FA3 – Department of the Interior

United States Department of the Interior

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November 4, 2019

Kimberly D. Bose
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Subject: COMMENTS on Draft Environmental Impact Statement for the proposed Alaska LNG Project, FERC No: CP17-178-000

Dear Secretary Bose:

The U.S. Department of the Interior (DOI) has reviewed the Federal Energy Regulatory Commission's (FERC) Draft Environmental Impact Statement (EIS) released on June 28, 2019, for the Alaska Liquefied Natural Gas (LNG) Project (Project) proposed by the Alaska Gasline Development Corporation (AGDC). The DOI appreciates the opportunity to provide comments and recommendations, which are submitted in accordance with the National Environmental Policy Act (83 Stat. 852; 42 U.S.C. 4321 et seq.; NEPA), National Park Service Organic Act (16 U.S.C. § 1 et seq.), Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.; ESA), Bald and Golden Eagle Protection Act (54 Stat. 250, as amended, 16 U.S.C. 668a-d), Migratory Bird Treaty Act (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.), Marine Mammal Protection Act (16 U.S.C. 1361-1407; MMPA), Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), Federal Land Policy and Management Act (43 U.S.C. § 1732; FLPMA), Mineral Leasing Act (30 U.S.C. § 185; MLA), Alaska National Interest Lands Conservation Act (94 Stat. 2371; ANILCA), National Wildlife Refuge System Administration Act (68 Stat. 718, as amended; 16 U.S.C. 668 et seq.), Clean Air Act (42 U.S.C. §7401 et seq.), Wilderness Act (16 U.S.C. §1131), National Historic Preservation Act (16 U.S.C. § 470 to 470w-6; NHPA), and National Invasive Species Act (16 U.S.C. 4701 et seq.).

The FERC is the lead federal agency developing an EIS to assess the impacts of constructing and operating the proposed Alaska LNG project, FERC docket CP17-178. There are ten cooperating agencies with jurisdiction by law or special expertise with respect to environmental resources and impacts associated with the Project. These agencies, which include the DOI's Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (FWS), and National Park Service (NPS), have provided comments, suggestions, and recommendations throughout the development of the Draft EIS.

From 2014 through 2018, the FWS submitted approximately 30 documents to the FERC ranging from formal letters to comment matrices and emails containing comments. They provided scoping comments in mid-2014, followed by a number of comments on draft resource reports from late 2014 through 2016. The FWS also provided comments on individual chapters of the Draft EIS during its development in 2018. In addition, they participated in several cooperating agency meetings with the FERC and individual planning meetings with the AGDC to discuss mitigation measures for FWS trust resources.

The NPS has been a cooperating agency on this EIS for the Alaska LNG project since April 14, 2017, and the FERC has been very responsive to many NPS comments on previous drafts, which were largely incorporated in the Draft EIS. In the Draft EIS, the FERC proposed the Denali Alternative as a minor route modification for the natural gas pipeline to go through Denali National Park and Preserve (DNPP).

The AGDC submitted an application to the BLM for a right-of-way (ROW) across federal lands for the Project's main natural gas pipeline. The EIS is a necessary component of the ROW decision process, and the BLM has participated as a cooperating agency in all phases to date. Their enclosed comments are provided to ensure that the Final EIS will allow the BLM to issue a decision in compliance with NEPA.

Background

The AGDC is requesting authorization from the FERC to construct and operate new gas treatment facilities on the North Slope and an 806.6-mile-long, 42-inch-diameter natural gas pipeline from Prudhoe Bay to a liquefaction facility at Nikiski, Alaska. From Nikiski, tanker ships would transport the natural gas through Cook Inlet for export. Additional infrastructure would include a 62.5 mile, 32-inch-diameter natural gas pipeline from Point Thomson to Prudhoe Bay and eight compressor/heater stations between Prudhoe Bay and Nikiski.

Project construction would impact about 35,548 acres of land, with approximately 8,504 acres retained for project operation. About 16,479 acres would be permanently affected beyond the 30-year life of the Project. Additionally, the Project would result in significant long-term to permanent impacts on thaw sensitive permafrost (6,377 acres), thaw stable permafrost (3,415 acres), and forest (12,474 acres) as well as convert about 4,162 acres of wetland to upland. The pipeline would also cross six major rivers (i.e., the Middle Fork Koyukuk, Yukon, Tanana, Nenana, Chulitna, and Deshka Rivers).

In the Draft EIS, the Denali Alternative, the minor route modification through DNPP was analyzed. On August 16, 2019, during the public review period for the Draft EIS, the AGDC informed the FERC that they were adopting the Denali Alternative route into the Mainline route, and the FERC has indicated that this change requested by the applicant would become effective immediately.

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General Comments

Below, the DOI offers comments on the Draft EIS, emphasizing issues related to fish and wildlife resources, cultural resources, and conservation units managed by the FWS, the NPS, and the BLM. Given each bureaus' unique authorities and trust responsibilities, by necessity these comments frequently highlight specific issues that are of greatest importance to each bureau. Where applicable, we also highlight issues shared by two or more bureaus.

Fish and Wildlife Resources

The three DOI bureaus serving as cooperating agencies for the proposed Project manage fish and wildlife resources on their respective conservation units. Additionally, the FWS has specific species management responsibilities, described below. FA3-1

The FWS's trust resources are natural resources they are entrusted to protect for the benefit of the American people. Within the proposed Project area, these include species listed as threatened or endangered under the ESA and their designated critical habitat, migratory birds (including bald and golden eagles), certain marine mammals protected under the MMPA, inter-jurisdictional fish, wetland habitats used by these species, and lands managed by the FWS (e.g., national wildlife refuges).

Threatened and Endangered Species: The FWS received a Biological Assessment (BA) and request to initiate formal consultation pursuant to section 7(a)(2) of the ESA on July 11, 2019. After reviewing the BA (also provided in the Draft EIS Appendix O), the FWS requested additional information regarding the project description on July 31, 2019. Once this information is received and the initiation package is deemed complete, formal ESA consultation can be initiated.

Caribou: The DOI recognizes the State of Alaska is the primary manager of caribou in the state and that caribou are not a federal trust resource. However, the Central Arctic caribou herd's annual range and seasonal migration routes include refuge lands, so the FWS offers some recommendations to help minimize potential impacts related to National Wildlife Refuge management purposes and bureau responsibilities under ANILCA.

Cultural Resources

The NPS, the FWS, and the BLM also manage historic properties and cultural resources on their respective conservation units. Section 106 of the NHPA and the implementing regulations in 36 CFR 800 require that adverse effects on historic properties are resolved, or a plan to resolve them is codified in an agreement document, prior to the issuance of any permit, authorization, or expenditure of federal funds for a project. Given the scale of this Project and the present stage of development of many of the Project plans, not all potential adverse effects on historic properties can be identified, much less resolved. Accordingly, the BLM and the NPS recommend development of an agreement document, pursuant to 36 CFR 800.4(c) or 36 CFR 800.14(b). FA3-2

FA3-1 AGDC provided the additional information requested by the USFWS in a letter sent to the USFWS on January 2, 2020.

FA3-2 We will work with the consulting parties to develop an agreement document.

The guidance provided by the Advisory Council on Historic Preservation (ACHP) on how to implement agreement documents provides an excellent framework for the FERC, the State Historic Preservation Officer (SHPO), the BLM, the NPS, and other participating agencies to develop an agreement and plan to resolve the anticipated adverse effects associated with the construction and operation of the Project. The BLM-preferred practice is to conduct consultation and initiate a NHPA agreement document in parallel with development of a NEPA document. The resulting record of decision (ROD) then incorporates decisions on the mitigation of adverse effects to historic properties. The BLM does not authorize a grant of right-of-way until the expected adverse effects have been resolved or, in the case of a phased identification and evaluation as allowed under 36 CFR 800.4(b)(2), an agreement document has been executed. The presence and general nature of anticipated adverse effects should be disclosed in the Final EIS and accompanied by a description of how those effects will be mitigated in the ROD. In this case, mitigation would occur through the development and execution of a phased Section 106 process that is developed through consultation and codified in an agreement document between the FERC, the SHPO, the BLM, the NPS, and other signatories. The FERC, or the AGDC by delegation, should provide the BLM and the NPS with a draft agreement document 30 days prior to ROD signing to aid in assessing proposed mitigation measures. FA3-3

DOI Managed Lands

Air Quality: The NPS and the FWS each have conservation units that may be affected by facilities associated with the proposed Project, including two that are designated as Class I areas, which are provided special air quality and visibility protection. The FERC has accepted many of the DOI's editorial recommendations for the air quality sections of the document provided during previous reviews of the preliminary administrative drafts of the Draft EIS. We appreciate the FERC's efforts to address the DOI's recommendations, as we believe this strengthens the air quality analysis sections of the document with respect to potential air impacts to conservation units managed by DOI bureaus in Alaska. Additionally, we commend the FERC's outreach to cooperating agencies to ensure that both the air analysis and mitigation recommendations address any outstanding concerns. FA3-4

Land Use Plans: While the authority to issue a ROW for a natural gas pipeline comes from the MLA, the guiding statute for the BLM administration of lands is the FLPMA, which requires the BLM to develop and maintain resource management plans (RMPs). Any authorizations by the BLM, such as granting of a ROW or authorizing a sale of mineral materials, must be in conformance with the existing RMP. FA3-5

The Central Yukon RMP is currently under revision to replace both the 1991 Utility Corridor RMP and the 1986 Central Yukon RMP. This RMP revision is expected to be finalized prior to completion of the ROD for the Project, but no decision has yet been made regarding the standard operating procedures. Given this uncertainty, the BLM has identified several mitigation measures drawn from current best management practices to help mitigate the impacts of constructing and operating a major pipeline. These practices are included in Enclosure 1 as agency recommended mitigation measures which may be adopted in the ROD, as needed, to ensure conformance with the RMP requirements in effect at that time.

FA3-3 See the response to comment FA2-63.

FA3-4 Comment noted.

FA3-5 Section 1.2.6 of the final EIS, which describes the BLM's responsibilities relative to the Project, has been updated to address this comment. An evaluation of consistency with the applicable RMP potentially affected by the Project is provided in sections 4.9 and 4.10 of the final EIS.

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Summary of Bureau-Specific Comments

Detailed FWS comments focus primarily on trust species managed by the bureau as well as issues related to National Wildlife Refuges potentially impacted by the Project (Enclosure 2).

The attached NPS comments (Enclosure 3) primarily address the adoption of the Denali Alternative by the FERC and AGDC and the ongoing concerns not previously incorporated in the Draft EIS. Comment topics for the Denali Alternative focus on recreation and visual resources, ground temperature changes and permafrost, revegetation and invasive species, and cultural resources. Other comments regarding the Draft EIS apply more broadly and relate to noise, air quality and visual impacts of the pipeline operations, and the Healy Compression Station operations.

Recommended BLM mitigation measures and comments on the Draft EIS are found in Enclosures 1 and 4, respectively. A common thread in the BLM comments is that the scale and complexity of the Draft EIS resulted in inconsistencies that challenge the reader. Some sections include detailed information and analysis that would be better suited in other sections or perhaps cross-referenced more effectively. The FWS also noticed a number of inconsistent statements in discussions throughout the Draft EIS, referenced resource reports, and appendices.

The DOI recommends making a concerted editorial effort towards integrating the various sections into a unified and consistent document. To that end, each of the bureaus have provided detailed comments on specific sections of the Draft EIS. Many of the bureau-specific comments and recommendations in the enclosures apply to the Draft EIS more broadly, emphasizing actions that would help avoid and/or minimize potential adverse impacts to DOI trust resources and each bureau's ability to meet their land management responsibilities.

Collectively, DOI bureau comments address the following topics, which are generally presented in the order described in the Draft EIS:

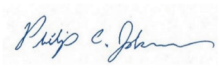
- Project Description (BLM)
- Alternatives (FWS, NPS, BLM)
- Geologic Resources and Geologic Hazards (BLM)
- Soils and Permafrost (FWS, NPS, BLM)
- Groundwater Resources (BLM)
- Freshwater Resources (FWS, BLM)
- Marine Water Resources (FWS)
- Wetlands (FWS, BLM)
- Vegetation and Restoration (FWS, NPS, BLM)
- Non-Native Invasive Species (FWS, NPS, BLM)
- Terrestrial Wildlife (FWS, BLM)
- Avian Resources (FWS, NPS, BLM)
- Threatened, Endangered, and Other Special Status Species (FWS, BLM)
- Land Use, Recreation and Special Use Areas (NPS, BLM)
- Visual Resources (NPS, BLM)
- Cultural Resources (NPS, BLM)

- Air Quality (FWS, NPS, BLM)
- Noise (NPS, BLM)
- Cumulative Impacts (FWS, BLM)

Thank you for the opportunity to collaborate and provide comments on this large and complex proposed Project. As planning progresses, the bureaus look forward to working closely with the FERC as cooperating agencies to address the issues and recommendations noted above and in the attached enclosures.

If you have any questions or need additional detail regarding the NPS comments, please contact Sharon Kim, Regional Environmental Protection Specialist (907-644-3361 or sharon_kim@nps.gov). For questions regarding the FWS comments, please contact Dr. Bob Henszey, Planning and Consultation Branch Chief (907-456-0323 or bob_henszey@fws.gov). For questions regarding the BLM comments, please contact Earle Williams, Natural Gas Pipelines Project Manager (907-271-5762 or e1willia@blm.gov).

Sincerely,



Philip Johnson
Regional Environmental Officer – Alaska

Enclosure 1: BLM Alaska Recommended Mitigation Measures - Alaska LNG Draft EIS
Enclosure 2: U.S. Fish and Wildlife Service Specific Comments and Recommendations on the Alaska LNG Draft Environmental Impact Statement (DEIS)
Enclosure 3: National Park Service Comments on Alaska LNG Pipeline Draft EIS and Associated References
Enclosure 4: BLM Specific Comments – Alaska LNG Draft EIS

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Number	Topic	Measure
1	Air Quality & Noise	Between May 15 and September 30, restrict activities such as equipment maintenance near the Galbraith Lake campground between the hours of 9:00 p.m. and 8:00 a.m. to ensure that a noise level of 45 dBA (when measured 100 ft from the campsite pad closest to an area of noise generating activity) is not exceeded.
2	Air Quality & Noise	Compressor stations will be constructed using sound absorbing materials and methods. Contribution to the soundscape measured 1/4 mile from the compressor station will not exceed 55 dBA.
3	Visual Resources	All permanent structures or facilities shall be painted a camouflaging color in accordance with BLM's Visual Resource Management standards. The Permittee will consult with the Authorized Officer to determine the appropriate color for a given site. Color options can be found at https://doiportal.doi.net/blm/WO200/250/blm-vrm/Case%20Studies/Standard%20Environmental%20Colors.jpg.
4	Fuel Handling	All fuel containers shall be marked with the responsible party's name, product type, and dates filled or brought on the lease. In bulk storage or staging areas, a single label will be sufficient. Refueling equipment and storing/maintaining equipment within 100 feet of the active floodplain of any waterbody is prohibited, except for watercraft and aircraft. Fuel storage stations shall be located outside the 100-year floodplain of water bodies, unless otherwise approved by the Authorized Officer. The BLM Authorized Officer may allow storage and operations at areas closer than the stated distances if properly designed to account for local hydrologic conditions. During equipment storage or maintenance, the lessee will ensure that the site is protected from leaking or dripping fuel and hazardous substances by the placement of drip pans or other surface liners designed to catch and hold fluids under the equipment, or by creating an area for storage or maintenance using an impermeable liner. During fuel or hazardous substance transfer, the lessee will ensure that a secondary containment or a surface liner is placed under all container or vehicle fuel tank inlet and outlet points, hose connections, and hose ends.

FA3-6 Nosie impacts and mitigation measures for the Mainline Facilities are discussed in section 4.16.3 of the final EIS. Additional mitigation measures for BLM lands could be included as conditions to the BLM right-of-way grant for the Project.

FA3-7 As discussed in section 4.16.4 of the final EIS, sound levels associated with operation of the Galbraith Compressor Station are estimated to be 55 dBA day-night sound level (L_{dn}) at approximately 0.1 mile from the compressor station boundary.

FA3-8 Comment noted. Section 4.10.2 of the final EIS has been updated to address this comment.

FA3-9 Standard practices and procedures for storage of fuels and other hazardous materials, refueling of equipment, and spill prevention and response are discussed in sections 4.2.6, 4.3.1.5, and 4.3.2.4 of the final EIS as well as in the Project SPCC Plan. Instructions for accessing this plan were provided in table 2.2-1 of the draft EIS and likewise are provided in table 2.2-1 of the final EIS. Additional measures for Project activities on BLM lands could be included as conditions in BLM's right-of-way grant for the Project.

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5	Vegetation	Reclamation of disturbed stream channels will be required to achieve 1:1 floodplain connectivity, streambank native vegetation cover greater than 70%, active streambank erosion (as defined in BLM Technical Reference 1735-2) of less than 10%, percent riffle between 60 and 70%, and no observable head cuts or mid-channel bars after two years of monitoring.	FA3-10
6	Vegetation	Cleared areas on BLM-administered lands for helicopter landing sites will be sized in accordance with the Minimum Touchdown Pad and Safety Circle Dimensions provided in the NWCG Standards for Helicopter Operations. Clearing for a helibase or for a helispot larger than a safety circle of 110' requires written approval from the Authorized Officer. (National Wildfire Coordinating Group, 2019)	FA3-11
7	Reclamation	Surface soil layers will be segregated and retained for use in reclamation and revegetation. While it is recognized that complete segregation of topsoil may not be technically feasible when trenching during some seasons, the permittee will take measures to save the surface soils (O, A, and B horizons) separate from other excavated materials. Saved surface soils will be used as cover placed back on the excavation and crowned to reduce ponding, encourage physical and thermal stability, and facilitate timely revegetation.	FA3-12
8	Reclamation	Reclamation of disturbed areas, including work pads, will be designed to achieve the following within five years: 1. Attainment of approximately 70% or more of native plant foliar cover. 2. A minimum of two growing seasons, with a self-sustaining upward trend in native plant species foliar cover. 3. Absence of non-native invasive plant species above baseline.	FA3-13
9	Wildlife	Aircraft associated with BLM-authorized activities must observe altitude restrictions at key locations as established under the resource management plan.	FA3-14
10	Winter Travel	Winter overland travel on BLM-administered lands may only occur when snow depth and ground freeze have reached minimums required under the applicable BLM resource management plan.	FA3-15

FA3-10 Sections 4.3.2.4 and 4.5.2.3 of the final EIS have been updated to address this comment. Specific revegetation requirements for Project activities on BLM lands could be included as conditions in BLM's right-of-way grant for the Project.

FA3-11 Comment noted.

FA3-12 AGDC's Segregation of Surface Layer document outlines AGDC's plans for surface layer segregation. We additionally note that, prior to construction, AGDC would file a final Revegetation Plan that incorporates all surface layer segregation information including the milepost ranges in which surface layer segregation would be executed. Additional requirements for surface layer segregation on federal lands could be included as conditions in the authorizations issued for the Project by the applicable agencies.

FA3-13 The performance standards for non-BLM lands are provided in section 4.5.2.3 of the final EIS. Specific requirements for Project activities on BLM lands could be included as conditions in BLM's right-of-way grant for the Project.

FA3-14 Comment noted.

FA3-15 Comment noted.

Enclosure 2: U.S. Fish and Wildlife Service Specific Comments and Recommendations on the Alaska LNG Draft Environmental Impact Statement (DEIS)

In this attachment, we first describe the U.S. Fish and Wildlife Service's (Service) trust resources that may be affected by the proposed Alaska LNG Project (Project). We then provide recommendations for consideration that will avoid, minimize, or provide a more complete understanding of these potential impacts.

Potentially Affected Fish and Wildlife Trust Resources: The Service's trust resources are natural resources we are entrusted to protect for the benefit of the American people. Within the proposed Project area these resources include species listed as threatened or endangered under the Endangered Species Act (ESA) and their designated critical habitat, migratory birds (including bald and golden eagles), certain marine mammals (northern sea otter, Pacific walrus, and polar bear) protected under the Marine Mammals Protection Act (MMPA), inter-jurisdictional fish, wetland habitats used by these species, and lands managed by the Service (e.g., national wildlife refuges).

Threatened and Endangered Species: The proposed Project would take place within the range of ESA-threatened spectacled (*Somateria fischeri*) and Alaska-breeding Steller's eiders (*Polysticta stelleri*), polar bears (*Ursus maritimus*), the southwest distinct population segment of northern sea otters (*Enhydra lutris kenyoni*), and the endangered short-tailed albatross (*Phoebastria albatrus*), as well as designated spectacled eider, polar bear, and sea otter critical habitat. FA3-16

The Service received a Biological Assessment (BA) and request to initiate formal consultation pursuant to section 7(a)(2) of the ESA on July 11, 2019. After reviewing the BA (also provided in the DEIS Appendix O), the Service requested additional information regarding the Project description on July 31, 2019. Once this information is received and the initiation package is deemed complete, formal ESA consultation can be initiated.

Pacific Walrus: On October 4, 2017, the Service determined the Pacific walrus (*Odobenus rosmarus divergens*) does not warrant listing as threatened or endangered under the ESA (82 FR 46618), but are provided specific protections under the MMPA. Because walrus can occur in the action area (e.g., swimming and/or feeding offshore or hauled-out on land), potential incidental take is likely to occur. We encourage contacting the Service's Marine Mammals Management Program in Anchorage to develop an appropriate mitigation plan to minimize any potential effects on walrus and ensure compliance with the MMPA. FA3-17

Eagles and Their Nests: Bald and golden eagle nests are located throughout the Project footprint. High concentrations of golden eagles are located along the Dalton Highway corridor and the Parks Highway corridor near Denali National Park and Preserve. Bald eagles are along coastal, lake, and riverine habitats anywhere along the Project footprint south of the Brooks Range. Staff in our Fairbanks and Anchorage Fish and Wildlife Conservation Offices are available to discuss known successful avoidance and minimization measures to address many potential impacts to eagles, which are most easily implemented through early project coordination. We also encourage contacting the Service's Migratory Birds Management Program in Anchorage to discuss the appropriate permits needed related to potential impacts to eagles and their nests, FA3-18 FA3-19

FA3-16 See response to comment FA3-1

FA3-17 Comment noted.

FA3-18 Comment noted.

FA3-19 Comment noted.

which both have special protections under the Bald and Golden Eagle Protection Act, and to develop an appropriate plan for mitigation, if needed. FA3-19

Other Migratory Birds: Extensive wetland, boreal forest, tidal flats, riverine, and mountain cliff habitats dominate the landscape within and surrounding the proposed Project area. These habitats provide nesting, brood-rearing, and spring and fall migration staging areas for over 150 species of migratory birds including waterfowl, shorebirds, passerines, and raptors returning from wintering areas in North and South America, Asia, Africa and Australia. The Service considers 21 of these Birds of Conservation Concern.[1] The area also supports overwintering habitat for at least 19 resident bird species. FA3-20

Interjurisdictional Fish: The Mainline Pipeline alone crosses 607 waterbodies (523 along the right-of-way, 70 along access roads, 5 at material sites). Many of these crossings contain resident and/or anadromous fish and potential impacts to fisheries resources can be significant. Except as noted below, the Service is deferring to the Alaska Department of Fish and Game, and the National Marine Fisheries Service for their expertise and recommendations for minimizing potential impacts to our shared fisheries resources. FA3-21

Wetlands: A large portion of the Project footprint includes wetlands regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (CWA). One of the more important functions of wetlands from a fish and wildlife perspective is providing habitat (e.g., staging, nesting, feeding, and brood-rearing areas for birds, foraging sites for mammals, feeding and rearing habitat for fish). Additional wetland benefits include reducing flood peaks, recharging groundwater aquifers, filtering pollutants, and supporting unique plant communities that contribute to biological diversity (USEPA 2015, National Research Council 1995). FA3-22

Lands Managed by the Service: The Arctic National Wildlife Refuge is located adjacent to the Point Thomson Unit Gas Transmission Line (PTTL) and the Mainline Pipeline, and as such may incur impacts associated with the Project. Specifically, the Central Arctic caribou herd (CAH) roams over 34,000 square miles in northeastern Alaska. In 2010, the herd numbered 68,000 animals and has since declined to an estimated 28,000 animals in 2017. The CAH uses refuge lands primarily during winter and mid-summer (after calving) as well as during the herd's northerly spring and southerly fall migrations (Nicholson et al. 2016). FA3-23

In addition to managing refuge lands for fish and wildlife, we are also responsible for preserving, protecting, and enhancing air quality and air quality-related values for lands managed by the Service. The proposed Project could affect the air quality for Arctic, Kanuti, Yukon Flats, Kenai, Tuxedni, and Kodiak National Wildlife Refuges (NWRs). Tuxedni NWR is designated a Class I air quality area, while the other refuges are designated Class II nationally protected air quality areas by the Clean Air Act.

Comments and Recommendations: The Service appreciates the information provided by the Alaska Gasline Development Corporation (AGDC) and the Federal Energy Regulatory Commission (FERC) during the Project scoping process and the development of this DEIS. As noted by the FERC, the Service also noticed a number of inconsistent statements throughout the

[1] https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

FA3-20 Comment noted.

FA3-21 Comment noted.

FA3-22 Comment noted.

FA3-23 Air quality impacts are discussed in section 4.15 of the final EIS.

DEIS, referenced resource reports, and appendices. The Service focused efforts for this review on the plans and actions presented in the DEIS Project Description, Alternatives, and Conclusions and Recommendations (i.e., Sections 2, 3, and 5). The Service only reviewed other sections of the DEIS when there were concerns with the Project description, alternatives, or conclusions and recommendations within those sections. Based on our review, we offer the following comments and recommendations in the same order as they are described in the DEIS. The following are submitted for consideration and early adoption into the Project's design to help minimize the proposed Project's impacts on fish, wildlife, and their habitats.

Soils:

Salvaging Topsoil: Salvaging topsoil (i.e., the surface layer containing native plant roots, rhizomes and other vegetative propagules, seeds, and soil microbes), and later spreading it as a top dressing on the reclaimed site, is a well-recognized restoration method to enhance native plant species reestablishment and maintain biodiversity. Thus, the Service concurs with the statement that "By not segregating and saving the surface organic layer along a large portion of the Mainline Pipeline right-of-way, erosion and permafrost thaw related impacts would be significantly increased" (page 4-95 Section 4.2.5.2 of the DEIS). FA3-24

Current construction plans as outlined by the ADGC, however, are to salvage topsoil for only a small portion of the Project footprint (about 190 miles of the Mainline Pipeline and for material sites). In the Revegetation Plan (AGDC 2018c), the AGDC cites several reasons why salvaging the topsoil in most Project areas will not be feasible, notably in frozen conditions, including "limitations of cost, logistics, and available technology" (Section 4.1.3). The DEIS also states "surface organic layer soil segregation would not occur in the winter, as the surface organic layer profile would be frozen and bonded to the underlying mineral soil" as well as indicates that "conventional excavation equipment would not be able to fully separate frozen organics from the mineral soil underneath unless the active layer is thawed" (page 4-95, Section 4.2.5.2).

We believe the AGDC's proposed rehabilitation approach may curtail restoration and site stability. Because impacts to soils associated with the construction of the pipeline and ancillary facilities (e.g., roads, work pads, additional temporary workspaces, etc.) could be significant, long-term, and in some cases permanent, the Service recommends salvaging topsoil wherever practicable and using it to enhance Project restoration. Topsoil is more conducive to plant establishment than the granular fill proposed (i.e., combination of gravels, sands, and fines) for about 37 percent of the Project right-of-way restoration. FA3-25

The Service considers salvaging frozen topsoil to be practicable; the technology is available and there are a number of benefits from using topsoil for reclamation. Equipment, such as a frozen topsoil cutter specifically designed to remove frozen topsoil, has been used by the pipeline industry for more than a decade in western Canada to meet mandated topsoil conservation requirements (Energy East 2016). The initial effort required to salvage and replace the topsoil will facilitate recolonization of native species and, therefore, decrease impacts associated with slower revegetation (e.g., colonization by invasive non-native species, erosion, maintenance and associated costs, long-term impacts to aesthetic value, reseeding, fertilizing, and slower return of wetland functions).

FA3-24 Comment noted.

FA3-25 Comment noted. Also see the response to comment FA3-12.

Erosion Control Materials: We appreciate the FERC's recommendation to *not* use synthetic monofilament mesh/netted erosion control materials in, and adjacent to, sensitive wildlife habitat (FERC 2013, Section IV.F.4.h). However, we recommend applying this requirement to the entire Project footprint when erosion control materials are needed. The plastic in these materials perpetuates in the environment and can disperse into sensitive areas. It also poses a significant threat to wildlife through ingestion and strangulation. FA3-26

Freshwater Resources:

Temporary Bridges: The Service supports the FERC's recommendation for the AGDC to install temporary bridge structures capable of withstanding a 10-year flood event rather than the proposed 2-year flood event. This recommendation will substantially reduce the likelihood of temporary bridge washouts and the resulting degradation of fish habitat from debris washing downstream. The 2-year flood event recurrence interval has a 50 percent chance of occurring in any given year, while the 10-year flood event recurrence interval has a 10 percent chance of occurring in any given year (i.e., five times less likely a temporary bridge will fail due to a flood event). FA3-27

Permanent Water Crossings: The Service supports the FERC's recommendation for the AGDC to develop a Culvert Design and Maintenance Plan for all fish bearing streams following the guidance in *Anadromous Salmonid Passage Facility Design* (NMFS 2011). In addition to considering hydraulics and fish passage, we also recommend the Project Culvert Design and Maintenance Plan include provisions for maintaining the floodplain integrity both up and downstream from the crossing (USFWS 2019). Floodplains are an important component of the aquatic ecosystem with many benefits beyond enhancing fish habitat. When considering floodplain connectivity (U.S. Forest Service 2008, Figure 2.5, page 2-6), options for water crossings range from no connectivity (simple high discharge passage) to preserving full functioning of all floodplain processes (full-span crossing). Thus, the Service recommends constructing stream crossings that preserve floodplain connectivity to the greatest extent possible. FA3-28

Pipeline Burial Depth in Floodplains: The Service appreciates the mitigation measures for addressing potential vertical scour damage to the pipeline buried under the 108 waterbodies assessed as having high susceptibility to vertical scour. The Service also recommends developing similar mitigation measures for channel migration within the channel meander belt to minimize potential future actions required to protect the pipeline from riverbank erosion and the natural process of channel migration across the floodplain required to maintain healthy fish and wildlife habitat (Naiman et al. 2010, Mouw et al. 2012). FA3-29

The Service was unable to review the *Onshore Geohazard Assessment Methodology and Results Summary* (WorleyParsons 2018), which analyzed the potential for channel migration and avulsion (rapid abandonment of an existing river channel), because the document is "Privileged." However, all of the 108 waterbodies susceptible to vertical scour are likely susceptible to substantial channel migration during the life of the Project. Most, if not all, of these waterbody crossings are for unregulated rivers and streams (i.e., no dams or diversions to regulate the flow), so the channels are free to migrate during high-flows without limitations, and will likely require river training structures to protect the pipeline, which have the potential to degrade fish habitat. FA3-30

FA3-26 This is a standard requirement based on the FERC Procedures. Additional requirements for Project activities on lands managed by the federal or state agencies could be included as conditions in the applicable permits for the Project issued by federal and state land managing agencies.

FA3-27 Section 4.3.2.5 has been updated to incorporate AGDC's commitment to design temporary bridges to withstand at least a 10 year flood event or file site-specific justifications showing that a design for a 2-year flood event is adequate

FA3-28 Section 4.7.1.6 of the final EIS has been updated to incorporate AGDC's commitment to apply measures from the U.S. Fish and Wildlife Service's Alaska Fish Passage Program Fish Passage Design Guidelines to the extent practicable in addition to NMFS' Anadromous Salmonid Passage Facility Design.

FA3-29 As discussed in section 4.18.10.2, federal pipeline safety regulations require all pipelines installed in navigable rivers and streams to have a minimum cover of 48 inches in normal soil or 24 inches in consolidated rock. In places where a minimum cover condition cannot be achieved, the regulations require additional protections for the pipeline to withstand anticipated external loads. While deep pipeline burial is appropriate at some locations to reduce the risk of pipe exposure from scour or channel migration, this mitigation measure would require additional workspace for spoil storage to account for the extra spoil removed from the trench, resulting in greater impacts on adjacent vegetation and habitats. AGDC's Onshore Geohazard Assessment Methodology and Results Summary identifies other mitigation measures, including bank armoring, river training, protective ditch cover, special backfill, and heavy-wall pipe. As noted in section 4.2.4 of the final EIS, AGDC would adopt a Field Design Change Manual to guide field decisions during construction and tailor mitigation measures to site-specific conditions. If river training or armoring were proposed as a mitigation measure at a specific crossing, AGDC would need to obtain the required authorizations for this work, including an approval from FERC and an approval from the COE under Section 404 of the CWA. Potential impacts on ESA listed species, EFH, and AWC waters would be addressed through the permitting processes for these authorizations.

FA3-30 See the response to comment FA3-29.

For example, the Tanana River near the mouth of the Chena River moved 2,000 feet between 1938 and 2007 before switching to eroding new areas (Henszey 2019), and sections of the Trans-Alaska Pipeline System (TAPS) in the Sagavanirktok River meander belt were exposed to minor damage due to erosion during the 2015 spring flood event (Romanovsky et al. 2017, Toniolo et al. 2017). FA3-30

Unlike aboveground streams crossings, such as roads that can adversely impact fish and wildlife habitat (Blanton and Marcus 2009), buried pipelines can potentially cross floodplains with minimal disturbance to fish and wildlife habitat. The proposed mitigation for vertical scour in the waterbody thalweg is 5-feet or greater compared to the typical 3 feet of overland burial depth (Section 4.1.3.10). The Service recommends burying the pipeline in the meander belt within the floodplain at the same elevation as the depth under the river or stream (e.g., at least 5 feet below the expected maximum-scour depth) by including the same scour mitigation measures within the meander belt. This would allow the channel to migrate freely across the meander belt without exposing a shallow buried pipe, which would require potentially expensive long-term protection measures and potentially degrade fish and wildlife habitat. As per the Service's standard practice, we do not recommend attempting to maintain the current channel planform by hardening the bank or using river training structures in Alaska's unregulated rivers because these measures are likely to fail at some point during the life of the Project and often adversely affect fish and wildlife habitat.

Marine Water Resources:

Spill Response: The DEIS states the Project would not result in significant adverse effects to marine waters in part due to the implementation of various plans including the Spill Prevention, Control, and Countermeasure Plan (SPCCP) and the Project Procedures and Waste Management Plan. However, the SPCCP plan does not discuss response associated with spills in an iced environment. Because of the severity of impacts to our trust resources that can result from an oil spill, the Service recommends expanding the plan to include measures to respond, contain, control, and clean up a spill in difficult sea ice situations. The potential for serious impacts from spills, coupled with the unique challenges of under-ice spills, spills in broken ice conditions, and spills during stormy conditions, warrant an in depth implementable spill response plan. FA3-31

Shoreline Impacts: Shoreline areas are important for many species of birds, offering breeding and resting sites as well as rich sources of food for migratory stopovers. Numerous species of shorebirds rely on intertidal habitats within the Cook Inlet Basin Subregion for feeding and migratory stopovers, including Pribilof rock sandpiper (*Calidris ptilocnemis ptilocnemis*), an endemic species of the Bering Sea that winters primarily within this region (Ruthrauff et al. 2012, TNC 2003). FA3-32

The DEIS states construction of offshore facilities in Prudhoe Bay and Cook Inlet would result in permanent loss of marine habitat, but the impacts would be insignificant because the impacts would encompass about 0.1 percent of the total water environments for both waterbodies. To ensure an accurate assessment of shoreline impacts, we recommend recalculating total impacted shoreline in both the Prudhoe Bay and the Cook Inlet systems to confirm the total impact assessed in the DEIS, including shoreline already impacted by previous activities and the shoreline potentially impacted by the Project. Lumping both the Prudhoe Bay and Cook Inlet

FA3-31 Section 4.3.3.3 of the final EIS has been updated to address this comment.

FA3-32 The EIS addresses impacts on the marine environment in Prudhoe Bay and Cook Inlet separately under section 4.3.3.3. The Prudhoe Bay impacts are addressed under the subsection entitled "Gas Treatment Facilities" and Cook Inlet impacts are addressed under the subsections entitled "Mainline Facilities" and "Liquefaction Facilities." Cumulative impacts are discussed in section 4.19 of the final EIS.

systems together, including previous impacts to the systems, is not an accurate assessment of impact. Since these are two very different marine environments, the Service recommends determining the significance separately for each system. FA3-32

Wetlands:

Temporary Granular Fill: The AGDC proposes to not remove granular fill (i.e., combination of gravels, sands, and fines) placed in wetlands for "temporary" work pads within and outside the construction right-of-way. Thus, the natural functions of these wetlands, including wildlife habitat, would be permanently lost even though the work pads are no longer needed. Standard wetland mitigation practice includes reclaiming wetland functions when the purpose and need for impacting the affected wetlands is no longer required. The Service recommends the AGDC reconsider their proposal to not remove fill placed in wetlands for temporary Project needs and reclaim wetland functions wherever practicable. An alternative would be to acknowledge the temporary work pads as a permanent loss in wetland and necessitate compensation. FA3-33

Hydrostatic Test Water Discharge: The Service estimates about 23 acre-feet of water will be discharged into wetlands and uplands after hydrostatic testing a 20-mile section of 42-inch diameter pipeline. Discharging such a large volume of water as a point source on the landscape during the bird-nesting season could destroy eggs and nestlings of ground-nesting birds. In addition to the proposed energy dissipation devices and sediment debris removal mitigation for discharging hydrostatic test water, we recommend avoiding discharging test water into nesting habitat during the bird-nesting season. If possible, the Service also suggests reusing the test water in the next section of tested pipeline to minimize the number of discharges required on the landscape. FA3-34

The Service also has concerns regarding the discharge of test water on permafrost soils. The relatively warm test water may have sufficient heat to cause thermal erosion or thermokarsting of the frozen soils and impact wildlife habitat. Using "natural" temperature water to thaw frozen ground was a standard practice during the gold dredging era (Boswell 1979). Boswell (1979) also describes how they tested water at natural temperature rather than steam or hot water for thawing, and they concluded the ground could be thawed with cold water, and it would remain thawed indefinitely. Based on this past experience, the Service recommends developing additional mitigation measures to avoid impacting wildlife habitat by thawing permafrost soils with discharged hydrostatic test water. FA3-35

String Bogs: String bogs, or "strangmoor," are characterized by peat deposits, acidic waters, and layers of thick sphagnum moss formed over thousands of years of wetland succession (Heinselman 1965, Viereck et al. 1992) and, therefore, are susceptible to anthropogenic damage and destruction. They are a unique form of bog habitat, formed in sloped areas and oriented perpendicular to the direction of drainage. String bogs consist of alternate, low ridges separated with water-filled linear depressions underlain with extensive, deep peat substrate. The depressions support a variety of aquatic vegetation and open water habitats, while the ridges may support brush and small trees (Viereck et al. 1992). FA3-36

The proposed Project will bisect about 1.0 mile of string bog habitat in 19 separate locations, disturbing about 3 acres. The AGDC proposes installing the Mainline Pipeline in string bog

FA3-33 Comment noted. See the response to comment FA1-53.

FA3-34 Section 4.6.2.3 of the final EIS has been updated to address this comment.

FA3-35 See the updates to section 4.2.5.2 of the final EIS.

FA3-36 In its response to question 136 of our EIR dated February 15, 2018, AGDC said that the pipeline was routed to avoid or minimize impacts on sensitive wetlands, such as string bogs, to the extent practicable (FERC Accession No. 20180330-5172). Where avoidance was not feasible, AGDC designed the route to cross narrower areas of wetlands at near 90 degrees to minimize impacts. Compensatory mitigation would be required for unavoidable impacts on wetlands including string bogs. See the response to comment FA1-53. An evaluation of Mainline Pipeline construction on VSMs is provided in section 3.7.1 of the final EIS.

habitats using Modes 2, 3, 4, and 5A with short crossings treated as wet-ditch open-cut crossings. The proposed crossings would damage the peat substrate of the bogs, accumulated over thousands of years, resulting in permanent and irreversible impacts to string bog habitats. Since string bogs form over centuries and their restoration is not feasible, the Service recommends avoiding the permanent loss of this unique wetland habitat by selecting an alternate pipeline alignment that avoids string bogs, or minimizing impacts to this wetland habitat by using vertical support members (VSMs) to elevate the pipeline. FA3-36

Permanent Loss of Wetland Functions: In 2008, the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers jointly promulgated regulation revising and clarifying requirements regarding compensatory mitigation. The purpose of this mitigation is to offset unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved. After employing the AGDC's and the FERC's avoidance and minimization measures for wetland impacts, the proposed Project would permanently convert about 4,162 acres of wetland to upland. Compensatory mitigation of these wetland functions should be recognized. FA3-37

Both Section 5.1.4 (second to last paragraph) and the Draft Wetland Mitigation Plan (AGDC 2017) suggest compensation may include credit for restoration of Project impacts. This impression may be an artifact of summarizing the definition of compensation. As noted in the previous paragraph, compensation cannot be generated by reducing Project impacts, but can only be generated on areas adjacent or contiguous to the Project impacts (i.e., on-site compensation) or generated in the same geographic area if practicable (i.e., off-site compensation).

Permanent loss of wetland functions can be compensated by third party mitigation providers (i.e., wetland banks and in-lieu fee programs), or by permittee-responsible mitigation ([PRM] e.g., AGDC-sponsored compensatory mitigation projects). Third party mitigation providers are unavailable for most of the pipeline route,[1] and it appears they will continue to be unavailable into at least the near future.[2] The PRM opportunities at the scale required to compensate for the permanent loss of wetland habitat proposed by the Project (i.e., 4,162 acres) will likely be difficult to identify and implement. Regardless of the compensation provider(s) chosen by the AGDC, the USACE may not require compensation for all Project permanent wetland losses.[3] Based on these precedents, the Service recommends the FERC employ all practicable wetland avoidance and minimization measures. Otherwise, the Project may result in substantial uncompensated permanent wetland impacts, which will adversely affect our trust resources.

Vegetation:

Revegetation and Restoration: The Service appreciates the thoroughness of the Revegetation and Restoration Plans (AGDC 2018b 2018c), and thanks the AGDC for setting revegetation FA3-38

[1] See Alaska District's banks and in-lieu fee sites at https://ribits.usace.army.mil.
[2] For example, the prospectus for the only potential North Slope mitigation bank (i.e., the Charles Etok Edwardsen Mitigation Bank) was recently found by the USACE to not have potential as written).
[3] The 28 March 2019 provisional permit for AGDC's similar Alaska Stand Alone Pipeline would require about 281 acres of compensation for about 7,939 acres of permanent waters of the US losses, including wetlands. Wetlands compensation is based on 145.2 credits (roughly equal to or less than acres) for the North Slope, 80.39 acres for the Interior, and 54.43 acres for South-central Alaska.

FA3-37 See the response to comment FA1-53.

FA3-38 See the response to comment FA3-12.

goals that include site stability and restoration of wildlife habitat. Natural colonization of disturbed sites, the Project's primary reclamation method, is an effective method to achieve species biodiversity and richness, and we commend the AGDC for recognizing the importance of this practice to overall habitat restoration. While this approach will be suitable for some areas of the Project, the Service has concerns regarding the ability to achieve timely and successful revegetation and site restoration without salvaging the topsoil for a larger portion of the Project footprint (see our Soils discussion above). This is of particular concern in areas of permafrost and a shorter growing season. FA3-38

For example, areas with cold soils (e.g., continuous and discontinuous permafrost, or high-altitudes) generally have a thin topsoil layer (i.e., the surface layer containing native plant roots, rhizomes and other vegetative propagules, seeds, and soil microbes). Once these soils are disturbed (removed, mixed with inorganic soils, and replaced), the natural recolonization process may take considerable time before there is sufficient plant cover to minimize or prevent thermal erosion, subsidence, and ponding. In areas with a very short growing season, like the North Slope, the natural recolonization may take more than the three-year span suggested by the AGDC (ABR 2012a, ABR 2012b, Kidd 2014, Raynolds et al. 2014). Restoration projects within the North Slope oil fields typically require 10 to 30 years of recovery before the sites are deemed stable. The Revegetation Plan indicates this area of the Mainline Pipeline will immediately receive fertilizer and seed application. While soil fertilization of a disturbed site may initially increase plant growth, once the nitrogen is absorbed, vegetation will dieback and natural recovery may still take decades (Bishop et al. 2001, Streever et al. 2011).

Invasive Plant Species: The Service appreciates the AGDC's and the FERC's recognition of potential impacts to Alaska's fish and wildlife habitat from invasive species and we appreciate that many of our previous comments have been incorporated into this section of the DEIS. The AGDC's effort and commitment to minimize impacts from invasive species from Project activities is also commendable. The DEIS references two separate plans developed by the AGDC: the *Noxious/Invasive Plant and Animal Control Plan* (Project Invasives Plan in AGDC 2018a) and the *Invasive Species Prevention Management Plan* (ISPMP, in Appendix B of AGDC 2018c). While there is considerable overlap between the two plans with distinctions as to where each plan would be applied on the ground, the Service finds the ISPMP to be the more thorough plan. Therefore, we recommend the Project Invasives Plan adopt the language and data sheets of the ISPMP. Additionally, if possible, we recommend combining the plans under one title to minimize misunderstandings in the analysis of the DEIS and to provide equal protection to all impacted areas (including city/borough, native, and private lands). This may also allow for efficiencies during construction and inspection activities. In summary, the Service suggests incorporating the invasive animal component of the Project Invasives Plan with the ISPMP to manage all invasive species across the entire Project footprint. FA3-39

Terrestrial Wildlife Using Lands Managed by the Service:

Caribou: The CAH roams over 34,000 square miles in northeastern Alaska, including the Arctic National Wildlife Refuge (Refuge). The CAH uses refuge lands primarily during winter and mid-summer (after calving) as well as during the herd's northerly spring and southerly fall migrations (Nicholson et al. 2016). FA3-40

FA3-39 The ISPMP would be implemented on BLM and state lands. The Invasives Plan would be implemented in all other areas unless additional or different requirements are identified by landowners (e.g., private landowners or the NPS for the DNPP).

FA3-40 Section 4.6.1.3 of the final EIS has been updated to address this comment.

Given the Refuge's management goals for caribou as well as caribou's vital importance as a subsistence resource to federally-qualified subsistence users and caribou's recent decline in abundance, the Service recommends the FERC examine all potential impacts of the proposed Project on the CAH. This includes examining disturbance due to construction and traffic, potential displacement from coastal insect relief habitat, delayed or displaced migratory movements, and reduced access to subsistence hunters. Depending on location, the proposed east-west alignment of the PTTL would likely impact coastal areas used for insect relief during the period of mosquito harassment (late June-July) and might delay or disrupt north-south movements of the herd traveling to and from these areas. The Mainline Pipeline will intersect with migration routes used by a majority of the CAH during spring and fall migrations, particularly in the northern Brooks Range foothills. Thus, mitigation measures, such as locating the PTTL farther from the coast and raising all pipelines in caribou habitat at least 7 feet above ground, is recommended. Recent published research (Wilson et al. 2016) documented the effects of the Red Dog Mine industrial road on caribou movements during migration and Nicholson et al. (2016) documented seasonal movements and migration routes of the CAH. The Service recommends including this research as well as other possible impacts to the CAH in the Final Environmental Impact Statement (FEIS). FA3-40

Avian Resources:

Migratory Bird Conservation Plan: The DEIS states the AGDC has developed mitigation measures to avoid, minimize, or mitigate impacts on migratory bird resources. Some of these measures are described in a *Migratory Bird Conservation Plan* (MBCP) developed for the Project (Section 7.1.2). The MBCP as it stands provides minimization measures for ESA-protected birds, eagles, the Service's Birds of Conservation Concern, and the Bureau of Land Management's Alaska's Sensitive and Watch List birds. However, the FERC's 2011 Memorandum of Understanding (MOU)[1] with the Service states projects should "…avoid or minimize, to the extent possible, impacts on migratory birds and their habitats, with emphasis on, *but not exclusive to* [emphasis added], species of concern…" The Project will likely affect all species of nesting birds, not only species of concern. For example, clearing and grading schedules in the MBCP Table 3 indicate over 500 miles of the right-of-way is proposed to be cleared of vegetation during the summer when birds are nesting. Clearing vegetation during the nesting season will result in bird mortality and loss of productivity regardless of intent.[2] The Service recommends conducting all vegetation clearing and associated ground disturbance outside the nesting season when practicable to minimize adult, nestling, and fledgling mortality. FA3-41

The Service also recommends reassessing the lost migratory bird productivity due to permanent habitat loss in the FEIS. In contrast to the proposed initial clearing during the nesting season, we appreciate that operational vegetation maintenance is scheduled outside the breeding season. FA3-42

[1] Required by Executive Order 13186 to further the purposes of the migratory bird conventions, the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act (BGEPA), the Fish and Wildlife Coordination Act, the Endangered Species Act (ESA), the National Environmental Policy Act (NEPA), and other pertinent statutes.
[2] "Intent" is addressed in the M-Opinion (https://www.doi.gov/sites/doi.gov/files/uploads/m-37050.pdf) for the incidental or unintentional take of migratory birds, but the M-Opinion does not address voluntary avoidance and minimization measures to help reduce incidental or unintentional take of migratory birds.

FA3-41 As discussed in section 4.6.2.3 of the final EIS, AGDC committed to conducting vegetation clearing, grubbing, and other disruptive activities outside the timing windows for nesting birds as identified by the USFWS to the extent practicable. See the updates to sections 4.6.2.3 and 4.6.2.5 of the final EIS with regard to additional AGDC commitments regarding timing windows and vegetation clearing.

FA3-42 Permanent habitat loss and corresponding impacts on birds are discussed in section 4.6.2.3 of the final EIS. We concluded in this section that population-level impacts on migratory birds would not likely occur with the implementation of our recommendations and AGDC's commitments regarding vegetation clearing and avoidance of land disturbing activities where practicable during the migratory bird nesting season, particularly in areas where concentrations of more sensitive species occur.

Impact Assessment to Migratory Birds: The 2011 MOU also specifies the MBCP objectives should address migratory bird habitat and population management, including national (Rosenberg et al. 2016) and regional (BPFWG 1999) conservation plans. FA3-42

The DEIS, however does not address potential population-level impacts from the Project. For example, the rusty blackbird population has declined by 88 percent range wide over the past four decades, with additional qualitative evidence that this decline has been continuing for a century or more (Greenberg and Droege 1999, Niven et al. 2004, Sauer et al. 2008, Greenberg et al. 2011). Therefore, the Service recommends the DEIS also analyze and disclose potential population-level impacts from the permanent loss of important migratory bird habitat from the proposed Project.

Full Life-cycle Conservation of Migratory Birds: In addition to conserving migratory bird breeding habitat, Rosenberg et al. (2016) recognizes the importance of understanding and addressing issues faced by migratory birds throughout their lives and during their full annual migratory cycles. Full life-cycle conservation of migratory birds requires actions that provide habitat and reduce mortality throughout the year and across their range (Spindler and Kessel 1980, Kessel 1998, BPFWG 1999). When evaluating potential Project impacts, the Service recommends the DEIS consider impacts to migratory birds throughout their entire life cycle, including impacts to breeding, wintering, and migratory habitat. FA3-43

North Slope Littoral Areas: Creating littoral areas for waterbirds in depleted mine sites south of the Brooks Range often works well if constructed properly and actively managed until stable. However, experience on the North Slope has shown creating littoral areas often fails when pushing overburden material into the excavation along the edges because the material either does not subside (i.e., does not create wetlands) or subsides too much (i.e., is too deep to support aquatic vegetation). When overburden is limited (i.e., single-cell sites), there may also be insufficient material to create a successful or meaningful littoral area. In addition, on the North Slope it may take 15 to 30 years to fill the excavation with water if the excavation is not connected to a stream or river. The Service therefore does not recommend creating littoral areas on the North Slope by placing overburden in deeply excavated material sites as it rarely produces functional habitat. FA3-44

Avian Avoidance and Minimization Plans: Several plans are missing minimization measures and risk assessments for migratory bird resources. The SPCCP does not contain any reference to managing threats to wildlife from spills. The Service recommends the AGDC incorporate wildlife management procedures into the SPCCP to include mitigation measures and a risk assessment. In addition, there is no mention of migratory birds in the *Wetland and Waterbody Construction and Mitigation Procedures* (WWCMP), or the *Winter and Permafrost Construction Plan*. "Wildlife" are only mentioned in the WWCMP discussion regarding non-use of synthetic monofilament materials in designated areas and "sensitive wildlife" habitat, unless designed to minimize harm to wildlife. Finally, the Service recommends developing a Lighting Plan to minimize attracting migrating birds at night and considering methods to mitigate the impacts of powerlines (e.g., from collisions or electrocutions). FA3-45

Hydrostatic Test Water Discharge: Adverse impacts from discharging hydrostatic test water on ground-nesting birds is not assessed in the DEIS. No assessment of the acreage flooded, water FA3-46

FA3-43 Section 4.6.2.3 of the final EIS evaluates Project impacts on birds, including impacts on breeding, wintering, and migratory habitat, such as displacement due to permanent habitat modification.

FA3-44 AGDC does not propose to create vegetated littoral zones north of the Brooks Range.

FA3-45 Impacts from spills on migratory birds are addressed in sections 4.6.2.3 and 4.6.2.5 of the final EIS as well as in the Project Migratory Bird Conservation Plan. Impacts would be avoided, minimized, or mitigated through implementation of the BMPs identified in the Project Migratory Bird Conservation Plan and SPCC Plan. AGDC developed a Lighting Plan. Instructions for accessing each of these plans were provided in table 2.2-1 of the draft EIS and likewise are provided in table 2.2-1 of the final EIS. Also see the response to comment CM6-4.

FA3-46 Section 4.6.2.3 of the final EIS has been updated to address this comment. Mainline Pipeline hydrostatic test water source and discharge locations are provided in table 4.3.4 5.

depth, time of year, or periodicity of testing is presented. As discussed above in Wetlands, the Service estimates about 23 acre-feet of water will be discharged into wetland and upland habitats after hydrostatic testing a 20-mile length of 42-inch diameter pipeline. To avoid destroying eggs and nestlings of ground-nesting birds, we recommend not discharging during the breeding season. FA3-46

Air Quality:

Effects on National Wildlife Refuge (NWR) Lands: When conducting air quality analyses, the DEIS acknowledges there will be impacts from the construction and operation of the Project facilities to the air quality of lands managed by the Service, including the Arctic, Kanuti, Yukon Flats, Kenai, Tuxedni, and Kodiak NWRs. These impacts include temporary and short-term impacts from construction, moderate and significant cumulative and long-term visibility impacts, and nitrogen and sulfur deposition on refuge lands. The Service recommends the AGDC reduce emissions and/or improve mitigation plans at each facility to reduce construction and operational emissions of nitrogen oxides (NO_x), sulfur oxides (SO_x), and inhalable particulate matter ($PM_{2.5}$ and PM_{10}) to reduce the predicted visibility impacts, and the sulfur and nitrogen deposition impacts to levels below the Federal Land Manager threshold guidelines (USFS et al. 2010). FA3-47

Updated Analyses: The FERC identified that the emission estimates are not consistent with the revised Project schedule submitted by the AGDC in November 2018, and recommended the AGDC file updated construction emission calculations to reflect the revised construction schedule. If the updated emissions are significantly different, the Service recommends revising the air quality related values (AQRV) model and reevaluating the potential impacts on refuge lands and the fish and wildlife using these protected areas. The Service also recommends the updated AQRV analysis include all short-term emissions, such as the maximum flare event. FA3-48

Cumulative Impacts:

Assessment of Prior Impacts: Cumulative impacts are an assessment of "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions…" (40 CFR §1508.7 [2019]). In other words, the cumulative fish and wildlife impact assessment describes and analyzes how the original state of the system has been, and is predicted to be, altered by impacts from various actions. Action impacts include anthropogenic and natural changes. The DEIS considered the impacts of past projects as already part of the affected environment (i.e., environmental baseline), which is described and evaluated in the environmental analyses section of the DEIS. For example, the AGDC states "impacts due to construction of the TAPS have become part of the environmental baseline, while ongoing operational impacts associated with the TAPS have the potential to contribute to cumulative effects." FA3-49

The environmental baseline condition considered in this DEIS does incorporate previous actions, but the ongoing impacts of individual past actions were not evaluated. For example, the TAPS and the Dalton Highway impacted the original state of fish and wildlife habitat by their ongoing presence on the landscape, not just during their construction. These actions fragmented the original state of fish and wildlife habitat, which remains fragmented, and as such should be included in the discussion of cumulative effects. Therefore, the Service recommends the AGDC

FA3-47 See the response to comment FA1-62.

FA3-48 Section 4.15.5 of the final EIS has been updated to address this comment.

FA3-49 As discussed in section 4.19.1 of the final EIS, past actions, such as the construction of TAPS, were considered part of the environmental baseline, but ongoing impacts associated with TAPS, the Dalton Highway, and other past projects were included in the cumulative impacts analysis.

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evaluate both past and ongoing impacts of these projects, as appropriate, during discussions of environmental baseline and cumulative effects on fish and wildlife assessed in the FEIS. FA3-49

Assessment Area: The Service acknowledges the usefulness of using hydrological unit code 12 (HUC12) watershed boundaries for assessing impacts to stationary resources including wetlands. However, these boundaries are not as useful for assessing bird and wildlife impacts. Limiting the boundary to HUC12 watersheds underestimates the overall impacts from various actions to bird and wildlife populations. The Avian Resources Section (4.6.2) describes migratory-bird populations by Ecoregions/Subregions and the Terrestrial Wildlife Section (4.6.1) describes wildlife populations by habitat type/subregion. The Service recommends using the same regions for describing migratory birds and terrestrial wildlife within the FEIS. FA3-50

Alternatives:

Approach to Analyses: Alternatives as defined under 40 CFR §1502.14 (Alternatives including the proposed action), 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 decision maker and the public. During our review, the Service found a number of inconsistent comparisons among the alternatives affecting our trust resources, especially for the level of impacts, which makes alternative comparisons difficult. The Fairbanks Alternative is used as an example below. FA3-51

The DEIS states the Fairbanks Alternative would increase the length of the Mainline Pipeline by 37.5 miles, resulting in a greater overall environmental impact. Table 3.6.3-1 indicates land disturbed for the Mainline Pipeline construction is a difference of 403 acres. The provided alternative analyses tables do not indicate the number of miles for access routes required for the preferred route (Appendix B, Volume 2 [pages B-92-B-103]). Nor is there an acreage indication/comparison between the alternatives. The preferred alternative appears to require 2 helipads, 9 mine sites, camps, 2 mainline block valves, and a compressor station. It is difficult to evaluate the impacts of the two alternative routes on fish and wildlife habitat without knowing the amount of land disturbed by each alternative.

The preferred pipeline alignment traverses a near pristine habitat for fish and wildlife through the Lower Tolovana watershed, while the Fairbanks Alternative follows a disturbed and fragmented area. The highway system from Fairbanks could support the development and construction of the route without impacting the sensitive Minto Flats in the Lower Tolovana watershed. The Minto Flats provides breeding habitat for multitudes of waterfowl, including sensitive trumpeter swans. Studies in Alaska have examined the effects of disturbance on nesting activities (Banko 1960, Bollinger 1982, ADF&G 1986, Hansen et al. 1971). The Tolovana watershed also includes the Chatanika River, which is a major spawning area for Yukon River Chinook salmon (Brown et al. 2017). The preferred route would result in habitat fragmentation and increased human disturbance, has the potential to introduce invasive species, and potentially increases the likelihood of future development, all of which have negative impacts to wildlife and their habitat. The Tanana Valley Watershed Association is currently evaluating the condition of the Tolovana

FA3-50 As shown in table 4.19.1-1 of the final EIS, the geographic scope for evaluating cumulative impacts on migratory animals (including birds) was based on HUC10 rather than the HUC12 watershed boundaries for the reasons suggested in the comment.

FA3-51 The ancillary facilities that would be required for alternative routes such as the Fairbanks Alternative, e.g., access roads, helipads, camps, and mine sites, are unknown. Section 3.6.3 of the final EIS has been updated to include the crossing of the Lower Tolvana watershed in the analysis.

watershed,[1] and preliminary results suggest portions of the upper watershed are in poor to fair condition, while the Minto Flats in the lower watershed is near pristine. The alternatives as presented do not assess this information; therefore, the conclusion that the preferred alternative is significantly less impactful on habitat and wildlife is not supported within the DEIS. FA3-51

In addition, the overall impacts to wetlands from a Fairbanks lateral originating from the preferred alignment near Minto Flats have not been assessed in Section 3.6.3. The DEIS states "However, it should be noted that, because wetland and waterbody crossings on a future lateral were not available for inclusion in our review, the combined impacts for the Mainline Pipeline plus the lateral could decrease or increase the overall differences between the Fairbanks Alternative and the proposed route." FA3-52

The Service recommends providing the total number of wetlands acres impacted under each alternative within the FEIS to help differentiate impact differences among the alternatives, such as the Fairbanks alignment. Until the full range of effects are quantified, choosing among the alternatives based on unquantified impacts to wetlands is not possible.

Aboveground Pipeline Alternative: The Service appreciates the FERC considering an aboveground pipeline alternative (Section 3.7.1). Early during the scoping stage, when much less information was available, we requested a simplistic analysis comparing the environmental impact of a trenched versus an elevated pipeline on the Arctic Coastal Plain (ACP). As Project details and resource information were provided, and after thorough review of known impacts on wildlife habitat from past trenching projects in permafrost, we now recommend conducting an analysis to compare a trenched pipeline versus constructing an elevated pipeline, only when traversing thaw-sensitive permafrost (but for the entire length of the proposed Mainline Pipeline). Thaw-sensitive permafrost is subject to the same vulnerabilities regardless of geographic location. This was the approach taken by the 800-mile TAPS from Prudhoe Bay to the Port of Valdez. The TAPS has transported processed oil with few problems for over 40 years. The few problems the TAPS experienced included subsidence associated with ice-rich (i.e., thaw-sensitive) permafrost. About 52 percent (420 miles) of the TAPS line is elevated on VSMs, while about 58 percent (about 470 miles) of the Mainline Pipeline could be elevated over thaw-sensitive permafrost (based on the proportion of Mainline Pipeline right-of-way construction acres in the DEIS Table 4.2.4-2). FA3-53

The Service appreciates the AGDC proposing to construct the 62.5-mile PTTL and the 1.0-mile Prudhoe Bay Unit Gas Transmission Line (PBTL) entirely on VSMs. These pipelines will almost exclusively traverse thaw-sensitive permafrost, and will permanently impact less than one acre of wildlife habitat per pile of pipeline. This level of permanent impact has often been considered *de minimis* by the USACE for pipelines employing VSMs on the ACP and is often considered to be the least environmentally damaging practicable alternative (LEDPA). When constructed on ice or snow pads, the 24 to 26-inch diameter boreholes for the TAPS VSM piles permanently impacted 3.7 ft^2 per VSM pile (McFadden and Bennett 1991), which is in line with the ADGC's estimated 2 acres of permanent impacts for 60 miles of VSM piles (DEIS Section 3.7.1; i.e., 0.03 acres per pipeline mile). Many pipelines on the ACP do not require service roads

[1] Tanana Valley Watershed Association's preliminary Tolovana Watershed assessment: http://www.escapewrap.com/wrap-map-tolovana

FA3-52 See the updates to section 3.6.3 of the final EIS and the response to comment FA3-51.

FA3-53 Our rationale for rejecting an aboveground pipeline alternative is provided in section 3.7.1 of the final EIS.

FA3 - Department of the Interior (cont'd)

because the elevated pipelines require little long-term maintenance that cannot be conducted during the winter with an ice/snow road. In contrast, the proposed trenched Mainline Pipeline would disturb a much larger permanent-impact footprint for the pipeline (2,662 acres), access roads (3,016 acres), and material sites (5,855 acres), which is about 14.3 acres of wildlife habitat impacts per pipeline mile and over 475 times more impact than an elevated pipeline. In addition, the pipeline trench would need to be revegetated post construction and likely would require remediation over an extended period to address subsidence issues.

The Service agrees there may be other issues to consider when evaluating buried versus elevated pipelines (e.g., wildlife movement patterns and gas stream condensation). However, the proposed Project would parallel the existing TAPS for much of the thaw-sensitive soils, so elevating the new pipeline in this area would not be a novel impact to wildlife. Additionally, the concern for gas stream condensation appears to be addressed for the elevated PTTL. For these reasons, the Service recommends the FERC reevaluate the alternative for elevating the Mainline Pipeline when traversing thaw-sensitive permafrost. We believe an elevated pipeline meets the FERC's criteria for offering a significant environmental advantage over the proposed action and is technically and economically feasible. The Service agrees the initial cost of elevating the Mainline Pipeline may be more expensive, but the costs for mitigating unavoidable permanent wetland losses and for the long-term operational costs of remediating pipeline subsidence and other post-construction activities may far exceed the initial construction costs of VSMs. FA3-54

FA3-54 See response to comment FA3-53.

FA3 - Department of the Interior (cont'd)

Literature Cited

ABR. 2012a. Rehabilitation Report for the Rocket Ship Site, Eastern Operating Area, Prudhoe Bay, Alaska. ABR, Inc. – Environmental Research and Services, Fairbanks, AK and BP Exploration (Alaska) Inc., Environmental Studies Group, Anchorage, AK. 10 pp.

ABR. 2012b. Rehabilitation Report for Powerline Trenching Sites 112/113, and 121-A, Prudhoe Bay, Alaska. ABR, Inc. – Environmental Research and Services, Fairbanks, AK and BP Exploration (Alaska) Inc., Environmental Studies Group, Anchorage, AK. 12 pp.

Alaska Department of Fish, and Game (ADFG). 1986. Alaska Habitat Management Guide: Life Histories and Habitat Requirements of Fish and Wildlife. (ed.). Alaska Department of Fish and Game Juneau, Alaska: pp.763.

Alaska Gasline Development Corporation (AGDC). 2017. Alaska LNG Draft Wetland Mitigation Plan. Revision 0. Included as Appendix O of Resource Report 2. Document No, USAI-PE-SRREG-00-000002-000. Docket No. CP17-178-000; Accession No. 20170417-5357.

Alaska Gasline Development Corporation (AGDC). 2018a. Alaska LNG Noxious / Invasive Plant and Animal Control Plan. AKLNG-5000-HSE-PLN-DOC-00032, Rev 1. Docket No. CP17-178-000; Accession No. 20180427-5256, RFI-528-FERC-001e, Attachment 1.

Alaska Gasline Development Corporation (AGDC). 2018b. Alaska LNG Draft Restoration Plan. AKLNG-6020-REG-PLN-DOC-00028, Rev 2. Docket No. CP17-178-000; Accession No. 20181120-5161, RFI-528-FERC-107-1, Attachment 1.

Alaska Gasline Development Corporation (AGDC). 2018c. Alaska LNG Revegetation Plan. AKLNG-6010-ENV-PLN-DOC-00035, Rev 1. Docket No. CP17-178-000; Accession No. 20181120-5161, RFI-528-FERC-107-1, Attachment 2.

Banko, W.E. 1960. The Trumpeter Swan: Its History, Habits, and Population in the United States. University of Nebraska Press. Lincoln, NE. pp.214.

Bishop, S.C., J.G. Kidd, T.C. Cater, K.N. Max, and P.E. Seiser. 2001. Land Rehabilitation studies in the Kuparuk Oilfield, Alaska. 2000. Fifteenth annual report prepared for Phillips Alaska, Inc., Anchorage, AK by ABR Inc., Fairbanks, AK. 64 pp.

Blanton, P., and W.A. Marcus. 2009. Railroads, roads and lateral disconnection in the river landscapes of the continental United States. Geomorphology 112(3–4): 212-227. http://www.sciencedirect.com/science/article/pii/S0169555X09002475.

Bollinger, K.S. 1982. Progress Report on Behavior of Nesting Trumpeter Swans in Minto Flats, Alaska 1982. Waterfowl Management, U.S. Fish and Wildlife Service. Fairbanks, Alaska. pp.21 + appendices. Belanger, S,E., K. Schurr, D.J. Allen, and A.F. Gohara. 1986. Effects of chrysotile asbestos on coho salmon and green sunfish: Evidence of behavioral and pathological stress. Environmental Research 39(1):74-85.

FA3 - Department of the Interior (cont'd)

Boreal Partners in Flight Working Group (BPFWG). 1999. Landbird Conservation Plan for Alaska Biogeographic Regions, Version 1.0. Unpubl. rep., U. S. Fish and Wildlife Service, Anchorage, Alas. 45pp. https://prd-wret.s3-us-west-2.amazonaws.com/assets/palladium/production/s3fs-public/atoms/files/conservation.pdf

Boswell, J.C. 1979. History of Alaskan Operations of United States Smelting, Refining and Mining Company. Mineral Industries Research Laboratory, University of Alaska, Fairbanks. 65 pp + appendices. https://scholarworks.alaska.edu/handle/11122/2209.

Brown, R.J., A. von Finster, R.J. Henszey, and J.H. Eiler. 2017. Catalog of Chinook Salmon Spawning Areas in Yukon River Basin in Canada and United States. Journal of Fish and Wildlife Management 8(2):558-586; e1944-687X. doi:10.3996/052017-JFWM-045. https://doi.org/10.3996/052017-JFWM-045.

Energy East Pipeline Ltd (Energy East). 2016. Energy East Project. Consolidated Application: Environmental and Socio-Economic Assessment. Volume 15: Biophysical Effects Assessment, Part A: Alberta. Table 7-20, Recommended Mitigation Measures for Soil Capability. Calgary, Alberta. Available at: https://apps.cer-rec.gc.ca/REGDOCS/File/Download/2968333.

Federal Energy Regulatory Commission (FERC). 2013. Upland erosion control, revegetation, and maintenance plan. May 2013. Washington, D.C. https://www.ferc.gov/industries/gas/enviro/plan.pdf

Greenberg, R., and S. Droege. 1999. On the decline of the Rusty Blackbird and the use of ornithological literature to document long-term population trends. Conservation Biology 13:553–559.

Greenberg, R., D. W. Demarest, S. M. Matsuoka, C. Mettke-Hofmann, D. Evers, P. B. Hamel, J. Luscier, L. L. Powell, D. Shaw, M. L. Avery, K. A. Hobson, P. J. Blancher, and D. K. Niven. 2011. Understanding declines in Rusty Blackbirds. Pp. 107– 126 in J. V. Wells (editor). Boreal birds of North America: a hemispheric view of their conservation links and significance. Studies in Avian Biology (no. 41), University of California Press, Berkeley, CA.

Hansen, H. A., P. E. K. Shepard, J. G. King, and W. A. Troyer 1971. The trumpeters wan in Alaska. Wildlife Monographs 26. 83pp

Heinselman, M. L. 1965. String Bogs and other patterned organic terrain near Seney, Upper Michigan. Ecology 46:1 & 2.

Henszey, R.J. 2019. Chena Slough and River changes over the past 100 years. Summer Sessions & Lifelong Learning @ UAF. University of Alaska at Fairbanks, July 109, 2019. Partial presentation available at: https://www.youtube.com/watch?v=5TifwuDYF1I&feature=youtu.be.

Kessel, B. 1998. Habitat characteristics of some passerine birds in western North American taiga. University of Alaska Press, Fairbanks. 117pp.

Kidd, J. 2014. Qualitative Assessment of MS3 Trenching Trial Test Site. ABR Memorandum. ABR, Inc. Environmental Research and Services, Fairbanks, AK. 19 pp.

Mouw, J.E., Chaffin, J.L., Whited, D.C., Hauer, F.R., Matson, P.L. and Stanford, J.A. 2012. Recruitment and successional dynamics diversify the shifting habitat mosaic of an Alaskan floodplain. River Research and Applications 29:671-685. doi:10.1002/rra.2569. https://onlinelibrary.wiley.com/doi/full/10.1002/rra.2569.

McFadden, T.T. and F.L. Bennett. 1991. Construction in cold regions: A guide for planners, engineers, contractors and managers. John Wiley and Sons, Inc., New York. Chapter 7 available in part at: https://books.google.com/books?isbn=0471525030.

Naiman, R.J., J.S. Bechtold, T.J. Beechie, J.J. Latterell, R. Van Pelt. 2010. A Process-Based View of Floodplain Forest Patterns in Coastal River Valleys of the Pacific Northwest. Ecosystems 13:1-31. https://link.springer.com/article/10.1007/s10021-009-9298-5.

National Marine Fisheries Service (NMFS). 2011. Anadromous Salmonid Passage Facility Design. National Marine Fisheries Service, Northwest Region, Portland, Oregon. https://www.westcoast.fisheries.noaa.gov/publications/hydropower/fish_passage_design_criteria.pdf.

National Research Council. 1995. Wetlands: Characteristics and Boundaries. Committee on Characterization of Wetlands, W.M. Lewis Jr. (chair). National Academy Press, Washington, D.C. 307 pp.

Nicholson, K.L, S.M. Arthur, J.S. Horne, E.O. Garton, and P.A. Del Vecchio. 2016. Modeling caribou movements: seasonal ranges and migration routes of the Central Arctic Herd. PLoS ONE 11(4): e01503333. https://doi.org/10.1371/journal.pone.0150333

Niven, D. K., J. R. Sauer, G. S. Bucher, and W. A, Link. 2004. Christmas bird count provides insights into population change in land birds that breed in the boreal forest. American Birds 58:10–20.

Raynolds, M. K., D. A. Walker, K. J. Ambrosius, J. Brown, K. R. Everett, M. Kanevskiy, G. P. Kofinas, V. E. Romanovsky, Y. Shur and P. J. Webber. 2014. Cumulative geoecological effects of 62 years of infrastructure and climate change in ice-rich permafrost landscapes, Prudhoe Bay Oilfield, Alaska. 2014. Global Change Biology. 20:1211-1224.

Romanovsky, V. E., S.L. Smith, K. Isakensen, N.I. Shiklomanov, D.A. Streetskiy, A.L. Kholodov, H.H. Christiansen, D.S. Drozdov, G.V. Malkova, and S.S. Marchenko. 2017. Terrestrial Permafrost [in arctic report Card 2017]. http://arctic.noaa.gov/Report-Card.

Rosenberg, K. V., J. A. Kennedy, R. Dettmers, R. P. Ford, D. Reynolds, J.D. Alexander, C. J. Beardmore, P. J. Blancher, R. E. Panjabi, D. N. Pashley, T. D. Rich, J. M. Ruth, H. Stabins, J. Stanton, T. Will. 2016. Partners in Flight Landbird Conservation Plan: 2016 Revision for Canada and Continental United States. Partners in Flight Science Committee. 119 pp. http://www.partnersinflight.org/wp-content/uploads/2016/08/pif-continental-plan-final-spread-single.pdf.

Ruthrauff, D.R., T.L. Tibbitts, R.E. Gill Jr., M.N. Dementyev, and C.M. Handel. 2012. Small Population Size of Pribilof Rock Sandpipers Confirmed Through Distance Sampling Surveys in Alaska. Condor 114:544–551.

Sauer, J.R., J.E. Hines, and J. Fallon [online]. 2008. The North American Breeding Bird Survey, results and analysis 1966–2007. Version 5.15.2008. U.S. Geological Survey, Patuxent Wildlife Research Center, Laurel, MD. http://www.mbr-pwrc.ugs.gov/bbs/ (30 June 2010).

Spindler, M.A. and B. Kessel. 1980. Avian populations and habitat use in interior Alaska taiga. Syesis 13:61-104.

Streever, B., R. Suydam, J.F. Payne, R. Shuchman, R.P. Angliss, G. Balogh, J. Brown, J. Grunblatt, S. Guyer, D.L. Kane, J.J. Kelley, G. Kofinas, D.R. Lassuy, W. Loya, P Martin, S.E. Moore, W.S. Pegau, C. Rea, D.J. Reed, T. Sformo, M. Sturm, J.J. Taylor, T. Viavant, D. Williams and D. Yokel. 2011. Environmental Change and Potential Impacts: Applied Research Priorities for Alaska's North Slope. Arctic 64(3): 390-397. Available at: http://pubs.aina.ucalgary.ca/arctic/Arctic64-3-390.pdf.

The Nature Conservancy (TNC). 2003. Cook Inlet Basin Ecoregional Assessment. Available online at https://www.conservationgateway.org/ConservationPlanning/SettingPriorities/EcoregionalReports/Documents/Cook_Inlet_Ecoregional_Assessment.pdf. Accessed August 2019.

Toniolo, H, J. Stutzke, A. Lai, E. Youcha, T. Tschetter, D. Vas, J. Keech, and K. Irving. 2017. Antecedent Conditions and Damage Caused by 2015 Spring Flooding on the Sagavanirktok River, Alaska. J. Cold Reg. Eng. 31(2): 05017001.

U.S. Environmental Protection Agency (USEPA). 2015. Connectivity of streams and wetlands to downstream waters: A review and synthesis of the scientific evidence (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-14/475F. https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=296414

U.S. Fish and Wildlife Service (USFWS). 2019. Fish passage design guidelines. U.S. Fish and Wildlife Service, Alaska Fish Passage Program, Revision 2, March 21, 2019. Available at Whats New: https://www.akfishhabitat.org/.

U.S. Forest Service (USFS), Stream-Simulation Working Group. 2008. Stream simulation: an ecological approach to providing passage for aquatic organisms at road-stream crossings. 0877 1801P. San Dimas Technology and Development Center, CA. https://www.fs.fed.us/eng/pubs/pdf/StreamSimulation/hi_res/%20FullDoc.pdf.

U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service (USFS et al.). 2010. Federal land managers' air quality related values work group (FLAG): phase I report – revised (2010). Natural Resource Report NPS/NRPC/NRR – 2010/232. National Park Service, Denver, Colorado. Available at: https://www.rosemonteis.us/sites/default/files/references/016592.pdf.

FA3 - Department of the Interior (cont'd)

Viereck, L.A., C.T. Dyrness, A.R. Batten, K.J. Wenzlick. 1992. The Alaska vegetation classification. Gen. Tech. Rep. PNW-GTR-286. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 278 p. https://doi.org/10.2737/PNW-GTR-286

Wilson, R.R., L.S. Parrett, K. Joly, and J.R. Dau. 2016. Effects of roads on individual caribou movements during migration. Biological Conservation. 195 (2016):2-8. https://doi.org/10.1016/j.biocon.2015.12.035

WorleyParsons. 2018. Onshore Geohazard Assessment Methodology and Results Summary. Included in response to Information Request No. 64 filed July 27, 2018. Prepared by WorleyParsons for AGDC. Docket No. CP17178-000; Accession No. 20180727-5049.

Suggested Edits	Comment	Full Citation / References	
There are no new access roads shown on the Denali Alternative Route project footprint maps included in AGDC's 8/16/19 Project Description Change Notification. If the maps are correct, there should be **0 miles of new access roads listed for the Denali Alternative in Table 3.6.2-1.**	If the number of miles of access roads listed in Table 3.6.2-1 changes to zero, the length of new access roads stated on page 3-25 would also change. Current text states, "It would reduce the length of new access roads by 1.9 miles...."		FA3-55
(NOTE: text in red font indicates new language to be added to the FEIS. Denali National Park and Preserve is referred to as DNPP as it was in the DEIS.) Please insert the following description of long-term recreational impacts in addition to the temporary impacts described in this paragraph: "This area of DNPP has been proposed for recreational trail development since 1997. The introduction of a pipeline corridor would alter the range of options available to the NPS for planning recreational opportunities in this area, including trails."	The discussion of recreational impacts on page 3-24 deals only with temporary impacts from construction, such as traffic delays. There would also be long-term impacts from the Denali Alternative on the choices that the NPS has for providing recreational opportunities on park lands between the George Parks Highway and the Nenana River. Because this location is easily accessible and not within the designated wilderness area, it is very attractive for trail, campground, and other recreational facility development. Construction of a pipeline in the same area would permanently alter the recreational experience and management options available to the NPS in this area.	National Park Service. 1997. Final Entrance Area and Road Corridor Development Concept Plan/ Environmental Impact Statement, Denali National Park and Preserve, Alaska. Denver Service Center, National Park Service, U.S. Department of the Interior.	FA3-56
"AGDC has developed a Project Pipeline Operation and Maintenance Plan that describes operational monitoring methods that would be used on the Mainline Pipeline to determine if altering conditions (including permafrost changes) create an unacceptable risk to the pipeline or to adjacent permafrost along the Denali alignment if it is being affected by the pipeline's temperature."	Monitoring should include assessing risk to natural and cultural resources, including soil and groundcover, due to permafrost changes along the Denali alignment.		FA3-57
Among the adaptive management techniques listed to address changes due to permafrost thawing, please include adjustment of pipeline gas temperatures to match ground temperatures to the extent possible.	The DEIS states on page 4-104: "The Gas Control Center would control gas temperature during operation of Mainline Facilities by heating and/or cooling gas at compressor and heater stations to maintain the geographic temperatures outlined above. This would include adjusting gas temperatures for seasonal variations in discontinuous permafrost areas to match ground temperatures to the extent possible." This technique should be reflected in the list of potential adaptive management techniques on page 4-105.		FA3-58

FA3-55 Table 3.6.2-1 of the final EIS has been updated to address this comment.

FA3-56 Section 3.6.2 of the final EIS has been updated to address this comment.

FA3-57 Additional requirements for operational monitoring on NPS lands could be included as conditions in the right-of-way permit for the Project issued by the NPS.

FA3-58 Section 4.2.5.2 of the final EIS has been updated to address this comment.

FA3 - Department of the Interior (cont'd)

Suggested Edits	Comment	Full Citation / References	
Please add the following sentence at the end of the revegetation paragraph quoted at left: "In addition, revegetation in DNPP would be done in consultation with the NPS, following NPS guidelines and specifications (NPS 2006, Densmore et al. 2000)."	This clarification should be added with the Denali Alternative as the proposed action.	NPS 2006. Management policies 2006. U.S. Department of the Interior, National Park Service, Washington, D.C. Densmore, R.V., M.E. Vander Meer, N.G. Dunkle, 2000. Native Plant Revegetation Manual for Denali National Park and Preserve. Information and Technology Report. USGS/BRD/ ITR-2000-006. USGS Alaska Science Center, Anchorage, Alaska. March 2000.	FA3-59
As the Denali Alternative has been selected as the proposed alignment, please include the NPS in references to authorizations for managing non-native invasive species on federal lands: "The federal Noxious Weed Act and Executive Order 13112 would apply to Project activities on BLM and NPS lands. The Carlson-Foley Act of 1968 (43 USC 1241-1243) further authorizes the BLM and the NPS to manage noxious weeds and coordinate with other federal and state agencies in managing noxious weeds on federal lands."			FA3-60
Please add a requirement that non-native invasive species management in DNPP would follow NPS guidelines and stipulations.	This clarification should be added with the Denali Alternative as the proposed action.		FA3-61

FA3-59 Section 4.5.2.3 of the final EIS has been updated to address this comment.

FA3-60 Section 4.5.8.1 of the final EIS has been updated to address this comment.

FA3-61 Section 4.5.8.1 of the final EIS has been updated to address this comment.

FA3 - Department of the Interior (cont'd)

Suggested Edits	Comment	Full Citation / References	
"A waiver of the clearing restriction would need to come from FERC, based on any input provided by the USFWS, in consultation with the responsible land management agency."	Section VII.A.5 of FERC's Plan prohibits applicants from conducting vegetation mowing or clearing for right-of-way maintenance in the migratory bird nesting season, unless specifically approved in writing by the responsible land management agency or USFWS. Table 4.6.2-3 indicates that the recommended timelines for avoiding vegetation clearing should be adapted to local conditions, including avoiding disturbance of early- and late-nesting bird species. Land management agencies should be consulted in addition to the USFWS prior to waiving vegetation clearing restrictions, in part due to their in-depth knowledge of avian populations on the lands they manage.		FA3-62
Please add the following bullet point: "design buildings and facility modules to reduce the reflectivity of glass and other reflective surfaces"		Loss, S. R., T. Will, S. S. Loss, and P. P. Marra. 2014. Bird-building collisions in the United States: Estimates of annual mortality and species vulnerability. The Condor: Ornithological Applications 116: 8-23. USFWS 2016 Report. Reducing bird collisions with buildings and building glass best practices. Division of Migratory Bird Management, Falls Church, VA. pgs 1-17.	FA3-63
As the Denali Alternative was selected as the proposed route, please change the wording of this section to require consultation with NPS regarding minimizing impacts on access to resources and recreational opportunities **prior to** construction.	Please also include mitigation of impacts on access to the planned Nenana River Trail because the trail could be built before pipeline construction begins. The trail would traverse the area of DNPP between the George Parks Highway and the Nenana River.		FA3-64
Not Applicable	If the Denali Alternative alignment is changed and includes any previously unsurveyed areas, **an additional cultural resource survey would be needed for the new** alignment.		FA3-65

FA3-62 Section 4.6.2.3 of the final EIS has been updated to address this comment.

FA3-63 Section 4.6.2.3 of the final EIS has been updated to address this comment.

FA3-64 Section 4.9.4.1 of the final EIS has been revised to address this comment.

FA3-65 Comment noted.

CC-269

FA3 - Department of the Interior (cont'd)

Suggested Edits	Comment	Full Citation / References	
Please add a table including the type(s) of aircraft and expected duration of flight time that will occur along the pipeline corridor on a typical day.	On page 4-941 the DEIS cites the DNPP Backcountry Management Plan, which contains noise standards such as maximum sound levels and percentage of time motorized noise may be audible in the backcountry. Information on helicopter type and flight duration would allow the NPS to assess compliance with the Backcountry Management Plan and the 2006 NPS Soundscape Management Policy. Using previously collected data we estimate that helicopters can be detected within a 10 kilometer radius of helipads at multiple locations. Two are within audible distance of Gates of the Arctic National Park & Preserve (MLV6, Coldfoot Compressor Station) and seven within audible distance of DNPP (Healy Compressor Station, MLV16, MLV17, MLV18, MLV19, Honolulu Creek Compressor Station, MLV22). Each of these locations should be included in the table.	NPS 2006. Management Policies 2006. U.S. Department of the Interior, National Park Service, Washington, D.C. NPS 2006. Denali National Park and Preserve Backcountry Management Plan. Denali Park, AK. https://parkplanning.nps.gov/documentsList.cfm?projectID=10016	FA3-66
In Table 4.16.3-4 and throughout section 4.16, predicted increases in ambient noise levels are calculated incorrectly. **Ambient sound levels should be reported using Leq, and the differences should be recalculated.** The correct values for this table would be: Existing Ambient Leq (dBA) = **45.6** Predicted Increase in Ambient Noise Level (dB) = **16.0**	**Ambient sound levels should be reported as Leq throughout the EIS, and difference calculations should be updated. This includes sections 4.6.1.3, 4.16.3.1, Table 4.16.3-1, Table 4.16.3-2, Table 4.16.3-3, Table 4.16.3-4, Table 4.16.3-5, 4.16.4.1, Table 4.16.4-2, and Table 4.16.4-3.** The only accepted use of the day-night level (Ldn) metric within the field of acoustics is to apply a 10 dB penalty to night-time noise added to an environment as the result of an action. This is because Ldn reflects that urban communities are typically 10 dBA quieter at night than during the day and so changes will be more obvious/annoying/disruptive at night. Using Ldn to penalize the existing ambient noise levels is redundant: field measurements already document the conditions that occur at night. Reporting ambient levels as Ldn incorporates a significant, undue bias into every analysis of this type presented in the document. In the case of Table 4.16.3-4, the bias results in a 6.0 dB difference. This means the DEIS reports the difference to be only half as large as it actually would be.	Rossing, T. ed., 2007. Springer handbook of acoustics. Springer Science & Business Media.	FA3-67
"If the noise attributable to operation of all equipment at the Coldfoot and Healy Compressor Stations under interim or full horsepower load conditions exceeds an Ldn of 55 dBA at any nearby NSAs or exceeds an Leq, 1s of 40 dB at the boundary of DNPP (*section 4.16.2.1*), AGDC shall file a report on what changes are needed and shall install the additional noise controls to meet the acceptable level within 1 year of the in-service date."	Thank you for acknowledging NPS management policies and plans in the DEIS. The Denali Backcountry Management Plan Zone B is adjacent to the Healy Compressor Station. Compressor noise that exceeds the numeric management standard for the area (an Leq, 1s of 40 dB) also indicates that additional noise controls would be required. Analogous text in section 4.16.4.2 regarding the Coldfoot and Healy Compressor stations should also be updated.	NPS 2006. Denali National Park and Preserve Backcountry Management Plan. Denali Park, AK. https://parkplanning.nps.gov/documentsList.cfm?projectID=10016	FA3-68
Simulation images should be presented in a larger format to adequately convey the predicted visual impacts of the project. **Panoramic Visual Simulation images should be high resolution, approximately 13 inches wide by 4.5 inches high.**			FA3-69

FA3-66 AGDC has not identified the types of helicopters or the expected duration of flight times that would occur along the Mainline Pipeline corridor on a typical day. No helipads would be constructed within the DNPP.

FA3-67 Both the ambient sound levels and the predicted operational sound levels are presented as a day-night sound level (Ldn), both of which include the nighttime penalty. Therefore, the predicted increase in decibels over existing conditions accounts for the penalty on both ambient and facility sound. Based on comments received from the NPS, background sound levels and Project noise levels are presented as L_{50} for areas near the Healy Compressor Station.

FA3-68 Comment noted. See the updates to section 4.16.4.2 of the final EIS.

FA3-69 Comment noted. We conclude that higher-resolution simulations are not needed to assess effect for the purposes of the EIS and would not change our significance determinations for visual resources. The NPS could request higher-resolution versions from AGDC as part of NPS' permitting and right-of-way process for the Project.

FA3 - Department of the Interior (cont'd)

Suggested Edits	Comment	Full Citation / References	
In the Denali Alternative alignment, the pipeline would be aboveground where it crosses the Park Road Fault, near the intersection of the George Parks Highway and the Park Road. None of the visual simulations show the aboveground section of the pipeline, although it would be visible from the Mount Healy Overlook Trail Summit, Government Hill, and Parks Highway Intersection KOPs. **Please include visual simulations of these KOPs that depict the aboveground section of the pipeline.**			FA3-70
Project footprint maps of the proposed Denali Alternative indicate that the pipeline corridor would be adjacent to the highway to the south of the west-east highway crossing, within view of the Nenana River Pedestrian Bridge KOP. **The visual simulations should show a long swath of cleared vegetation adjacent to the highway as far south as the highway can be seen from the KOP.** It is unlikely that any screening trees would remain in this area between the highway and the pipeline corridor after construction.	With the Denali Alternative as the proposed alignment, the NPS would work with the applicant to identify feasible visual resource mitigations in this area, including the potential to retain screening trees.		FA3-71
For KOPs with deciduous screening vegetation between the KOP and the pipeline, **the winter simulations should more accurately show that screening is less effective when leaves are off the trees and shrubs.**			FA3-72

FA3-70 Section 4.10.2.2 and appendix S of the final EIS have been revised to incorporate updated simulations and analysis for the locations identified in this comment.

FA3-71 Comment noted. It is our understanding that AGDC worked with the NPS to identify KOPs and locations for visual simulations along the Denali Alternative (now the proposed route). The simulations provided in appendix E of the draft EIS as part of our alternatives analysis have been incorporated into appendix S of the final EIS for our evaluation of Project effects on visual resources. Our significance determinations for Project effects on visual resources, including those within and near the DNPP, are based on these simulations. As indicated in the comment, NPS would work with AGDC to identify feasible mitigation measures along the Parks Highway, including the potential to retain screening trees.

FA3-72 Comment noted. We conclude that revised winter simulations are not needed to assess effect and would not change our significance determinations for visual resources. The NPS could request revised versions from AGDC as part of NPS' permitting and right-of-way process for the Project.

Suggested Edits	Comment	Full Citation / References	
Prior to construction, AGDC shall file with the Secretary, for the review and written approval of the Director of the OEP, a Visibility and Deposition Air Quality Mitigation Plan ~~a Class I and Sensitive Class II Mitigation Plan~~ developed in consultation with the FLMs and ADEC to reduce operational emissions of NOx and SOx associated with the GTP, Mainline Facilities, and Liquefaction Facilities to ensure that the predicted visibility impacts and deposition impacts are below the associated ~~NPS~~ FLM thresholds. The Plan shall demonstrate this by including all relevant data, such as updated impact tables, applicable enforcement mechanisms, BACT information provided to ADEC and FLMs, and a narrative discussing any additional	We agree with FERC's conclusion that emissions from AK LNG associated facilities would contribute to visibility and nitrogen deposition impacts in nearby units of the National Park System particularly for DNPP and Lake Clark National Park & Preserve (NPP), and that mitigation in the form of improved emission controls is necessary to alleviate these impacts. As such, we support FERC's inclusion of Requirement # 72 presented in Chapter 5.0, with the suggested changes which would strengthen and clarify the requirement (see column to the left). We recommend that corollary language in Chapter 4 on page 4-937 is also revised to reflect the recommended changes and throughout the document wherever reference is made to the "Class I and Sensitive Class II Mitigation Plan." We appreciate FERC's initiative to collaborate with the NPS to address predicted impacts to units of the National Park System. Reductions in ongoing operational emissions may be achievable for all AK LNG facilities, including the mainline facilities subject to minor source permitting requirements as well as the two major Prevention Significant Deterioration (PSD) sources (GTP and liquefaction facility). Reductions in the emission limitations for these facilities would ensure the project moves forward in a more environmentally responsible manner by protecting park resources and values.		FA3-73
mitigation measures or emission limitations achieved at other similar facilities which are lower than those initially proposed by AGDC. (Section 4.15.5.3)	We note that we have conducted our own preliminary CALPUFF assessment of the liquefaction facility plus all compressor and heater stations within the existing CALPUFF modeling domain. These preliminary results indicate that nitrogen deposition is a significant concern in DNPP and Lake Clark NPP. In the maximum modeled meteorological year (2002), nitrogen deposition is 0.0133 kg/ha/yr or 166.5% of the nitrogen Deposition Analysis Threshold (DAT) at DNPP and is 0.0130 kg/ha/yr or 159.8% of the nitrogen DAT at Lake Clark NPP. As noted in the DEIS analysis, "… in natural environments, nitrogen deposition can result in harmful nitrogen fertilization. Excess nitrogen can disrupt nutrient cycling in the ecosystem and create competitive advantages for some species at the expense of others. This can lead to shifts in species composition and declines in biodiversity, particularly for lichen species, which are important for wildlife forage and habitat in Alaska. Changes related to nitrogen deposition can also stress vegetation, leading to increases in disease and insect outbreaks." The NPS results support and supplement the analyses presented in the DEIS and underscore the need for additional NOx emission reductions called for in proposed Requirement #72.		
Not Applicable	We agree with FERC's inclusion of requirement #70 to complete "revised CALPUFF air dispersion modeling for the GTP, Mainline Facilities, and Liquefaction Facilities that includes the modeled source (e.g., LNG Plant) and all other air emission generating sources proposed by AGDC associated with the Project," as it fully discloses project impacts and supports the need for reduced emissions. See comment above regarding preliminary NPS modeling results.		FA3-74
Delete Statement	Please remove this statement from the document. An "AQRV impact analysis" is a term specific to air quality regulations that refers to an environmental effects or environmental impacts assessment, and these air quality assessments <u>are also required under the provisions of NEPA</u>. Environmental impacts to be considered under NEPA include impacts to Nationally Designated Protected Areas, such as units of the National Park System, regardless of their status under the Clean Air Act.		FA3-75

FA3-73 Comment noted.

FA3-74 Comment noted.

FA3-75 Section 4.15.3.1 of the final EIS acknowledges that an AQRV impact analysis is required by PSD permitting for Class I areas; an analysis for Class II nationally designated protected areas was provided to more fully disclose Project impacts.

FA3 - Department of the Interior (cont'd)

Suggested Edits	Comment	Full Citation / References	
NPS Deposition Analysis Thresholds	Please remove the term "Class I" from this and all other tables in the document that refer to the DAT. The DAT is an environmental threshold used to determine whether the impact of an air pollution source is insignificant and is irrespective of the area's status under the CAA. (See https://irma.nps.gov/DataStore/Reference/Profile/2180652.)	U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service. 2011. Federal land managers' interagency guidance for nitrogen and sulfur deposition analyses: November 2011. Natural Resource Report NPS/NRSS/ARD/NRR-2011/465. National Park Service, Denver, Colorado. https://irma.nps.gov/DataStore/Reference/Profile/2180652	FA3-76
	The analysis disclosed maximum flaring event modeling results for National Ambient Air Quality Standards (NAAQS) and air toxics exposure impacts. A maximum flare modeling analysis should also be disclosed for visibility and deposition impacts per analysis recommendations in FERC requirement #70.		FA3-77
AGDC has not yet submitted Minor NSR permit applications for the eight compressor stations and the heater station, and has stated that these applications are currently under development. AGDC would apply for a Title V operating permit within 180 days of commencing operation at each station. The facility permits should consider any emission limitations agreed to under the mitigation plan called for by FERC Requirement #72.	Note, per recommended mitigation requirement 72, the proponent should consider whether lower NO_x emissions can be achieved at the mainline compressor and heater stations prior to constructing and finalizing minor source construction permits and associated Title V Operating Permits.		FA3-78
Not Applicable	Alaska LNG Resource Report No. 9 states: "*As noted in Section 6.5 above, CALPUFF uses measurements of background ammonia concentrations to estimate secondary particulate formation which contributes to the amount of regional haze and visibility degradation predicted by the model. CALPUFF simulates each modeled source individually; thus, the background ammonia concentration is assumed by the model to be fully available to react with emissions from each source. This can lead to the model overestimating secondary particulate formation and regional haze impacts because, in reality, the total emissions from the combination of emission units compete for the available ammonia. Therefore actual secondary particulate formation would be less due to less background ammonia availability. Despite the inherent conservatism in the model, far-field cumulative regional haze impacts were determined by conventional utilization of CALPUFF.* *Regional haze impacts due to the Liquefaction Facility were refined by subtracting the offsite regional haze impact from the cumulative regional haze impact, as shown below. This was accomplished by conventional utilization of CALPUFF for the cumulative and existing source groups noted below and post-processing using the POSTUTIL program.*"		FA3-79

FA3-76 Section 4.15.5 of the final EIS has been updated to address this comment.

FA3-77 The revised modeling filed by AGDC on September 25, 2019 in response to Staff Recommendation 70 of the draft EIS (Accession No. 20190925-5027) was based on normal operation of the GTP and Liquefaction Facilities, including flare events. We recommend that if additional analysis is needed, it should be included as part of the analysis associated with the PSD permitting of the GTP and Liquefaction Facilities.

FA3-78 The GTP and Liquefaction Facilities are currently undergoing PSD permitting by ADEC, which provides additional opportunity to incorporate enforceable mitigation measures, if needed, based on input from FLMs. Additional mitigation measures may be identified during the PSD permitting process to further minimize predicted visibility and deposition impacts on Class I and Class II nationally designated protected areas.

FA3-79 The air quality modeling was developed by AGDC using a modeling protocol reviewed by multiple agencies, including ADEC. On August 15, 2018, AGDC filed the modeling protocol along with agency feedback and an explanation of how agency feedback was incorporated into the protocol and report in response to question 279 of our EIR dated February 12, 2018 (Accession No. 20180815-5078). If additional refinement to the air quality modeling analysis is needed, we recommend that this be included as part of the PSD permitting of the GTP and Liquefaction Facilities currently underway by ADEC.

FA3 - Department of the Interior (cont'd)

Suggested Edits	Comment	Full Citation / References	
	We have previously commented that the subtraction method is an inappropriate application of the CALPUFF modeling system for single-source analyses for several reasons. First, the background ammonia value included in the CALPUFF model is meant to represent ambient background ammonia concentrations. Presumably, the background ammonia concentration should represent what is available after reaction with existing pollutants from existing sources, as it is by definition, ambient ammonia. Second, the application of POSTUTIL with the MNITRATE=1 is to prevent overlapping puffs in a given CALPUFF cell from using all available ammonia in that particular cell. In other words, this switch repartitions the available ammonia among the puffs present in the cell to prevent over estimation of particulate nitrate formation. Direct impacts of the Liquefaction Facility alone should be modeled in a single CALPUFF modeling run, as this is how the model was intended to be used for single source applications. It is unclear whether this issue was ever corrected, or if it is relevant to the results reported in the DEIS, but given the reporting of results, it is assumed the issue is still relevant. Please clarify this in the document and correct the issue in subsequent modeling performed pursuant to recommended requirement 70.		FA3-79
We also recommend that AGDC file ~~a Class I and Sensitive Class II~~ a Visibility and Deposition Air Quality Mitigation Plan, developed in consultation with FLMs and ADEC, to reduce operational emissions to ensure that the predicted visibility and deposition impacts at Class I and II areas are below NPS thresholds.	Please see Comment #19 above and revise accordingly.		FA3-80

FA3-80 Comment noted.

CC-274

FA3 - Department of the Interior (cont'd)

Enclosure 3: National Park Service Comments on Alaska LNG Pipeline Draft EIS and Associated References

Literature Cited

Densmore, R.V., M.E. Vander Meer, and N.G. Dunkle, 2000. Native Plant Revegetation Manual for Denali National Park and Preserve. Information and Technology Report. USGS/BRD/ ITR-2000-006. USGS Alaska Science Center, Anchorage, Alaska. March 2000.

Loss, S. R., T. Will, S. S. Loss, and P. P. Marra. 2014. Bird-building collisions in the United States: Estimates of annual mortality and species vulnerability. The Condor: Ornithological Applications 116: 8-23.

National Park Service. 1997. Final Entrance Area and Road Corridor Development Concept Plan/ Environmental Impact Statement, Denali National Park and Preserve, Alaska. Denver Service Center, National Park Service, U.S. Department of the Interior.

National Park Service. 2006. Denali National Park and Preserve Backcountry Management Plan. Denali Park, AK. https://parkplanning.nps.gov/documentsList.cfm?projectID=10016

National Park Service. 2006. Management Policies. U.S. Department of the Interior, National Park Service, Washington, D.C.

Rossing, T.D., editor. 2007. Springer Handbook of Acoustics. Springer Science & Business Media, LLC.

U.S. Fish and Wildlife Service. 2016. Reducing bird collisions with buildings and building glass best practices. U.S. Fish and Wildlife Service Division of Migratory Bird Management, Falls Church, VA. Report. Pgs 1-17.

U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service. 2011. Federal land managers' interagency guidance for nitrogen and sulfur deposition analyses: November 2011. Natural Resource Report NPS/NRSS/ARD/NRR-2011/465. National Park Service, Denver, Colorado.

Enclosure 4: BLM Specific Comments – Alaska LNG Draft EIS

NUMBER	DOCUMENT TITLE	DOCUMENT SECTION	DOCUMENT PAGE	COMMENT	
1.	Appendix S Visual Resources	Table S-1	5	The Sag [Sagavanirktok] River Overlook and Happy Valley Wayside are on state lands. The BLM has interpretive panels at these locations but the lands were conveyed to the state many years ago.	FA3-81
2.	Appendix S Visual Resources ACRONYMS AND ABBREVIATIONS		14	Add any missing acronyms used in Appendix S to the List of Acronyms page.	FA3-82
3.	Appendix S Visual Resources - KOP 3, KOP 10, and KOP 11	Project Activities Generating Impacts	S-10, S-18, S-20	Mitigation measures that have the potential to alter the landscape should blend in with the surrounding landscape and match color, form, line and texture.	FA3-83
4.	Appendix S Visual Resources - KOP 5: Atigun Pass and KOP 6: Base of Atigun Pass	Visual Impacts During Operation	S-12 S-13	This states that the Revegetation Plan will be followed. The Revegetation Plan is still in draft form. The Revegetation Plan should state that where there is currently no vegetation or minimal vegetation, no new vegetation will be introduced that create contrasts to the existing visuals of the area.	FA3-84
5.	02 Alaska LNG DEIS Volume 2	4.7 Aquatic Resources	4-396	The Kanuti River provides anadromous habitat downstream of the pipeline crossing.	FA3-85
6.	02 Alaska LNG DEIS Volume 2	4.7 Aquatic Resources	4-396	The genus species of inconnu/sheefish is *Stenodus leucichthys*	FA3-86
7.	02 Alaska LNG DEIS Volume 2	4.7 Aquatic Resources	4-396	Lingcod (*Ophiodon elongatus*) are a marine species and are not found in the Tanana River.	FA3-87
8.	Alaska LNG Project Draft EIS	4.3.1.5 Impacts and Mitigation - Groundwater Quality	4-125	Paragraph 3 lists the contents of an SPCC prepared by the AGDC for this Draft EIS. The plan is not appended to the Draft EIS and therefore in not available for review. As part of the comment resolution process for the Preliminary Draft EIS, it was agreed that the SPCC would be referred to as an SPCC template because that version of the plan was missing significant required sections. It is recommended that either the text in this paragraph be revised to reference a template SPCC or provide the plan for review.	FA3-88

FA3-81 Appendix S of the final EIS has been updated to address this comment.

FA3-82 Appendix S of the final EIS has been updated to address this comment.

FA3-83 Section 4.10.2 of the final EIS has been updated to address this comment.

FA3-84 Section 4.10.2 and appendix S of the final EIS have been updated to address this comment.

FA3-85 Section 4.7.1.2 of the final EIS has been updated to address this comment.

FA3-86 Section 4.7.1.2 of the final EIS has been updated to address this comment.

FA3-87 Section 4.7.1.2 of the final EIS has been updated to address this comment.

FA3-88 Instructions for accessing AGDC's SPCC Plan were provided in table 2.2-1 of the draft EIS and likewise are provided in table 2.2-1 of the final EIS. Also see the response to comment CM6-4.

Enclosure 4: BLM Specific Comments – Alaska LNG Draft EIS

9.	Alaska LNG Project Draft EIS	4.4.2 General Impacts and Mitigation	4-229	The first paragraph indicates that, "Adherence to the fueling, storage, containment, and cleanup measures discussed in the Project Procedures and SPCC Plan would decrease the potential for an incidental release into wetlands and reduce the impacts if a release should occur." The Project Procedures Plan is not appended to the Draft EIS and therefore is not available for review. It is recognized that facility specific SPCCs will be developed. However, the current SPCC is incomplete and should be referenced as a template SPCC.	FA3-89
10.	Alaska LNG Project Draft EIS	4.5.2.2 Disturbance	4-250	Paragraph 4 briefly discusses potential impacts of spills on vegetation. The general SPCC is described as a template and future facility specific SPCCs are included in the text. The Project Waste Management Plan, not appended to the Draft EIS is also referenced as a source of procedures to be applied in preventing or minimizing potential damage to the environment via spills.	FA3-90
11.	Alaska LNG Project Draft EIS	4.9.6.3 Impacts and Mitigation - Project Generated Waste	4-550	All of the plans listed in previous comments as not appended to the Draft EIS and thus not available for review are provided as references in Section 4.9.6 that contains much of the information on spill mitigation and waste management applicable to the facilities included in this project. Therefore, it's not possible to verify the adequacy of these plans, as they pertain to the entire project.	FA3-91
12.	Alaska LNG DEIS Volume 1	4.1.3.10	4-42	Not considering the impacts of climate change, especially for areas underlain by permafrost, is certain to underestimate the impacts of some actions. This should at least be acknowledged in the text.	FA3-92
13.	Alaska LNG DEIS Volume 1	4.1.3.10	4-43	The lack of locations, equipment, and implementation techniques of mitigation measures does not allow for a robust analysis of impacts	FA3-93
14.	Alaska LNG DEIS Volume 1	4.2.2.1	4-69	Not considering the impacts of climate change on permafrost and permafrost alterations does not adequately convey potential future impacts. Given the visibility of permafrost degradation to residents of interior and northern Alaska, there should be some discussion and analysis in the Final EIS.	FA3-94
15.	Alaska LNG DEIS Volume 2	4.7.1.6	4-405	The description of fuel storage and refueling activities is inconsistent with the required stipulations established in the Utility Corridor RMP. The BLM Recommended Mitigation Measure 4 will	FA3-95

FA3-89 Instructions for accessing the Project Procedures were provided in table 2.2-1 of the draft EIS and likewise are provided in table 2.2-1 of the final EIS. See the responses to comments FA3-88 and CM6-4.

FA3-90 Instructions for accessing the Project Waste Management Plan were provided in table 2.2-1 of the draft EIS and likewise are provided in table 2.2-1 of the final EIS. See the responses to comments FA3-88 and CM6-4.

FA3-91 Instructions for accessing these plans were provided in table 2.2-1 of the draft EIS and likewise are provided in table 2.2-1 of the final EIS.

FA3-92 The potential impacts of climate change on permafrost related to the Mainline Pipeline are discussed in section 4.2.5.2 of the final EIS.

FA3-93 Comment noted.

FA3-94 The potential impacts of climate change on permafrost related to the Mainline Pipeline are discussed in section 4.2.5.2 of the final EIS.

FA3-95 Section 4.3.2.7 of the final EIS has been updated to address this comment.

Enclosure 4: BLM Specific Comments – Alaska LNG Draft EIS

				allow for fueling within a floodplain provided the fuel containment system is designed appropriately for the hydrologic conditions.	FA3-95
16.	Alaska LNG DEIS Volume 2	4.7.1.6	4-408	While the impacts of road crossings may be localized, the impacts up and downstream are frequently not minor. Changes in sediment regime upstream and downstream of road crossings can be considerable and long lasting.	FA3-96
17.	Alaska LNG DEIS Volume 2	4.7.1.6	4-415	While the impacts of spills may be localized, the impacts have the potential to be anything but "minor" in that localized area. This should be reflected in the analysis.	FA3-97
18.	Alaska LNG DEIS Volume 2	4.7.1.6	4-415	Using the words "minor" and "death" in the same sentence does not seem to adequately convey impacts to the public.	FA3-98
19.	Alaska LNG DEIS Volume 2	4.7.1	4-389	Given the lack of surveys within the project area, and no details on how it was determined that flow was insufficient to support fish, it should be assumed that all non-surveyed areas are fish bearing until surveyed to show otherwise.	FA3-99
20.	Alaska LNG DEIS Volume 2	4.9.1.2	4-513	The comparison of the acres of open land affected by the project to the acreage of all lands in Alaska does not provide the reader with a useful context. Using a metric such as the acreage of open land within the utility corridor would be more meaningful.	FA3-100
21.	Alaska LNG DEIS Volume 2	4.9.1.2	4-514	The Draft EIS states "Although AGDC states that the Alaska Forest Resources and Practices Act (AS 41.17) is not applicable to the Project." It is unusual to allow the applicant to determine which regulations are applicable to their projects, and is likely to raise public objections. The Final EIS should state whether the Alaska Department of Natural Resources, Division of Forestry, considers AS 41.17 to be applicable.	FA3-101
22.	Alaska LNG DEIS Volume 2	4.9.1.2	4-515	The administrative Draft EIS stated that "Mainline Facilities would affect 40 acres of open water", whereas the Draft EIS estimates impacts at 264 acres. It is not evident where the increase comes from nor which water bodies are affected. Please explain the six-fold increase and whether the increased acreage has been propagated into the cumulative impacts analysis.	FA3-102

FA3-96 As described in section 4.7.1.6 of the final EIS, with the implementation of properly sized culverts and mitigation measures to reduce the introduction of sediment into watercourses, impacts from sediment regime changes would be minimized.

FA3-97 The impacts on fisheries from any given spill would vary based on the size of the spill, the material spilled, the habitat in which the spill occurs, and the distance in which the spill travels within a waterbody. With the implementation of the mitigation measures discussed in section 4.7.1.6 of the final EIS, we concluded that impacts from spills on fisheries would be minimized.

FA3-98 Comment noted.

FA3-99 As discussed in section 4.7.1 of the final EIS, prior to construction, AGDC would conduct fish surveys at waterbodies where fish survey data are not available within 290 feet of the current pipeline crossing location.

FA3-100 The information provided is based on publicly available data. We conclude that this information is sufficient for our significance determinations. BLM could request additional information from AGDC as part of BLM's' permitting and right-of-way process for the Project.

FA3-101 In comments on the draft EIS (specifically comment SA2-249), the Alaska Division of Forestry concurred with this statement and indicated that it supports AGDC's use of BMPs consistent with those of the Alaska Forest Resources Practices Act.

FA3-102 The final EIS has been revised to reflect the most up-to-date impact acreages for the Project. None of the revisions from the draft EIS to the final EIS changed our overall conclusions regarding the Project. Section 4.3 of the final EIS and its associated appendices provide details on the specific waterbodies that would be affected by the Project.

FA3 - Department of the Interior (cont'd)

Enclosure 4: BLM Specific Comments – Alaska LNG Draft EIS

23.	Alaska LNG DEIS Volume 2	4.9.1.2	4-516	As was previously commented, information provided on reclamation (especially regarding riparian vegetation) indicates that impacts would be long-lasting and potentially have impacts on water quality that extend beyond "minor and temporary"	FA3-103
24.	Alaska LNG DEIS Appendix D	VI.D.2		Depending upon the type of intended aircraft, the size stated for helicopter landing zones (170'x300') may be excessive and could result in unnecessary vegetation clearing. Department of Interior guidelines for a helispot call for a safety circle of 110 feet with a 30'x30' touchdown pad for Type I helicopters, with smaller LZ requirements for Type II and Type III helicopters.	FA3-104
25.	Volume 1	2.2.2.4	2-71 and GLOBAL	VEGETATION CLEARING AND MIGRATORY BIRDS: Although the following is stated here: "Vegetation clearing would be conducted in accordance with the clearing windows identified in the Project Migratory Bird Conservation Plan," information that does not support this assertion is found in various places throughout the document. In keeping with our policy on special status species (SSS) the BLM may require that nest surveys are conducted prior to clearing within the nesting periods. Since a current Project Migratory Bird Conservation Plan has not been provided it is difficult to determine whether impacts on avian species (esp. SSS) would be significant. A definitive assessment cannot be made regarding impacts until the final plan is provided including mitigation measures that would reduce impacts. ***Global: For avian species and throughout the document no calls on the significance of impacts on a given resource can be made until mitigation measures, as provided in final Plans or elsewhere, are finalized.***	FA3-105

FA3-103 Section 4.9 of the final EIS discusses uses of open water areas. Impacts on surface waters, wetlands, and vegetation are discussed in sections 4.3, 4.4, and 4.5 of the final EIS, respectively.

FA3-104 Comment noted.

FA3-105 Instructions for accessing the Project Migratory Bird Conservation Plan were provided in table 2.2-1 of the draft EIS and likewise are provided in table 2.2-1 of the final EIS. Additional mitigation measures for migratory birds could be included as conditions in the BLM's right-of-way grant for the Project. Also see the response to comment CM6-4.

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26.	Volume 1	2.2.2.3	2-70 and GLOBAL	The current wording about ice road impacts on vegetation does not address how compaction associated with work pad construction can damage and alter underlying vegetation and hydrology, regardless of construction techniques. Suitably constructed ice work pads can support heavy loads without permanent destruction of underlying vegetation. However, changes to underlying vegetation and hydrology within the entirety of the disturbance footprint AND the surrounding disturbance buffer would be apparent for an extended time period. Also, where mention of a disturbance footprint is made, the document should also acknowledge the likely spatial extent of the edge effect on the given resource.	FA3-106
27.	Volume 1	4.2.4	4-87	RECLAMATION/REVEGETATION TIMELINE: The length of this revegetation process could take decades depending on site specific factors, including ground ice content, ground temperature, thermal boundary conditions at the ground surface, and work pad material type and pad properties such as fines content, moisture content, thickness, and thermal conductivity.	FA3-107
28.	Volume 1	4.2.5.1	4-89	LACK OF RECLAMATION OF WORK PADS: The reclamation methods described for the Gas Treatment Plant (GTP) on page 4-90 should be applied to work pad reclamation. These methods would allow for speedier reclamation than that described for those sites (i.e. decades)- see section 4.2.4	FA3-108
29.	Volume 1	4.2.5.2	4-95 and GLOBAL	Regarding the separation of the surface organic layer, in the statement "AGDC has noted that conventional excavation equipment would not be able to fully separate frozen organics from the mineral soil underneath unless the active layer is thawed." and the related discussion, it is unclear why AGDC is maintaining that winter segregation of topsoil is not feasible or practicable. See the following INGAA Foundation document as reference to successful winter segregation: https://www.ingaa.org/File.aspx?id=21144 (pp 12). Also, why are other seasons not being considered for topsoil removal? ***Global: The***	FA3-109

FA3-106 Impacts on vegetation and hydrology from ice roads and pads are discussed in sections 4.5.2.2, 4.5.3.1, and 4.4.3.1 of the final EIS. Potential edge effects from the disturbance footprint are discussed in sections 4.5.2.2, 4.5.3.1, and 4.5.3.2 of the final EIS.

FA3-107 Comment noted. Most of the analysis related to revegetation is provided in section 4.5 of the final EIS.

FA3-108 Comment noted. Additional requirements for reclamation on BLM lands could be included as conditions in the BLM's right-of-way grant for the Project.

FA3-109 See the response to comment FA3-12.

				applicant should provide explanation of why organics can't be separated and stockpiled in the winter AND why other seasons (late summer, autumn) are not being considered as appropriate for clearing.	FA3-109
30.	Volume 1	4.2.5.2	4-96 thru 4-109 and GLOBAL	Interactions of soils, permafrost, hydrology, and vegetation effects need to be acknowledged. Currently these sections are not cross-referenced and are sometimes contradictory.	FA3-110
31.	Volume 1	4.2.5.2	4-112	BLASTING: The Draft EIS states "Blasting operations in permafrost would be conducted in the winter, which would dissipate any heating due to blasting or other conventional trenching construction methods." Additional blasting impacts are addressed later in the document (esp. under subsistence sections); cross-reference them here for consistency.	FA3-111
32.	Volume 2	4.6.1.2	4-285 AND GLOBAL	BLASTING AND NOISE: Impacts of blasting and noise are discussed here and in several other sections of the document, however these sections are not well-linked to one another and provide various incongruous information. Cross-reference all sections related to noise impacts and blasting and clearly define sensitive time periods (wildlife and hunting) to be avoided in the Plan. Conclusions about noise impact significance cannot be drawn until Plans/mitigation measures are finalized. Provide the Baseline Noise Level Report for review with plans if possible.	FA3-112
33.	Volume 2	4.6.1.2	4-297 and across species	WILDLIFE IMPACTS: There should be some mention of the link between increased predation and road/infrastructure (pad) berm height (see Roby 1978). Berm height should be mentioned as a general impact on other species (advantage to predator, disadvantage to prey species)	FA3-113

FA3-110 Section 4.2.5 of the final EIS has been updated to address this comment.

FA3-111 Section 4.2.5 of the final EIS has been updated to address this comment.

FA3-112 Section 4.6.1.2 of the final EIS discusses noise impacts specific to terrestrial wildlife, which differ from noise impacts on other resources, and identifies the measures that AGDC would implement to reduce noise impacts from blasting on terrestrial wildlife. Also see the response to comment CM6-4.

FA3-113 Section 4.6.1.2 of the final EIS has been updated to address this comment.

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34.	Volume 2	4.6.1.2	4-306	The reference to a 40-dBA isopleth in Volume 2 needs a citation/cross reference to Volume 3 where more detail is provided. Without that linkage there is no context to understand the information in Volume 2. Roby, D. D. 1978. Behavioral patterns of barren-ground caribou of the Central Arctic Herd adjacent to the Trans-Alaska Oil Pipeline. M.S. thesis, University of Alaska, Fairbanks. 200 pp.	FA3-114
35.	Volume 2	4.6.1.2	4-306 and GLOBAL	WILDLIFE HABITUATION: In regards to sheep in this section, as well as in other portions of the wildlife section, there are inferences that: "individuals [animals] would be expected to habituate" to human activity. This may be true in some cases but the extent to which it would occur would vary with species and individual animal. Unless there are concrete references that can be used to substantiate the assumption that habituation will occur (per species), assertions regarding this assumption should be stated as potential effects not presumed to be true.	FA3-115
36.	Volume 2	4.6.2	Global	BLM SSS: There is no mention in this section of the BLM policy on special status species. It would be expected to be mentioned in the section that describes fish and wildlife species of concern. This policy is what drives the special status species list and should be mentioned in this section. Policy and current list are both readily available on BLM websites. **UPDATE:** this information is provided in Section 4.8.2 which is appropriate, however it should be cross-referenced here (note: most SSS are avian species).	FA3-116
37.	Volume 2	4.6.2	Global	BIRDS AND OPEN PIPES: One bird-related mitigation measure that is not addressed in either the Draft EIS or the project plans is the need to prevent open pipes associated with all infrastructure. Open pipes provide attractive but dangerous habitat for nesting birds. Considerable information is available about this hazard. For instance: https://www.partnersinflight.org/resources/death-pipes/	FA3-117

FA3-114 Section 4.6.1.2 of the final EIS has been updated to address this comment.

FA3-115 Section 4.6.1.3 of the final EIS has been updated to address this comment. In most cases, our references to habituation are general statements regarding potential impacts on terrestrial wildlife.

FA3-116 Section 4.6.2.1 of the final EIS notes that BLM sensitive and watch list species are discussed in section 4.8.

FA3-117 Section 4.6.2.3 of the final EIS has been updated to address this comment.

FA3 - Department of the Interior (cont'd)

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38.	Volume 2	4.8.2.2	4-503	HAZING AND BLASTING: The Draft EIS states: "To reduce noise disturbance impacts on birds and small mammals from blasting, AGDC committed to performing non-lethal hazing to clear areas of wildlife prior to blasting" (see section 4.6.1). Response: As previously mentioned in another section, it would be best to avoid blasting during sensitive time periods for wildlife (e.g. lambing, calving, nesting) and subsistence hunting activities. Hazing animals is also energetically taxing and should be avoided. Provide alternate methods for avoiding noise impacts and describe these measures in the appropriate mitigation measures and plans.	FA3-118
39.	Volume 2	4.8.2.2	4-503	WATER WITHDRAWAL AND BIRD HABITAT: Water withdrawals section: Should also mention other species (esp. waterfowl and shore-nesting birds) whose habitat (esp. nesting) may be impacted.	FA3-119
40.	Volume 2	4.10.2.1	590	VISUAL IMPACTS: The Draft EIS states : "Depending on viewer sensitivity, the visual impacts of the Mainline Pipeline would vary from low north of the Brooks Range (between Nenana and Clear) and in the Susitna River valley (south of Talkeetna) to high in the Brooks Range (from Galbraith Lake to south of Coldfoot) and Alaska Range (from Clear to Talkeetna), including the DNPP and Denali State Park. Due to their higher visual sensitivity, recreational visitors would generally perceive higher visual impacts, particularly in more heavily visited recreational areas, such as near Denali State Park and DNPP." Response: There are errors in the first sentence since Nenana and Clear are not north of the Brooks Range. Other visually sensitive resource areas should also be noted here (i.e. cross-reference Table S-1 in Appendix S), consider the Galbraith/Atigun area in addition to DNPP and Denali State Park.	FA3-120
41.	Volume 3	4.16.3.2	4-948	BLM's Utility Corridor Resource Management Plan (RMP) requires that aircraft associated with BLM-permitted activities observe altitude restrictions in some places along the proposed Right of Way. It should be noted that the BLM's Grant of Right of Way will likely include stipulations to ensure compliance with the RMP.	FA3-121

FA3-118 Additional requirements or measures for blasting activities on BLM lands could be included as conditions in BLM's right-of-way grant for the Project.

FA3-119 Section 4.8.2.2 of the final EIS has been updated to address this comment.

FA3-120 Section 4.10.2 of the final EIS has been updated to address this comment. The intent of the sentences referenced in the comment is not to identify every high-quality scenic area, but rather to provide a broad overview of visual impacts. Details regarding specific visual impacts are provided elsewhere in section 4.10 and in appendix S of the final EIS.

FA3-121 Section 4.16.3.2 of the final EIS has been updated to address this comment.

FA3 - Department of the Interior (cont'd)

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42.	Volume 3	4.19.4.5	4-1130	Non-Native Invasive Species: Draft EIS statement: "Because the northern sub-regions have no known occurrences of NNIS, cumulative impacts on native vegetation as a result of NNIS are less likely in this area under current conditions." Response: This is erroneous, there are some occurrences of NNIS in northern sub-regions (visit the Alaska Exotic Plants Information Clearinghouse (AKEPIC) at https://accs.uaa.alaska.edu/invasive-species/non-native-plants/). Also note that other factors, not just climate change, could cause expansion; there are a plethora of human activities (including road maintenance activities) that are currently expanding the range of several NNIS species that are currently present. An updated and/or current Invasive Species Plan needs to be provided to determine whether impacts will be appropriately mitigated.	FA3-122
43.	Volume 3	4.19.4.6	4-1132 and GLOBAL	WILDLIFE MOVEMENT: Physical barriers also create areas where natural predation is higher. Reduced berm height for roads, ice roads and other infrastructure built on gravel workpads above normal ground level would help mitigate the potential increase in predation. Add the projected impacts of berm height here and in other sections where impacts to prey species (esp. caribou and moose) are mentioned (see above comment and reference to Roby 1978)	FA3-123
44.	Volume 3	4.19.4.6	4-1133 and GLOBAL	BIRDS AND OPEN PIPES: Add open pipes associated with infrastructure to the list of activities (and/or infrastructure placement) that could impact birds. Also add to other sections where impacts on avian species are mentioned.	FA3-124
45.	Appendix M. Winter and Permafrost Construction Plan	2.2 Project Procedures, Table 2.6-2 AND 4.1.2	13, 37	**Relevant/Unresolved Comment from previous review:** V1.B.2.h: The statement that soil will be stockpiled and replaced "except in areas where standing water is present or soils are saturated or frozen" is of concern; a substantial portion of the clearing will occur during winter months. We do not agree that it is not feasible to stockpile the cumulative topsoil (organic and mineral soils to a depth of 1 ft) in the winter (a brief description of why winter topsoil salvage is not feasible is provided on pg 37). There is strong evidence that winter salvage is actually preferable for harvesting topsoil http://www.cif-ifc.org/wp-content/uploads/2018/03/3_17-0012-A-guide-to-soil-salvage_nov_29_acc-1.pdf	FA3-125

FA3-122 Section 4.19.4.5 of the final EIS has been updated to address this comment.

FA3-123 Comment noted.

FA3-124 Section 4.19.4.6 of the final EIS has been updated to address this comment.

FA3-125 See the response to comment FA3-12.

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46.	Appendix M. Winter and Permafrost Construction Plan	Universal and esp Section 3.2 Construction Seasons	17, 18	**Relevant/Unresolved Comment from previous review(s):** Section 3.2 provides some dates and details regarding the seasonal parameters involving construction. There is specific mention of needing to meet the snow/freeze depths required by the North Slope Borough. Note that BLM land use plans also typically have snow depth and freeze down restrictions on overland travel, including on lands outside the North Slope Borough.	FA3-126
47.	Appendix P	Table P-1	P-5	While Clear Creek chum salmon (Hogatza River drainage) are on the BLM watch List, this stream is not in close proximity to the project. Recommend it be removed from Table P-1.	FA3-127
48.	4.0 Environmental Analysis	4.7.1.5 Commercial and Recreational Fisheries	4-402	Under the heading "Mainline Facilities," citations are needed to substantiate the existence of commercial fisheries at mainline milepost (MP) 90.3 and MP 229.1.	FA3-128
49.	Summary of Landfills, Mines, and Spill/Release Sites near Mainline Facilities	Table R-2	R-6	The footnote for the Regulatory Status column directs the reader to see Section 4.9.6.1 for definitions of the entries listed under that column. There is no definition for 'Inactive' mines within Section 4.9.6.1. More importantly, Linda Creek, Minnie Creek, and Slate Creek mines are shown as 'Inactive'. They are all active mine sites. Also, Minnie Creek is on lands administered by BLM, not ADNR/BLM.	FA3-129
50.	Summary of Landfills, Mines, and Spill/Release Sites near Mainline Facilities	Table R-2	R-7	The South Fork Koyukuk River mine is active, not 'Inactive' as shown under Regulatory Status	FA3-130
51.	Summary of Landfills, Mines, and Spill/Release Sites near Mainline Facilities	Table R-2	R-8	The Prospect Creek mine is active, not 'Inactive' as shown under Regulatory Status	FA3-131

FA3-126 Comment noted. Additional requirements for snow depth and freeze down restrictions for overland travel could be included as conditions in BLM's right-of-way grant for the Project.

FA3-127 Section 4.8.2.1 and appendix P of the final EIS have been updated to address this comment.

FA3-128 Information provided by AGDC on commercial fisheries is provided in table I-2 of appendix I of the final EIS. See the text updates to section 4.7.1.5 of the final EIS.

FA3-129 Section 4.9.6.1 and appendix R of the final EIS have been updated to address this comment.

FA3-130 Appendix R of the final EIS has been updated to address this comment.

FA3-131 Appendix R of the final EIS has been updated to address this comment.

FA3 - Department of the Interior (cont'd)

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52.	Alaska LNG Project DEIS	4.1.2.1	PDF: 232 Page 4-11	Last sentence seems to state the ADNR mining claims include Federal mining claims, which is incorrect. Also, all Federal mining claims are unpatented. "ADNR mining claims include those purchased by individuals or mining companies and federal mining claims, which are mostly unpatented and grant exclusive rights to locatable minerals at a particular site."	FA3-132
53.	Alaska LNG Project DEIS	4.1.2.1	PDF: 233 Page 4-12	Federal mining claims are not included on the figure (as they likely wouldn't be seen at the map's scale); therefore, the figure should instead be titled ADNR Mining Claims and Leases in the Project Area.	FA3-133
54.	Alaska LNG Project DEIS	4.1.2.1	PDF: 235 Page 4-14	First non-bulleted paragraph: Change 'BLM' to 'Federal'. There are no BLM mining claims; rather, BLM adjudicates federal mining claims.	FA3-134
55.	Alaska LNG Project DEIS	4.1.2.1	PDF: 236 Page 4-15	First paragraph states that Project construction will require 26.6M CY of granular fill. The total, using the volumes provided for each facility, is 31.3M CY. It appears the volume for the Liquefaction Facilities was not included. This should be corrected in the Final EIS.	FA3-135
56.	Alaska LNG Project DEIS	4.1.2.3	PDF: 238 Page 4-17	Last paragraph, first sentence states that there are no mining claims within the project area. That is incorrect. Mining claims at Linda Creek extend to Middle Fork Koyukuk River. Sheet 52 shows the Mainline running across Linda Creek and, as such, across federal mining claim AKFF 054169 and/or AKFF 054168. The Mainline also appears to cross several state mining claims near Livengood and east of Denali NP.	FA3-136
57.	Alaska LNG Project DEIS	4.1.2.3	PDF: 238 Page 4-17	Last paragraph, second sentence: wording of sentence implies that AGDC is a permitting agency. Recommend removing "AGDC has stated that".	FA3-137
58.	Alaska LNG Project DEIS	4.1.2.3	PDF: 240 Page 4-19	The first paragraph on this page does not accurately paraphrase Federal or state mining law. Recommend deleting it or editing to correctly describe Federal mining law. The BLM does not prevent staking of mining claims. Unless an area is withdrawn from mineral entry, or some law prevents staking of mining claims, claims may be staked. Existing claims will not be 'cancelled', unless a claim holder wishes to relinquish or fails to maintain their claims. Compensation may or may not be involved for a voluntary claim relinquishment. A validity exam may be	FA3-138

FA3-132 Section 4.1.2.1 of the final EIS has been updated to address this comment.

FA3-133 Figure 4.1.2-1 of the final EIS has been updated to address this comment.

FA3-134 Section 4.1.2.1 of the final EIS has been updated to address this comment.

FA3-135 Section 4.1.2.1 of the final EIS has been updated to address this comment.

FA3-136 Section 4.1.2.1 of the final EIS has been updated to address this comment.

FA3-137 Section 4.1.2.3 of the final EIS has been revised to address this comment.

FA3 - Department of the Interior (cont'd)

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				performed by a BLM certified mineral examiner at the proponent's expense.	FA3-138
59.	Alaska LNG Project DEIS	4.1.2.3	PDF: 240 Page 4-19	Except for the first sentence, paragraph two is speculative, contains incorrect information, and could be considered pre-decisional. As such, it should be deleted.	FA3-139
60.	Alaska LNG Project DEIS	4.1.2.3	PDF: 240 Page 4-19	Third paragraph: Given that several mining claims were overlooked previously, verify that no mining claims exist within the proposed ROW for the Alaska Stand Alone Gas Pipeline (ASAP) that Alaska LNG intends to collocate with. In last sentence, change "of" to "or" after 'BLM State Director'.	FA3-140
61.	Appendix B	Volume 1	B-3 - B-19	North arrows are missing from maps.	FA3-141
62.	Alaska LNG Project DEIS	4.1.2.3	PDF: 240 Page 4-19	First paragraph: Suggest changing "Existing mining claims are a prior existing right to mine," to "Existing mining claims include a prior existing right to mine," or something similar.	FA3-142
63.	Alaska LNG Project DEIS	4.1.2.3	PDF: 241 Page 4-20	First paragraph: Suggest changing "(material)" to "(mineral material)". Same for paragraphs three, four, five, and the bulleted paragraph, and all subsequent references to 'material' when used as a term for 'mineral materials'. The BLM is not sure how test holes themselves cause contamination; spills from construction equipment are impacts, whether they somehow spill into test holes or not. As part of reclamation, both overburden and topsoils are used, whether stockpiled for later use or used immediately, as part of concurrent reclamation.	FA3-143
64.	Alaska LNG Project DEIS	4.1.3.1		There are several mineral material pits along or near the proposed Mainline. Mineral materials aren't really discussed, other than as sources for LNG construction. How will Mainline crossings of active pits be addressed? What are the Mainline impacts to existing and future mineral material operations?	FA3-144

FA3-138 Section 4.1.2.3 of the final EIS has been revised to address this comment.

FA3-139 Section 4.1.2.3 of the final EIS has been revised to address this comment.

FA3-140 Section 4.1.2.3 of the final EIS has been revised to address this comment.

FA3-141 North arrows are provided in the upper right corner of the inset maps on pages B-3 through B-19 of Appendix B of the final EIS.

FA3-142 Section 4.1.2.3 of the final EIS has been revised to address this comment.

FA3-143 "Material" refers to borrow material to be used as granular fill for the Project. Section 4.1.2.3 of the final EIS has been updated to address the other comments.

FA3-144 Section 4.1.2.3 of the final EIS has been updated to address this comment.

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65.	Alaska LNG Project DEIS	4.1.3.1	PDF: 243 Page 4-22	Last paragraph: Since August of 2018, there have been several earthquakes of 5.0 or greater near the project area (including two greater than 6.0), roughly 50 miles southeast of Point Thomson. Recommend updating this paragraph to reflect seismic activity that has occurred since August 2018.	FA3-145
66.	Alaska LNG Project DEIS	4.1.3.1 Figure 4.1.3-1	PDF: 244 Page 4-23	Recommend updating the figure to include earthquakes of 6.0+ that have occurred since the figure was produced in October 2017.	FA3-146
67.	Alaska LNG Project DEIS	4.1.3.1 Table 4.1.3-1	PDF:245 Page 4-24	Recommend updating the table to account for the August 2018 earthquakes.	FA3-147
68.	Alaska LNG Project DEIS	4.1.3.8	PDF: 258 Page 4-37	It should be noted that magnesiocarpholite, an asbestiform-like mineral, was encountered at MP 222 on the Dalton Highway (LNG MP 193). Although this mineral is not a regulated serpentine or amphibole asbestos mineral, due to its rarity, any health concerns are unknown at this time.	FA3-148
69.	Alaska LNG Project DEIS	4.18.6.2	PDF: 360 Page 4-1044	First paragraph: As the Richter Scale is a bit outdated, verify that the magnitudes are correct for the Richter Scale. Otherwise, use the Moment Magnitude scale when referring to earthquake magnitude.	FA3-149
70.	Alaska LNG Project DEIS	4.18.6.2	PDF: 362 Page 4-1046	Second complete paragraph states that only one earthquake greater than magnitude 6.0 has occurred within 100 miles of the GTP site since 2015. According to the UAF Alaska Earthquake Center Monthly Seismicity Report for August 2018, there were two similar events, one within 86 miles of Deadhorse and one within 108 miles. The analysis should either incorporate the more distant earthquake or state why it is below the threshold for inclusion. Also, as earthquakes are occurring almost daily in the northern project area that are 2.5 or greater, the numbers discussed in this paragraph are inaccurate. Recommend using a bracketed time frame when discussing the number and magnitude of earthquakes. For example, instead of saying "since 2015", which is open-ended, perhaps use language such as "between January 2015 and January 2019".	FA3-150
71.	Alaska LNG Project DEIS	4.18.6.2	PDF: 364 Page 4-1048	First full paragraph: As recommended above, use a time bracket instead of an open-ended time reference. Depending on when the paragraph was written, the numbers of earthquakes for each	FA3-151

FA3-145 Section 4.1.3.1 of the final EIS has been updated to address this comment.

FA3-146 Figure 4.1.3-1 of the final EIS has been updated to address this comment.

FA3-147 Table 4.1.3-1 of the final EIS has been updated to address this comment.

FA3-148 Section 4.1.3.8 has been updated in the final EIS to address this comment.

FA3-149 We recognize that the Richter scale is no longer the default scale and that the Moment Magnitude is a more accurate representation of energy release during an earthquake. The discussion at the beginning of Section 4.18.6.2 of the final EIS is intended to provide an overview of earthquake measurement parameters. Additionally, Section 4.18.6.2 of the final EIS has been updated to clarify whether the Moment Magnitude is used when discussing specific historical events in the EIS.

FA3-150 We reviewed the 2018 in-review report from University of Alaska Fairbanks - Alaska Earthquake Center, which indicates a magnitude 6.4 earthquake and a magnitude 6.1 aftershock occurred. Section 4.18.6.2 of the final EIS has been updated to address this comment.

FA3-151 Section 4.18.3.2 has been updated to address this comment.

FA3 - Department of the Interior (cont'd)

				magnitude may be significantly greater. In the last month of 2018, there were about 6,000 earthquakes in the area.	FA3-151
72.	Alaska LNG Project DEIS	4.18.6.2	PDF: 371 Page 4-1055	First full paragraph, last sentence: What valves would move into a fail-safe position?	FA3-152
73.	Alaska LNG Project DEIS	4.18.6.2	PDF: 373 Page 4-1057	First full paragraph, last sentence: What valves would move into a fail-safe position?	FA3-153
74.	Alaska LNG Project DEIS	5.1.1	PDF: 479 Page 5-1	First paragraph under 5.1.1: The Mainline crosses at least one, possibly two, federal mining claims and several state mining claims (see row 9 above). Also, existing mining claims are not a prior right. Instead, active mining claims come with prior existing rights.	FA3-154
75.	Alaska LNG Project DEIS	5.1.1	PDF: 479 Page 5-1	Second paragraph under 5.1.1: As stated above in row 12, most of this paragraph is speculative and borders on being pre-decisional. Consider removing the third and fourth sentences.	FA3-155
76.	DEIS Volume 1	4.1.6	4-56	Excavation at material sources presents a large risk of potential disturbance for paleontological materials and should be noted in the first paragraph.	FA3-156
77.	DEIS Volume 1	4.1.6	4-56	Indirect effects could also include degradation of paleontological resources once they are exposed (e.g., weather from wind, water, freeze-thaws, etc.) and should be noted in the first paragraph.	FA3-157
78.	DEIS Volume 1	4.1.6	4-56	The fossils that could be encountered include both large and small terrestrial vertebrate species. Currently the second paragraph just suggests that "large" vertebrate fossils could be encountered. The second paragraph should include the full range of species that could be encountered in Mesozoic through Pleistocene geologic deposits, which would include both large and small vertebrate species.	FA3-158
79.	DEIS Volume 1	4.1.6	4-56	It is unclear the relevance of the information this sentence is conveying: "Traditional knowledge regarding paleontological resources was obtained from residents of the Nuiqsut community, which primarily related to the unanticipated findings of Pleistocene-age mammal fossils in the Colville River region (Braund, 2016)". The Colville River and associated "region" is well outside of the project footprint. If the purpose of the interviews was to generally assess traditional knowledge about fossil	FA3-159

FA3-152 Section 4.18.3.2 has been updated to address this comment.

FA3-153 Section 4.18.3.2 has been updated to address this comment.

FA3-154 Section 5.1.1 of the final EIS has been updated to address this comment.

FA3-155 Section 5.1.1 of the final EIS has been updated to address this comment.

FA3-156 Section 4.1.6 of the final EIS has been updated to address this comment.

FA3-157 Section 4.1.6 of the final EIS has been updated to address this comment.

FA3-158 Section 4.1.6 of the final EIS has been updated to address this comment.

FA3-159 Section 4.1.6 of the final EIS has been updated to address this comment.

FA3 - Department of the Interior (cont'd)

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				locales on the North Slope, then it should state that; or, the sentence could be removed as there is no discussion of this information in the following sections.	FA3-159
80.	DEIS Volume 1	4.1.6	4-56	Where did the survey that is referenced in the third paragraph occur? How many areas were surveyed? Acres?	FA3-160
81.	DEIS Volume 1	4.1.6.1	4-57	The first mention of the potential fossil yield classification (PFYC) system is in this paragraph and the text just discusses the results. Suggest introducing the PFYC system in the previous section, and explain that a PFYC model was created for the project.	FA3-161
82.	DEIS Volume 1			The first paragraph should be more explicit about why the project is unlikely to encounter the fossil resources that are described here.	FA3-162
83.	DEIS Volume 1	4.1.7	4-59	This sentence misstates the potential adverse effects: "Therefore, with implementation of the PRUDP and PRMP during construction and operation, the Project would not have significant adverse effects on paleontological resources." Recommend revising to say "The Project could have significant adverse effects to paleontological resources, but the implementation of the PRUDP and PRMP will minimize and mitigate those effects."	FA3-163
84.	DEIS Volume 1	4.1.7	4-59	The conclusion seems to be copied from another section. It needs to be revised to actually reflect the summary of the previous discussion and how paleontological resources will be affected by the project.	FA3-164
85.	DEIS Volume 3	4.13	4-685	NEPA requires a broader consideration of "cultural resources" than does the National Historic Preservation Act (NHPA). That discussion seems to be entirely lacking throughout the Cultural Resources section, which is entirely focused on the NHPA. This section should be revised to be more inclusive of a broader range of resources than just "historic properties" which are narrowly defined under 36 CFR 800.16(l)(1) and does not capture other resource types such as Sacred Sites, cultural landscapes, traditional use areas, etc.	FA3-165
86.	DEIS Volume 3	4.13	4-685	Have the acronyms "NRHP" and "ACHP" been defined prior to this section?	FA3-166

FA3-160 Section 4.1.6 of the final EIS has been updated to address this comment.

FA3-161 Section 4.1.6 of the final EIS has been updated to address this comment.

FA3-162 Section 4.1.6.1 of the final EIS has been updated to address this comment.

FA3-163 Section 4.1.6.4 of the final EIS has been updated to address this comment.

FA3-164 Section 4.1.7 of the final EIS has been updated to address this comment.

FA3-165 Comment noted.

FA3-166 Comment noted.

FA3 - Department of the Interior (cont'd)

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87.	DEIS Volume 3	4.13	4-685	Taking historic properties into account and affording the Advisory Council on Historic Preservation (ACHP) an opportunity to comment are only part of what's required by Section 106 of the NHPA. This first paragraph should be expanded to note that consultation, inventory, evaluation, assessment of effects, and resolution of adverse effects are all part of the required steps, pursuant to 36 CFR 800.3 through 800.6.	FA3-167
88.	DEIS Volume 3	4.13	4-685	Information, analyses, and recommendations are not authorized by 36 CFR 800.2(a)(3); the ability for a lead federal agency to shift some of the Section 106 obligations to the applicant is authorized. This sentence needs revised to reflect that fact.	FA3-168
89.	DEIS Volume 3	4.13	4-685	If historic properties are defined in the second paragraph, it should use the language directly from 36 CFR 800.16(l)(1) which reads "Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places.... This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization"	FA3-169
90.	DEIS Volume 3	4.13	4-685	Note that the current language in the second paragraph is also inaccurate as the definition of "tribe" includes ANSCA Village and Regional Corporations, pursuant to 36 CFR 800.16(m). Therefore, "locations of traditional value" can be identified by ANCSA corporations as well as federally recognized tribes.	FA3-170
91.	DEIS Volume 3	4.13.1	4-685	Has the abbreviation "APE" been previously explained? If not, there should be an explanation here as to what it is and how it's relevant to cultural resources.	FA3-171
92.	DEIS Volume 3	4.13.1	4-685	"To date, AGDC has surveyed approximately 27,925 acres of the terrestrial direct APE." Include the approximate percentage of the Project footprint that AGDC's survey has covered.	FA3-172
93.	DEIS Volume 3	4.13.1	4-685	The Draft EIS states: "A database inventory of shipwrecks and remote-sensing data was completed to assess the potential for submerged resources along the offshore Mainline Pipeline route, Marine Terminal and approach channel, and two offshore dredged material placement areas in	FA3-173

FA3-167 Comment noted.

FA3-168 Comment noted.

FA3-169 Comment noted.

FA3-170 Section 4.13 of the final EIS has been updated to address this comment.

FA3-171 Comment noted.

FA3-172 Section 4.13.1 of the final EIS has been updated to address this comment.

FA3-173 Offshore survey results are discussed in sections 4.13.1.2 and 4.13.1.3 of the final EIS.

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				Cook Inlet." Describe what the results of the inventory were.	FA3-173
94.	DEIS Volume 3	4.13.1	4-685	The Draft EIS states: "AGDC would survey the remaining Mainline Pipeline route and ancillary facilities for archaeological and aboveground historic architectural resources, and submit the results of surveys in future survey reports." This sentence is a direct indication that FERC plans to complete the Section 106 inventory obligations using a phased approach, pursuant to 36 CFR 800.4(2), but that is never directly stated in this section, and should be.	FA3-174
95.	DEIS Volume 3	4.13.1.1	4-686	This paragraph is confusing. It doesn't matter what was previously identified vs. found during AGDC's surveys. What matters is how many resources are located within the APE(s), what the potential impacts may be to those resources, and what the resolution of adverse effects may be.	FA3-175
96.	DEIS Volume 3	4.13.1.1	4-686	The Draft EIS states: "In a letter dated May 16, 2019, the Alaska SHPO requested additional documentation of the site." Is not relevant to this section nor does it provide any information regarding what resources are present and what the impacts may be.	FA3-176
97.	DEIS Volume 3	4.13.1.2	4-686	According to the Draft EIS: "Archaeological surveys resulted in the identification of 117 archaeological resources." It is unclear if this statement is just referencing AGDC's surveys, or if this is inclusive of all known resources along the mainline facility. It is also confusing in that this is referencing sites within the direct APE, not the indirect APE (which has not yet been surveyed, per previous section). Also, because this section is NHPA-focused, and the NHPA only applies to historic properties, this section should use the number of NRHP-eligible properties within the direct APE, rather than "archaeological resources and other sites". The status of "Alaska SHPO comments" seems irrelevant to the analysis.	FA3-177
98.	DEIS Volume 3	4.13.1.2	4-686	Footnote 102 should be moved to "Highways" rather than attached to "burial site"	FA3-178
99.	DEIS Volume 3	4.13.1.2	4-686	Suggest including a separate paragraph for the Gallagher Flint Station National Historic Landmark (NHL) as NHL's have additional status and considerations under 36 CFR 800.10, particularly	FA3-179

FA3-174 See the response to comment FA2-63.

FA3-175 Comment noted.

FA3-176 Comment noted.

FA3-177 Comment noted.

FA3-178 Section 4.13.1.2 of the final EIS has been updated to address this comment.

FA3-179 Section 4.13.1.2 of the final EIS has been updated to address this comment.

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				for the agency official (FERC) " to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to [NHL's]", and requires the involvement of the ACHP and the Secretary of the Interior.	FA3-179
100.	DEIS Volume 3	4.13.1.2	4-686	"AGDC has not yet identified how the NRHP-eligible sites would be avoided or mitigated or how the burial would be avoided." This is problematic as the NHPA requires that adverse effects are resolved (or a plan to resolve them are codified in an agreement document), prior to the issuance of any permit, authorization, or expenditure of federal funds for a project. In previous sections, it's clear that FERC (through AGDC) intends to use a phased approach to identification, which requires either an executed MOA or PA, pursuant to 36 CFR 800.4(b)(2). In either case, this should be disclosed in the DEIS so the public may be aware of FERC's intentions for Section 106 compliance. Any potential agreement document should be discussed in the Impacts and Mitigation section (4.13.5).	FA3-180
101.	DEIS Volume 3	4.13.1.2	4-686	"Above Ground Resources" need to be defined, as it is confusing to read that none were identified in the direct APE of the mainline. Table 4.13.1-1 suggests there are, in fact, many above ground resources within the mainline facilities.	FA3-181
102.	DEIS Volume 3	4.13.1.2	4-686	This section explains the methods used to investigate offshore resources, and SHPO's recommendations for avoidance, without disclosing whether offshore resources are present or what they may be. The section should be revised so that resources are discussed prior to SHPO's recommendations for avoidance.	FA3-182
103.	DEIS Volume 3	4.13.1-1	4-687	The title makes it unclear what resources this table is listing. Is it all known resources within the direct APE? Or is it just resources that were identified by AGDC survey? The table should be revised to reflect all known resources in the direct APE (whether they were identified by AGDC survey or by other surveys). The site numbers should be ordered in some way, preferably from north to south (or vice versa), or ordered based on NRHP status. The "Eligibility Recommendation" should note that they are AGDC's recommendations, not the recommendations from land owners or managers, and whom concurrence is required from.	FA3-183

FA3-180 See the response to comment FA2-63.

FA3-181 Comment noted.

FA3-182 Offshore survey results are discussed in sections 4.13.1.2 and 4.13.1.3 of the final EIS.

FA3-183 Comment noted.

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104.	DEIS Volume 3	4.13.1.3	4-692	The section on Archaeological Sites should be revised for clarity. One historic property is present within the Liquefaction Facilities, and, provisionally, will be impacted by the project. However, this is not clearly disclosed, nor are potential resolution measures discussed that would minimize or mitigate adverse impacts.	FA3-184
105.	DEIS Volume 3	4.13.2	4-693	Recommend making the Alaska Native Tribal Consultations a separate section as many of the concerns voiced by Tribal entities are relevant to other sections of the DEIS, not just cultural resources. This would also highlight FERC's efforts for tribal consultation for the project as a whole.	FA3-185
106.	DEIS Volume 3	4.13.2-1	4-694	The requirements for tribal consultation under Section 106 are more inclusive than just federally recognized tribes, and includes ANCSA Village and Regional corporations. This section should indicate the extent of consultation with those entities.	FA3-186
107.	DEIS Volume 3	4.13.5	4-698	"To date, AGDC has not filed any SHPO or BLM comments on the plan." This doesn't seem relevant to the purposes of the DEIS, which is to disclose affected resources and potential mitigations to the public. Recommend deleting or re-wording.	FA3-187
108.	DEIS Volume 3	4.13.5	4-698	"Project construction and operation could potentially affect historic properties (i.e., cultural resources listed on, or eligible for, the NRHP)." Sentence is problematic. Historic properties have a very specific definition under 36 CFR 800.16(l)(1); they are not 'cultural resources listed on, or eligible for NRHP'. It may be unnecessary to redefine historic properties here, as the definition is at the beginning of the Cultural section. If it is redefined here, it should use the accurate definition following the CFR citation.	FA3-188
109.	DEIS Volume 3	4.13.5	4-698	"Direct effects could include destruction or damage" is an incomplete definition of "adverse effects." Per 36 CFR 800.5, adverse effects could include physical destruction of or damage; alteration of a property, including restoration, rehabilitation, repair, maintenance, or stabilization that is not consistent with the Secretary's standards; removal of the property from its historic location; change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance; and introduction of visual,	FA3-189

FA3-184 Comment noted. Section 4.13 of the final EIS discusses the current status of cultural resources investigations. See the response to comment FA2-63 and our recommendation in section 4.13.5 of the final EIS.

FA3-185 Comment noted.

FA3-186 Information provided by Alaska Native tribal organizations was used to inform our analysis of impacts throughout the EIS, including information provided at meetings, in written comments, and through tribal knowledge workshops.

FA3-187 Comment noted.

FA3-188 Comment noted.

FA3-189 Comment noted.

				atmospheric or audible elements that diminish the integrity of the property's significant historic features. The Project may not result in all of these potential types of adverse effects to historic properties within the APE, but will, provisionally, have more than just "destruction or damage."	FA3-189
110.	DEIS Volume 3	4.13.5	4-698	"Indirect effects could include the introduction of visual, atmospheric, or audible elements that affect the setting or character of a historic property." This definition needs revision. In March 2019, the D.C. circuit court issued an opinion that clarified the meaning of the term "directly" in the NHPA as referring to the causality, and not the physicality, of the effect to historic properties. This means that if the effect comes from the undertaking at the same time and place with no intervening cause, it is considered "direct" regardless of its specific type (e.g., whether it is visual, physical, auditory, etc.). "Indirect" effects to historic properties are those caused by the undertaking that are later in time or farther removed in distance but are still reasonably foreseeable.	FA3-190
111.	DEIS Volume 3	4.13.5	4-698	"If NRHP-eligible resources are identified that cannot be avoided, AGDC would prepare treatment plans." Linear historic properties have been identified that cannot be avoided and the project MUST cross (e.g., XBP-00114, SAG-00098, LIV-00556, LIV-00764, FAI-02177, FAI-02366, HEA-00450, TYP-00084). This section should be edited to more fully disclose to the public that some impacts to historic properties cannot be avoided.	FA3-191
112.	DEIS Volume 3	4.13.5	4-698	"Treatment plan implementation would only occur after Project authorization and after FERC provides written notification to proceed." This statement could be interpreted as being in conflict with the legal requirements of the NHPA, which requires that Section 106 compliance is completed prior to the issuance of any federal permit, license, or approval. This section should be edited to make clear how Section 106 compliance will be achieved; either by resolving all adverse impacts prior to the issuance of a certificate or by developing an	FA3-192

FA3-190 Comment noted.

FA3-191 We have not yet completed an assessment of effects on linear historic properties. See the response to comment FA2-63.

FA3-192 See the response to comment FA2-63.

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				agreement document in compliance with 36 CFR 800.	FA3-192
113.	DEIS Volume 3	4.13.5	4-698	Instead of "recommending" that AGDC completes the steps listed in bullet items a) through d), FERC should require that the steps are completed, in order to be in compliance with the NHPA.	FA3-193
114.	DEIS Volume 3	4.13.5	4-698	FERC should also disclose that they intend to develop an agreement document pursuant to 36 CFR 800.6(c) or 36 CFR 800.14(b) or whether the Commission has delegated this responsibility to AGDC.	FA3-194

FA3-193 This recommendation would be included as a condition to any Order issued by the Commission for the Project.

FA3-194 See the response to comment FA2-63.

FA3 - Department of the Interior (cont'd)

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