternatives	2.2.2	page 2- 13	"...an 187-mile gas pipeline..."	Most of the EIS, including project description (Appendix N), describes a 188-mile pipeline.
DNR/DOG/SPCS	4.14 Soils	4.14.2 Alternative 1	4.14-2	"Other agencies that may require... (ADNR) for an Approved Pipeline Right-of-Way (ROW) Permit; ..."	ADNR requires a Pipeline Right-of-Way Lease, not an "Approved Pipeline Right-of-Way Permit"; please correct terminology from permit to lease, and lowercase the "Approved", as it is not part of the name of the authorization.
DNR/DOG/SPCS	Multiple; example from 4.14 Soils	4.14.6.2	4.14-28	re: "unlikely to result in any appreciable impact... or actions outside of the cumulative effects analysis area..." and the list that follows "Past, present, and RFFAs that could contribute..."	This text, and similar text in 4.13, are good examples of well-focused cumulative effects for the relevant resource. This focused approach is preferable to, but inconsistent with, the approach in 4.3, 4.7, 4.20, others. Suggest updating those other sections to a more focused style such as 4.14, if updates include Cumulative Effects descriptions.
DNR/DOG/SPCS	4.13 Geology	4.13.6	4.13-17	"...or actions outside of the cumulative effects analysis area (e.g., Donlin Gold, Shotgun...)"	This is a good example of acknowledging the list from 4.1 but making it applicable to the resource in question (here, geology). Much better than 4.7, 4.20, and others, which contain full lists including projects not reasonably related to the reviewed resource in the Pebble Project area.
DNR/DOG/SPCS	4.9 Subsistence	4.9.6	4.9-16	bulleted list includes Donlin Gold, Alaska Stand Alone Pipeline, Alaska LNG, and Drift River Oil Pipeline	Donlin Gold is geographically separate from Pebble - it is unclear why it is included in this list of RFFA's. Alaska LNG & ASAP - of which only one is likely to be built - both share possible impacts to Cook Inlet subsistence resources, but that is not well explained. Furthermore, "Drift River Oil Pipeline" is already changed. Hilcorp constructed Tyonek pipeline and modified CIGGS-A pipeline to divert oil from Drift River terminal during the summer of 2018. Decommissioning of Drift River may be complete before Pebble, if approved, could begin construction.
DNR/DOG/SPCS	4.9 Subsistence	4.9.6.2	4.9-18	"Since the other mineral exploration RFFAs are generally close to the Pebble Project, subsistence use areas..."	As the Donlin Gold mine is roughly 170 miles away, it is hard to consider it as "generally close" to the Pebble Project.
DNR/DOG/SPCS	4.3 Socioeconomic	4.3.6 Cumulative Impacts	4.3-15 to 16	"RFFAs identified... that could contribute to the regional and state socioeconomic cumulative effects..."	Section does not address how Donlin Gold, Alaska Stand Alone Pipeline, Drift River Oil Pipeline, and Alaska LNG relate to RFFA for the Pebble Project for this resource. Revisions from PDEIS to DEIS did not expand on the relation between Pebble and these projects' impacts. Please elaborate.
	4.7 Cultural Resources	4.7.7	4.7-9	"The following RFFAs... apply to the consideration of cumulative effects on cultural resources"	This bulleted list includes projects geographically distinct from Pebble Project, such as Donlin Gold and Alaska Stand Alone Pipeline, and their cumulative effects on cultural resources with Pebble are not well expressed.
DNR/DOG/SPCS	4.1 Environmental Consequences	Table 4.1-1	4.1-17	Donlin Gold project is listed	If Donlin Gold is being included as a RFFA, then it should be displayed with the other RFFA's on Fig 4.1-1, to illustrate proximity to/distance from Pebble Project resources (Figure 4.1-1, page 4.1-22)

Department/ Division/Section	Document Name	Section/ Fig./Table	Page #	Comment/Issue	Recommendation/Action
DNR/DOG/SPCS	4.1 Environmental Consequences	Figure 4.1-1	4.1-22	Donlin Gold project is not shown	If Donlin Gold is included as a RFFA and will continue to be listed in table 4.1-1, it should be added to the map in Figure 4.1-1
DNR/DOG/SPCS	4.12 Transportation	4.12.2.3, Natural Gas Pipeline Corridor	4.12-7	"The magnitude and extent... would be 94 miles of pipeline crossing the Cook Inlet seabed..."	The 94-mile distance is inconsistent with the 104-mile distance noted in the project description and other sections of the DEIS.
DNR/DOG/SPCS	4.1 Environmental Consequences	Table 4.1-2	4.1-24	Alt 1 - after 20 years, an additional natural gas compressor would be built at Amakdedori less truck traffic with concentrate and diesel transported via pipeline from Iniskin	No explanation is given for why an additional gas compressor is needed in addition to the construction of the ill-defined diesel pipeline at Iniskin
DNR/DOG/SPCS	4.1 Environmental Consequences	Table 4.1-2	4.1-24	Alt 2 and Alt 3- after 20 years, an additional natural gas compressor would be built at Diamond Port less truck traffic with concentrate and diesel transported via pipeline from Iniskin	No explanation is given for why an additional gas compressor is needed in addition to the construction of the ill-defined diesel pipeline at Iniskin
DNR/DOG/SPCS	4.1 Environmental Consequences	4.1.3.3	4.1-26 to 27	"...a compressor station on the Kenai Peninsula side, and a second compressor station located at a Cook Inlet port site."	Project description update list calls for one compressor station, on the Kenai Peninsula side (see Appendix N, unnumbered intro page), rather than the two compressors described here. The two-compressor reference here is inconsistent with the remainder of the EIS review (see 4.20-16 or 4.19-17 for examples), with the exception of references to possible mine site expansion which would include construction of a second compressor station.
DNR/DOG/SPCS	4.1 Environmental Consequences	Table 4.1-1	4.1-18	Drift River: "proposes to repurpose an existing natural gas pipeline crossing Cook Inlet to an oil pipeline. Involves the installation of 9 miles of new cross-inlet between Beluga and Nikiski."; Status - Decommissioning of Drift River initiated in 2017...	New gas pipeline from Beluga to Tyonek platform is complete (fall 2018). Converted gas pipeline is now transporting oil eastward across Cook Inlet (fall 2018), which will allow for the decommissioning of Drift River Terminal.
DNR/DOG/SPCS	Ch 4, multiple sections	Natural Gas Pipeline	4.24-7 (also p 4.24-9 and 4.24- 18)	"HDD would be used to install the pipeline segments from the shoreline into waters deep enough to avoid navigational hazards"	Note that the transitions are inconsistently described in Chapter 4. Section 4.24 says Iliamna and the shore transitions are all HDD, but other locations such as 4.16-35 say "construction of the pipeline (by HDD or trenching)". Executive Summary (page 13) says "by HDD or trenching". Please clarify the apparent inconsistencies.
DNR/DOG/SPCS	Appendix E	Table E-1	Page E-18	"ROW leases for road, pipeline, and, and fiber optic cable on state lands and waters"	Roads and AS 38.05 pipeline authorizations are proposed to be issued as easements, not leases. Please reference the correct authorization type.
DNR/DOG/SPCS	Appendix E	Table E-1	Page E-18	"(under Right-of-Way Leasing Act) AS 38.35.020"	Suggest listing the statutory reference as AS 38.35 because leasing conditions are addressed throughout the chapter.
DNR/DOG/SPCS	Appendix I	6.8	Owl Ridge p 118	"Inactive pipelines that remain in place, will be properly pigged, purged, filled with seawater, and capped"	This does not specify that it is intended for the subsea pipeline components; suggest clarifying that uplands buried pipeline would not be filled with seawater when/if abandoned in place.

Department/ Division/Section	Document Name	Section/ Fig./Table	Page #	Comment/Issue	Recommendation/Action
DNR/DOG/SPCS	Appendix N	2.4	19	"... which is located on private land owned by the University of Alaska..."	UA land is not listed in Table 2-4 but was mentioned in preceding paragraph; Kenai Peninsula pipeline component not clearly stated in table. How much land is involved on that eastern Cook Inlet section, and who are the land owners?
DNR/DOG/SPCS	Chapter 3	Table 3.2-4	3.2-11	ADL 218329 & ADL 232949: "obsolete" noted by these authorizations	DNR still considers these authorizations as active. Uncertain why they are listed as "obsolete" in this table.
DNR/DOG/SPCS	Chapter 3	3.2.2	3.2-11	No reference is made to University land management	Appendix N (page 19, section 2.4) references a tie-in to compressor station on University of Alaska land. Please resolve the inconsistency
DNR/DOG/SPCS	Chapter 4		4.2-5	"One state public access easement exists... (see Section 3.2)"	The State of Alaska still recognizes all three easements listed in Table 3.2-4, not just one. Uncertain why others were considered "obsolete" and excluded from review.
DNR/DOG/SPCS	Chapter 4	4.12.2.1	4.12-4	"During construction of the pipeline on the Kenai Peninsula ... traffic on the Sterling Highway would be affected by vehicles transporting materials to the site. The magnitude and extent of the effect would be delays and disruption of traffic due to construction of the project components. However these traffic delays are expected to be less than the usual delays experienced on Sterling Highway during the summer months when tourist traffic at its highest and road construction is most active (PLP 2018-RFI 037). Disruption of traffic may include lane closures and slow vehicles in the immediate vicinity of the construction site. This disruption would be short-term, only occurring during pipeline construction, but the likelihood of occurrence is certain under Alternative 1."	This traffic may be less than summer construction traffic, but would be cumulative with road maintenance traffic, so the impact should not be disregarded. Additional traffic on the only major local road is not an insignificant impact to local transportation.
DNR/DOG/SPCS	Ch 2 Alternatives	2.2.4.5	2-113	The pipeline would consist of a single, approximately 6.25-inch-diameter API 5L X60 grade (or similar) steel pipeline with an internal high-density polyethylene (HDPE) liner to prevent corrosion.	DNR pipeline engineers raised concerns with maintenance of plastic-lined steel pipelines: repairs to plastic cannot be made during operations without cutting through steel; steel casing cannot be welded without causing damage to the lining; and abrasions or damage to the lining can expose the steel to water and internal corrosion but cannot be reached for repair or replacement short of removing full sections of lined pipe at some type of joining flange. Final design of concentrate pipeline would need to consider these issues.
DNR/DOG/SPCS	Ch 2 Alternatives	2.2.4.5-Alt 3, Transportati on Corridor	2-113	The pipeline would transport a mixture of 55 percent concentrate and 45 percent water by mass	No discussion exists on how slurry in concentrate pipeline would be kept from freezing during months of winter operation; likewise, no discussion exists how the water in the return water pipeline variant would be kept in liquid state during sub-zero temperatures. This is not insurmountable, but may require additional facilities to heat the slurry or water, or may require the addition of salt or chemicals to the water to prevent freezing, which would increase overall project footprint.

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DNR/DOG/SPCS	Ch 2 Alternatives	2.2.4.5-Alt 3, Transportati on Corridor	2-113	Lined concentrate pipelines cannot be built as a continuous welded segment over the entire length, because the tight-fitting HDPE liner would need to be pulled through the inside of the steel pipe. Welded segments can be up to 2,000 to 2,500 feet in length, typically allowing for river crossings that do not include flange connections.	What considerations have been made to allow for repair of damaged sections of pipe or lining? What plans are proposed to detect scour damage in the HDPE liner which could allow corrosion of the steel casing pipe?
DNR/DOG/SPCS	Ch 2 Alternatives	2.2.4.5-Alt 3, Concentrate Pipeline Operations	2-119	The return water pipeline would be placed in the same trench as the slurry and natural gas lines, adjacent to the road, so the trench would be widened by a few feet (see Figure 2-64). This pipeline would need to be sized to accommodate water from flushing operations, resulting in a return water size of approximately 8 inches. This would also be an HDPE-lined steel pipeline with appropriate corrosion protection and other controls, as discussed above.	Concerns about the optional return water pipeline are similar to the concerns with the concentrate pipeline. How will the water be kept liquid in winter? How will damaged pipe be repaired? For the water pipeline specifically, was non-steel pipe considered? In-Alaska example of an alternative is the North Fork natural gas pipeline, which is successfully operating and was constructed of FiberSpar fiber-reinforced composite pipe.
DNR/DOG/SPCS	Ch 2 Alternatives	Table 2-2	2-126	187 miles (pipeline length)	Most of the EIS, including project description (Appendix N), describes a 188-mile pipeline.

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DNR/DPOR/ OHA	3.7 Cultural Resources	3.7.2.1	3.7-5	The Previous Cultural Resource Research section should mention the creation and composition of the archaeological site location model since it will be used in later analyses.	Include a brief summary of the archaeological site location model and its limitations.
DNR/DPOR/ OHA	3.7 Cultural Resources	3.7.3.1	3.7-6	Discussion of the site location model states that low potential areas do not need to be surveyed. This issue still needs to be discussed regarding appropriate level of effort.	Rephrase: "...low potential for sites,...have been surveyed or may not need to be surveyed,..."
DNR/DPOR/ OHA	3.8 Historic Properties	3.8	3.8-1	The introduction to the National Historic Preservation Act and the purpose of this section is unclear.	If the Pebble EIS needs to introduce the National Historic Preservation Act then it needs to make clear what the requirements of the statute are, that 36 CFR 800 are the ACHP's implementing regulations, and that Appendix C is the alternative process developed by the USACE, which has not been approved by the Advisory Council on Historic Preservation - the only authority designated under the National Historic Preservation Act to propagate implementing regulations for NHPA.
DNR/DPOR/ OHA	3.8 Historic Properties	3.8	3.8-1	The second paragraph implies that consultation is only required under 36 CFR 800, when it is also required under Appendix C.	Please also reference Appendix C when discussing consultation requirements.
DNR/DPOR/ OHA	3.8 Historic Properties	3.8	3.8-1	Third Paragraph - Historic properties are determined eligible through consultation between parties. Consultation was gathering information about potential historic properties.	Revise sentence: "...gather input on potential historic properties."
DNR/DPOR/ OHA	3.8 Historic Properties	3.8	3.8-1	Third Paragraph - The role of the programmatic agreement is unclear.	Add language: USACE has chosen to exercise phased identification and evaluation of historic properties under 36 CFR 800.4(b)(2) through the execution of a Programmatic Agreement pursuant to 36 CFR 800.14(b).
DNR/DPOR/ OHA	3.8 Historic Properties	3.8.1	3.8-2	Third bullet - the model is focused on archaeological resources.	Add language: "GIS modeling used to delineate areas of low potential for archaeological resources... "
DNR/DPOR/ OHA	4.8 Historic Properties	4.8	4.8-2	2nd para, 5th line - unnecessary reference.	36 CFR 800.6 can be deleted since it refers to the use of a memorandum of agreement and does not pertain to this project.
DNR/DPOR/ OHA	3.8 Historic Properties	3.8		Discussion and use of various terms referring to the geographic area under consideration (permit area, APE, and analysis area) is confusing and may be inconsistent.	Recommend revising language for clarity.
DNR/DPOR/ OHA	4.8 Historic Properties	4.8		Discussion and use of various terms referring to the geographic area under consideration (permit area, APE, and analysis area) is confusing and may be inconsistent.	Recommend revising language for clarity.

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DNR/DGGS/Engineering Geology	3.14.2.3	3.14-4	Under "Erosion" heading, soils are described as having "a 'slight' water erosion hazard." What is the basis of this determination? Fine-grained soils such as those described (silt and sand mixtures) are commonly (very) susceptible to water erosion.	Provide more detail as to basis of determination of "slight" water erosion hazard, or reword so as to more fully express/acknowledge the potential hazard.
DNR/DGGS/Engineering Geology	4.14.2.4	4.14-4	Under "Erosion" heading, silty loam soils are "considered not (to) be susceptible to erosion by water." Despite low slopes, soils with a loamy texture (consisting of fine sand and silt particles) have moderate to high erodibility and should be considered at least somewhat susceptible to erosion by water, especially where vegetation has been disturbed. Even with slight variability along slopes, sheet flows begin to accumulate and can create concentrated flow under conditions of natural topography or human activities (for example, ditches and berms).	Reword to more fully express/acknowledge the potential hazard.
DNR/DGGS/Engineering Geology	4.15.2.3	4.15-12	Under "Tsunamis" heading: Debris avalanches from Augustine Volcano have reached the sea about every 150-200 years and can generate waves up to 60 feet, yet the tsunami modeling (and mitigation design) are predicated on seismic events with 2500-year and 100- to 500-year return periods and lower inundation (42 feet and 19-30 feet, respectively). For 70-year life of port (including closure), the probability of a debris-avalanche tsunami occurring may be as high as 1 in 2, and the potential impacts are greater than the seismic tsunamis.	The hazard from a local tsunami generated by an Augustine debris avalanche should explicitly be included as part of the detailed tsunami analysis prior to final port design, and should be so stated in the third paragraph in this section. Sentence "The port diesel fuel facility would be designed to withstand the 2,500-year event" should be revised to reflect that a volcano-generated tsunami may be the largest design event.
DNR/DGGS/Engineering Geology	4.15.2.3	4.15-14	Under "Volcanoes" heading, the likelihood of a volcanic debris avalanche occurring during the project's life is characterized as "low." See previous comment--the probability of such an event is on the order of 1 in 2, which is not low. The potential for such a flow to reach the pipeline of port facilities is indeed low, but the chief hazard is a tsunami.	Reword to more fully express/acknowledge the potential hazard.
DNR/DGGS/Engineering Geology	4.15.2.4	4.15-20	Coastal Hazards - Seafloor scour and ice gouging are potential issues.	If seafloor scour and ice gouging have been considered, it should be so noted in text.
DNR/DGGS/Engineering Geology	4.15.2.4	4.15-20	Coastal Hazards - Seafloor scour and ice gouging are potential issues.	If seafloor scour and ice gouging have been considered, it should be so noted in text.
DNR/DGGS/Engineering Geology	4.15.6.2	4.15-24	Third paragraph of "Pebble Mine Expanded Development Scenario" section: The example given for potential increase in the likelihood of impacts assumes the largest tsunami will be generated by an earthquake; see earlier comments regarding likelihood and magnitude of a potential tsunami generated by a volcanic debris avalanche from Augustine Volcano.	Reword to include possibility of a debris-avalanche tsunami.
DNR/DGGS/Engineering Geology	3.15.1.1	3.15-1	second paragraph in section, third sentence: recurrence intervals/return periods are long-term statistical averages	use "average" or "mean" as a clarifier when referring to recurrence intervals or return periods
DNR/DGGS/Engineering Geology	3.15.1.3	3.15-4	second paragraph in section, second sentence: the lateral spread of liquified soil up to a "few feet" is ambiguous/arbitrary. In Sulawesi, Indonesia, for example, a large earthquake triggered several hundred hectares of ground to fail as a result of liquefaction.	either remove "a few feet" or reword to emphasize that the extent of liquefaction and resulting ground failures are dependent on pre-existing soil conditions and earthquake characteristics and are difficult to anticipate

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DNR/DGGS/Engineering Geology	4.15.2.1	4-15.5	in the "Seismic Stability Analysis" section, second sentence. I would argue that the Alaska-Aleutian megathrust is the most significant active geologic structure near the mine site. Also, there is no evidence of Holocent activity on the Bruin Bay fault, and by the standards defined in 3.15 is not technically active. This phrase is repeated verbatim in K4.15 pg K4 15-23 in the "Analyses of Seismic Hazards Deformation"	If you do not designate the Alaska-Aleutian megathrust as the most significant active structure "near the mine site," then perhaps stipulate a distance threshold across which you are considering active faults or a particular type of fault you are considering (e.g., plate boundary vs intraplate vs upper crustal) that leads you to exclude the Alaska-Aleutian megathrust here.
DNR/DGGS/Engineering Geology	4.15.2.1	4.15-6	the 30 November 2018 Anchorage earthquake magnitude has officially been changed to Mw 7.1 by the Alaska Earthquake Center at UAF	update magnitude to 7.1
DNR/DGGS/Engineering Geology	4.15.2.1	4.15-8	footnote #8 - while the Usibelli coal mine is near the strike-slip Denali fault, it is not "situated in a strike-slip regime." The Usibelli coal mine is in a regime of north-south shortening and uplift within the Northern Alaska Range Quaternary fold and thrust belt. Also, the phrase "due to the tectonic forces that created Denali" is ambiguous. The Denali fault? or Denali the mountain?	rephrase summary description of how the Usibelli Coal Mine and the Pebble mine site are in similar seismically active areas or change the last sentence on the page to have a different meaning.