

State Agencies

SA1 – Senator Cathy Giessel

20190925-5010 FERC PDF (Unofficial) 9/24/2019 5:17:48 PM

ALASKA STATE LEGISLATURE

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North to the Future

Senator Cathy Giessel
Senate District N

September 24, 2019

Alaska LNG Project DEIS Comments
Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

RE: Project docket number CP17 178-000: **SUPPORT** for Preferred Alternative B with the LNG facility sited at Nikiski

Dear Ms. Bose,

I write in strong support of the Alaska LNG Project as reflected in your agency's Preferred Alternative, Alternative B, siting the liquefaction facility at Nikiski, in the draft environmental impact statement.

The Federal Energy Regulatory Commission (FERC) is aware of the potential benefits this project brings to Alaska and the nation:

- The project would bring significant jobs to Alaska, as described in the DEIS. Workers hired for construction will hone valuable skills and experience to carry into their next opportunities.
- As noted on DEIS page 4-1108, the major impacts during construction and many affected resources are expected to return to pre-construction condition within a few years.
- The impacts that will remain should be a net positive. With three interconnections proposed in Alaska, the project should result in better air quality in Alaska as gas takes the place of coal and wood for heat and power generation.
- A national treasure and major tourism destination, Denali National Park and Preserve (DNPP), has the potential to benefit from first-ever access to natural gas to fuel buses, visitor services and more. I support the DNPP route alternative, which is consistent with the U.S. Army Corp of Engineers' 'Least Environmentally Damaging Practical Alternative' for the similar ASAP pipeline.

SA1-1

SA1-1

Comment noted.

CC-298

SA1 – Senator Cathy Giessel (cont'd)

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- The project would deliver clean natural gas to foreign markets largely dependent today on coal; better still, the LNG would be sourced from one of the most heavily regulated and safeguarded jurisdictions in the world.
- Much of the project would be sited in well-understood areas of the state, near existing infrastructure. The pipeline would generally align with the Trans Alaska Pipeline System (TAPS) and highways and the U.S. Army Corp of Engineers in the ASAP pipeline permitting effort thoroughly evaluated (and permitted) that route. Nikiski is a largely industrialized area where local residents co-exist with a refinery and, for decades, with an LNG export facility (Conoco Phillips, now Marathon and not operating) and an appropriate site for the liquefaction facility.

SA1-1

The benefits, however, aren't just in terms of jobs and economic activity. Alaska is unique among the states, joining the union 60 years ago with the understanding Alaska would need to develop its resources to carry its weight and support the tremendous needs of a young state. A long tradition of legislators and governors have prioritized that mission, and we continue today. Our needs remain great, but so is our potential, providing we are authorized to tap it.

The Alaska Legislature created the project applicant, AGDC, to facilitate development of a natural gas pipeline opening the door for more resource development. AGDC, and this project, carries out the long-standing policy of the State of Alaska. Gas stranded on the North Slope would have access to markets, enabling additional oil production that is our economic lifeline. Gas delivered throughout our state would further support local economies and individuals, and may enable other, non-petroleum resource development critical to our state's economy and our national security. Alaska requires such opportunities to see the promises of statehood fulfilled and to provide fiscal resources to support our residents.

Where natural resources have been developed in Alaska – be those petroleum, fish, or mineral – health and life expectancy for Alaskans nearby has increased. As reported in the Journal of the American Medical Association, life expectancy on Alaska's North Slope and Northwest Arctic Borough increased by 8 to 13 years between 1980 and 2014. TAPS came online in 1977 and oil production peaked at 2 million barrels per day in 1988. Not only did life expectancy increase, so did quality of life. Locals realized better wages and health care, steady employment, and stronger communities. At the same time, Alaskans in these rural areas have continued their cultural tradition of subsistence. Continuing the legacy of responsible resource development through the Alaska LNG Project will perpetuate these health and longevity benefits for our northernmost Alaskans. Please consider this in conjunction with the DEIS section 4.11.8.2, evaluating health impacts and impacts on environmental justice populations.

I am confident in reviewing the DEIS that Alternative B will balance our environmental and cultural wealth with the tangible benefits responsible resource development delivers to our people, our communities, our state and our nation. I urge the Federal Energy Regulatory Commission to select Alternative B and site the liquefaction facility at Nikiski for the Alaska LNG Project proposed by AGDC.

Sincerely,



Sen. Cathy Giessel

CC-299

SA1 – Senator Cathy Giessel (cont'd)

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Document Content(s)

AKLNG DEIS comments - Giessel.PDF.....1-2

CC-300

SA2 – Alaska Department of Natural Resources and Others

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THE STATE
of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Natural Resources
OFFICE OF PROJECT MANAGEMENT AND PERMITTING
550 West 7th Avenue, Suite 1430
Anchorage, AK 99501
Main: 907.269-8690
Fax: 907-269-5673

October 2, 2019

Jim Martin, Project Manager
Federal Energy Regulatory Commission
888 First Street, NE, Room 61-25
Washington, D.C. 20426

Re: State of Alaska Comments on the Draft Environmental Impact Statement for the Alaska LNG Project, Docket Number CP17-178-000

Dear Mr. Martin:

The State of Alaska (State) received the Notice of Availability for the Draft Environmental Impact Statement (Draft EIS) for the Alaska Liquefied Natural Gas (Alaska LNG) Project published by the Federal Energy Regulatory Commission (FERC) in the Federal Register. The Office of Project Management and Permitting (OPMP) coordinated with the State's agencies to review and develop comments on the Draft EIS. Our comments are based upon the collective technical and regulatory expertise of the State Comment and Review Team, including representatives from the:

- Department of Natural Resources (DNR)
- Department of Environmental Conservation (ADEC)
- Department of Fish and Game (ADF&G)
- Department of Commerce, Community, and Economic Development (DCCED)
- Department of Health and Social Services (DHSS)
- Department of Transportation & Public Facilities (DOT&PF), and
- Department of Public Safety (DPS).

Please refer to the *State of Alaska Comment Matrix for the Alaska LNG Draft EIS* (Comment Matrix), attached, for the State's consolidated agency comments on the Draft EIS.

The project proponent, the Alaska Gasline Development Corporation (AGDC), was not a member of the review team. AGDC is an independent public corporation and government instrumentality of the State; however, they are not a regulatory agency. As their participation in the review team would have diminished the integrity of the State's regulatory and land management responsibilities, they were not asked to participate in this review.

Overall, the State found the Draft EIS to be satisfactorily written and supports the applicant's Proposed Action. Additionally, the State supports the Denali Alternative through the front country of Denali National Park as the ground is more geologically stable, co-locates the pipeline with

SA2-1

SA2-1

Comment noted.

SA2-2

SA2-2

Comment noted.

CC-301

SA2 – Alaska Department of Natural Resources and Others (cont'd)

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existing transportation corridors (for approximately half of the alternative route), and would be less visually intrusive in a heavily visited tourist area.

SA2-2

The State participates as a Cooperating Agency in the development of virtually all programmatic and project specific EISs within Alaska. Our highly experienced State Comment and Review Team recognizes the inherent challenges of analyzing potential impacts associated with major infrastructure projects; the State chooses to dedicate substantial agency resources to assist federal regulators and land managers to improve the quality of analysis through local input. However, for the Alaska LNG Project, FERC denied the State's request to be a Cooperating Agency and the absence of State agency input is apparent. The deficiencies found in multiple sub-sections, such as Construction Procedures (regarding permafrost), Soils and Sediments (regarding gravel), Water Resources, Wildlife Resources (caribou), Land Use, Subsistence, and Air Quality, reflect the authors' inexperience regulating unique Alaskan issues and reveals a lack of in-depth understanding of the permitting process in Alaska.

SA2-3

SA2-3

In a letter dated December 14, 2018 (accession number 20181214-3028), FERC staff notified the ADNR that the Commission's *ex parte* rules prohibit the State of Alaska from acting as a cooperating agency in which AGDC, a wholly owned public corporation of the State of Alaska, is a party to the proceeding (see 18 CFR 385.2201(b)). We note that the draft EIS was prepared by qualified individuals with input from the cooperating agencies.

Of the various issues the State is commenting on, we have identified three topics that require substantial improvement and would benefit from engagement with State regulatory agencies prior to finalizing the EIS. We offer our collective, overarching concerns on these three topics below for your consideration; targeted comments can be found within the Comment Matrix.

Buried Pipeline Construction in Permafrost

Permafrost refers to subsurface soils and sediments that remain frozen throughout the year. Once disturbed, the stability of these soils continues to degrade unless appropriate measures are taken. In 2015 and 2016, two fiber optic cables were installed along the Dalton Highway from Coldfoot to Deadhorse. The contractor did not have experience constructing in permafrost and did not implement best management practices as was specified in their permits. The contractor's primary failure was backfilling the trenches with frozen material, which resulted in permafrost degradation along the length of the trenches. The regulatory agencies continue to monitor the remediated lands due to on-going issues with thermokarsting, subsidence, flowing water, and erosion for which the responsible parties are still conducting restorative measures.

SA2-4

SA2-4

See the updates to section 4.2.5.2 of the final EIS.

The oil and gas industry have a history of successfully constructing within and on permafrost in Alaska, and our State agencies have substantial expertise permitting these activities. The State will require AGDC to implement best management practices for the construction of the Alaska LNG Project under State permitting authorizations, if issued; however, we found multiple instances in the Draft EIS where details concerning permafrost construction techniques and monitoring efforts were not well explained. Therefore, the State recommends further detail and clarification on these topics.

SA2-5

SA2-5
SA2-6

Comment noted.
See the updates to section 4.6.1.3 of the final EIS. For the PTTL, most construction activities and corresponding impacts would occur in the winter, but some impacts would extend into spring or summer. As discussed in section 4.6.1.3, activities in the spring and summer could affect calving or movements to, and use of, insect relief habitat. For the Gas Treatment Facilities, impacts on caribou habitat types from Project operation would be permanent, including changes in the landscape, which would include about 13 miles of new permanent gravel roads, the Gas Treatment Plant, and other facilities such as the operations center. While the effects of infrastructure on caribou distribution, habitat use, and population trends in Alaska are not well understood (Joly et al., 2009), several studies have found that roads can affect caribou migration by altering the movement behavior of caribou (BLM, 2006; Cameron et al., 2005; Wilson et al., 2016). Our analysis is consistent with current literature regarding anthropogenic impacts on caribou on the North Slope. Mitigation measures for impacts on caribou, as described in sections 4.6.1.2 and 4.6.1.3 of the final EIS, were considered in our impact determination. Based on our analysis, we concluded that Project construction and operation activities would result in significant impacts on the Central Arctic Herd.

Impacts to Central Arctic Caribou Herd

The Alaska Department of Fish and Game (ADF&G) found multiple instances in the Draft EIS where information concerning the Central Arctic Caribou Herd was inconsistent with ADF&G data. These inconsistencies include the location of calving areas, insect relief areas, wintering areas, and the effectiveness of caribou mitigation measures. Substantial research on these topics

SA2-6

CC-302

SA2 – Alaska Department of Natural Resources and Others (cont'd)

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has been conducted in the past 40 years and ADF&G is providing FERC with references to several pertinent research papers within the Comment Matrix for consideration. ADF&G disagrees with FERC's assessment that the Alaska LNG Project would result in significant adverse impacts to the Central Arctic Caribou Herd and requests that FERC update their caribou information; including the adoption of mitigation measures that are considered effective in contemporary oil and gas development.

SA2-6

Primary Regulatory Authority for Air Quality

The Clean Air Act requires federal land managers to participate in air permitting decisions for Class I areas. In 2011, federal land managers entered a Memorandum of Understanding that unified how those agencies would fulfill this requirement. This agreement also expanded their opportunities to consult in air permitting decisions for areas they designated as Sensitive Class II. This Sensitive Class II designation is a land management tool and has no foundation within the Clean Air Act, or in the State's statutes or regulations.

SA2-7

SA2-7

The analysis of sensitive Class II areas (Class II nationally designated protected areas) was completed in consultation with the cooperating agencies. Because Class II nationally designated protected areas were raised as potential areas of concern with respect to air quality impacts during Project scoping and in subsequent discussions with cooperating agencies, some of which are FLMs, we have included these areas in the impact analysis and mitigation discussions. Our environmental review process is intended to disclose potential impacts associated with the Project and identify practicable mitigation measures; it does not replace the air permitting process.

In Alaska, the Department of Environmental Conservation (ADEC) is responsible for carrying out the permitting responsibilities required by the Clean Air Act. The State acknowledges that the federal land managers are responsible for protecting their respective lands; comments from federal land managers are considered during the review of the ADEC air permits. Based on comments from the National Parks Service, AGDC provided FERC a Best Available Control Technology (BACT) analysis as part of the NEPA process. That review would have been more appropriately conducted under the ADEC air permitting program. Having the federal land managers duplicate the ADEC permitting process could lead to different – and potentially inconsistent – decisions and permit requirements. Such inconsistency leads to regulatory uncertainty and litigation, along with project delay, and does not serve the public interest. Therefore, the State is asking FERC to remove the Sensitive Class II designation term from the Draft EIS.

Conclusion

The State Comment and Review Team appreciates the opportunity to comment on the Draft EIS. Because FERC declined the State of Alaska's request to participate as a Cooperating Agency, the interdisciplinary team did not have the benefit of the State regulatory agencies' expertise on the Alaskan environment, resources of concern, and local jurisdictions that provide a robust regulatory framework outside of the federal permitting process. To ensure consistent management of the proposed Alaska LNG Project between federal and State agencies, we are requesting the following opportunities for coordination as FERC approaches the conclusion of the NEPA process:

SA2-8

SA2-8

See the response to comment SA2-3. Although ADNR is not a cooperating agency for the purposes of preparation of the EIS, it is not precluded from coordinating with other federal and state agencies for reviewing and approving the applicable plans and permits needed to construct and operate the Project.

- Recommendation 1 – State involvement with the review and approval of Construction, Restoration, and Operation plans.
- Recommendation 2 – Engagement with the State Historic Preservation Officer during Section 106 consultation.
- Recommendation 3 – Coordination with ADF&G, ADEC, and DNR concerning the State's submitted comments.

CC-303

SA2 – Alaska Department of Natural Resources and Others (cont'd)

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Please contact me directly at faith.martineau@alaska.gov or (907) 269-0949 for questions.

Sincerely,



Faith Martineau
Executive Director, OPMP

Attachments:

1. State of Alaska Comments Matrix for the Alaska LNG Draft EIS
2. State of Alaska Comments Exhibit 1: DEC Correspondence re: Sensitive Class II
3. State of Alaska Comments Exhibit 2: DCCED Table re: Population Differences

Ecc: Kip Knudson, GOV Director of State/Federal Relations (kip.knudson@alaska.gov)
Corri Feige, DNR Commissioner (corri.feige@alaska.gov)
Jason Brune, ADEC Commissioner (jason.brune@alaska.gov)
Doug Vincent-Lang, ADF&G Commissioner (douglas.vincent-lang@alaska.gov)
Julie Anderson, DCCED Commissioner (julie.anderson@alaska.gov)
Adam Crum, DHSS Commissioner (adam.crum@alaska.gov)
John MacKinnon, DOT&PF Commissioner (john.mackinnon@alaska.gov)
Amanda Price, DPS Commissioner (amanda.price@alaska.gov)

CC-304

SA2 – Alaska Department of Natural Resources and Others (cont'd)

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State of Alaska Comments Matrix for the Alaska LNG Draft EIS

CC-305

SA2 – Alaska Department of Natural Resources and Others (cont'd)

CC-306

Comment
<p>There appears to be no reference to any of the impacts that occurred during construction of the Trans-Alaska Pipeline System (TAPS). Significant effects to fish and wildlife, fish and wildlife habitat, and socio-economic effects, such as housing, schools, traffic, communication, and local job pools were documented in a number of publications. TAPS is the closest analog for proposed effects from construction of the proposed buried gas line. A thorough search within the Alaska Resources Library and Information Services (ARLIS) in Anchorage should provide a number of references concerning TAPS impacts that would be useful in assessing potential impacts of gasline construction activities. For example:</p> <p>Pamplin, W.L. 1979. Construction-related impacts of the Trans-Alaska Pipeline System on terrestrial wildlife impacts (Special Report No. 24). Joint State/Federal Fish and Wildlife Advisory Team. USFWS and ADF&G, Anchorage, Alaska. 132 pp.</p> <p>Milke, G. 1977. Animal feeding problems and solutions (Special Report No. 14. Joint State/Federal Fish and Wildlife Advisory Team. USFWS and ADF&G, Anchorage, Alaska. 11 pp.</p> <p>Folmann, E.H., R.A. Dieterich, and J.L. Hechtel. 1980. Recommended carnivore control program for the Northwest Alaskan Pipeline Project including a review of human-carnivore encounter problems and animal deterrent methodology. Institute of Arctic Biology, University of Alaska, Fairbanks, Alaska. 113 pp.</p> <p>Burger, C. and L. Swenson. 1977. Environmental surveillance of gravel removal on the Trans-Alaska Pipeline System with recommendations for future gravel mining (Special Report No.13). Joint State/Federal Fish and Wildlife Advisory Team. USFWS and ADF&G, Anchorage, Alaska. 35 pp.</p>
<p>There is extensive use of web pages for information and as references, particularly in the Environmental Analysis section. Web pages are not static and may well disappear after a period of time. They are often generalized summaries that may not reflect localized use or conditions that should be the focus of these analyses. Published scientific literature, gray literature, and other printed documents that are static, particularly from Alaska or Northern Canada, should have been used in the preparation of this document, rather than easily searched web pages. The Alaska Resources Library and Information Services (ARLIS) is an excellent repository for Alaska and Arctic information.</p>
<p>The phrase "nationally designated protected" areas could be misleading. Class I areas are nationally designated protected areas by the Clean Air Act (CAA). Special protections for Class II areas only exist due to a 2011 memorandum of understanding signed by the Department of Interior, Environmental Protection Agency, and the Department of Agriculture, U.S. Forest Service regarding air quality analyses and mitigation for federal oil and gas decisions through the National Environmental Policy Act Process. The Federal Land Managers' Air Quality Related Values Work Group (FLAG) guidance document requires that the above agencies consult with federal land managers for NEPA projects that involve lands designated "Sensitive Class II areas" by the federal land management agency. This "Sensitive Class II" designation does not provide any special protections, it only requires that the above federal agencies involved in the NEPA process consult with the federal land managers if there could be air quality impacts. Please remove the phrase "nationally designated protected" from the text and replace it with "sensitive Class II areas" as identified in the 2011 memorandum of understanding.</p>

SA2-9

SA2-9

Articles and other resources addressing impacts and mitigation from TAPS and other industrial development in Alaska were reviewed and incorporated where applicable throughout the draft and final EIS, including for geology, soils, vegetation, wildlife, socioeconomics, and subsistence (see sections 4.1, 4.2, 4.5, 4.6, 4.11, and 4.14, respectively). Because TAPS is an aboveground oil pipeline and the proposed Project would be a belowground natural gas pipeline, not all associated impacts and mitigation measures would be the same for the projects.

SA2-10

SA2-10

The phrases "sensitive Class II areas" and "Class II nationally protected areas" were used interchangeably within section 4.15 of the draft EIS. Class II areas were included in our analysis based on feedback from cooperating agencies who are also FLMs.

SA2 – Alaska Department of Natural Resources and Others (cont'd)

CC-307

Comment	SA2-11	SA2-11	See the responses to comments FA1-62, FA3-78, and SA2-7.
<p>The Clean Air Act (CAA) specifically authorizes federal land managers (FLMs) with responsibility for Class I areas to participate in air permitting decisions where emissions from a proposed facility could affect the Class I areas. See 42 U.S.C. 7475(d)(2). In Alaska, there are two Class I areas near the Alaska LNG project: Denali National Park and Tuxedni Wilderness Area. Class I designations are defined in Section 162 of the Clean Air Act: only states or Tribes may reclassify a Class II area as a Class I area under the Clean Air Act. Under the Memorandum of Understanding (MOU) signed by the U.S. Department of Agriculture (USDA), the Department of Interior (DOI) and the Environmental Protection Agency (EPA) in 2011, the federal land managers established a new designation - a "Sensitive Class II" area that does not appear in the relevant statutes, including 42 U.S.C. 7416, 42 U.S.C. 7474 and 42 U.S.C. 7475. For the Alaska LNG Project, the federal land managers have identified nine areas as "Sensitive Class II" areas that may warrant air quality protection analysis equivalent to Class I areas. The Clean Air Act Title I Prevention of Significant Deterioration (PSD) permitting process includes an analysis of Air Quality Related Values (AQRVs) for designated Class I areas, in consultation with the federal land managers. ADEC understands that the federal land managers are responsible for protecting the public lands that they manage. However, the "Sensitive Class II" designation, as it is being used by the federal land managers, conflicts with other requirements set out in the Clean Air Act. The department is concerned that with the federal land managers are duplicating aspects of ADEC's permitting process within NEPA and the subsequent record of decision (ROD) could end up with a project that is different from the decision ADEC may make through the rigorous state permitting process. This could lead to regulatory uncertainty, and possibly lead to litigation and project delay. Please note that this concern was raised to FERC in a July 17, 2019 letter from Joe Balash and Susan Combs of the Department of Interior. Those letters are provided as a separate attachment to this comment matrix. Please rewrite this description so that the regulatory authority of the agencies and federal land managers is clearer, so that the EIS is not written in a way that would conflict with the department's permitting authority.</p>	SA2-12	SA2-12	See the responses to comments SA2-3 and SA2-8.
<p>BLM Alaska and the Department of Natural Resources (DNR) coordinate closely on permitting for, and management of, pipelines that are located on both federal and state lands. The two agencies maintain a standard practice of using the same series of construction and operational plans for their respective authorizations to simplify oversight. This is the model that has been successfully implemented to manage TAPS consistently and effectively.</p> <p>There are multiple references throughout the DEIS to plans that FERC has either already approved or will require approval before various stages of the project. Many of these plans are intended to be attached to BLM's ROW grant and DNR's ROW lease. As a cooperating agency, BLM has had the opportunity to review these plans during the NEPA process; however, as the State was rejected as a cooperating agency, DNR has not been provided the same opportunity.</p> <p>Cooperating agency status for the NEPA process should not be a consideration for the review and approval of these plans. Because DNR is the primary regulatory entity for the sections of the pipeline that would cross State lands, the applicable plans referenced in the DEIS must be provided to DNR for review and approval before they can be finalized.</p>	SA2-13	SA2-13	Sections 1.2.3, 1.6.8, and 4.3.3.3 of the final EIS have been updated to address this comment.
<p>The description for the APDES program is correct but recommend including "(Metlakatla)" after Indian Country. Also note that Page 420 refers to "all tribal land" instead of Indian Country. Recommend using the same language from Page 58 on 420 for consistency.</p>			

SA2 – Alaska Department of Natural Resources and Others (cont'd)

CC-308

Comment			
As noted above the designation of "Sensitive Class II" areas could lead to conflicts with the department's permitting authority. Please revise from this sentence, as the Fish and Wildlife Service does not have "direct responsibility" to protect air quality and related values on sensitive Class II lands. According to the 2011 memorandum of understanding they have a consulting role, not direct responsibility.	SA2-14	SA2-14	See the responses to comments SA2-7 and SA2-11.
Section 1.2.8 (National Park Service) inaccurately cites PL 116-9 as giving the NPS authority to issue a RWE for a high-pressure natural gas transmission line and does not identify the exemption from Title XI should the project cross Denali National Park and Preserve, even though Section 1.6.15 references it doing so "as stated previously [in Section 1.2.8]." Please correct/amend both sections as follows: [Page 1-9] "On September 18, 2013, Public Law 113-33, the Denali National Park Improvement Act, was enacted, which allows for: A high-pressure natural gas transmission pipeline (including appurtenances) in nonwilderness areas within the boundary of Denali National Park and any distribution and transmission pipelines and appurtenances that the Secretary determines to be necessary to provide natural gas supply to the Park. On March 12, 2019, Public Law 116-9 - the John D. Dingell, Jr. Conservation, Management and Recreation Act - amended Section 3(b) of Public Law 113-33. Section 3(b) includes the following exemption: A high pressure gas transmission pipeline (including appurtenances) in a nonwilderness area within the boundary of the Park, shall not be subject to title XI of the Alaska National Interest Lands Conservation Act (16 U.S.C. 3161 et seq.)." allows for: A high-pressure natural gas pipeline (including appurtenances) in nonwilderness areas within the boundary of Denali National Park and any distribution and transmission pipelines and appurtenances that the Secretary determines to be necessary to provide natural gas supply to the Park [Page 1-35] "As previously stated, the Denali National Improvement Act, as amended by Public Law 116-9 - the John D. Dingell, Jr. Conservation, Management, and Recreation Act, exempts a high pressure gas transmission pipeline, sited in a nonwilderness area, from Title XI of ANILCA. We note that AGDC's proposed route does not cross any conservation system units subject to Title XI of ANILCA, regardless of Public Law 116-9."	SA2-15	SA2-15	Sections 1.2.8 and 1.6.15 of the final EIS have been updated to reflect the incorporation of the Denali Alternative into the proposed Project and the applicability of Public Laws 113-33 and 116-9.
North Slope Area Special Use Lands (ADL 50666) and Dalton Highway Corridor (AS 19.40.210) should be identified.	SA2-16	SA2-16	Table 1.6-1 of the final EIS has been revised to add these state regulations.
Missing from the list appears to be FERC Guidance on Subsistence Data Requirements (see Public File, Docket No. PF09-11-000 [PDF available]. FERC general requirements for the State of Alaska state "Define baseline conditions using data that is no more than three years old or provide justification for why the use of certain older data is still valid and accurate. Data more than three years old often do not reflect current factors such as levels of participation, specific resources used and levels of use, current status of resources, exchange systems, and harvest patterns." Much of the subsistence baseline data in the DEIS are older than three years old. The justification provided at 4.14.1 (page 4-701) does not take into account the fact that the subsistence baseline data that the DEIS relies on are single-year "snapshots" of a community's harvest and use, and not representative of trends over time until further data are collected.	SA2-17	SA2-17	Comment noted.
There is no direction in the National Trails System Act (NTSA) to conduct ongoing studies to identify qualifying segments and sites for congressional designation under the NTSA that would supersede the prohibition in ANILCA Section 1326(b) against studies for the purpose of establishing new conservation system units (CSUs) in Alaska unless authorized in ANILCA or a subsequent Act of Congress. Congressionally designated national Trails are defined by ANILCA as CSUs. Please remove the first half of the agency action as follows: "Review Project to identify segments and sites for inclusion in National Historic Trail System; coordinate protection and improvement of Trail System.	SA2-18	SA2-18	Table 1.6-1 of the final EIS has been revised to address this comment.

SA2 – Alaska Department of Natural Resources and Others (cont'd)

Comment	SA2-19	SA2-19	Table 1.6-1 of the final EIS has been revised to add these regulations.
Add line under ADNR (DMLW or SPCS) major permits, approvals and consultations for AS 27.19.030-.050 for any material site reclamation plan on or off state land.			
Add line under ADNR in the Major Permits, Approvals and Consultations table for easements on State land.			
This table needs to be updated to include: Update the status of the Gas Treatment Plant (GT ²) Air Quality construction permit, which started a public comment period in July 2019.	SA2-20	SA2-20	Table 1.6-1 of the final EIS has been revised to include this permit.
This page incorrectly lists only the Construction Storm Water General Permit. The DEC Division of Water, Wastewater Discharge Authorization Program issued General Permit AKG332000 – Statewide Oil and Gas Pipelines to cover Construction, Operation, and Maintenance of the pipeline and related facilities. The authorized discharges include: Inadvertent Releases of Drilling Fluids, Domestic Wastewater, Gravel Pit Dewatering, Excavation Dewatering, Hydrostatic Test Water, Mobile Spill Response, and Construction/Operation Storm Water. Please correct the table for this general permit. The department's Environmental Health Division's Solid Waste Program should also be added to this listing. This is the program that reviews and approves landfills.	SA2-21	SA2-21	The comment appears to incorrectly reference AKG332000 as the Statewide General Permit. AKG332000 is the North Slope General Permit. Table 1.6-1 of the final EIS has been revised to reference AKG320000 - Statewide Oil and Gas Pipelines General Permit. Regarding the comment to add the Environmental Health Division's Solid Waste Program, AGDC has not proposed to develop any new landfills. Therefore, no landfill review or approval would be needed from the Environmental Health Division.
Please add a reference to State food service permits to the list. In addition to permit requirements for permanent food services, each temporary food service location may require a permit. If food service is offered at a camp that 1) serves fewer than 24 individuals each day over a 14-day period; and 2) is located in an area with no year-round access to a major road system and at least 25 road miles to the nearest community or paved highway, it should be noted that the camp operation may be eligible for a temporary camp authorization.	SA2-22	SA2-22	Table 1.6-1 of the final EIS has been updated to address this comment.
"…Within the limits of ordinary high water OF (not or) any streams with fish presence to prevent…"	SA2-23	SA2-23	Table 1.6-1 of the final EIS has been updated to address this comment.
We suggest rewording the sentence to read "Under the CAA, the EPA sets limits on certain pollutants and grants states and federal land managers the authority to limit air pollutant emissions coming from sources such as industrial facilities."	SA2-24	SA2-24	Section 1.6.10 of the final EIS has been updated to address this comment. Also see section 4.15.3 of the final EIS for a discussion of ADEC's permitting authority under the Clean Air Act.
The DEIS does not address byproduct disposal, including CO ₂ and H ₂ S. Neither the Prudhoe Bay Unit (PBU) working interest owners nor the Alaska Gasline Development Corporation (AGDC) currently have the right to use PBU facilities for this purpose. The PBU leases allow the PBU working interest owners to use the surface to process oil and gas from those leases, but not production from other leases, such as the Point Thomson Unit (PTU), or from third parties, such as AGDC. Even assuming these contractual issues are resolved, AGDC's plan to transport byproducts to the PBU Treated Gas Dehydration System does not address disposal of these byproducts, including where and how AGDC intends to dispose of the byproducts, how AGDC will acquire the legal ability to do so, and what potential impacts this disposal will have on the land.	SA2-25	SA2-25	GTP byproduct would be transported by pipelines to the PBU for injection into the production field via existing or new wells as part of the PBU Major Gas Sales (MGS) Project, which is not subject to the Commission's jurisdiction. Information on the PBU MSG Project is provided in section 4.19.2 of the final EIS.
How would Dock Head 4 be authorized? Dock Heads 1, 2, 3, and the processed water plant are authorized under tideland leases issued to BPXA. Would Dock Head 4 be part of BPXA's tideland leases?	SA2-26	SA2-26	AGDC would coordinate with the ADNR-DMLW on the acquisition of tideland leases or interests therein to secure construction authorization on state-owned tidelands. Following its use by AGDC during construction, Dock Head 4 would be maintained and operated by BP Exploration (Alaska), Inc. A description of screening is provided in section 2.1.3.2 of the final EIS.
Suggest adding a short explanation about what screening is and specify why no disposal site is needed (Unlike dredging).	SA2-27		
There are no freshwater aquifers available for water wells in Prudhoe Bay or Deadhorse.	SA2-28	SA2-27	
The beaches at the nearshore pipeline crossings, the MOFs, and the Product Loading Facility are subject to AS 38.05.127 Access To Navigable or Public Waters.	SA2-29	SA2-28	Section 2.1.3.8 of the final EIS has been updated to address this comment.
		SA2-29	Section 4.9.4.2 of the final EIS has been updated to address this comment.

SA2 – Alaska Department of Natural Resources and Others (cont’d)

Comment	SA2-30	SA2-30	Section 2.1.4.2 of the final EIS has been updated to address this comment.
It is not the policy of DNR to allow lessees to abandon docks once they are done with them. AGDC will be required to either maintain it under the ROW lease, remove it, find another party willing to take responsibility for it by entering into an AS 38.05.070 tideland lease, or as otherwise approved of by the DNR Commissioner.	SA2-30	SA2-30	Section 2.1.4.2 of the final EIS has been updated to address this comment.
Please provide the volume of fuel to be stored on the dock.	SA2-31	SA2-31	AGDC has not identified the quantity of fuel to be stored at the Mainline MOF.
Approx. 75% of the construction footprint will be located on State lands. This means a high percentage of the gravel pads and access roads will fall under the jurisdiction of DNR's ROW lease. A case-by-case review of each gravel pad and road will need to be conducted in order to determine if abandoning in place is appropriate.	SA2-32	SA2-32	AGDC would implement measures identified in its SPCC Plan, such as the use of secondary containment for single-walled containers, to prevent spills of fuel and respond to, and clean up, any spills that might occur. We additionally note that AGDC has committed to developing facility/work site-specific SPCC Plans prior to construction as discussed in section 4.2.6 of the final EIS.
The number of roads described in this paragraph does not equal the total number reported in the first sentence of this paragraph.	SA2-33	SA2-32	Comment noted. See the response to comment FA1-50 regarding removal of granular fill.
The number of Heli pads described in this paragraph does not equal the total number discussed in the same paragraph.	SA2-33	SA2-33	Section 2.1.4.3 of the final EIS has been updated to address this comment.
Please provide additional information on fuel storage capacity at each construction camp so that regulatory authority and potential mitigation measures are clear. ADEC's SPAR Division would oversee any fuel storage (refined petroleum) over 10,000 gallons aggregate in fuel storage capacity.	SA2-34	SA2-34	AGDC has not identified the quantity of fuel to be stored at each construction camp. See the response to comment SA2-31.
Construction waste from packing of material and supplies, camp refuse, and sanitary waste should be backhauled to existing approved landfills. If this is not possible, then it should be noted that new landfills would need to have plans reviewed and approved by the DEC Environmental Health Division's Solid Waste Program. Excavated material such as stumps, blast rock, acid rock drainage material, and slash should be disposed of in "Excess Material" disposal sites. If possible, these sites should be co-located with material sites, particularly those not within floodplains, where the material would be easily accessible for reclamation activities. Any new landfill or disposal site located on State land would also require DNR authorization. ADF&G authorization also would be required for sites located within the Minto Flats and Susitna Flats state game refuges.	SA2-35	SA2-35	Comment noted. See the updates to section 2.1.4.3 of the final EIS.
Please provide additional details on the amount of mercury that will be disposed of and how it will be disposed or provide a citation to where the information is provided in more detail.	SA2-36	SA2-36	Section 2.1.5.1 of the final EIS has been updated to address this comment.
Per Section 2.1.5.1 first paragraph, "Operation of the LNG Plant would result in discharges of treated wastewater, boiler blowdown, reverse osmosis reject water, and storm water. Given the listing of proposed discharges, the facility would need an individual permit covering these discharges. When developing potential mitigation measures and monitoring measures it is important to understand what safeguards would be provided by state permits. It would be useful for the public and decision makers for this information to be provided.	SA2-37	SA2-37	Section 4.3.3.3 of the final EIS has been updated to address this comment.
Please provide an estimate of the volume of the storage tanks for condensate storage, so it can be determined what regulatory requirements would be appropriate.	SA2-38	SA2-38	This information is provided in table 2.5.3-1 of the final EIS. With regard to condensate storage and other facilities, the requirements considered by FERC staff for spill containment, leak detection, and hazard mitigation are presented in section 4.18.5.5 of the final EIS.
Add that this plan includes vegetation maintenance clearing along the right-of-way.	SA2-39	SA2-39	While the Revegetation Plan describes vegetation maintenance for the right-of-way, the primary purpose of the plan is to establish revegetation protocols for the Project. Right-of-way vegetation maintenance is addressed in sections 2.5.2.1 and 4.5.2.2 of the final EIS.

CC-310

SA2 – Alaska Department of Natural Resources and Others (cont’d)

CC-311

Comment			
<p>The Waste Management Plan indicates that waste will be shipped to appropriate disposal locations, and in the case of non-hazardous wastes, the plan lists four DEC regulated Class I Municipal Solid Waste Landfills along the corridor of construction (Oxbow – NSB Deadhorse, Fairbanks, Anchorage, and Soldotna). Please note that this list does not include the Class I landfill in Palmer. While the project is probably years off, please note that there are already space considerations with some of these landfills, as well as other site specific limitations, such as whether the landfills will accept waste from outside of their service area. As such, it is possible that these disposal locations will not allow, or be able to, accept waste from this project. If the existing landfills cannot accommodate the relevant wastes, there would be additional permitting and effort required from ADEC Solid Waste Program. In addition, the EIS document inferred that there could be a number of small landfills (probably camp and construction waste) that could be constructed as part of this project. These small landfills do not appear to be addressed in the Waste Management Plan. If read correctly, this would indicate that the two documents conflict with one another. Please clarify which is true.</p>	SA2-40	SA2-40	<p>Section 6 of the Project Waste Management Plan states that while landfill expansions are not planned at this time, future waste management plans would identify if new landfill options, including landfill expansion, would be required to accommodate Project waste. 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. Permitting of new or expanded landfills, if these are needed, would be outside of FEREC's jurisdiction. AGDC would be responsible for obtaining the required federal or state permits for any new or expanded landfills. See the updates to section 2.1.4.3 of the final EIS regarding disposal of construction debris and camp wastes.</p>
<p>Per Section 2.2.1.2.2 of the Water Use Plan, "If winter testing becomes necessary, the test plans would list any additives (such as antifreeze chemicals) proposed for the use. Hydrostatic testing on the North Slope could require the use of additives year-round, and the hydrostatic testing discharge water would be injected to UIC-permitted wells." Please note that under AKG320000 - Statewide Oil and Gas Pipelines (Permit), Section 2.6.1.3, the use of antifreeze in hydrostatic test water is prohibited. The AK LNG Project would need to seek specific approval outside the General Permit for discharging or disposing of treated hydrostatic test water if antifreeze (glycol) is proposed.</p>	SA2-41	SA2-41	<p>Comment noted.</p>
<p>Please make the following edits to the "Unanticipated Contamination Discovery Plan": (1) Section 2.1, fourth bullet - it should be clear whether the Contractor will provide initial notification to DEC and, if necessary EPA/NRC, or whether the Project entity will provide initial notification. (2) Fig. 2 - recommend replacing this figure with the June 2019 Contaminated Sites Process Flowchart. (3) Fig. 3 - is not applicable, as newly discovered sites would not typically be managed under the Superfund process during the LNG project. (4) Sect 3.1 - "Agency contacts" should be clarified to include "timely initial notification to DEC and, when appropriate NRC". (5) Sect 3.1 or 3.2 - either the Project entity or Contractor should ensure that they document regulatory approvals for any site characterization, cleanup, and waste treatment or disposal plans.</p>	SA2-42	SA2-42	<p>The ADNRC should work directly with AGDC to regarding any proposed changes to the Unanticipated Contamination Discovery Plan.</p>
<p>An overburden berm will also need to be placed around the perimeter of the mine site to decrease the thermal degradation of the surrounding permafrost and as a visual cue to any snowmachines traveling in the area.</p>	SA2-43	SA2-43	<p>Section 2.2.1.3 of the final EIS has been updated to address this comment. Additional information on berms is provided in the Project Gravel Sourcing Plan and Reclamation Measures. 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.</p>
<p>This proposed activity will also require Fish Habitat Permits from ADF&G-Habitat.</p>	SA2-44	SA2-44	<p>Section 2.2.1.4 of the final EIS has been updated to address this comment.</p>
<p>Fish Habitat Permits also will be needed for these withdrawals and will dictate measures designed to minimize impacts to fish.</p>	SA2-45	SA2-45	<p>Section 2.2.2.1 of the final EIS has been updated to address this comment.</p>
<p>There is no mention or discussion of nondestructive testing/certification of individual welds before the pipeline is lowered into the trench. However, this testing is identified in Appendix D, page D-9.</p>	SA2-46	SA2-46	<p>This is addressed in section 4.1.3.10 of the final EIS.</p>

SA2 – Alaska Department of Natural Resources and Others (cont’d)

Comment	SA2-47	SA2-47	Section 4.2.5.2 of the final EIS has been updated to address this comment.
<p>What will be done when trenching encounters ice lenses and ice wedges to reduce thermokarsting? The second paragraph in this section seems to indicate that frozen material will not be used to backfill the trench. Please clarify if this is accurate. The GCI/Quintillion fiber optic installation along the Dalton Highway demonstrates why this is such an important factor.</p>			
<p>Does this include stick picking? The sooner items are picked up, the less likelihood of trash being blown off-site.</p>	SA2-48	SA2-48	In this section, “cleanup and restoration” refer to actions associated with removal of construction debris, final stabilization, contouring, revegetation, and installation of permanent erosion controls and pipeline markers.
<p>Replace 'could' with 'cannot'.</p>	SA2-49	SA2-49	Section 2.2.2.2 of the final EIS has been updated to address this comment.
<p>There is no explanation either in the table or in the surrounding text describing what “Open-Cut/pipelay” is or why the table lists one waterbody crossing as using this technique. Was this an editorial glitch or is there another technique that should be discussed?</p>	SA2-50	SA2-50	Table 2.2.2-4 of the final EIS has been updated to address this comment.
<p>For Directional Micro-tunneling (DMT), the DEC Water Division suggests adding information at the end of the third paragraph on page 2-64 noting that the permit offers coverage for inadvertent releases to waters of the U.S., as provided for in AKG320000 as a contingency to fluids released to surface water and grants a 500 meter mixing zone to comply with turbidity limits.</p>	SA2-51	SA2-51	Section 2.2.2.2 of the final EIS has been updated to address this comment.
<p>A new natural gas pipeline, referred to as the Tyonek West 10 (ADL 232962), was built in 2018 from the Tyonek platform to Ladd Landing (sub-sea). It appears from project drawings that the AKLNG pipeline would cross this pipeline and thus needs similar protection as the fiber optic cables to avoid anchor strikes during construction. Additionally, the crossing needs to be properly designed by project engineers.</p>	SA2-52	SA2-52	Section 2.2.2.2 of the final EIS has been updated to address this comment.
<p>Has HDD installation been investigated for the shoreline crossings in Cook Inlet? HDD is usually better than trenching in regards to maintaining shoreline stability. HDD is required for oil and gas leases in the Cook Inlet Area-wide lease sale area (ADNR, 2018) and this technique should be vetted for this project.</p>	SA2-53	SA2-53	See the discussion of shoreline crossing methodologies in section 4.3.3.3 of the final EIS.
<p>Alaska Department of Natural Resources (ADNR). 2018. Cook Inlet areawide oil and gas lease sale: Written finding of the director. November 2, 2018. Available online at http://dog.dnr.alaska.gov/Documents/Leasing/BIF/Cook_Inlet/20181102_Final_CI_BIF.pdf. Accessed August 2019.</p>			
<p>Multiple places in the DEIS reference that there are three above ground fault crossings yet there are four listed here. Please clarify.</p>	SA2-54	SA2-54	Sections 2.1.4.1, 2.2.2, 4.1.3.10, and 4.18.10.5 have been updated to address this comment.
<p>The top 30 cm of the soil profile must be -5° C or colder.</p>	SA2-55	SA2-55	Comment noted.
<p>On North Slope state lands, DNR/DMLW has an approved list of low psi vehicles that can be used for pre-packing/frost packing prior to the opening of the winter tundra travel season.</p>	SA2-56	SA2-56	Comment noted.
<p>The discussion should describe measures needed to ensure appropriate measures are available so that water can flow across the crowned ditch line (i.e., cross drainage structures).</p>	SA2-57	SA2-57	Section 2.2.2.3 of the final EIS has been updated to address this comment. Also see the discussion regarding trench crowning in section 4.2.5.2 of the final EIS.

CC-312

SA2 – Alaska Department of Natural Resources and Others (cont'd)

CC-313

Comment			
It is not clear what permits would be required from the Corps and from ADEC for removal of the Marine Terminal Materials Offloading Facility. Please provide more details.	SA2-58	SA2-58	Removal of the Marine Terminal MOF would affect water quality and waters of the United States similar to construction of the facility. Therefore, removal of the facility, like construction, would require permits from the COE and ADEC.
Please provide more details on <u>who</u> would ensure that issues and complaints would be resolved in a timely and efficient manner. Will the Federal Energy Regulatory Commission have boots on the ground to ensure these issues are resolved in a timely and efficient manner?	SA2-59	SA2-59	As indicated in the executive summary, “we,” “us,” and “our” refer to the environmental and engineering staff of FERC’s Office of Energy Projects. Our compliance monitoring program is discussed in section 2.4.2 of the final EIS.
Please add a sentence noting that corrosion control is still required for gas transmission pipelines. (Corrosion control requirements by PHMSA are under Subpart I (sections 451 to 491) of 49 C.F.R. 192. Specifically, atmospheric (i.e. aboveground) corrosion control is addressed in sections 479 - 481.)	SA2-60	SA2-60	Section 2.5.1.5 of the final EIS has been updated to state that atmospheric corrosion control would still be required per 49 CFR 192.479 to 481.
It is not clear what specific “hazardous fluid requirements” are being referred to here. Please explain. It should also be noted that because there is a total of greater than 420,000 gallons of petroleum storage at the Liquefaction Facility, all petroleum storage tanks greater than 10,000 gallons storage capacity will be regulated by ADEC, under Alaska Statutes at AS 46.04.030 and department regulations at 18 AAC 75 Article 1 and Article 4. It is also not clear how the water tank system will prevent freezing during the winter months. Will it be housed in a building or will it be insulated or heated? Please explain.	SA2-61	SA2-61	We apply a consistent set of safety and reliability design criteria to LNG projects under our jurisdiction, and these criteria can exceed current federal code. Therefore, we do not rely on an evaluation of individual state statutes regarding plant safety design. The criteria used for spill containment, leak detection, and onsite hazard mitigation for hazardous fluids are addressed in section 4.18.5.5 of the final EIS. However, to address emergency response scenarios, our related recommendation in section 4.18.9 of the final EIS would require AGDC to develop, prior to initial site preparation, an adequate Emergency Response Plan and coordinate procedures with the Coast Guard; state, county, and local emergency planning groups; fire departments; state and local law enforcement; and appropriate federal agencies. In addition, AGDC would be required to develop a Cost Sharing Plan that identifies the mechanisms for funding all Project-specific security/emergency management costs that would be imposed on state and local agencies. The firewater tank would be provided with a heater. See also the updates to section 2.5.3.1 of the final EIS.
Some state spill containment and spill response regulations are more stringent than federal rules. Please add references to Alaska statutes and regulations. Secondary containment requirements for regulated petroleum storage tanks are found in ADEC regulations at 18 AAC 75 Article 1.			
Please provide additional details on the high-expansion foams being used as a fire suppressant. Please clarify if PFAS or PFOA compounds are contained in this foam. It would be appropriate to add a statement here that any discharge of Class B fire suppression foams to the environment requires release notification to DEC and may trigger a requirement for site characterization and cleanup.	SA2-62		
Was shifting the location of the Operation Center’s gravel pad slightly so that it was no longer located within the lake evaluated?	SA2-63	SA2-62 SA2-63	Section 2.5.3.3 of the final EIS has been updated to address this comment.
Was an evaluation of the road preferred by the ASAP project (with some changes to allow for wide radius turns) conducted? (K-Pad road is labeled as E Pad Access Road).	SA2-64	SA2-63	The Operations Center and Camp configuration is constrained by a large lake to the east and smaller ponds to the west. The proposed pad location abuts, but does not lie in, the lake and is configured to avoid the lake and other ponds to the immediate west of the entrance road for the camp.
There is no known muskox calving area in the Oliktok area.	SA2-65	SA2-64	The proposed module delivery access road would use a portion of the existing road from West Dock to K Pad Road, reducing the total volume of granular fill required for access roads. The new portion of the access road route avoids waterbodies and uses a direct path to the GTP main pad to minimize impacts on wetlands and reduce vehicular emissions. We understand the ASAP Project also proposed to use existing roads. We note that the Gas Conditioning Facility for ASAP would be near, but not at the same site as, Alaska LNG’s Gas Treatment Plant.
Are there opportunities to pick up gravel that’s already sitting on the tundra instead of pulling all of the needed gravel out of mine sites? This could contribute to wetland mitigation.	SA2-66	SA2-64	Table 3.3.4-1 of the final EIS has been updated to address this comment.
The DEC Water Division recommends expanding the discussion to explain why using DMT could mitigate impacts to the family fishing operation. Specifically, AGDC should call attention to a requirement for a “time-area restriction” associated with the accompanying discharge permit authorized by the DEC Wastewater Discharge Authorization Program (WDAP). Essentially, based on input from ADF&G, DEC would impose restrictions on when discharges could occur, thus eliminating conflict at the time of discharging.	SA2-67	SA2-64	Comment noted. We are unaware of the locations and quantities of gravel referenced in the comment, or how gravel removal from the surface would be accomplished in a manner that would be environmentally preferable to the use of mine sites.
		SA2-65	Sections 3.6.1.2 and 4.9.1.2 of the final EIS have been updated to address this comment.
		SA2-66	
		SA2-67	

SA2 – Alaska Department of Natural Resources and Others (cont’d)

CC-315

Comment			
<p>The topography of the mainline route from approx. MP 536 to MP 544 is comprised of steep mountain slopes which are subject to mass waste events (landslides, rock flows, etc.) and are susceptible to additional erosion if disturbed. The SPCS supports the use of the Denali Alternative as it will be located in more geologically stable soils (i.e. relatively flat riverine sediments), will cost the applicant less overall to install, will utilize an already developed transportation corridor, reduces the length of new access roads, and reduces impacts to wetlands. Additionally, the majority of the Denali Alternative route would not be visible to people visiting the area. Conversely, the proposed mainline route would be highly visible from the Parks Highway and local businesses.</p>	SA2-68	SA2-68	Comment noted.
<p>The Fairbanks alternative route takes the pipeline inside the PM 2.5 air quality nonattainment area boundary. The EPA's recent designation of the area as being in Serious nonattainment would bring additional analysis for general conformity impacts (70 tpy de minimus threshold) for non-transportation projects and transportation conformity for road projects. Air quality should be identified as an environmental impact of interest in that section in addition to identifying the wetlands issue.</p>	SA2-69	SA2-69	The comment notes that the Fairbanks Lateral would bring air quality benefits to the Fairbanks area, which is listed as serious non-attainment for PM _{2.5} . To the extent that this statement is premised on the assumption that fuels such as coal or oil would be replaced by natural gas, this benefit would be realized with the proposed Project once the envisioned lateral pipeline to Fairbanks is built; therefore, air quality impacts would be the same for either alternative. A similar conclusion can be reached regarding fugitive dust during construction; both the Fairbanks Alternative and a lateral to Fairbanks would generate temporary increases in fugitive dust within the Fairbanks region.
<p>Please explain why additional vessel transits would be required if the facility is located at Point McKenzie. Throughout the chapter the report discusses the limitation that will be implemented within the project area but does not specify the actual limits of the project area. During the investigation, the authors of the document mention that they have identified mineral resources within 0.5 miles of the plan route. Is this the intended size of the closure to mineral entry?</p>	SA2-70		Section 3.8.1.3 of the final EIS has been updated to address this comment.
<p>A discussion of placer gold is discussed in this bullet, but nowhere within this section is there a discussion of lode gold. The Livengood project, which is adjacent to and is crossed by the Mainline Pipeline is not discussed. It can be almost certain that this project will be developed in the future and should be addressed in this section of the DEIS.</p>	SA2-71	SA2-70 SA2-71	A description of the Project, including the land requirements for construction and operation, are discussed in section 2 of the final EIS. See the updates to section 4.1.2.3 of the final EIS.
<p>The project should use certified weed-free gravel, when available. AGDC can coordinate with local Soil and Water Conservation Districts to have gravel sources certified as weed-free.</p>	SA2-72	SA2-72	Lode and placer claims associated with the Livengood Gold Project are considered in the cumulative impacts assessment provided in section 4.19.4 of the final EIS.
<p>Recommend adding a map that show the Coal Resources that are crossed by the Mainline Pipeline.</p>	SA2-73	SA2-73	As discussed in section 4.5.8.3 of the final EIS, AGDC would use granular fill sources certified as weed-free through the Weed-Free Gravel Certification Program of the ADNR Plant Materials Center or would adopt the weed-free gravel inspection standards for new granular fill sources if certified sources were not available.
<p>State of Alaska mining claims cannot be cancelled. Mining claims may be abandoned if a miner fails to meet the requirements of the mining statute or regulations, or they can be relinquished by the miner at any time.</p>	SA2-74	SA2-74	Coal resources along the Project footprint are provided in figure 6.3.3-1 of Resource Report 6 (Accession No. 20170417-5338). Additionally, table 4.1.2-3 of the final EIS identifies coal resources crossed by the Mainline Pipeline by milepost.
<p>State of Alaska mining law also requires for reasonable access to existing and future mining claims through State of Alaska lands. And like the federal government, the state cannot deny a claim holder the ability to recover locatable minerals from the claim. Any limitations on the method of mining must be in statute or regulations of the agencies that authorizes mining activity. Access across State of Alaska lands may only be denied if it is for the safety of the general public such as during the construction of the pipeline.</p>	SA2-75	SA2-74	Section 4.1.2.3 of the final EIS has been updated to address this comment.
<p>The geographic reference point that the authors should use is "the seafloor trench of the subduction zone"--subduction zone by itself is far too vague. Additionally, the authors should clarify that this statement only generally holds true for earthquakes that specifically occur on the plate interface of the subduction zone. This statement does not necessarily describe the general behavior or upper crustal, intra-slab, and outer rise earthquakes. For example, the 2002 Denali M7.9 earthquake was over 500 km from the "seafloor trench" of the subduction zone but occurred at only 13 km depth.</p>	SA2-76	SA2-75 SA2-76 SA2-77	Section 4.1.2.3 of the final EIS has been updated to address this comment. Section 4.1.2.3 of the final EIS has been updated to address this comment. Section 4.1.3.1 of the final EIS has been updated to address this comment.

SA2 – Alaska Department of Natural Resources and Others (cont'd)

CC-316

Comment	SA2-78	SA2-78	Section 4.1.3.1 of the final EIS has been updated to address this comment.
<p>Suggestion for clarity: "Ground surface displacement (i.e., fault surface rupture) occurs when the slip patch on an earthquake-producing fault (within the brittle crust) is shallow enough and large enough to intersect the surface of the earth."</p>	SA2-79	SA2-79	Section 4.1.3.1 of the final EIS has been updated to address this comment.
<p>Suggest for clarity: "...where the Mainline Pipeline intersects known or previously unknown faults." This is an important distinction to make, and it acknowledges that there are basically 3 types of faults out there that may produce damage: 1) mapped faults that we know have been active in historic times or throughout the Holocene, 2) mapped faults, but that are classified as "old" (not yet active in Holocene) but are still able to produce significant earthquakes, and 3) previously unmapped, unknown faults that can also produce significant earthquakes...</p>			
<p>To emphasize my previous point about unknown earthquake sources: this event occurred within the downgoing slab (as stated) on a fault that we were previously unaware of. Afterwards, using the aftershock sequence we were able to learn more about the fault (location, depth, orientation), but we knew nothing about it before the earthquake. There is the potential for this to happen ANYWHERE within the downgoing slab, including the outer rise (within the Pacific plate south of the seafloor trench--e.g., offshore Kodiak, 23 Jan 2018 Mw 7.9, 25 km depth). This discussion would be more useful if the authors envisioned a similar Mw 7.1 intraplate earthquake scenario, but directly under the project site. Epicentral PGAs of 0.843 g is what should be a concern here...</p>			
<p>If this is the Iniskin earthquake it should be referenced by name.</p>	SA2-80	SA2-80	Section 4.1.3.1 of the final EIS has been updated to address this comment.
<p>should read: "The most significant, <i>instrumentally-recorded</i> earthquake to have affected the Project area was the 1964 Great Alaska Earthquake." Also, all previous/subsequent uses of "Alaskan" to describe the 1964 earthquake should be corrected</p>	SA2-81	SA2-81	Section 4.1.3.1 of the final EIS has been updated to address this comment.
<p>Both of these footnotes are erroneous. An earthquake's magnitude is the amount of energy that was released in the earthquake. Shaking intensity represents the strength of shaking produced by an earthquake and is dependent up on the magnitude, location, and depth of the earthquake relative to the location where the shaking is observed.</p>	SA2-82	SA2-82	Table 4.1.3-1 of the final EIS has been updated to address this comment.
<p>See previous comment. For example: an earthquake in Japan with body wave magnitude of 6 will cause zero perceived shaking in North Carolina--shaking intensity depends on your location relative to the earthquake's epicenter. They are not one and the same.</p>			
<p>Authors should consult (and potentially add) a reference for this statement, as I'm not aware of "right-lateral strike-slip anticlines."</p>	SA2-83	SA2-83	Section 4.1.3.1 of the final EIS has been updated to address this comment.
<p>The Frozen Debris Lobe (FDL-A) at Dalton Hwy MP 219/AGDC MP 196.5 is moving faster than initially reported. EIS says it will reach the new highway alignment & gasline alignment in 40 years, but the latest rates of movement (Darrow, 2018) indicate that it will only be 15 years. FDL-A includes a component of movement into bedrock, so pipeline installation needs to be designed carefully.</p>	SA2-84	SA2-84	Section 4.1.3.3 of the final EIS has been updated to address this comment. Section 4.1.3.10 of the final EIS addresses monitoring and mitigation measures for potential impacts on the pipeline from a frozen debris lobe.
<p>there are several more causes of seiches: submarine and subaerial mass movements, earthquakes, storms/strong winds</p>	SA2-85	SA2-85	Section 4.1.3.4 of the final EIS has been updated to address this comment.

SA2 – Alaska Department of Natural Resources and Others (cont’d)

CC-317

Comment	SA2-86	SA2-86	Section 4.1.3.6 of the final EIS has been updated to address this comment.
The anecdotal description of seismically-induced subsidence hazards in megathrust earthquakes should be supplemented by reference to: Plafker, George, Kachadoorian, Reuben, Eckel, E.B., and Mayo, L.R., 1969, Effects of the earthquake of March 27, 1964 on various communities: U.S. Geological Survey Professional Paper 542-G, p. G1-G50, 2 sheets. In this report, Plafker et al note 3 feet of tectonic subsidence at Port Graham and 3.5 feet subsidence at Seldovia; almost all the damage in these two communities was caused by this subsidence.			
Suggest that thermopiles be considered (in lieu of adfreeze piles) at Sagwon and Galbraith Lake compressor stations to address the potential for climate warming and future failure of adfreeze piles.	SA2-87	SA2-87	Adfreeze piles were considered in structural design criteria. AGDC indicates that the specification for adfreeze piles would be verified for feasibility during the detailed design phase for the Project. Mitigation of impacts on thaw-sensitive permafrost is discussed in sections 4.2.4 and 4.2.5 of the final EIS.
It should be noted that the State of Alaska has regulatory authority regarding naturally occurring asbestos (NOS): AS 09.65.245, AS 44.42.400(b), and AS 18.31.250 - 260.	SA2-88	SA2-88	Section 4.1.3.8 of the final EIS has been updated to address this comment.
The proposed Gas Treatment Facilities at Prudhoe Bay are near the coast where shoreline change is measured as stable or between 3.3-6.6 feet (1-2 meters) of coastal erosion per year (https://marine.usgs.gov/coastalchangehazardsportal/). Reductions in the extent and concentration of sea ice resulting in increased open water days may result in increased rates of erosion at this site (https://www.uaf.edu/geology/faculty/publications-pdfs/Farquharson-et-al-2018-coastal-changes-Chukchi-Sea--Marine-Geology.pdf). Consider adding coastal erosion as possible result of hydrologic hazard.	SA2-89	SA2-89	Sections 4.1.3.9 and 4.18.6 of the final EIS have been updated to address this comment.
The North Slope Borough is not mapped by FEMA, so no floodplain maps are available publicly. We are unable to determine whether the proposed Prudhoe Bay facilities are indeed outside of the 500-year floodplain as written. Please include a reference to the floodplain study used to determine the 100- and 500-year floodplain extent.	SA2-90	SA2-90	Section 4.1.3.9 of the final EIS has been updated to address this comment. Also see section 4.18.6.1 of the final EIS.
Mainland facilities between Point Thompson and Prudhoe Bay follow the coastline. This portion of the coastline is subject to coastal erosion which can exceed 6.6 feet (2 meters) per year (https://marine.usgs.gov/coastalchangehazardsportal/). This is also mentioned in Section 4.3.2.7-Floodplains, so should be considered in the geologic hazard section. Consider adding coastal erosion as possible result of hydrologic hazard.	SA2-91	SA2-91	Section 4.1.3.9 of the final EIS has been updated to address this comment.
There is no information available regarding the potential for coastal flooding between Point Thompson and Prudhoe Bay.			
There is no information available regarding the potential for erosion at the proposed Beluga Marine Camp or the mainland connection facility joining the proposed pipeline to the Kenai Peninsula mainland.	SA2-92	SA2-92	See the updated discussion of coastal erosion in section 4.18.6 of the final EIS.
There is no information available regarding the potential for coastal flooding at the proposed Beluga Marine Camp.			
From the maps provided with this study (page 29 of Appendix B4) and the Flood Insurance Rate Maps (FIRMs) available by FEMA (FIRM Panel 0200121350A Effective date May 19, 1981), it is not clear whether the mainland connection facility joining the proposed pipeline to the Kenai Peninsula near Suneva Lake is within a flood zone or not. Consider identifying the flood zone according to these maps and in consultation with FEMA and the Kenai Peninsula Borough.	SA2-93	SA2-93	See the updated discussion of coastal erosion in section 4.18.6 of the final EIS.
The proposed location of the liquefaction facility at Nikiski may be subject to coastal erosion. Coastal erosion in the Nikiski area was measured on average at 0.8 feet (0.2 meters) per year with hot spots of 4-5.7 feet (1.2-1.7 meters) per year (https://www.commerce.alaska.gov/web/Portals/4/pub/Risk_Report_Kenai_Final.pdf). Consider adding coastal erosion as possible result of hydrologic hazard.	SA2-94	SA2-94	Section 4.1.3.10 of the final EIS has been updated to address this comment.

SA2 – Alaska Department of Natural Resources and Others (cont’d)

CC-318

Comment	SA2-95	SA2-95	The VE flood zone (“coastal flood zone with velocity hazard (wave action); base elevation determined”) is only applicable/assigned to the coastal area at the base of the bluff. The marine trestle ranges from 42 to 85 feet above MLLW. See section 4.18.6.2 of the final EIS for more detail.
The proposed location of the marine terminal as a part of the liquefaction facility infrastructure in Nikiski is located in a FEMA special flood hazard area, Zone VE (https://msc.fema.gov/portal/search?AddressQuery=99734#searchresultsanchor).	SA2-96	SA2-96	Sections 4.1.3.9 and 4.18.6 of the final EIS has been updated to address this comment.
Mitigation measures for hydrologic processes may need to include further study if appropriate studies cannot be referenced.	SA2-97	SA2-97	As described in section 4.18 of the final EIS, AGDC has committed to (1) conduct a site-specific analysis for coastal erosion at the GTP and Liquefaction Facilities and propose a prevention and mitigation plan prior to commencement of construction, and (2) prepare a monitoring and maintenance plan, stamped and sealed by the professional engineer-of-record registered in Alaska, that ensures the grade of the GTP site would be maintained to prevent flooding throughout the life of the facility considering settlement, subsidence, thermocycling, and sea level rise.
Mitigation measures for hydrologic processes should include monitoring coastal flooding and erosion.	SA2-98	SA2-97	Section 4.18.6.2 of the final EIS discusses the FEMA flood maps for the Liquefaction Facilities. The section also notes that FEMA flood maps are not available for the GTP and provides an alternate flooding analysis.
Mitigation measures should include identifying the appropriate FEMA flood zones which infrastructure are in and following FEMA regulations for building within the floodplain.	SA2-99	SA2-99	Section 4.1.5.2 of the final EIS has been updated to address this comment.
There are known north-east trending faults in the area of the Yukon River boring crossing, which DGGs staff have evaluated.	SA2-100	SA2-98	Section 4.2.5.2 of the final EIS has been updated to address this comment. Additional information on settlement is provided in section 4.18.6.
However, in accordance with 18 AAC 75.380, future information or changing site conditions, including deteriorating permafrost or unanticipated contaminant migration, may pose an unacceptable risk to human health, safety, or welfare or to the environment requiring additional assessment and/or cleanup actions may be identified in consultation with ADEC and ADNIR.	SA2-101	SA2-99	Comment noted.
The State agrees with FERC’s recommendations to expand on AGDC’s permafrost mitigation plans; especially reducing the duration of cleared vegetation, minimizing the duration of open trenches before backfilling, and maximizing winter construction. It would also be beneficial to add a discussion in this section concerning how AGDC would mitigate backfill settlement after construction, particularly north of the Brooks Range where the alignment is significantly offset from the Dalton Highway. Furthermore, please clarify in this section if AGDC will or will not be backfilling the trenches with thawed materials, including during winter construction. The importance of using thawed material can be seen in the installation of the GCI/Quintillion fiber optic project.	SA2-102	SA2-100	Comment noted.
While it may be easier to leave gravel in place, with proper techniques and rehab, it is possible to pick up gravel after its usefulness is complete.	SA2-103	SA2-101	Additional information on the GTP pad is provided in section 4.18.6.1 of the final EIS. The GTP pad design includes the use of adfreeze piles.
There is no description of the general design of the gravel surfaces. Will they include impermeable liners, locations of thermosiphons (what facilities are they proposed to be located next to), side slopes, and if insulation will be used under the pad.	SA2-104	SA2-102	Comment noted.
For winter construction, DNR/DMLW/NRO requests the use of ice pads instead of granular work pads, whenever possible.	SA2-105	SA2-103	Section 4.2.4 of the final EIS has been updated to address this comment. A description of the construction mode selection process is provided in section 2.2.2 of the final EIS.
Will the winter gravel pads be compacted prior to use? Typically, gravel needs to be turned over and/or compacted prior to traffic on it. Will this all occur in one winter season? What is the advantage of a granular work pad for winter construction instead of an ice work pad?			

SA2 – Alaska Department of Natural Resources and Others (cont'd)

CC-319

Comment	SA2-106	SA2-106	Section 4.2.5.2 of the final EIS has been updated to address this comment.
Please add a short description or list outlining what the "lessons learned" from the GCI/Quintillion fiber optic installation were.	SA2-107	SA2-107	Section 4.2.5.2 of the final EIS has been updated to address this comment. Additional information on settlement is provided in section 4.18.6.
This estimate of ditch settling as the result of melting interstitial ice and ice lenses seems to be quite low, considering the thaw settlement issues that have occurred with fiber optic cable installations along the Dalton Highway in the last few years and the BP trench settlement studies. This estimate should be carefully reexamined.	SA2-108	SA2-108	AGDC has not committed to using thermosiphons along Mainline Facility granular work surfaces.
Will thermosiphons be used in these areas to maintain thermal stability?	SA2-109	SA2-109	Section 4.3.1.3 of the final EIS has been updated to address this comment.
Suggest defining and using "public water system" and acronym "PWS", when referring to public water systems and public water system sources (i.e., wells, intakes, springs, etc.)	SA2-110	SA2-110	Section 4.3.1.3 of the final EIS has been updated to address this comment.
Suggest defining and using "Drinking Water Protection Area" and acronym "DWPA", when referring to the area delineated by ADEC to represent where the PWS source gets its water.	SA2-111	SA2-111	Section 4.3.1.3 of the final EIS has been updated to address this comment.
Suggest rephrasing quoted text as "Through its Drinking Water Source Protection group, the DWP completed Source Water Assessments for all public water system sources. One primary component of the Source Water Assessment is the delineation of a Drinking Water Protection Area (DWPA) for each public water system (PWS) source. The DWPA is generally defined as representing the area that contributes water to the PWS source and varies in shape depending on the PWS source type (e.g., well, intake, spring) and water type (i.e., surface water, groundwater, or groundwater under the direct influence of surface water (GWUDSIW)). DWPA's are classified into zones based on groundwater time of travel or distance from surface water and the immediate contributing tributaries or watershed boundary. For PWS sources using groundwater, Zone A represents several months time of travel for groundwater to reach the PWS source, and Zone B represents 2 years time of travel. Provisional DWPA's are a circle with a 1,000-foot radius from the PWS source, and is a temporary placeholder until a full delineation can be completed. DWPA's continue to be maintained and delineated by the Drinking Water Source Protection group. The PWS source locations and their associated DWPA's can be reviewed using the interactive web map found at http://dec.alaska.gov/das/gis/apps , titled "Alaska DEC Drinking Water Protection Areas".			
Suggest rewording underlined text as "DWPA's for active PWS sources using groundwater that are crossed...DWPA zone classification...PWS sources", to be consistent with defined acronyms as recommended above, and to indicate that it is the DWPA that is being crossed, not just the PWS source (e.g., well, intake, spring).			
Suggest reword "permitted public water system DWP areas" as "the DWPA's for active PWS sources", to be consistent with defined acronyms as recommended above.			

SA2 – Alaska Department of Natural Resources and Others (cont'd)

Comment				
Suggest rewording "public water wells" as "active PWS sources using groundwater", to be consistent with defined acronyms as recommended above.		SA2-111		
Suggest identifying all PWS sources in which "Project facilities" and activities intersect their DWPA, not just using 500 feet criteria.		SA2-112	SA2-112	Table 4.3.1-2 lists all DWPA zones for active PWS sources using groundwater crossed by the Mainline Facilities.
Suggest rewording "public groundwater system zones" as "DWPA zones for PWS sources using groundwater" to be consistent with defined acronyms as recommended above.		SA2-113	SA2-113	Section 4.3.1.3 of the final EIS has been updated to address this comment.
Suggest identifying all active PWS sources using groundwater in which "Mainline Facilities" and activities intersect their DWPA, not 500 feet.		SA2-114	SA2-114	Section 4.3.1.3 of the final EIS has been updated to address this comment.
Suggest rewording "public water system zones" as "DWPA zones for active PWS sources using groundwater", to be consistent with defined acronyms as recommended above.		SA2-115	SA2-115	Section 4.3.1.3 of the final EIS has been updated to address this comment.
The ADNWR WELTS database is not the authoritative database for the locations of active PWS sources. Please use the information available from ADEC's database, found at http://dec.alaska.gov/das/gis/apps , or at http://data-soa-adec.opendata.arcgis.com/ .		SA2-116	SA2-116	Comment noted. As discussed in section 4.3.1.5, AGDC would conduct pre-construction private and public water well surveys where the Mainline Facilities cross the Interior and South-Central Hydrologic Regions and in the Liquefaction Facilities area, and would file an updated list of public water wells within 500 feet of the Project and private water wells and springs within 150 feet of construction workspaces based on survey results.
Suggest rewording "Public Water Systems" as "DWPA zones for active PWS sources using groundwater", to be consistent with defined acronyms as recommended above.		SA2-117	SA2-117	
Suggest rephrasing "public groundwater systems" as "DWPA zones for active PWS sources using groundwater", to be consistent with defined acronyms as recommended above.			SA2-117	Section 4.3.1.3 of the final EIS has been updated to address this comment.
Suggest identifying all active PWS sources using groundwater in which "Liquefaction Facilities", "LNG Plant" and associated activities intersect their DWPA, not 500 feet.		SA2-118	SA2-118	Section 4.3.1.3 of the final EIS has been updated to address this comment.
Suggest rephrasing "public wells" as "DWPA zones for active PWS sources using groundwater", to be consistent with defined acronyms as recommended above.		SA2-119	SA2-119	Section 4.3.1.3 of the final EIS has been updated to address this comment.
The ADNWR WELTS database is not the authoritative database for the active PWS sources. Please use the information available from ADEC's database, found at http://dec.alaska.gov/das/gis/apps , or at http://data-soa-adec.opendata.arcgis.com/ .		SA2-120	SA2-120	See the response to comment SA2-116.
The ADNWR databases are not the authoritative databases for the active PWS spring sources. Please also search and use the information available from ADEC's database, found at http://dec.alaska.gov/das/gis/apps , or at http://data-soa-adec.opendata.arcgis.com/ .				
Suggest rewording "Public" as "Active PWS sources using groundwater", to be consistent with defined acronyms as recommended above.		SA2-121	SA2-121	Section 4.3.1.5 of the final EIS has been updated to address this comment.
Suggest rewording "public water wells" as "active PWS sources using groundwater", to be consistent with defined acronyms as recommended above.				

SA2 – Alaska Department of Natural Resources and Others (cont'd)

CC-321

Comment				
Suggest rewording "public" as "active PWS sources using groundwater", to be consistent with defined acronyms as recommended above.		SA2-122	SA2-122	Section 4.3.1.5 of the final EIS has been updated to address this comment.
Suggest rewording "water well or spring" as "groundwater source".		SA2-123	SA2-123	Section 4.3.1.5 of the final EIS has been updated to address this comment.
<p>The Kadleroshilik and Shaviovik rivers are not likely to have flow at the P TTL crossings in winter. See the following reference for stream data for the Kadleroshilik and Shaviovik rivers collected for the Canadian Arctic Gas Pipeline project (these proposed crossings were considerably upstream of the P TTL crossings): McCart, P.J. 1974. Late winter surveys of lakes and streams in Canada and Alaska along the gas pipeline routes under consideration by Canadian Arctic Gas Study Limited, 1972-1973. Chapter 1 in P.J. McCart, ed. Fisheries research associated with proposed gas pipeline routes in Alaska, Yukon, and Northwest Territories. Arctic Gas Biological Report Series. Volume 15. 181 pp.</p> <p>The Sagavanirktok River can carry some winter flow into winter, although surface flow has ended at the East Channel Sagavanirktok River crossing generally by January. Some intergravel flow may still occur at this location.</p>		SA2-124	SA2-124	Section 4.3.2.1 has been updated to address this comment. Note that the Shaviovik River East has known overwintering habitat for fish (see table I-3 in appendix I of the final EIS), which indicates it does not freeze solid.
Although low stream flows for major rivers may occur as late as December or January, freeze-up generally occurs in late September or October.		SA2-125	SA2-125	Section 4.3.2.1 of the final EIS has been updated to address this comment.
The Put 23 Mine Site identified in Figure 4.3.2-4 is an active gravel mine site, rather than a flooded mine site discussed in this paragraph and figure. It does have limited amounts of water from snow melt, rain, and gravel thawing that is pumped out of the site each summer to continue gravel mining.		SA2-126	SA2-126	Section 4.3.2.1 and figure 4.3.2-4 of the final EIS have been updated to address this comment.
Suggest rewording the quoted text as "The DWP identifies public water system (PWS) sources using surface water and their associated Drinking Water Protection Areas (DWPAs). For PWS sources using surface water, the DWPA zones are classified as follows: Zone A represents a 1,000-foot distance from the edge of the contributing surface water body and its immediate tributaries; Zone B represents a 1-mile distance; and Zone C represents the immediate watershed boundary. Provisional DWPAs are a circle with a 1,000-foot radius from the PWS source, and is a temporary placeholder until a full delineation can be completed. DWPAs continue to be maintained and delineated by the Drinking Water Source Protection group. The PWS source locations and their associated DWPAs can be reviewed using the interactive web map found at http://dec.alaska.gov/das/gis/apps , titled "Alaska DEC Drinking Water Protection Areas. Active PWS sources using groundwater and protections within the Project area are described in section 4.3.1.3. Figures 4.3.2-6 through 4.3.2-9 show active PWS sources using surface water and their associated Zone A and Zone B Drinking Water Protection Areas".		SA2-127	SA2-127	Section 4.3.2.2 of the final EIS has been updated to address this comment.

SA2 – Alaska Department of Natural Resources and Others (cont’d)

CC-322

Comment			
Suggest rewording first underlined text as "...Drinking Water Protection Areas for active PWS sources...and the second underlined text as "active PWS sources...".	SA2-128	SA2-128	Section 4.3.2.2 of the final EIS has been updated to address this comment.
Suggest rewording underlined text as "ADEC's web map, titled "Alaska DEC Drinking Water Protection Areas".	SA2-129	SA2-129	Section 4.3.2.2 of the final EIS has been updated to address this comment.
Stabilizing streambanks within 24-48 hours of completion of instream work to minimize turbidity and sedimentation impacts, particularly during winter with frozen backfill material, may not be feasible in many locations. Initial stabilization efforts may be partially effective but final stabilization activities will likely need to occur during thawed conditions.	SA2-130	SA2-130	Section 4.3.2.4 of the final EIS has been updated to address this comment.
The lessons learned appear to be associated with the placement of fiber mats or ditch plugs to redirect the flow from following along the trench and providing for connectivity in the natural drainage patterns. Please include these lessons learned in the text so the potential mitigation measures are better understood.	SA2-131	SA2-131	Section 4.3.2.4 of the final EIS includes AGDC's potential mitigation measures based on the trench trials.
The crossing of the West Channel of the Sagavanirktok River would use the existing bridge. The crossing of the Main (East) Channel would require a new aerial crossing.	SA2-132	SA2-132	Section 4.3.2.5 of the final EIS has been updated to address this comment.
Concur with FERC's recommendation for AGDC to design temporary bridges to withstand at least a 10 year flood event.	SA2-133	SA2-133	Comment noted.
Additionally, it is DNR's standard practice to prohibit the storage of fuel or other hazardous materials/substances, with a total capacity larger than 55 gallons, within 100 feet of a waterbody or waterway. Site specific exceptions may be granted during the adjudication of authorizations if additional protections are proposed.	SA2-134	SA2-134	Comment noted. The Project Procedures limit fuel and hazardous material storage within 100 feet of wetlands and waterbodies. Additional restrictions may be imposed through other permits.
The Atigun River is not a designated wild and scenic river.	SA2-135	SA2-135	See the updates to sections 4.3.2.6 and 4.9.5.1 of the final EIS.
Additionally, it is DNR's standard practice to prohibit vehicle refueling within the annual floodplain or within tidelands on State owned lands.	SA2-136	SA2-136	Section 4.3.2.7 of the final EIS has been updated to address this comment.

SA2 – Alaska Department of Natural Resources and Others (cont’d)

CC-323

Comment
<p>In the event of a discharge or release of oil or a hazardous substance, ADEC's notification, cleanup, and disposal regulations apply. See Alaska regulations 18 AAC 75 Article 3. Oil storage facilities may exist at various locations, including temporary facilities used during construction as well as permanent facilities. Examples of listed facilities: Power Supply, Diesel Fuel System, Support Systems, Construction Camps, offices, warehouses, and building complexes. A facility with a storage capacity of 10,000 barrels (420,000 gallons) or more of noncrude oil, stored in aboveground oil storage tanks are classified as an oil terminal facility and are required to meet the financial responsibility and oil discharge prevention and contingency plan regulations. See Alaska regulations 18 AAC 75, Article 2 and 4. The provisions of Alaska Statutes at AS 46.04.030 and 46.04.040 do not apply to a natural gas exploration facility if the Alaska Oil and Gas Conservation Commission has determined under AS 31.05.030(l) that evidence obtained through evaluation demonstrates with reasonable certainty that all of the wells at a natural gas exploration facility will not penetrate a formation capable of flowing oil to the ground surface. See Alaska Statutes at AS 46.04.050. Self-propelled LNG tank vessels and other nontank support vessels that are greater than 400 gross registered tons are classified as a nontank vessel and are required to meet ADEC's financial responsibility and oil discharge prevention and contingency plan regulations. See Alaska regulations 18 AAC 75 Articles 2 and 4. Please also note that use of oil as a dust suppressant is regulated. See Alaska regulations 18 AAC 75 Article 7. Facilities with a storage capacity of 1,000 gallons or greater, but less than 10,000 barrels (420,000 gallons) that store noncrude oil in aboveground storage tanks may be classified as a Class 2 facility and be required to register their fuel storage tanks. See Alaska regulations 18 AAC 75 Article 9. This section should include a discussion of how the project will meet the State of Alaska regulatory standards and how the required mitigations measures in those regulations could decrease the impacts on the environment.</p>
<p>There is little information about the environmental impacts of a subsea natural gas leak. However, recent incidents have shown that a subsea release in winter may not be immediately controlled and could continue for months due to available technology to readily and safely control a release. Release of natural gas can change the temperature of the water column in the immediate area of release, and could pose a threat to fish and marine mammals near the release site. Because of the lack of information on how subsea natural gas releases impact the environment (vulnerability) and the lack of thorough review of pipeline construction and mitigation measures (probability), by the appropriate agencies, this statement cannot be evaluated. Regarding petroleum releases the EIS cites Assessment of Marine Oil Spill Risk and Environmental Vulnerability for the State of Alaska (NOAA 2014) to demonstrate low probability for spills larger than 50 barrels and concludes therefore that significant adverse impacts on Cook Inlet are unlikely. ADEC recommends that the EIS specifically use Cook Inlet data found in the work cited (rather than data for the whole state), define what is construction or operational equipment failure (these were not terms used in the cited document), and include a discussion about Cook Inlet vulnerability. Spills less than 50 barrels can have large localized impacts and impacts on fisheries and aquaculture.</p>
<p>Please describe potential oil spill sources associated with construction and operation of the Liquefaction facility. Without discussion of operations at the facility that might result in a spill, it is not possible to assign risk for spills and impacts. Without assigning the risk it is not possible to determine the impacts and potential mitigation measures. Please provide more details to support the conclusion that oil spills and impacts would be unlikely at the Liquefaction Facility.</p>

SA2-137

SA2-137

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

SA2-138

SA2-138

The potential for the occurrence of a subsea natural gas leak in Cook Inlet, the resulting potential impacts on the environment, and measures to limit the duration of such a leak are discussed in section 4.3.3.3 of the final EIS under “Accidental and Unintentional Releases and Spills.” The potential impacts of an oil or fuel spill on fish are discussed in section 4.7.1.6 of the final EIS.

SA2-139

SA2-139

Section 4.3.3.3 of the final EIS has been updated to address this comment. See also section 4.18 of the final EIS for detailed information regarding potential oil spill sources and mitigation associated with construction and operation of the Liquefaction Facilities.

SA2 – Alaska Department of Natural Resources and Others (cont'd)

CC-324

Comment			
In the department's experience, Cook Inlet pipeline transitions have been constructed via trenching or HDD (not DMT). Areas that were trenched have had some erosion and sloughing issues. The choice of HDD versus DMT is many times determined by the soil conditions. The more cobbles or boulders (terratics) mixed with the fine-grained soils can be problematic for either method. A common opinion is that DMT should be able to drill through more rocky conditions.	SA2-140	SA2-140	Comment noted. See section 4.3.3.3 of the final EIS regarding the potential use of the DMT continuation methodology at the shoreline crossings at Beluga Landing and Suneva Lake.
It should be noted that low probability, high consequence impacts should be discussed to determine potential impacts and to determine if adequate mitigation measures exist. There is little information about the environmental impacts of a subsea natural gas leak. However, recent incidents have shown that a subsea release in winter may not be immediately controlled and could continue for months due to available technology to readily and safely control a release. Release of natural gas can change the temperature of the water column in the immediate area of release, and could pose a threat to fish and marine mammals near the release site. Because of the lack of information on how subsea natural gas releases impact the environment (vulnerability) and the lack of thorough review of pipeline construction and mitigation measures (probability), by the appropriate agencies, this statement cannot be evaluated. Regarding petroleum releases the EIS cites Assessment of Marine Oil Spill Risk and Environmental Vulnerability for the State of Alaska (NOAA 2014) to demonstrate low probability for spills larger than 50 barrels and concludes therefore that significant adverse impacts on Cook Inlet are unlikely. ADEC recommends that the EIS specifically use Cook Inlet data found in the work cited (rather than data for the whole state), define what is construction or operational equipment failure (these were not terms used in the cited document), and include a discussion about Cook Inlet vulnerability. Spills less than 50 barrels can have large localized impacts and impacts on fisheries and aquaculture.	SA2-141	SA2-141	See the response to comment SA2-138.
Discusses sediment transport model used for dredge scenarios, however, no results on the potential for bluff erosion landward of the dredge site is presented.	SA2-142	SA2-142	Section 4.2.5.3 of the final EIS discusses bluff erosion and mitigation measures to reduce bluff erosion rates.
The traffic will need to be coordinated with BP's Dock Master and communicated at the annual spring West Dock Causeway Stakeholders' Meeting	SA2-143	SA2-143	Comment noted.
In addition to the water withdrawal associated permits required by the various state agencies listed, ADF&G must also authorize all water withdrawals taking water from fish bearing waterbodies in accordance with its Alaska Statute Title 16 authority.	SA2-144	SA2-144	Section 4.3.4.2 of the final EIS has been updated to address this comment.
It should be noted the Putuligayuk River, other than at breakup, has limited flow during the open water period. Other than at breakup, this river would not be a significant summer water source.	SA2-145	SA2-145	As discussed in section 4.3.4.4 of the final EIS, water would only be withdrawn from the Putuligayuk River during the high water levels of spring breakup.
Suggest rewording underlined text as "...Drinking Water Protection Areas for active PWS sources".	SA2-146	SA2-146	Section 4.3.4.4 of the final EIS has been updated to address this comment.
The ADNRR WELTS database is not the authoritative database for the active PWS sources. Please use the information available from ADEC's database, found at http://dec.alaska.gov/das/gis/apps , or at http://data-soa-adecc.opendata.arcgis.com/ .	SA2-147	SA2-147	See response to comment SA2-116.
The estimate of black water and grey water produced daily appears low for the construction of the Mainline Facilities. At the generally used rates of 50-100 gallons of water used per person per day, AGDC's estimate would only support a maximum workforce of 1,500 people. This estimate should be re-examined to determine if it was generated as the maximum discharge for each facility on the project, rather than the project as a whole.	SA2-148	SA2-148	Section 4.3.4.4 of the final EIS has been updated to address this comment.

SA2 – Alaska Department of Natural Resources and Others (cont’d)

CC-325

Comment			
How big will these ice roads be? How far is the flyrock expected to reach? Flyrock & active layer chunks from other mine site blastings on the North Slope has traveled decent distances (>500 ft).	SA2-149	SA2-149	Section 4.4.3.1 of the final EIS has been updated to address this comment. Road widths are provided in table 2.1.3-1 of the final EIS.
Is there a set of maps that depicts which mode of construction will be use where?	SA2-150	SA2-150	Construction modes are not shown on maps in the final EIS. Appendix K-2 identifies construction mode for the wetlands crossed by the Mainline Pipeline.
The Alaska Plant Materials Center (AKPMC) recognizes the need for the option to allow natural plant recruitment as an option for restoration as recommended in the project revegetation plan. AKPMC recommends to AGDC as the project progresses further, discussion with AKPMC agronomists to identify sites where natural plant recruitment is applicable.	SA2-151	SA2-151	Comment noted. Section 1.1.3.1 of the Project Restoration Plan and section 4.2.1 of the Project Revegetation Plan address where revegetation would rely on natural plant recruitment. The ADNRP Plant Materials Center was involved in the development of both plans. Instructions on accessing the Project Restoration and Revegetation 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.
ADF&G recommends that FERC consult with northern revegetation experts who are familiar with the ecology of Alaska to determine monitoring locations.	SA2-152	SA2-152	As discussed in sections 6.1.1 and 6.3.2 of the Project Revegetation Plan, AGDC would collaborate with the ADNRP Plant Materials Center regarding the selection of RMES and reference sites for monitoring. Instructions on accessing the Project Revegetation 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. AGDC would conduct the monitoring.
This paragraph is a bit misleading. The Gas Treatment Facilities will result in a loss of 625 acres of wetland vegetation (tundra). While it's true that the overall amount of wetland vegetation loss on the North Slope is a relatively small area, the 625 acres will be permanently destroyed.	SA2-153	SA2-153	The impact analysis in section 4.5 of the final EIS is limited to vegetation. This analysis found that impacts from the Gas Treatment Facilities on tundra vegetation would be less than significant. Impacts on wetlands are discussed in section 4.4 of the final EIS.
Stating no rare plant species occur within the project footprint, although know to occur within 1.0 mile of the project site with out a targeted survey? AKPMC recommends to AGDC identification of potential occurrences should be formulated and targeted surveys may be necessary.	SA2-154	SA2-154	Federally listed plant species regulated under the ESA are not in the Project area, and state or federal regulations do not require surveys for rare plant species in Alaska. Section 4.5.7 of the final EIS notes that there are no known occurrences of rare plant species in the Project footprint while acknowledging that certain rare plant species could occur in the Project footprint. We concluded that even if rare plant species were affected, impacts would likely be less than significant.
Invasive species stipulations as well as revegetation criteria should be consistent between state and federal-managed lands to simplify effectiveness and compliance, particularly in locations where land ownership may change multiple times over a relatively short distance.	SA2-155	SA2-155	Requirements for NNIS on federal and state lands would be determined by the appropriate federal or state land managing agencies through their respective permitting processes for the Project.
Bird cherry <i>Prunus padus</i> is also a species of concern.	SA2-156	SA2-156	The NNIS documented to occur in the Project area in table 4.5.8-1 of the final EIS are based on the Alaska Natural Heritage Program's 2014 Alaska Exotic Plant Information Clearinghouse Database. As discussed in section 4.5.8.3 of the final EIS, AGDC has committed to pre-construction NNIS surveys to verify the locations and invasiveness rankings of NNIS in the Project area.
Mainline Facilities Creeping thistle <i>Cirsium arvense</i> was found along the Dalton High MP 308 in 2017	SA2-157	SA2-157	See the response to comment SA2-156.

SA2 – Alaska Department of Natural Resources and Others (cont’d)

Comment			
There has been Foxtail barley <i>Hordeum jubatum</i> and Common dandelion <i>Taraxacum officinale</i> found within the North Slope Oil fields.	SA2-157		
If straw wattles will be used, then certified weed-free straw should also be used when available.	SA2-158	SA2-158	As discussed in section 4.5.8.3 of the final EIS, AGDC has committed to using weed-free straw.
While imported fill includes gravel, this list should specifically include gravel/ granular material.	SA2-159	SA2-159	Section 4.5.8.2 of the final EIS has been updated to address this comment.
Add coyote and beaver to this sentence.	SA2-160	SA2-160	Section 4.6.1 of the final EIS has been updated to address this comment.
The reference cited for this paragraph (NPS 2018b) actually refers to Denali National Park and Preserve. An appropriate reference specific to Denali State Park should be used.	SA2-161	SA2-161	Section 4.6.1.1 of the final EIS has been updated to address this comment.
Denali State Park was created under AS 41.21.151. Activities within the park boundaries are regulated under 11 AAC 20.400 through 11 AAC 20.437. The park is also subject to 11 AAC 12.170 which includes restrictions against disturbance of natural objects. AS 41.21.153 allows for the issuance of a DNR ROW lease within a specific corridor through the park. DPOR is concerned that the impact from the access roads, material sites, disposal sites, and storage yards could potentially extend outside of the designated lease corridor. If they are, the project must comply with the park enabling legislation, park management regulations, and the management plan. Land in the park may not be disposed of. Furthermore, if it is determined that the project components within the ROW lease adversely affect the park, mitigation options or other land use authorizations must be pursued to provide enforceable best management practices. The 2006 Denali State Park Management Plan outlines resource extraction as not compatible in the natural, wilderness, cultural, and recreational development zones.	SA2-162	SA2-162	Comment noted. Specific mitigation measures for impacts outside the designated corridor could be addressed through the state permitting process.
Add red fox to the list of mammals common to the GTP area as red foxes have been displacing Arctic fox in the Prudhoe Bay area.	SA2-163	SA2-163	Section 4.6.1.2 of the final EIS has been updated to address this comment.
Need to reconcile this statement with the statement on Page 4-297 (which is the correct assessment): Generally, pipelines elevated to the minimum height of 5 feet are high enough to accommodate caribou crossings during snow-free periods (BLM, 2006). While there are limited data on pipeline crossings by caribou in the winter, the available evidence indicates that pipeline heights in the range of 7 to 8 feet are more likely to be used by caribou than lower heights during those periods (BLM, 2006).	SA2-164	SA2-164	Section 4.6.1.2 of the final EIS has been updated to address this comment.
Should include increased stress and related physiological response/ effects of increased cortisol production/release which is eluded to in the paragraph	SA2-165	SA2-165	The physiological stress responses of terrestrial animals to noise are discussed in section 4.6.1.2 of the final EIS.

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SA2 – Alaska Department of Natural Resources and Others (cont'd)

Comment			
<p>One aspect of human presence that is not mentioned in this discussion is the intentional feeding of animals, particularly bears, foxes, and wolves, by project workers. There were major issues with wildlife feeding during construction of the Trans-Alaska Pipeline system and for many years following construction. Information regarding this issue can be found in:</p> <p>Milke, G. 1977. Animal feeding problems and solutions (Special Report No. 14. Joint State/Federal Fish and Wildlife Advisory Team. USFWS and ADF&G, Anchorage, Alaska. 11 pp.</p> <p>Follmann, E.H., R.A. Dieterich, and J.L. Hechtel. 1980. Recommended carnivore control program for the Northwest Alaskan Pipeline Project including a review of human-carnivore encounter problems and animal deterrent methodology. Institute of Arctic Biology, University of Alaska, Fairbanks, Alaska. 113 pp.</p>	SA2-166	SA2-166	Section 4.6.1.2 of the final EIS has been updated to address this comment.
<p>The discussion of impacts to bears does not include any information regarding the effects of intentional feeding, management of putrescible wastes, and general facility management. These were major issues during construction of the Trans-Alaska Pipeline system and for many years following construction. Information regarding this issue can be found in: Milke, G. 1977. Animal feeding problems and solutions (Special Report No. 14. Joint State/Federal Fish and Wildlife Advisory Team. USFWS and ADF&G, Anchorage, Alaska. 11 pp. Follmann, E.H., R.A. Dieterich, and J.L. Hechtel. 1980. Recommended carnivore control program for the Northwest Alaskan Pipeline Project including a review of human-carnivore encounter problems and animal deterrent methodology. Institute of Arctic Biology, University of Alaska, Fairbanks, Alaska. 113 pp.</p> <p>Furthermore, the State recommends that the Wildlife Avoidance and Interaction Plan be amended, before construction is allowed, to include how AGDC will prohibit animal feeding, educate their workers on the effects of feeding bears and other wildlife, enact proper storage of food and other potential attractants, enact proper storage and disposal of putrescible wastes at camps and work sites, and describe safety measures that will be utilized such as fencing around camps (including the use of electric fences where major issues occurred during TAPS construction).</p>	SA2-167	SA2-167	Section 4.6.1.3 of the final EIS has been updated to address this comment. We additionally note that AGDC provided a draft Wildlife Avoidance and Interaction Plan framework and committed to providing a final plan once permitting is complete.
<p>FERC's caribou analysis seems to be based on generalized distributions for the CAH during calving, parasitic insect harassment, and winter that does not identify site-specific high use habitats during these seasons. Additionally, citing conclusions about impacts to caribou based on Prudhoe Bay Oilfield studies when the oil field was constructed prior to the development of modern comprehensive caribou mitigation measures (Cronin et al 1994) is misleading. Issues with low pipelines (some less than 2 feet above the ground) that block or delay movements of large groups of caribou within the older parts of the Prudhoe Bay Oilfield have been significantly reduced by the application of modern mitigation measures. ADF&G requests that FERC reconsider the conclusions of significant impacts to the CAH in light of current mitigation measures and specific habitat use data such as concentrated calving areas in Arthur and Del Vecchio (2009); winter use areas in Nicholson et al. (2016); and site-specific information on caribou habitat use in the Point Thomson Project EIS (USACE 2012). Note that the conclusion drawn for the Point Thomson Project (which parallels the proposed PTTL route) was that there would be minor impacts to caribou and caribou harvest from development of the project (USACE 2012).</p>	SA2-168	SA2-168	Section 4.6.1.3 of the final EIS has been updated to address this comment. Also see the response to comment SA2-6

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SA2 – Alaska Department of Natural Resources and Others (cont'd)

Comment			
<p>For further information please see: Arthur, S. M. and P. A. Del Vecchio. 2009. Effects of oil field development on calf production and survival in the Central Arctic Herd. Alaska Department of Fish and Game, Division of Wildlife Conservation, Final Research Technical Report 1 July 2001-30 June 2006. http://www.adfg.alaska.gov/static/home/library/pdfs/wildlife/research_pdfs/ca-oil_finaltr.pdf (Accessed 1/17/2017). Cronin, M. A., W. B. Ballard, J. Truett, and R. Pollard. 1994. Mitigation of the effects of oil field development and transportation corridors on caribou. LGL Alaska Research Associates, Inc, Anchorage, Alaska. http://www.arlis.org/docs/vol2/point_thomson/1011/1011A_~1.pdf (Accessed May 19, 2017). 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): e0150333. http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0150333&type=printable. (Accessed January 12, 2017). USACE (United States Army Corps of Engineers). 2012. Point Thomson Project Final Environmental Impact Statement. Alaska District, Alaska Regulatory Division CEPOA-RD, July 2012. Anchorage, Alaska.</p>	SA2-168		
<p>Impacts to bears could be significant, if situations occur similar to those observed during construction of TAPS. For additional information see: Milke, G. 1977. Animal feeding problems and solutions (Special Report No. 14. Joint State/Federal Fish and Wildlife Advisory Team. USFWS and ADF&G, Anchorage, Alaska. 11 pp.</p>	SA2-169	SA2-169	Section 4.6.1.3 of the final EIS has been updated to address this comment.
<p>Follmann, E.H., R.A. Dieterich, and J.L. Hechtel. 1980. Recommended carnivore control program for the Northwest Alaskan Pipeline Project including a review of human-carnivore encounter problems and animal deterrent methodology. Institute of Arctic Biology, University of Alaska, Fairbanks, Alaska. 113 pp.</p>	SA2-170	SA2-170	Section 4.6.1.3 of the final EIS has been updated to address this comment.
<p>Calving by the Central Arctic Caribou Herd (CAH) is to the south of the PTTL and either east or west of the Mainline Pipeline. The North Slope is not really good winter range for the CAH, as very few caribou remain here during winter. The number of construction camps identified within sensitive habitat should be re-evaluated.</p>	SA2-171	SA2-171	Based on the mapping provided in figure 4.6.1-5, three arctic herds (Central Arctic, Teshekpuk, and Porcupine) could be affected by the Project. As indicated in AGDC's response to question 33 of our EIR dated November 22, 2019, ADF&G staff have indicated that figure 4.6.1-5 is accurate for the purpose of depicting general ranges of caribou herds.
<p>The CAH is really the only Arctic herd potentially affected by the project.</p>	SA2-172	SA2-172	Section 4.6.1.3 of the final EIS has been updated to address this comment.
<p>While the GTP, PTTL and Mainline facilities are within the general range of the CAH, calving occurs outside of the project area, little use of the North Slope occurs for winter range, and the Mainline Facilities and the GTP areas are generally not used for insect relief.</p>	SA2-173	SA2-172	Section 4.6.1.3 of the final EIS has been updated to address this comment.
<p>The Mainline Pipeline passes on the eastern limit of the Teshekpuk herds range. The Porcupine Herd's general range is to the east of the Mainline Pipeline. Portions of the Porcupine Herd may move west into the area of the eastern PTTL during spring and summer.</p>	SA2-174	SA2-173	Table 4.6.1-6 of the final EIS has been updated to address this comment. Figure 4.6.1-5 illustrates the location of each range with respect to the Project facilities. See the response to comment SA2-171.
<p>The area of the GTP is not used for calving, and generally not used for insect relief or as winter range.</p>	SA2-175	SA2-174	Section 4.6.1.3 of the final EIS has been updated to address this comment. See the response to comment SA2-171.
<p>Please provide the citation for this statement.</p>	SA2-175	SA2-175	Section 4.6.1-3 of the final EIS has been updated to address this comment.

SA2 – Alaska Department of Natural Resources and Others (cont’d)

CC-329

Comment				
The CAH is not calving within the limits of the project area. Calving by the CAH is to the south of the PTTL and either east or west of the Mainline Pipeline.	SA2-176	SA2-176		See the response to comment SA2-174.
Very few CAH caribou winter on the North Slope in the vicinity of the PTTL; therefore few adverse effects will occur to this herd from winter construction of the PTTL.	SA2-177	SA2-177		See the response to comment SA2-174.
Please provide an explanation as to where these numbers came from or how they were developed. Also, impacted insect relief habitat should be compared with total available insect relief habitat to show the magnitude of the potential impacts.	SA2-178	SA2-178		AGDC filed data regarding the area of impact for caribou habitat on July 7, 2017 (FERC Accession No. 20170707-5105). We determined that comparing the area of direct Project impact with the area of available habitat for insect relief would misrepresent Project effects on caribou. As discussed in sections 4.6.1.2 and 4.6.1.3, noise, human activity, and vegetation disturbance could affect areas beyond the Project footprint, making these areas unavailable either temporarily or permanently for caribou use. We additionally note that section 4.6.1-3 of the final EIS has been updated to include a map set (see figure 4.6.1-6) depicting Central Arctic Herd concentration areas on the North Slope, including insect relief areas and seasonal distribution.
There is a herd or portion of the Nelchina Caribou Herd called the Western Talkeetna Caribou Herd that over winters in unit 14B and 13E. Some years this nonmigratory portion numbers in excess of 1500 caribou spending the whole year in the Talkeetna Mountains.	SA2-179	SA2-179		Comment noted.
Contrary to FERC’s assessment, the ADF&G believes there will be no significant impact to the Central Arctic Caribou Herd. The CAH is not calving within the limits of the project area. Calving by the CAH is to the south of the PTTL and either east or west of the Mainline Pipeline. The area of the GTP is not used for calving, and generally not used for insect relief or as winter range. Very few CAH caribou winter on the North Slope in the vicinity of the PTTL; therefore few adverse effects will occur to this herd from winter construction of the PTTL. There are good mitigation measures in place within the oilfields when caribou are present around oilfield infrastructure. A 7 foot pipeline height is now the standard for caribou passage. For additional mitigation measures see:	SA2-180	SA2-180		Section 4.6.1-3 of the final EIS has been updated to include a map set (see figure 4.6.1-6) depicting Central Arctic Herd concentration areas on the North Slope, including calving, insect relief areas, and seasonal distribution. Also see response to comment SA2-6.
Cronin, M.A., W.B. Ballard, J. Truett, and R. Pollard, eds. 1994. Mitigation of the effects of oil field development and transportation corridors on caribou. Final Report to the Alaska Caribou Steering Committee. LGL Alaska Research Associates, Inc. Anchorage, Alaska.	SA2-181	SA2-181		Section 4.6.1-3 of the final EIS has been updated to address this comment.
The harvest reported is a statewide harvest summary. No open season or harvest of muskoxen has occurred since the 2006-2007 season within Game Management Unit GMU 26B through which the proposed pipeline crosses (see: Lenart, E. A. 2015. Units 26B and 26C muskox. Chapter 4, pages 4-1 through 4-26 in P. Harper and L.A. McCarthy, eds. Muskox management report of survey and inventory activities. 1 July 2012 - 30 June 2014. Alaska Department of Fish and Game. Species Management Report ADF&G/DWC/SMR-2015-4, Juneau.)	SA2-182	SA2-182		Section 4.6.1-3 of the final EIS has been updated to address this comment.
The Canning River Delta is east of the PTTL component of this project. Activities on the PTTL component of the project should not affect any muskoxen potentially using the Canning River Delta.	SA2-183	SA2-183		We have added additional information to identify the source of the habitat data used in the figures provided in section 4.6.1.3 of the final EIS.
The entire Sagavanirktok River drainage from the Ribdon River north to the Sagavanirktok River Delta should be considered summer and fall/winter habitat rather than depicting isolated 10 mile circles of habitat. There is no muskoxen calving habitat at Oliktok Point.	SA2-184	SA2-184		Comment noted.
Since much of the pipeline corridor is within existing pipeline and transportation corridors, coupled with the generally low density of wolverines in any given area, potential impacts to wolverines and their habitat should be regarded as low.				

SA2 – Alaska Department of Natural Resources and Others (cont'd)

CC-330

Comment				
The ADF&G is not involved with eagle take permits. This is solely the jurisdiction of the USFWS.		SA2-185	SA2-185	Section 4.6.2.4 of the final EIS has been updated to address this comment.
Delete VSM installation for the PTTL as VSM installation for the PTTL will occur in winter one or more miles inland from the coast. None of these species would occur in the immediate area of the PTTL during winter. Ribbon seals also are unlikely to occur in the area of the West Dock Causeway during summer; they generally occur in the Bering and Chukchi seas, with incidental sightings in the western Beaufort Sea.		SA2-186	SA2-186	Section 4.6.3.2 of the final EIS has been updated to address this comment.
Ribbon seals also are unlikely to occur in the area of the West Dock Causeway during summer; they generally occur in the Bering and Chukchi seas, with incidental sightings in the western Beaufort Sea.		SA2-187	SA2-187	Based on our analysis of information provided by AGDC and other sources, we concluded that ribbon seals could occur within the Project area, which includes the vessel routes shown in Figure 4.6.3-4 of the final EIS. Our analysis in section 4.6.3.2 of the final EIS acknowledges that ribbon seals are unlikely to occur in the area, but could be present incidentally.
Delete narwhals from the discussion here and elsewhere as they rarely occur in western Beaufort Sea waters.		SA2-188	SA2-188	Based on our analysis of information provided by AGDC, the range map for the species, and the map in the 2017 NMFS stock assessment report, the species could overlap the project area and the vessel transit routes. Therefore, we concluded that narwhals could potentially be affected by Project activities as described in section 4.6.3.1 of the final EIS.
Ribbon seals also are unlikely to occur in the area of the West Dock Causeway during summer; they generally occur in the Bering and Chukchi seas, with incidental sightings in the western Beaufort Sea.		SA2-189	SA2-189	See the response to SA2-187.
Contrary to FERC's assessment, the ADF&G believes there will be no significant impact to the Central Arctic Caribou Herd. The CAH is not calving within the limits of the project area. Calving by the CAH is to the south of the PTTL and either east or west of the Mainline Pipeline. The area of the GTP is not used for calving, and generally not used for insect relief or as winter range. Very few CAH caribou winter on the North Slope in the vicinity of the PTTL; therefore few adverse effects will occur to this herd from winter construction of the PTTL. While the project may be in the center of the herd's range, they do not use the area much. There are good mitigation measures in place within the oilfields when caribou are present around oilfield infrastructure. A 7 foot pipeline height is now the standard for caribou passage. For additional mitigation measures see: Cronin, M.A., W.B. Ballard, J. Truett, and R. Pollard, eds. 1994. Mitigation of the effects of oil field development and transportation corridors on caribou. Final Report to the Alaska Caribou Steering Committee. LGL Alaska Research Associates, Inc. Anchorage, Alaska.		SA2-190	SA2-190	See the updates to section 4.6.3.1 of the final EIS and the response to comment SA2-6

SA2 – Alaska Department of Natural Resources and Others (cont’d)

CC-331

Comment			
Add northern pike and sheefish to sport and subsistence resources.	SA2-191	SA2-191	Section 4.7.1 of the final EIS has been updated to address this comment.
The 2019 AWC update was adopted into state regulation in spring 2019. The DEIS could cite the 2019 edition (Johnson and Blossom, 2019) throughout the DEIS. The 2019 edition will contain AWC nomination updates from 2017 and 2018 field seasons.	SA2-192	SA2-192	EFH consultation for the Project is complete (see the updates to table 1.6-1 and section 4.7.4 of the final EIS). In section 4.7.1 of the final EIS, AGDC has committed to, prior to construction, reviewing and confirming waterbody crossings with the newest available ADF&G AWC list and NMFS EFH species list would ensure that the conservation measures for AWC and EFH waters are implemented at the applicable crossings. Section 4.7.1 of the final EIS has been updated to address this comment. Section 4.7.1 of the final EIS has been updated to include access road crossings. Material site impacts are discussed in section 4.7.1.7 of the final EIS. See the updates to section 4.7.1 of the final EIS. AGDC would conduct fish surveys at waterbodies where fish survey data are not available within 290 feet of pipeline crossings.
The ADF&G also manages commercial and subsistence fisheries within the project area.	SA2-193		
The number of AWC waters that are crossed by access roads or contain instream material sites should be included in the tally.	SA2-194		
Fish species, including rearing anadromous species, frequently use very small and even intermittent waterbodies that are often overlooked. Also, limiting surveys only to waterbodies that have previously been documented to support fish is problematic. Fish distribution, whether resident or anadromous, is sparse across much of Alaska and waterbodies that currently lack fish documentation should be considered of high importance for targeted fish community assessment.	SA2-195	SA2-193 SA2-194	
		SA2-195	
Concur with FERC that fish surveys should be conducted at all waterbodies where fish survey data are not available. Additionally, fish surveys should include effort sufficient to document not just the suite of fish species present but also life stage and habitat types to better inform appropriate mitigation measures. Resident fish streams should also be documented with species and life stage information, not just AWC streams.	SA2-196	SA2-196	The State of Alaska could obtain this information through their ADF&G Title 16 permit requirements. See the response to comment SA2-195 regarding fish surveys.
Fish survey results should be sent to ADF&G Sport Fish Division Regional Office for potential updates to the AWC.	SA2-197	SA2-197	See the response to comment SA2-196.
This paragraph discusses the Beringia Boreal Ecoregion (comprising interior Alaska). Pacific halibut, sand lance, and capelin (all saltwater species) do not occur in interior Alaska waters, all of which would be freshwater lakes and rivers along the pipeline corridor. Sockeye and pink salmon also do not occur at Interior Alaska pipeline crossings north of the Alaska Range.	SA2-198	SA2-198	Section 4.7.1.1 of the final EIS has been updated to address this comment.

SA2 – Alaska Department of Natural Resources and Others (cont'd)

CC-332

Comment	SA2-199	SA2-199	Section 4.7.1.2 of the final EIS has been updated to address this comment.
Arctic char are not commonly found along the coast; these are probably misidentified Dolly Varden	SA2-200	SA2-200	Comment noted.
For additional information regarding overwintering broad whitefish in the Sagavanirktok River, see Morris (2000). Morris, W.A. 2000. Seasonal movements of broad whitefish (<i>Coregonus nasus</i>) in the freshwater systems of the Prudhoe Bay Oil Field. M.S. Thesis. Univ. Alaska, Fairbanks. 71 pp.	SA2-201	SA2-201	Section 4.7.1.2 of the final EIS has been updated to address this comment.
This statement references a 1991 ADF&G report, but newer information suggests that the Canning and Anaktuvuk rivers support as large or larger spawning and overwintering populations of Dolly Varden. Technically Dolly Varden are a "char", however, previously in this document Dolly Varden are referred to as Dolly Varden not char. There are also Arctic char in the project area, but this passage is specifically referring to Dolly Varden. Suggest changing char to Dolly Varden.	SA2-202	SA2-202	Comment noted.
On the North Slope, increasing numbers chum and pink salmon in both adult and juvenile form have been observed, but to some it is still unclear at this point if these are a self-sustaining populations or strays. Because juvenile salmon cannot tolerate the supercooled water under sea ice, smolt that emerge from the gravel in the springtime would have to almost immediately begin migrating to the southern Bering Sea, which seems unlikely. Until confirmation of a complete life-cycle of a North Slope-spawned salmon occurs, some can only speculate that viable salmon populations exist on the North Slope.	SA2-203	SA2-203	Table 4.7.1-1 of the final EIS has been updated to address this comment.
Many of these species, particularly resident fish, spend their entire life cycle in fresh water streams within Interior Alaska but the table shows adult and juvenile resident periods for less than the full year. Examples are Arctic grayling, northern pike, burbot, whitefish species, and Dolly Varden (resident populations). Re-examine this table and extend the shaded blocks as appropriate for all species.	SA2-204	SA2-204	Section 4.7.1.2 of the final EIS has been updated to address this comment.
Only a portion of the length of the Putuligayuk River is classified as anadromous. Most, but not all, of the Sagavanirktok River is classified as anadromous.	SA2-205	SA2-205	Section 4.7.1.2 of the final EIS has been updated to address this comment.
While Arctic cisco may be present in waters offshore of the Kuparuk River and the lower reach of the river downstream of the Spine Road, they do not occur inland in the Kuparuk River at the Mainline Pipeline crossing.	SA2-206	SA2-206	This information was provided by traditional knowledge survey participants.
Saffron cod is a marine species found in the Beaufort Sea. Galbraith Lake is approximately 150 miles inland and does not have any marine waters to support this species.	SA2-207	SA2-207	Section 4.7.1.2 of the final EIS has been updated to address this comment.
The Mainline Pipeline crossing is upstream of the anadromous fish habitat within the Kanuti River.			