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United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE

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DEC 21 2018

Mr. Shane McCoy
Program Manager, Regulatory Division
U.S. Army Corps of Engineers, Alaska District
P.O. Box 6898
Joint Base Elmendorf-Richardson, Alaska 99506-0898

Dear Mr. McCoy:

The United States Fish and Wildlife Service (Service) appreciates the opportunity to review chapters of the U.S. Army Corps of Engineers' (USACE) preliminary Draft Environmental Impact Statement (DEIS), evaluating the Pebble Limited Partnership Project, which proposes to develop existing State of Alaska-owned mine claims at the Pebble deposit. Our preliminary comments are provided in the enclosure, *U.S. Fish and Wildlife Service Cooperating Agency Review, Pebble Limited Partnership Project Draft Environmental Impact Statement*, and are limited to the following chapters and appendices:

- Commercial and Recreational Fisheries (Chapter 3.6, Chapter 4.6, Appendix K 3.6)
- Subsistence (Chapter 3.9, Chapter 4.9, Appendix K 3.9)
- Wildlife Values (Chapter 3.23, Chapter 4.23)
- Fish Values (Chapter 3.24, Chapter 4.24)
- Threatened and Endangered Species (Chapter 3.25, 4.25, Appendix K 4.25)
- Mitigation (Chapter 5.0)
- Appendix E – Laws, Permits, Approvals, and Consultations Required

The Service is participating as a cooperating agency in the preparation of the subject Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq., with implementing regulations). Our comments and recommendations are provided in accordance with the NEPA, Endangered Species Act (16 U.S.C. 1531 et seq., as amended), Marine Mammal Protection Act (16 U.S.C. 31), Bald and Golden Eagle Protection Act (16 U.S.C. 668), Migratory Bird Treaty Act (16 U.S.C. 703-712), and Fish and Wildlife Coordination Act (16 U.S.C. 661-667e, et seq., as amended).

The Service conducted a limited review of specific sections of the DEIS provided by the USACE in staggered releases in November 2018. The process employed by the USACE to facilitate cooperating agency review made it challenging to assess the DEIS for sufficient baseline information in the Affected Environment (Chapter 3) and sufficient analysis and discussion of impacts in the Environmental Consequences (Chapter 4); further complicating the review was the incomplete nature of the chapters. Many of the chapter sections contain notations that 2018 and 2019 field data are pending, and an analysis of those data will be added to the EIS when available. Due to a lack of current data for the affected environment, the Service is not able to provide comprehensive analysis of the environmental consequences of the proposed project on fish and wildlife resources.

Additionally, several of the chapter sections referenced documents or chapters that were not available for our review. Therefore, our comments on the DEIS are preliminary and we look forward to reviewing the DEIS in its entirety, after the field data referenced in the document have been incorporated and the environmental consequences rigorously analyzed.

If you have any questions, please contact Ecological Services Branch Chief, Mr. Douglass Cooper, Anchorage Fish and Wildlife Conservation Office, at 907-271-1467 or via e-mail at douglass_cooper@fws.gov.

Sincerely,



Mary Colligan
Assistant Regional Director
Fisheries and Ecological Services

Enclosure

U.S. Fish and Wildlife Service Cooperating Agency Review, Pebble Limited Partnership Project Draft Environmental Impact Statement

The U.S. Fish and Wildlife Service (Service) defers to the National Marine Fisheries Service (NMFS) for all listed species and marine mammals under their jurisdiction, defers to the National Park Service for the Recreation section, and defers to the Environmental Protection Agency for the Wetlands section.

General Comments

The Service submitted comments on preliminary draft chapters of the U.S. Army Corps of Engineers' (USACE) Draft Environmental Impact Statement (DEIS) on July 13, 2018, and August 31, 2018. There were no subsequent responses from the USACE indicating how or if our comments were addressed. Consequently, the Service is unable to discern which of our previous comments were incorporated into the current draft. Our review highlights instances where our previous comments were not adequately addressed, or the analyses remain unclear.

The Service recommends structuring each of the sections of Chapter 4 of the DEIS to thoroughly analyze the environmental consequences of the proposed project for each of the four main project components, as described in Chapter 2, Alternatives: the Mine Site, the Transportation Corridor, the Amakdedori Port and Lightering Locations, and the Natural Gas Pipeline. Structuring the analysis and discussion in this way will ensure full disclosure of the proposed project's environmental consequences in the DEIS. We recommend each of the sections of Chapter 4 adequately address the full scope of the potential direct, indirect, and cumulative environmental impacts from the proposed action or action alternatives; contain sufficient information to adequately assess the magnitude or intensity of the impacts; and evaluate the overall significance of these impacts to resources in the project area and surrounding region.

The Service has management authority for the conservation of a variety of trust resources including migratory birds, inter-jurisdictional fish, threatened and endangered species, and their habitats. Invasive species have the potential to negatively impact these resources. Therefore, we recommend initial site evaluations be conducted to determine what appropriate control and management actions should be taken to avoid and minimize adverse impacts associated with invasive species and encourage the development of an invasive species control plan for all phases of the proposed project.

Specific Comments

Commercial and Recreational Fisheries

Chapter 3.6: Affected Environment

The Service provided comments on this pre-draft chapter section, by letter dated August 31, 2018. We have no additional comments on this section at this time.

Chapter 4.6: Environmental Consequences

- Please specify which section or sections this statement refers to: “*Section 4.24, Fish Values indicate Alternative 1 would not reduce the returning adult salmon to the Kvichak and Nushagak river systems as a result of the project operations.*” It is unclear where the numbers of returning adult King Salmon under different conditions are discussed in Section 4.24 Fish Values. Rather, Section 4.24 provides information describing changes to the quantity of King Salmon spawning and rearing habitat occurring within the project area. Please provide a citation or documentation that correlates the quantity and quality of existing, and future, King Salmon habitat within the project area to numbers of returning King Salmon adults.
- Several Service comments provided on the pre-draft chapter by letter dated August 31, 2018, were not addressed by the USACE in this version. We continue to recommend incorporation of the following information into the DEIS:
 - An assessment of King Salmon productivity in the Mulchatna River system.
 - The extent of the project area located within each of the watersheds described within this section. Even if detailed in another section of the DEIS, this information would allow the reader to more clearly understand the affected environment in this section.
- The pre-draft chapters previously reviewed for this section had placeholders for discussion on the economic contribution of lodges by drainages. No new information on the economic contribution from lodges by drainages is included in the most recent chapter of the DEIS. We recommend future versions include this information.
- The pre-draft chapters previously reviewed for this section had placeholders for additional discussion on the response of consumers to industrial accidents near fishery resources, and the general consumer awareness (or lack of awareness) of Bristol Bay salmon. No new information on these topics is included in the latest version of the DEIS. We recommend future versions include this information.

Appendix K 3.6: Commercial and Recreational Fisheries

The Service has no comment at this time on Appendix K 3.6 Commercial and Recreational Fisheries.

Subsistence

Chapter 3.9: Affected Environment

The Service appreciates the amount of detail provided in the Affected Environment chapter and has no comment at this time.

Chapter 4.9: Environmental Consequences

The Service offers the following specific recommendations for this chapter:

- Include more detail on the potential cumulative impacts for all alternatives, and the magnitude of such impacts. Specifically, provide detailed information on the cumulative and additive impacts each action alternative would have on the water, subsistence, and cultural resources which the people living in the area depend on for survival. In particular, this chapter should describe how anticipated impacts to the river system, water quality, fish habitat, and wildlife habitat would affect subsistence users that rely on these resources. If some of this information is available in one or more other chapters of the DEIS, please also refer to those chapters here.
- Discuss and provide more detail on how construction and operation of a large commercial enterprise, an open pit copper and gold mine, in a relatively remote part of Alaska could permanently impact the environment, fish, wildlife, habitats, and the subsequent effects on indigenous people and their culture, including subsistence use.

Appendix K 4.9: Subsistence

The Service has no comment at this time on Appendix K 4.9 Subsistence.

Wildlife Values

Chapter 3.23: Affected Environment

Thank you for incorporating most of the Service recommendations for the pre-draft chapter, provided by letter dated August 31, 2018, into the DEIS. The Service offers the following additional comments for this chapter:

- Many important avian resources outside the mine site could be impacted by the proposed development, including those along the Koktuli, Nushagak, and Mulchatna Rivers. Nushagak Bay supports an estimated 60,000 shorebirds within the Nushagak Bay Western Hemisphere Shorebird Reserve Network (<https://www.whsrn.org/nushagak-bay>). Bird communities along the mine access road, on Iliamna Lake, and the Upper Talarik Creek drainage could be affected by the proposed action. Impacts could occur to bird populations as far away as Kvichak Bay, including tens of thousands of long-tailed ducks and black scoters, over 100,000 king eiders (Larned 2002, 2003, 2004, 2005), and more than 20,000 shorebirds in the Kvichak Bay Western Hemisphere Shorebird Reserve Network site (<https://www.whsrn.org/kvichack-bay>).
- Both the Nushagak and Kvichak Bays are recognized by Audubon as areas of global importance. Up to 89 percent of the king eiders and black scoters recorded during spring migration surveys along the coast of southwestern Alaska were documented in Kvichak Bay (Larned 2002, 2003, 2004, 2005), making it among the most important sites in the region for those species.

- The DEIS should incorporate updated information from the Alaska Department of Fish and Game on sensitive breeding populations of Aleutian terns in both the Nushagak and Kvichak Bays. Contact Kelly Nesvacil (kelly.nesvacil@alaska.gov) for additional information.
- The Service recommends the addition of the Kittlitz's murrelet, marbled murrelet, Aleutian tern, and pigeon guillemot to the Species of Concern list.
- Water quality is important to wildlife, including birds and fish. The withdrawal, capture, storage, and release of treated and untreated water could impact raptors, shorebirds, and waterbird species inhabiting downstream locations, and should be discussed in this section of the DEIS.
- We were unable to evaluate wildlife resources for the North Access Road in Alternative 3, because no road is present in Alternatives 1 and 2 where wildlife resources are predominantly discussed, and no discussion of this proposed road is presented in this chapter. We recommend including a more detailed analysis of the North Access Road in Alternative 3 so potential impacts to wildlife resources can be evaluated across the Alternatives.
- The proposed project has a direct footprint in marine areas and could potentially impact the Lower Cook Inlet (and possibly Shelikof Strait), yet the DEIS does not address these habitats nor the potential impacts of spills, accidents, and disturbance in marine waters. The same is true for the marine waters of Bristol Bay. We recommend the DEIS include a discussion of the marine areas potentially affected by the proposed project, as well as the potential impacts of spill, accidents, or disturbance in marine waters.
- Summaries of species present within the proposed site focus only on the most common species. Therefore, it is unknown if less common species, including species of high conservation concern, are present. The conservation status of species detected within the proposed site is not included in the chapter section, and the chapter references the Alaska Biological Resources (ABR) reports, which were not available for our review. The information provided does not contain sufficient detail to evaluate the potential environmental impacts of the proposed action, or its alternatives. Information for this review was summarized, and no references were provided, so it was difficult to evaluate the scope and intensity of potential environmental impacts. We recommend providing additional details on wildlife species that occur for each of the four main project components: the Mine Site, the Transportation Corridor, the Amakdedori Port and Lightering Locations, and the Natural Gas Pipeline.
- Data on the marine distribution of seabirds, or seabird population estimates, are largely lacking in the DEIS. The document references seabird colony sites in the region and provides an estimated number of birds at "*many colonies*," but it is unclear how many colonies are included in this estimate, and what methodology was used to collect colony data. We recommend expanding the seabird colony information to better quantify the

number of birds and species at each colony site, and providing a map showing all colony locations in the region. The seabird colony database is available online via <http://axiom.seabirds.net/portal.php>. We note, however, that some of the colony data contained therein is decades old, and should be updated to accurately reflect current seabird populations at risk.

- On the Bristol Bay side, the outer regions of this bay have been identified as molting and foraging areas for marbled murrelets and other species during fall migration from coastal breeding sites. Murrelets may be flightless for periods in the fall, and would be susceptible to oil spills or disturbance.
- The DEIS should incorporate updated information from the U.S. Geological Survey investigators from their Cook Inlet marine bird and forage fish surveys for 2016-2018. Lead investigators are Dr. John Piatt (Jpiatt@usgs.gov) and Mr. Dan Ruthrauff (druthrauff@usgs.gov); reports may be available to update seabird colony data for selected study sites and offshore distribution of non-colonial species such as murrelets.
- Classification of habitat use for each species into value classes (i.e., high, moderate, low, or negligible) appears to be very subjective. More information on this classification method should be incorporated into this chapter.
- Wording about survey methodology is unclear. “*The second survey for each year was timed to coincide with peak nesting of cliff-nesting raptors...*” What is “*peak nesting*”? The species listed as examples (e.g., golden eagle, gyrfalcon, rough-legged hawk) have slightly different nesting phenologies, so there might be different timing among the species. Determining nesting success and productivity for multiple species is difficult with a single survey due to differences in phenology. For example, most gyrfalcons will have fledged before golden eagles can be surveyed for nest success. Please clarify the survey methodology used to assess peak nesting.
- Some raptor species (e.g., Northern harrier, ground-nesting species including short-eared owl) are not well surveyed by the aerial methods used; thus negative nest survey results at the mine site may be misleading. Additional ground surveys for these species would clarify their presence or absence at the mine site. We recommend clearly disclosing the limitations of the survey methods used to evaluate wildlife presence and impacts in the project area.
- It is unclear if raptor studies were conducted in the same or different areas during the 2004 and 2005 periods. For example, was the entire site and buffer area surveyed both years, or were forested areas surveyed in 2004 and cliff habitats in 2005? Please clarify the timing and locality of the raptor surveys.
- Both active and inactive bald and golden eagle nests are protected under the Bald and Golden Eagle Act.

- Eagle surveys identified golden eagle and bald eagle nests within 0.8 and 4 miles of the project footprint, respectively. Please note that eagle nests are dynamic and locations frequently change from year to year (due to blow-down, new construction, etc.). Additionally, raptor breeding productivity may undergo large inter-annual fluctuations related to changing densities of prey availability. A nest that is unoccupied during a period of low prey density may be occupied when prey levels increase. Therefore, a subsequent eagle nest survey is recommended in the year prior to construction to locate previously unidentified nests or unoccupied nests. If bald or golden eagle nests occur within 0.5 mile of project activities, the Service recommends project proponents consult with the Service's Migratory Bird Management permit office regarding potential disturbance/take and the subsequent need for an eagle or eagle nest take permit.
- One golden eagle nest was identified 0.2 miles north of the south access road. The nest is sufficiently close to warrant consultation with the Service regarding potential disturbance and the need for an eagle take (including disturbance) permit. Although the nest was identified as inactive in 2018, the nest could be active in subsequent years, triggering the need for an eagle take permit to conduct activities within 0.5 mile of the nest.
- The Service highly recommends that any potential eagle or eagle nest permit applications be submitted as far in advance of the project start date as practicable. Once issued, the permit may be updated with the most recent survey data (gathered within 1 year of the start of construction activities). This will help avoid any delays to the project that may be associated with eagles and their take, and help ensure legal coverage of any previously unidentified eagle nest or eagles potentially taken by project activities.
- It is unclear why shorebirds are included in the definition of waterbirds, but then included independently in their own section. Many of the methods used to survey waterbirds (e.g., aerial surveys) are not appropriate for shorebirds. Supporting documentation of shorebird use of Amakdedulia Cove and Kamishak Bay does not include shorebird use of these areas during autumn migration. In addition, supporting documentation is 20 to 40 years old and thus likely outdated. We recommend shorebirds and waterbirds be analyzed as two different categories. Additionally, we recommend using the most current data available or collecting new information where possible.
- Analyses should incorporate all available data, not just the most recent surveys. Ground based surveys do not necessarily indicate higher-quality data, especially if they were poorly timed, utilized inappropriate methodology, or were based on a non-statistical sampling design, etc. It is not clear what data were included in this assessment. No figures were available and few references were provided, and of those that were, no documents or reports were made available (e.g., reference ABR 2011a, NDM 2004, 2005).
- The DEIS contained a comparison between the North Fork Koktuli and Upper Talarik Creek drainages, both of which support a large number of waterbirds. Only information on scaup and "broods" are presented. Please describe what other migratory bird species occur in these drainages. The document fails to describe the resources that are at risk.

For example, what are the anticipated impacts to black scoters in the Pebble Mine study area, including the mine site and transportation corridor where they occur in relatively high abundance (Stehn 2009, 2010)?

- The Service provides the following comments for survey methods used to evaluate bird resources in the project area:
 - A variable circular-plot point count method was used to survey breeding landbirds and shorebirds; this method is not appropriate to survey many breeding shorebirds.
 - Information describing the locations and numbers of breeding landbird and shorebird survey points is insufficient. This information is needed to evaluate whether sampling effort is adequate to make inferences of species densities and distributions across larger spatial scales.
 - Point-count surveys were conducted between 4:30 a.m. and 4:00 p.m. Breeding landbird surveys should begin 30 minutes after sunrise (sunrise in Anchorage, Alaska on June 15 is approximately 4:30 a.m.) and end no later than 5 hours after sunrise, to account for declining song rate and detectability (ALMS 2004 available online at: <https://ecos.fws.gov/ServCat/DownloadFile/111623?Reference=70866>).
 - Survey timing often does not include migration or staging periods, a time period that is important for shorebirds in this region.
 - Survey timing may not be appropriate for all species, as timing of nesting is variable among species. Timing of nesting is also impacted by annual weather conditions. More information is needed to determine if surveys were indeed conducted during what the DEIS refers to as “*peak*” breeding periods.
 - Landbird and shorebird survey information is only provided for the Iliamna Spur Road. Fifteen point-count surveys were conducted in 2005 in proximity to the Newhalen River. Instead of conducting surveys for the majority of the proposed transportation corridor, the authors make comparisons to montane surveys conducted in Katmai National Park and Preserve and Lake Clark National Park and Preserve (Ruthrauff et al. 2007). Such comparisons are potentially inappropriate based on differing survey methods used or real differences in species assemblages in the two areas.
 - Survey data presented in the document appears to be based on aerial surveys (fixed-winged aircraft and helicopter). Aerial surveys are not an ideal method to census seabird species, because smaller birds (e.g., murrelets) can be missed or not identified to species, or their numbers underestimated. In addition, the report documents that the majority of the ABR surveys were only conducted over land or at the mouth of bays. The survey data do not account for the offshore component of the seabird population in the region of Kamishak Bay and the Lower Cook Inlet.
 - No surveys were performed (aside from aerial raptor nesting platform surveys) pertaining to the natural gas pipeline corridor from Ursus Cove to Diamond Point, and Diamond Port is not discussed separately. It is difficult to assess impact without information for the entire impacted area. This chapter does not

adequately assess the potential direct and indirect impacts of either action alternative in this area because no wildlife studies were conducted or no substantive information for the area is available for review.

- This chapter section uses minimizing language, such as, “*No shorebirds were considered common breeders.*” It is not clear how “*common breeder*” is defined. Additionally, the DEIS states, “*In summary, the majority of the mine site supports landbird species that are common in similar vegetation communities across Alaska. Shorebird species are not particularly numerous as breeding residents in the mine site.*” The DEIS does not include data describing how these conclusions were reached.
- If bird densities were calculated from point-count data collected by ABR, then how many birds are estimated to be directly impacted due to loss of habitat at the mine site? How many are estimated to be directly impacted due to the construction of 75 miles of new road? How many birds would be indirectly impacted due to the loss of home range or territory in adjacent areas? How long are these impacts anticipated to last? This information should be included in the DEIS.
- The construction of the proposed road corridor would destroy approximately 110 hectares of waterbird breeding habitat. Because no waterbird, shorebird, or landbird surveys were completed in this area, the magnitude and scope of the potential impacts to migratory birds in this area are unknown. Survey data are lacking within the majority of the transportation and natural gas pipeline corridors. As the transportation and natural gas pipeline corridors traverses a variety of habitats, the avian community is likely different throughout the region. Without data throughout the entire region, the relative impact on the bird community cannot be assessed. Because “*waterbird data were only collected north of Iliamna Lake,*” additional data should be collected outside of the mine site, including the proposed road corridors, power-generating station, wastewater treatment plant, administrative offices, housing and support services, port facilities, gas pipeline corridor, as well as other associated infrastructure.
- Because “*no project-specific waterbird surveys have been conducted to date for areas south of Iliamna Lake,*” insufficient information is available to adequately evaluate the environmental consequences of the proposed action to migratory birds or understand potential differences in the affected environment among the various alternatives.
- The proposed port, lightering facilities, and gas pipeline from Anchor Point to Kamishak Bay would pass through an area of high-quality habitat supporting high bird densities. Kamishak Bay is known to support thousands of waterbirds, seabirds, and shorebirds (*Pebble Project Environmental Baseline Studies, 2004-2008, Technical Summary*), comprising some of the highest marine-oriented waterbird densities in Cook Inlet. The marine waters in the vicinity of Anchor Point provide important habitat to multiple waterbird species, including thousands of Steller’s eiders, common eiders, king eiders, black scoters, and long-tailed ducks (Larned 2004, 2005, 2006a, 2006b, 2006c). We recommend these data be considered and included in the analysis.

- The DEIS should evaluate the impacts of benthic disturbance due to pipeline construction on seabirds and waterbirds that use the area. In addition, it should evaluate behavioral disturbance to shorebirds (e.g., phalaropes), seabirds, and waterbirds due to increased shipping activity and potential impacts from accidents and spills.
- On Page 3.23-23, the last paragraph addresses seabirds and should be moved to the waterbird section to remain consistent in the document.
- The Pebble Partnership contracted ABR to conduct boat-, airplane-, and helicopter-based surveys for birds and mammals in Cook Inlet near Kamishak Bay in 2004 and 2005, recording 69 species of marine-associated birds. The document fails to incorporate survey data as summarized in *Pebble Project Environmental Baseline Studies, 2004-2008, Technical Summary* into this assessment.
- Waterfowl and seabirds comprised the majority of observations recorded by ABR; however, in May tens of thousands of shorebirds also occupied the extensive mudflats in the region. Bird densities were greatest in the near-shore zone (*Pebble Project Environmental Baseline Studies, 2004-2008, Technical Summary*), which would be most affected by the proposed gas pipeline, port terminal, lightering barge activities, mooring sites, and handysize bulk carriers weighing up to 60,000 tons. Bird densities were generally greatest in the fall, winter, and spring; however, more than 4,100 birds of 8 species were estimated to be breeding in the study area. Please revise the analyses using all available data.
- Kamishak Bay supports thousands of sea ducks, including common eider, king eider, long-tailed duck, scoter species, harlequin duck, and the federally-threatened Steller's eider. Large numbers of Steller's eiders were recorded in Kamishak Bay during the months of January, February, March, April, September, and December, with a high count of 4,284 birds (Larned 2004, 2005, 2006a, 2006b, 2006c). Kamishak Bay had an average monthly count of 1,713 Steller's eiders, while Anchor Point supported an average monthly count of 134 Steller's eiders.
- If Steller's eiders were impacted in Kamishak Bay, the effects could be seen in surrounding areas such as Kodiak Island, due to the movement of birds between Kamishak Bay and Chiniak Bay (Rosenberg 2007). The proposed port facility, lightering locations, and pipeline corridor could impact waterbirds throughout the surrounding area.
- Lightering cargo, fuel, and supplies between the port facility and the offshore mooring sites would require cargo to be off-loaded and transferred multiple times, likely increasing the chance of an accident or spill.
- The DEIS should include a description of the nesting seabird colonies at Amakdedulia Cove, Nordyke Islands, Paint River, McNeil Cove, McNeil Islet, and McNeil Head in the vicinity where proposed and alternative lightering activities are planned (southwest and west of Augustine Island, respectively), along with potential avian impacts at these sites

(http://axiom.seabirds.net/maps/js/seabirds.php?app=north_pacific#z=10&ll=59.16355,-154.10553).

- The DEIS should include a description of seabird colony census methods used to estimate seabird population declines (e.g., 1,264 and 1,585 breeding birds in 2004 and 2006 respectively, compared to 4,172 breeding birds in 1976 and 1978). There do appear to be population declines of seabirds from the Lower Cook Inlet area (e.g., tufted puffin). However, documenting numbers of breeding birds for nocturnal burrowing species will require on-site re-census of the colonies within the affected area. The Service recommends cooperation and collaboration with the Alaska Maritime National Wildlife Refuge to conduct land-based counts using their accepted methodologies at these colony sites.
- In Section 3.23.4 Climate Change and Wildlife, it is incorrect to say waterbird and shorebird species may experience an increase in habitat due to increased thawing. The habitat will simply become available sooner; no additional habitat will be created.
- The DEIS should evaluate the impact the Amakdedori Port facility would have on bears. This facility would be located between Bruin Bay and McNeil Cove (near the McNeil River State Game Sanctuary and Refuge), where bears congregate each spring, sometimes by the hundreds, attracted by the high-quality emergent green vegetation found in the coastal meadows near the site.

Chapter 4.23: Environmental Consequences

- This DEIS focuses on the direct impacts within the footprint of the proposed mine site, with little consideration given to potential direct and indirect impacts from the gas pipeline, transportation corridor, power plant, ports, and other facilities. Wildlife resources within Cook Inlet are generally not included in the description of the environmental consequences. The scope should be broadened to adequately capture the direct and indirect impacts of the proposed project, as is required by the NEPA.
- The *Wildlife Management Plan* referenced on Page 4-23-1 has not been completed; therefore, the Service is unable to evaluate the proposed impact avoidance and mitigation measures.
- The Service was unable to evaluate the direct effects of wildlife contact with contaminants (including acid generating tailings and dissolved heavy metals), because “*analysis of risk to wildlife from pit lake water is pending*” (Page 4-23-4). The DEIS should evaluate and disclose these potential impacts.
- The mine is expected to emit air-borne pollutants including particulates and heavy metals (e.g., mercury) as a result of burning large amounts of natural gas and diesel fuel. What are the potential effects of pollutants on water and air quality? What are the associated adverse effects on wildlife and human health? The DEIS should evaluate and disclose the potential impacts from air-borne pollutants.

- The DEIS should include a discussion about the potential of new infrastructure and human waste (garbage, landfills) to attract avian predators (Powell and Backensto 2018). https://www.researchgate.net/publication/237228506_Common_ravens_Corvus_corax_nesting_on_Alaska's_North_Slope_Oil_Fields.
- The DEIS should include a discussion of any transmission lines that would be built along roadways. Electrical transmission lines are known to cause bird strikes and electrocution of raptors. Transmission lines and poles are also known to provide artificial perch sites for avian predators, which may lead to increased mortality of prey species, including birds. Facility lighting can also significantly affect avian migration behaviors, as well as inland flights of nocturnal seabirds during the breeding season. Lighting can result in disorientation or injury and death of nesting seabirds. The Service can provide specific recommendations on both the type and location of lighting to reduce these effects.
- The environmental impacts associated with constructing and operating the proposed 270-megawatt power plant should be discussed. A comparable plant, the 248-megawatt gas-fired River Road Generating Plant in Vancouver, Washington, was among the biggest greenhouse gas emitters in the Pacific Northwest, producing greater than 100,000 metric tons of carbon dioxide equivalent (CO₂e) per year from 2012 to 2016 (<https://ecology.wa.gov/DOE/files/2d/2d41cf1e-8947-4a80-9a66-e412a051e45b.pdf>). What are the anticipated impacts of the proposed power plant on wildlife? What measures would be in place to reduce and mitigate these emissions?
- These other significant sources of injury and mortality should be discussed in this chapter:
 - Increased raptor mortality associated with roadkill. Raptors often scavenge heavily on roadkill. Subsequent gutpiling reduces their ability to take off quickly when vehicles approach, increasing collisions and raptor mortality. Roadkill removal programs are recommended to ameliorate these problems; and
 - Ingestion of toxins and poisons from the project site (e.g., raptors may consume rodenticide poisoned animals around the facility if rodent control measures are implemented).
- Analyses of potential spill impacts to migratory birds, listed species, and other wildlife and their habitats outside the immediate mine site and within transportation corridors are not included in the DEIS. The DEIS should address the potential for vessel groundings and oil spills in the region given the varied and complex bathymetry of Kamishak Bay. The potential for spills and accidents that might result from lightering at two offshore locations (Figure 1-5) should also be evaluated. Kamishak Bay and the waters around Augustine are known to be frequented by both marbled and Kittlitz's murrelets and listed Northern sea otters.
- Potential disturbance of seabird colony sites is not included in the DEIS. Seabirds could be disturbed at breeding colonies by the noise generated by port construction, and by

helicopter overflights in the region. Disturbance could also impact non-colonial birds such as marbled murrelet and Kittlitz's murrelet, both of which nest inland and are relatively abundant in the Lower Cook Inlet. The most recent at-sea surveys indicate that in the Lower Cook Inlet, the more abundant marbled murrelet has an estimated population of approximately 30,000 birds, which is approximately 7 percent of Alaska's total population (Piatt et al. 2007), whereas the Kittlitz's murrelet has a minimum estimated population of approximately 3,000 birds, which could be 9 percent of the world population (Kuletz et al. 2011). Additionally, the southwestern, outer portion of Kachemak Bay is known to be a "nursery" area for newly fledged murrelet juveniles (Kuletz and Piatt 1999).

- No effort is made to quantify the number of animals of any species that might be affected by the individual project components, and/or different project alternatives. Impacts to wildlife are unlikely to be the same across the different alternatives; simply saying "*same as alternative 1*" is not sufficient.
- Chapter 4.23.6 Cumulative Effects is inadequate. The document talks about Reasonable and Foreseeable Alternatives identified in Section 4.1 being carried forward for analysis; however, the analysis presented is one paragraph that provides general statements of effects. More details should be included based on impacts documented at other development sites (e.g., the Prudhoe Bay oil field, Red Dog Mine).

Fish Values

Chapter 3.24: Affected Environment

- The chapter does not clearly describe how mainstem reaches are defined. Points on maps provided in the text are labeled A, B, C, D, etc. Does "A" begin at the point "A" on the map and extend upstream to point "B"? If so, to where does the uppermost designation, that is the upstream terminus for Reach "D", extend on the stream and map in the figure? The Service suggests clarifying the definition of mainstem reaches throughout this chapter.
- According to Table 3.24-1, beaver ponds are referenced as occurring within the upper reaches of area rivers and are also included in the definition of "other off-channel" habitats. The text indicates off-channel habitats include "*side channels, percolation channels, alcoves, isolated pools, riverine wetlands, and beaver ponds...*" Please clarify the distinction between beaver ponds occurring in upper reaches versus beaver ponds occurring in off-channel habitats.
- Descriptions of the upper river mainstem (in areas above the mine site) suggest a greater quantity of sand and silt substrate particles. Are these substrates from beaver ponds in the upper reaches, rather than from riffle, run, glide, and pool habitats?
- There are several instances of information in tables and figures without supporting information in the text. Examples include:

- Table 3.24-2 titled “*Estimated Mileage of Habitat for Pacific Salmon and Rainbow Trout in Tributaries Draining the Mining Site*” would be strengthened if we knew what percent of total stream length each of the values represented. That is, of the total area, what portion of it “represents” spawning or rearing habitat? The text makes frequent references to this table in support of “distribution” of a given species within a river.
- Table 3.24-2 suggests that habitat of a given quantity (square miles) for a particular fish species is present but does not provide a spatial relationship or scale to suggest distribution of the habitat or the fish within a given stream. Distribution is relative to scale and needs to be better quantified by watershed, stream, reach, etc. For example, Pink Salmon are widely distributed in Alaska, but they do not occur within every river or waterbody that supports Pacific Salmon. Similarly, a tributary river may be 75 miles in length yet has only 5 miles of suitable spawning or rearing habitat.
- Table 3.24-2 does not have spatial relational information. It lists only a total number of miles of a given habitat type by fish species, by sub-basin.
- Figure 3.24-3 only reports Reach A-E and does not indicate habitat use type (spawning or rearing). Figure 3.24-3 is titled “*Fish Distribution and Relative Abundance*.” Please double-check figure and table numbers in the text to the corresponding figure and table number for consistency of use and meaning.
- Figure 3.24-5 “*Transportation and Natural Gas Pipeline Corridors*” does not define the analyses area of impacts from road and pipeline construction and operations. No defined area or boundary is outlined in the referenced figure.
- “*Chum spawning habitat is limited to the lower 20 miles of the river, downstream of the seasonally dry channel (Table 3.24-2).*” There is no spatial reference within the table to indicate if these miles occur within the upper, middle, or lower river segments. Without citations to lend support to ground verified occurrences of spawning, this assertion is misleading.
- Table 3.24-3 titled “*Estimated Mileage of Habitat for Pacific Salmon and Rainbow Trout within Streams Crossed by the Transportation and Natural Gas Pipeline Corridor*” does not include any information on Rainbow Trout. Please include Rainbow Trout information or remove the species from the title.
- Figure 3.24-3 “*South Fork Koktuli Fish Distribution and Relative Abundance*” does not show stream crossings for the South Access Road, as referenced in the text on Page 3.24-13 under South Access Road. Similarly, the South Access Road as referenced in the text does not appear labeled as such within Figure 3.24-5 “*Transportation Corridor Fish Stream Crossings*.”
- As referenced within the text, there are no unique streams identified within Table 3.24-3.
- Table 3.24-5 as referenced on Page 3.24-14 does not provide stream miles for life stage of fish species found within the North Fork Koktuli as stated in the text.
- There are insufficient literature citations to support assertions made within Chapter 3.24 Fish Values. For example, Page 3.24-5 Paragraph 4, Lines 6-8 states, “*The low-gradient*

and gravel-dominated substrate of the mainstem South Fork Koktuli below the mine site provides spawning and rearing habitat for resident and anadromous salmonids.” What literature or study supports this claim?

- In-text citations are not consistent with citations within the works cited list. As examples:
 - In text citation, R2 et al. (2011) does not appear in the works cited list. However, R2 et al. 2011a and R2 et al. 2011b may be found.
 - The full citation for NMFS (1977), as first appears in Section 3.24 on Page 3.24-13, does not appear in the provided works cited list.
 - ADFG 2018. Chinook Salmon Research Initiative citation within the works cited list contains a link to a webpage that is only a summary of the project and not specific findings to support the assertion within the text.
 - ADFG 2018i does not appear in the Works Cited list; however, ADFG 2018h and ADFG 2018j are present.
 - SEBD (2018) does not appear within the works cited list.
- There does not appear to be a discussion of geospatial scale most relevant to fish populations. The USACE does indicate within this latest draft the proportion of the affected watershed(s) (e.g., the South Fork Koktuli River) as related to the total watershed area that contributes to Bristol Bay. However, there is no discussion of this in either Affected Environment or Environmental Consequences. Please see Service comment submitted by letter dated July 13, 2018: *“Include discussion and later analyses of identified resources at scales relevant to fish populations, impacted sub-watersheds (i.e., North Fork Koktuli, South Fork Koktuli, and Upper Talarik Creek) and within the context of the entire Bristol Bay watershed.”*
- Sections within the Affected Environment chapter remain missing, which makes it difficult review to review the Environmental Consequences. For example, fish distribution data is pending review of 2018 field data, and will be included in the DEIS.
- Much of the chapter uses old data and sampling analyses. Environmental Baseline Data (2008) used for analysis at the Mine Site and the North Fork Koktuli River is outdated. Given a changing climate and warming temperatures occurring at higher latitudes, organism response appears to be causing some flowers to bloom earlier than usual and seems to be altering some wildlife migration and hibernation patterns. Changes in fish distribution may also occur as individuals and populations seek out thermal conditions most suitable for completion of their life stages. Understanding how fish species are responding to these changes is critical for analyses of effects to populations occurring in the affected project area. Examples include:
 - Periphyton samples collection occurred in 2005 and 2007, more than 10 years ago. Current information is needed for further evaluation.
 - Beach seining results were published in 2005; these results are more than 13 years old.

- We recommend more clearly defining how available habitat is quantified for fish. The DEIS refers to miles of spawning or rearing habitat; however it is unclear how habitat miles were determined or calculated. Text frequently refers to the Anadromous Waters Catalog (AWC) in reference to available habitat; however, using miles of habitat reported in the AWC as a metric of total suitable habitat will likely result in inaccurate estimates of available habitat for critical stages of salmon life history. The AWC calculates miles of habitat by identifying the upper most point within a stream segment based on the extent of fish surveys or known anadromous fish use in a particular waterbody, rather than the actual limit of anadromous fish occurrence or habitat use. The resultant “miles of habitat” is not reflective of the extent of suitable spawning or rearing habitat that exists throughout the waterbody below the uppermost point documented in the AWC. Discrete habitat units used by fish for completion of their life history are typically distributed in a fragmented and patchy manner within a river system. Furthermore, reporting “Stream miles” is an inadequate measure to quantify fish habitat in a biological meaningful manner. We recommend that fish habitat be quantified as a measure of area (e.g., meters square, square miles). For an example elsewhere in Alaska, the 17-mile stretch of the Kenai River between Kenai Lake and Skilak Lake has more substrate area, and thus more available spawning and rearing habitat, than the lowest 17 miles of Eagle River. To accurately assess the habitat available in the project area and then assess the potential impacts of the project, the analyses should be based on a more robust unit of measure of habitat than simply miles of river.
- We request adding a discussion of baseline surface flow pathways. Please provide citations for the hydrographic components when referencing specific data in the context of temperature and water chemistry effects. Water quality parameters discussed would be easier to understand within table format in addition to where it is written within the text.
- Chapter sections are missing, precluding our ability to evaluate all of the information. Examples include:
 - Page 3.24-22 and Page 3.24-28: Kokhanok East Ferry Terminal
 - Page 3.24-30 Transportation Corridor and Natural Gas Pipeline Corridor
 - Page 3.24-36 Table 3.24-8 Fish Stream Summary Table
- The DEIS should include a discussion on the physical properties of Iliamna Lake, including vertical profile analysis of temperature and dissolved oxygen by season, and lake turnover rates (timeline) and stratification. These are important factors affecting diel vertical migrations by juvenile salmonids (e.g., Sockeye Salmon) rearing in Iliamna Lake.
- The DEIS should include a table that summarizes information for all anadromous streams crossed or affected by the proposed action for each alternative. The current format does not allow review of at-a-glance information. Rather, the reader must skip through to various sections and subsections of the chapter to gather this information.

- The DEIS should describe how fish values (e.g., spawning, rearing) are assigned to a proposed stream crossing. Many figures indicate fish information comes from the AWC, but it is unclear how fish values are assigned at a particular proposed road crossing. Please provide clarification.
- The DEIS should describe how the USACE has addressed the following comments, submitted in our letter dated July 13, 2018:
 - *“Include a separate discussion of baseline functions and values of wetlands that may be impacted by the project. For example, quantified baseline wetland habitat functions and values relevant to fish habitat (e.g., rearing, overwintering, refugia) should be presented to streamline future analysis of losses from project impacts.”*
 - *“Include a discussion of water quality (including temperature and chemistry) that can be analyzed with respect to mine discharge receiving waters. Include a discussion of watershed hydrography, including the seasonal hydrograph, for later use to determine potential project impacts to water quantity and availability for fishery resources. Include a discussion of surface flow pathways.”*
 - Please analyze *“relative contributions of marine-derived nutrient input and transport from anadromous fish carcasses brought into the freshwater environment from the marine environment; this should include timing, extent, distribution, delivery, and location.”*

Chapter 4.24: Environmental Consequences

- Within the document, stream miles are reported as “spawning” or “rearing” values based on the AWC observations of spawning or rearing fish. These stream miles are then designated as “number of miles” of spawning or rearing habitat. However, using a single linear value (i.e., stream miles) does not take into account the relative value or importance of unique areas of the affected streams that support spawning or rearing. Spawning or rearing activities may be limited to portions of a stream and typically do not occur throughout the stream’s longitudinal distance. It is well documented that fish will occupy and use areas of a stream disproportionately for rearing and spawning (Tilman 1982; Frissell et al. 1986; Dunning et al. 1992; Foley 2018). A more useful metric of spawning or rearing habitat is a unit of measure associated with area (e.g., average stream reach width x length of stream reach), and not a linear distance (see previous comment on this subject). It is worth discussing this point within the context of describing habitat types. We recommend quantifying using a measure of area, not simplifying as “stream miles”.
- The DEIS should include a discussion on the productivity of Tributary 1.19 contributing to aquatic and terrestrial invertebrate food inputs to fishes downstream. Aquatic and terrestrial food inputs to the system should be discussed within this chapter in terms of the annual food resource budget available to fish. Fish presence and density may be directly related to food sources within a stream network, and a discussion of

environmental consequences is not complete without a discussion of annual food inputs within a system and the affected area.

- The document includes use of vague language (e.g., [Best Management Practices] BMPs *may* be considered...) when discussing BMPs in the context of describing “temporary” or “minimal” effects. Including a discussion on BMPs or including a complete list of BMPs which may be considered is necessary to allow for an assessment of potential environmental consequences.
- Greater detail is needed to quantify the effects of displacement of fish captured out of the mine site and into relocation areas. Resident non-anadromous species displaced from the project area will have an effect upon fish resources in locations up- and downstream of the release site, where they may displace (through competition or predation) anadromous fish.
- Tracking between Chapter 3.24 and 4.24 is difficult due to inconsistencies with headings of major and minor chapter section and sub-sections. We suggest revising chapter formatting to ensure sections in each chapter (Chapter 3, Affected Environment and Chapter 4, Environmental Consequences) match. For example, 4.24.2.3 Streamflow is difficult to follow because of organizational structure.
- When applicable, please include references to other chapters as needed. For example, within Chapter 4.24.2.2 Fish Displacement, Injury, and Mortality, the Transportation Corridor section discusses bridges and culverts, but does not refer to the loss of habitat due to potential sedimentation associated with these activities, as discussed in Chapter 4.24.6 Cumulative Effects. Reference to the impacts of sedimentation in this section would help alleviate reader confusion. See earlier comment on difficulty following chapter sections and subsections. As an example, reference the Surface and Groundwater section within the Mine Site subsection of 4.24.2.3 Stream Flow.
- The document contains vague or undefined language, and does not always quantify impacts resulting from the action within the Environmental Consequences chapter. For example, Page 4.24-3 Ferry Terminal/Iliamna Lake Pipeline does not quantify the area of substrate, or types of “impacts” that may be permanently or temporarily caused by horizontal directional drilling. However, the document does detail specific impacts as part of Fish Displacement, Injury, and Mortality that may occur as part of the Amakdedori Port, Page 4-24-6. Impacts are often described as both short- and long-term, without a clear definition of the temporal scales associated with short- and long-term. Examples include:
 - Consequences are not adequately quantified, and vague language descriptors are used to characterize conditions (e.g., Page 4.24-7 Paragraph 4, sentence 1 “in general, a larger percentage...”).
 - Quantify the area that is decreased in the downstream direction (as in spawning habitat decreased because of decreased flows). As written it is vague and lacking the necessary detail, for example: “*The percentage reductions in habitat would*

generally decrease in a downstream direction until reaching the confluence of the NFK and SFK (with a few exceptions)."

- Specify the directionality of change, e.g., from Page 4.24-9 Paragraph 2 Sentence 4 "*Habitat changes are less than 1%...*" It is unclear if this change is an increase or decrease of habitat.
- The source of the increase in habitat identified within Table 4.24-3, "*Average precipitation year, spawning habitat for all streams and species in the mine site area pre-mine, during operations, and post closure,*" is unclear. This information is not included in the discussion, and is important information for understanding the full scope of Environmental Consequences. Please provide discussion on the additional available habitat post closure.
- The DEIS should provide an analysis of how flow is expected to change with future climate change projections for wet and dry rainfall years. There is currently no discussion of the future impacts of the project under different environmental adaption scenarios, and future climate conditions are not discussed within subsection 4.24.2.7 Water Temperature.
- Juvenile habitat subsection within Section 4.24.2.3 Stream Flow indicates, "*Sockeye juvenile habitat increases would generally be associated with the SFK-C reach, where habitat would be increased by 0.76 acres (44 percent) during mining operations...*" Please provide citations for these data or further clarification in the text. An increase of 0.76 acre resulting in a 44 percent increase in Sockeye Salmon juvenile habitat suggests 1.73 acres of juvenile habitat within the South Fork Koktuli-C reach. The table presented (Table 4.24-4) in the text does not include the quantity of juvenile habitat per stream, but rather presents data in aggregate for all streams. As such, the table indicates a value of 41.85 acres of available habitat for juvenile Sockeye Salmon during operations. Please assign units of measure associated with the values in Table 4.24-4 (and others).
- The DEIS should discuss and specify the types and magnitude of impacts to fishery resources from increased sediment input from the mine site (and its associated facilities). The consequences of increased sediment loads and inputs are well documented in the literature. Please discuss the potential impacts in the context of all species and life stages occurring in the project area. There is discussion on specific impacts within the Transportation Corridor subsection that could be expanded to include all subsections within Section 4.24.2.5 Stream Sedimentation and Turbidity.
- The DEIS should analyze and discuss the effects of increased water temperatures on growth and development of juvenile salmon eggs. Increased water temperatures correlates with an increase of development rates and earlier emergence (degree days) of juveniles. There is no discussion on the effects of early emergence and population level effects.

- Please identify how the USACE has addressed the following comments, submitted in our letter dated August 31, 2018:
 - *“Please present environmental consequences to individual fish species. For example, the Bristol Bay region provides 51 percent of the commercial catch of the world’s Sockeye Salmon. We recommend a detailed analysis of the potential short- and long-term environmental consequences of the project to this internationally important resource. The chapter should analyze the potential for environmental consequences to destabilize the existing Bristol Bay salmon portfolio represented by numerous individual stocks. It should identify the potential for additional fishing closures due to losses to fisheries and fish habitat. Different species are targeted in commercial, sport, and subsistence fisheries supported by the region. We recommend analyzing the impacts to individual species, distribution, abundance, and availability to the different fishery user groups that rely on these resources.”*
 - *“The geographic scope of the analyses for project impacts to fishery and fish habitat resources should include the immediate project-site (i.e., north and south fork Koktuli River and upper Talarik Creek), local watersheds (i.e., Newhalen River, Gibraltar Lake, Lake Iliamna), and regional scale (i.e., Bristol Bay, Cook Inlet), and should include analysis related to the global importance of the Bristol Bay fishery.”*
 - *“Certain metals that are essential to fish health at low concentrations may become toxic with relatively small increases in concentration; such metals include copper (Cu), zinc (Zn), selenium (Se), and molybdenum (Mo). Copper is specifically toxic to anadromous salmon. These same metals have a narrow window of non-toxicity before becoming toxic. Non-essential metals are more likely to be toxic even at low concentrations (e.g., gold (Au), lead (Pb), arsenic (As) and mercury (Hg)). Please analyze the environmental consequences from point and non-point process discharges, for different species and at different scales.”*

Threatened and Endangered Species

Chapter 3.25: Affected Environment

Thank you for incorporating most of the Service recommendations for pre-draft Chapter 3.25 Threatened and Endangered Species, provided by letter dated July 13, 2018, into the DEIS. The Service offers the following additional recommendations for this chapter:

- Currently, this chapter uses a mixture of Federal Register notices (i.e., humpback whale, fin whale), and Service and NMFS documents cited as “USFWS (Year)” or “NMFS (Year)” (i.e., Cook Inlet beluga, Steller sea lion, Northern sea otter, Steller’s eider) to discuss listing of species under the Endangered Species Act. Some of the references seem incongruous. For example, discussion of the Northern sea otter uses a NMFS reference (NMFS 2005) for a Service managed species, and discussion of the Steller’s eider uses a 2011 document (USFWS 2011) to reference a species listed by the Service in

1997. Please review the literature cited in this chapter to ensure reference of original source material whenever possible rather than secondary references, such as reports or biological opinions.

- We recommend citing the Service or the NMFS listing of species and critical habitat using the associated Federal Register notice published in support of listing. As an example of citing the Federal Register notice to discuss listed species, “The Service listed the Southwest Alaska Distinct Population Segment of the Northern sea otter as threatened under the Endangered Species Act on August 9, 2005 (70 FR 46366), with critical habitat designated on October 8, 2009 (74 FR 51988).”

Chapter 4.25: Environmental Consequences

Thank you for incorporating into the DEIS most of the Service recommendations for pre-draft Chapter 4.25 Threatened and Endangered Species, provided by letter dated August 31, 2018. The Service offers the following additional recommendations for this chapter:

- Rework and expand the action area, as described in the second paragraph, fourth and fifth sentences, to include discussion of the entire project. As currently written, these sentences state: *“The action area encompasses all marine components (all proposed port locations, lightering locations, and natural gas pipeline routes), plus a surrounding 5-mile buffer in the marine environment. No terrestrial components of the project (e.g., the mine site, ferry terminals, terrestrial portion of the transportation and natural gas pipeline corridors, and compressor station on the Kenai Peninsula) are included in the action area, because TES do not occur in the area; only marine components of the project are included in the action area.”* We recommend the action area in each of the sections of Chapter 4 be described the same way, and include the four main project components, as described in Chapter 2, Alternatives: the Mine Site, the Transportation Corridor, the Amakdedori Port and Lightering Locations, and the Natural Gas Pipeline. Standardizing the action area, and evaluating each of the four main project components for potential impacts to resources of concern, would ensure impacts of the proposed project are fully analyzed and disclosed in the final Environmental Impact Statement (EIS) and documented in the record of decision.
- Include analysis of potential water quality impacts at the mine site, along the transportation corridor, and at the Amakdedori Port for discussion in this section, with a focus on impacts to listed species and protected marine mammals. This should include the potential for water quality alteration or degradation to originate at the mine site, then move downstream to Lake Iliamna and Cook Inlet, and impact or affect listed species and protected marine mammals. Please note this recommended water quality analysis differs from analysis referenced in Chapter 4.27 Spill Risk.
- Some of the language in this section appears to minimize the environmental consequences the project may have on listed species. Chapter 3.25 Threatened and Endangered Species notes that 2018 environmental field survey results will be incorporated into the DEIS, when available. Until a full analysis of the project’s impacts

and effects on listed species is complete and included in the environmental consequences chapter, reference to effects as minimal, localized, limited, negligible, etc. are premature. The Service recommends review of the entire section, and removal of minimizing language.

- Include a rigorous analysis of the impacts and effects of the proposed port facility, the proposed pipeline, the proposed lightering of concentrate using barges to transport concentrate to bulk carriers moored in deeper water, including the risks of fuel and hazardous materials spills, on sea otters and sea otter critical habitat through all phases of the project. For example, currently no analysis of fuel or hazardous materials spills is included in this section. In addition, there is no meaningful analysis or quantification of anticipated impacts to sea otters or sea otter critical habitat for the construction and operation of the two port facilities under consideration. Additional details on the anticipated impacts of each alternative during construction and operation of the proposed port facility, the proposed pipeline, the proposed lightering of concentrate using barges to transport concentrate to bulk carriers moored in deeper water, is essential to compare the effects and impacts of each alternative. Simply saying, *“All impacts are anticipated to be the same for the two alternatives...”* is not sufficient.
- Discussion of the environmental consequences on Northern sea otter critical habitat, as found in Section 4.25.2.5 Northern Sea Otter, Critical Habitat, is lacking specificity. This section states, *“all sea otter critical habitat primary constituent elements...would be directly affected,”* but does not detail how. This section does not fully analyze the proposed project’s impacts and effects on each primary constituent element, and does not analyze the impacts and effects of fuel or hazardous materials spills on sea otter critical habitat.
- The Steller’s eider section is a good example of analyzing and disclosing potential environmental consequences of the project on listed species. The information and discussion in this section is thorough, based upon the biology of the species, and does not use minimizing or qualifying language. Similar rigorous analysis and discussion should be conducted for all listed species in this chapter.
- The Service recommends the following sentence in Section 4.25.4.1 Summary of Key Impacts be removed or rephrased: *“For all TES, it is not possible to quantify the exact number of individuals that may be impacted by vessel collisions or strikes; therefore, the number is considered less than significant.”* Please note being unable to quantify an impact in terms of numbers of individuals is not the same as the impact being *“less than significant”*. It would be more correct to state the impact of vessel collisions or strikes is *“unquantifiable”* or *“unknown.”*
- The Service has no comment at this time on Figure 4.25-1: Federally Listed Marine Mammal Critical Habitat and Location within the Action Area, or Figure 4.25-2: Steller’s Eider Molting and Wintering Locations within the Action Area.

Appendix K 3.25: Threatened and Endangered Species

The Service has no comment at this time on Appendix K 3.25 Threatened and Endangered Species. Please continue to coordinate any required Marine Mammal Protection Act Incidental Harassment Authorization or Incidental Take Regulations with the Service's Marine Mammals Management program.

Chapter 5.0 Mitigation

The Service provides the following specific recommendations for Chapter 5.0 Mitigation:

Chapter 5.1 Introduction

- The Service recommends this section incorporate information found in Section 5.1.3. Because this Federal document analyzes the environmental impacts of a Federal action, it is important to lay the foundation of how the NEPA and its guiding regulations drive the analysis of mitigation as well as environmental impacts.
- The Service recommends adding the following text to the introduction section: *“The primary purpose of an environmental impact statement is to insure the goals defined in the National Environmental Policy Act are incorporated in the actions of the federal government, to provide full and fair discussion of significant environmental impacts, and to inform decision makers and the public of the reasonable alternatives, which would avoid or minimize adverse impacts and enhance the quality of the human environment (40 CFR 1502.01).”*

Chapter 5.1.2 Definitions and Processes

- The Service recommends the definition of the term “mitigation” be moved from Section 5.1.3 to this section on definitions. This would help clarify that this DEIS will be using the terms and processes defined in the NEPA Regulations (40 CFR 1508.20). “Mitigation” includes the following:
 - Avoiding the impact altogether by not taking a certain action or parts of an action;
 - Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
 - Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
 - Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
 - Compensating for the impact by replacing or providing substitute resources or environments.

Table 5-1. Common Mitigation Terms

- The Service recommends Table 5.1 either describe the common mitigation terms as listed above and in 40 CFR 1508.20, or the title of the Table should be changed to “Terms Used in the EIS” as is currently labeled in the first column.
- The Service recommends revising the language used to describe Agency Considered Mitigation. Currently the focus of the definition is related to permit conditions. Since this is an environmental impact analysis required under the NEPA, and not a permitting document, we recommend that the text disclose the responsibility of Federal agencies to consider and include appropriate mitigation measures not already included in the proposed action or alternatives to prevent or eliminate damage to the “human environment” (defined below; 40 CFR 1508.20, 40 CFR 1502.14, and CEQ 2011).
- The Service recommends using the NEPA Regulations (40 CFR 1508.14) to define “human environment,” which comprehensively includes, “*the natural and physical environment and the relationship of people with that environment.*” It is particularly important to define “human environment” for this project due the relationship of Native Alaskans with subsistence, cultural, and socio-economic resources in this area.

Chapter 5.2.1 Avoidance and Minimization Measures under the NEPA

- The Service suggests moving the discussion about the Department of Natural Resources’ Permitting for Large Mine Projects in Alaska from under the NEPA title. Although the information presented is good, it describes a State process, not one required by the NEPA. Another solution would be to remove the term “NEPA” from the heading of Section 5.2.1.

Table 5-2. Applicant’s Proposed Mitigation

- The Service recommends relocating and providing a reference to the information in Table 5-2. Given that all of the actions listed in Table 5-2 are design features of the proposed action, and many are standard operating procedures that will be analyzed under the proposed alternative, this could be moved with just a reference to where it can be found, to reduce redundancy. Mitigation actions listed in Table 5.2 that are beyond those required by law could be added to the additional analysis of mitigation measures that were not included in the proposed action (as suggested below in our comments on Chapter 5.2.3 Additional Mitigation). Footnotes could be used to indicate it is mitigation included in the proposed action.

Chapter 5.2.3 Additional Mitigation

- The Service recommends the USACE collaborate with the cooperating agencies to develop appropriate mitigation measures to avoid and minimize impacts to the human environment. The Service is available to provide this technical assistance.
- We recommend this section include all reasonable mitigation measures. According to the Council for Environmental Quality (CEQ), *“All relevant, reasonable mitigation measures that could improve the project are to be identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies, and thus would not be committed as part of the RODs of these agencies (1981).”* The CEQ (1981) further explains, *“This will serve to alert agencies or officials who can implement these extra measures, and will encourage them to do so...”* In conclusion, the CEQ (1981) points out, this is *“because the EIS is the most comprehensive environmental document, it is an ideal vehicle in which to lay out not only the full range of environmental impacts but also the full spectrum of appropriate mitigation.”*

Table 5-3. Mitigation and Monitoring Assessed as Likely to be Implemented

- The Service recommends replacing Table 5-3 with additional mitigation measures that have not already been included in the proposed action or alternatives. This will allow the environmental impacts of the proposed action and the alternatives to be analyzed in comparative form, to more sharply define the issues and provide a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14).
- We recommend removal of the term *“Likely to be Implemented”* from the Table 5-3 title and making the likelihood that mitigation and monitoring will be implemented a column instead, so the full spectrum of appropriate mitigation may be considered in the EIS (CEQ 1981).

Appendix E – Laws, Permits, Approvals, and Consultations Required

The Service recommends this appendix address laws and regulations related to the control and spread of noxious weeds, including the following:

- Executive Order 11987 (1977): Requires Federal agencies, to the extent permitted by law, to:
 - Restrict the introduction of exotic species into the natural ecosystems on lands and waters owned or leased by the U.S.;
 - Encourage States, local governments, and private citizens to prevent the introduction of exotic species into natural ecosystems of the U.S.; and
 - Restrict the importation and introduction of exotic species into any natural U.S. ecosystems as a result of activities they undertake, fund, or authorize; and restrict the use of Federal funds, programs, or authorities to export native species for introduction into ecosystems outside the U.S., where they do not occur naturally.

- Executive Order 13112 (1999): Intended to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.
- National Invasive Species Act (NISA): Intended to prevent invasive species from entering waters of the U.S. (marine and freshwater) through ballast water carried by ships. The NISA reauthorized and amended a previous measure, the Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990.

We recommend adding clarification on the depth of the Service involvement under the Clean Water Act. Also, consider adding a summary of this information in Table E-1 as provided below:

- Clean Water Act (CWA, 33 U.S.C 1344): Section 1344(m) authorizes fish and wildlife comments from the Department of Interior to be made through the U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service has extensive involvement with the Environmental Protection Agency under provisions of the CWA, section 404, which deals with discharge of dredge and fill. Section 404 of the CWA requires a permit to be obtained before dredged or fill material may be discharged into waters of the U.S. The basic premise is the U.S. Fish and Wildlife Service will provide recommendations on potential methods to avoid and minimize impacts to fish and wildlife, as well as provide recommendations for compensation that will be necessary for any remaining unavoidable impacts.

We recommend reflecting the dual involvement of both the Service and the NMFS under the Fish and Wildlife Coordination Act (FWCA). The FWCA requires consultation with the Service, the State wildlife resources agency, and, if applicable, the NMFS. State involvement may result in a separate report.

The Service recommends clarifying the summary statement in Table E-1, Bald and Golden Eagle Protection Act. The Service works with permitting agencies and project proponents to develop mitigation measures to avoid and reduce impacts to eagles, and assists in developing methods for compensatory mitigation for impacts that are unavoidable. The Service may provide limited take permits of eagles or nests where avoidance and minimization measures have been incorporated into project design.

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