

North Slope Borough

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Harry K. Brower, Jr., Mayor

March 13, 2019

Bureau of Land Management
Alaska State Office
Attention-Coastal Plain Oil and Gas Leasing Program EIS
222 West 7th Avenue, #13
Anchorage, AK 99513

Submitted via mail and at www.blm.gov/alaska

RE: Draft Environmental Impact Statement for the Coastal Plain Oil and Gas Leasing Program, Alaska

Dear Sir or Madam,

The North Slope Borough (Borough) submits these comments on the Bureau of Land Management's (BLM) Draft Environmental Impact Statement (DEIS) for the Coastal Plain Oil and Gas Leasing Program (Leasing Program). We commend BLM and the Department of the Interior (DOI) for their efforts in producing this DEIS. We also greatly appreciated DOI and BLM's frequent outreach and recent visits to our communities to discuss this planning process.

The Borough supports oil and gas leasing and development in the 1002 Area (Coastal Plain) of the Arctic National Wildlife Refuge (ANWR) that is conducted in an environmentally and culturally responsible manner. The lands and waters of ANWR have sustained the Iñupiat for many generations. Our people's continued existence in ANWR is dependent upon the maintenance of its natural ecosystem. We would not support opening the Coastal Plain to leasing if it presented a serious threat to our way of life, the Arctic ecosystem, and its wildlife populations.

Based on our review of the DEIS and the proposed Leasing Program, BLM has not fulfilled Congress's intent in providing for oil and gas leasing, development, and production on the Coastal Plain. The proposed lease stipulations and required operating procedures (ROPs) in the DEIS are unnecessarily restrictive and will hinder or preclude responsible oil and gas leasing and development activities. Oil and gas development in the Coastal Plain should be conducted in a manner that maximizes benefits to the Borough, the State of Alaska, the oil and gas industry, Native corporations, local businesses, and ultimately the United States and all its citizens.

Responsible oil and gas development will ensure the Borough's tax base, create important jobs for local residents and others throughout the country, and supply continued oil flow through the Trans-Alaska Pipeline System. An overly restrictive Leasing Program threatens this objective and defeats Congress's intent in opening the Coastal Plain.

The Borough's support of oil and gas development on the North Slope has always been, and still is, contingent upon such activities providing benefits for our residents. One of the primary ways our residents benefit from development is through property taxes levied on oil and gas infrastructure. Taxation of property is an inherent power of local governments that is necessary for self-determination. These tax revenues fund our Borough, allowing us to employ many of our residents, provide crucial services, and help offset the impacts of development on our residents, wildlife, and land.

In the Tax Cuts and Jobs Act of 2017 (Tax Act), Congress provided considerable protection for the Coastal Plain, and the broader ANWR environment, in the form of the 2,000 surface acre limitation on production and support facilities. When compared to development in the Prudhoe Bay area, this acreage limit greatly restricts the potential surface disturbance footprint in the Coastal Plain. Accordingly, the Tax Act's acreage limitation is the first layer of protection for the Coastal Plain, and the lease stipulations and ROPs provide a second, additive layer of protection. Development will require another environmental impact statement, with additional stipulations and ROPs. Furthermore, oil and gas exploration and development also requires Borough permits and zoning ordinances, which will recognize and implement further protections. It is simply unnecessary and unwise to hamstring exploration at the outset with an overly restrictive Leasing Program. Consistent with Congress's directive, we believe that industry should be able to lease those areas with potential for oil and gas without unnecessary no surface occupancy and other restrictions.

The development of Prudhoe Bay, which began decades ago, occurred on a far vaster scale than what is authorized for the Coastal Plain today. This development was conducted with less environmental protections and inferior technology than what is currently used by the oil and gas industry. Nevertheless, the development of Prudhoe Bay did not result in significant damage to wildlife or the environment, such as a decline in the caribou herd populations. There is no reason to believe that development in the Coastal Plain, with modern oil and gas technology and a restricted development footprint, will cause significant harms to caribou, polar bear, or other wildlife populations.

Based on our experience with oil and gas development on the North Slope, we are confident that the Leasing Program will not significantly affect wildlife populations, the environment, or the health and subsistence lifestyle of our residents. Unfortunately, ANWR has been sensationalized by people who live thousands of miles away, most of whom know nothing about the land, its people, or its history. This sensationalism is not based on accurate information concerning the environmental impacts of oil and gas development in the Coastal Plain.

The village of Kaktovik is the only community located within the Coastal Plain and the 19 million acres of ANWR itself. There are no other communities located within a hundred

miles of the Coastal Plain. Among concerned stakeholders, no one understands the controversy surrounding the development of the Coastal Plain better than its own residents, who have lived and subsisted on this land and its resources for hundreds of years. They have a better understanding and dependence on the landscape and wildlife than other concerned parties, and thus have the greatest stake in preserving this area for future generations. Thus, the needs and concerns of Kaktovik residents must be given greater consideration in the decision making process for ANWR than other communities or groups that are not directly affected.

I. The North Slope Borough

The Borough is a regional government spanning the North Slope of Alaska. Its jurisdiction stretches from the United States-Canadian border across to the western border of Alaska, with a coastline that extends along the Beaufort and Chukchi Seas. The Borough has built and maintains most of the public infrastructure and provides services to its eight communities, including education, health and social services, roads, water and sewer and emergency services.

Over 70 percent of Borough residents are Native Alaskan Iñupiat. Residents depend on subsistence resources for their physical and cultural health. Traditional foods are far more nutritious than imported "store-bought" food, and their continued consumption is critical to the health of our people. The social fabric of our communities revolves around subsistence traditions. All of our communities, whether through direct harvest or extensive sharing networks, utilize the full range of terrestrial and marine subsistence resources that abound in Arctic lands and waters. Any threat to subsistence resources is a threat to the continued viability of Borough communities and the Iñupiat culture.

Many of our citizens participate in species conservation efforts, as well as in Arctic circumpolar scientific, cultural, and educational initiatives. Further, the Borough has adopted a Code of Ordinances that explicitly provides for cooperative management of North Slope wildlife resources. The Borough's Department of Wildlife Management facilitates sustainable subsistence harvests and monitors the population and health of fish and wildlife species. This is accomplished through research, cooperation, and collaboration with both federal and State of Alaska agencies, university researchers, oil and gas companies, consultants, and non-profit organizations. Likewise, the Borough is actively engaged in conservation and recovery planning efforts for polar bears, bowhead whales, and Steller's and spectacled eiders. As a result, the Borough has a significant amount of knowledge and data regarding Arctic species that should be more fully incorporated into relevant management and policy decisions.

II. The Borough's Comments on the DEIS

In the following sections, the Borough provides its comments on the DEIS, and includes suggested modifications and improvements. These comments primarily focus on BLM's selection of the appropriate preferred alternative, the merits of the applicable lease stipulations and ROPs, and general comments on the analysis contained in the DEIS. In addition, the Borough has provided more specific, textual comments on the DEIS in a table attached to this comment letter.

A. BLM's Identified Alternatives, Lease Stipulations, and ROPs

1. BLM Should Adopt Alternative B as the Preferred Alternative with Additional Modifications

In the Tax Act, Congress required that BLM “establish and administer a competitive oil and gas program for the leasing, development, production, and transportation of oil and gas in and from the Coastal Plain.” BLM is directed to manage this oil and gas program similar to those under the Naval Petroleum Reserves Production Act, and offer for lease “those areas that have the highest potential for the discovery of hydrocarbons.”

Based on our review of the identified alternatives, the Borough recommends that BLM adopt a modified version of Alternative B as the preferred alternative. In general, Alternative B is the only alternative that is consistent with Congress's intent in establishing the Leasing Program for the Coastal Plain. However, as explained below, the Borough recommends that BLM revise Alternative B in the following manner: (1) modify the setback distances in Lease Stipulation 1 and only apply them to the identified rivers; (2) remove the no surface occupancy limitation imposed by Lease Stipulation 4 at this stage of leasing; and (3) revise the timing limitations in Lease Stipulation 7 to better reflect calving location and occurrence.

To inform BLM's identification and selection of a preferred alternative, the Borough provides the following comments on the proposed lease stipulations and ROPs as they apply to each alternative:

Comments on the Lease Stipulations	
Lease Stipulation 1 <i>Rivers and Streams</i>	Alternative B with modifications to the river setbacks is preferred. BLM should only include the following river setbacks: (1) 0.5 mile on either side of the Okpilak River; (2) 0.5 mile on either side of the Hulahula River; (3) 0.5 mile on the Staines-Canning River along the east side of the Coastal Plain border; and (4) 1 mile around Fish Hole One. Alternatives C and D should not be selected as the stipulations are unnecessary and would impose overly restrictive limitations on leasing in areas with high and medium hydrocarbon potential.
Lease Stipulation 2 <i>Canning River Delta and Lakes</i>	Alternative B is preferred. Alternative D should not be selected as it is overly restrictive and precludes leasing in areas with high hydrocarbon potential.
Lease Stipulation 3 <i>Springs/Aufeis</i>	Alternative B is preferred. The Borough supports conducting additional studies to ensure that drilling would not disrupt the flow of seasonal springs. In addition to the identified agencies, these study plans should be coordinated with the Borough and the Native Village of Kaktovik. Perennial springs are critical to the overwintering of unique fish populations which are important to subsistence users and other wildlife. Industry may seek to use these springs due to the scarcity of fresh water sources in the winter season. These springs are vulnerable and, if polluted, the entire watershed and ecosystem could be threatened.

Lease Stipulation 4 <i>Nearshore marine, lagoon, and barrier island habitats of the Southern Beaufort Sea within the boundary of the Arctic Slope Refuge</i>	The imposition of no surface occupancy restrictions should be evaluated in subsequent phases of the Leasing Program and should be based on site-specific impacts. For this reason, the Borough recommends removing this lease stipulation as overly burdensome. Development activities at Prudhoe Bay demonstrate that production in coastal areas is not harmful to wildlife and the environment. In addition, the barrier islands along the coast of the Beaufort Sea provide additional protection for development in coastal areas by reducing erosion potential. The Borough also opposes this stipulation because it could shift oil and gas development offshore into state waters. Such an occurrence would increase the risks associated with oil and gas leasing, such as potential impacts to subsistence species.
Lease Stipulation 5 <i>Coastal Polar Bear Denning River Habitat</i>	Alternative B is preferred. Alternative D should not be selected because the application of the Endangered Species Act and Marine Mammal Protection Act is sufficient to minimize disturbance to denning polar bears and their denning habitat. Furthermore, Alternative D is overly restrictive as it applies generally to "potential" polar bear denning habitat with no correlation to actual denning locations of polar bear in a particular year.
Lease Stipulation 6 <i>Caribou Summer Habitat</i>	Alternative B is preferred. Alternative D2 should not be selected as it is overly restrictive.
Lease Stipulation 7 <i>Porcupine Caribou Primary Calving Habitat Area</i>	Alternative B with modifications to the timing limitation is preferred. BLM should revise the area subject to the timing limitation to reflect the location where calving predominantly occurs based on the most current wildlife surveys. BLM also should reserve the ability to reduce or remove the timing restriction if calving is not occurring in a particular area. Alternatives C and D should not be selected as the stipulations are overly restrictive. The Borough does not support imposing no surface occupancy limitations as part of the Leasing Program.
Lease Stipulation 8 <i>Porcupine Caribou Post-Calving Habitat Area</i>	Alternative B is preferred. Alternative D should not be selected as it would preclude the ability to locate central processing facilities on significant portions of the Coastal Plain, which would be contrary to the intent of the Tax Act. If BLM considers Alternative C, it should clarify that road passage is allowed in emergency situations and to maintain the integrity of operations and crew.
Lease Stipulation 9 <i>Coastal Area</i>	Alternative B is preferred. Alternatives C and D should not be selected as BLM should not preclude the ability to site potential wells and central processing facilities in proximity to the coast. As noted above, these stipulations could promote offshore development which could increase risks associated with oil and gas activities. Instead, it is preferable to site oil and gas facilities onshore which, given modern technology, have the ability to reach offshore deposits.
Lease Stipulation 10 <i>Wilderness Boundary</i>	Alternative B is preferred. Alternative D should not be selected as it is unnecessary and inconsistent with the Tax Act's requirement to provide for an oil and gas program on the Coastal Plain.

BLM should ensure that the Leasing Program allows for road and local infrastructure development for the community of Kaktovik. Road connectivity would benefit Kaktovik by lowering the cost of goods and also reduce development costs in the Coastal Plain. Other benefits of a road connecting Kaktovik to future oil and gas facilities include greater access for subsistence activities and increased employment opportunities for local residents. Increasing road connectivity is also consistent with the Arctic Strategic Transportation and Resources (ASTAR) project being undertaken by the Borough and Alaska Department of Natural Resources to identify, evaluate, and advance opportunities in North Slope communities through responsible infrastructure development. BLM must exempt such road and local infrastructure development from any restrictions under this program.

Similarly, BLM should promote local energy development as a benefit associated with the Leasing Program. Specifically, BLM should allow for the construction of infrastructure to supply natural gas to Kaktovik. Several of our communities, such as Utqiagvik and Nuiqsut, have benefited from access to natural gas provided by nearby development projects. BLM should encourage lessees on the Coastal Plain to work with the Borough and the City of Kaktovik to provide the community with access to natural gas resources. As with the above, BLM must exempt local energy infrastructure from any restrictions.

In Lease Stipulation 9, for Alternative C, BLM would require that the lessee/operator/contractor consult with the Alaska Eskimo Whaling Commission, the Borough, and local whaling captains' associations to minimize impacts on subsistence whaling and other subsistence activities of the communities of the North Slope. This lease stipulation should be included in Alternative B and, in addition to open water activities, should be expanded to apply to any activities that could potentially impact subsistence whaling and other subsistence activities of the communities of the North Slope.

Finally, when siting any oil and gas facilities, we suggest that BLM encourage the use of existing sites that have already been subject to development activities. For example, this could include Distant Early Warning Line sites. By co-locating facilities or by reusing such areas, the impacts of development under the Leasing Program could be reduced.

Comments on the ROPs	
ROP 1	The Borough is interested in establishing a service area to provide utility services to industry in the Coastal Plain, similar to the services we provide in Service Area 10 (Prudhoe Bay), which would help consolidate infrastructure and operations. A landfill will be needed in the Coastal Plain to dispose of waste. Without a landfill on site, waste disposal costs would be unnecessarily burdensome, and transporting waste out of the Coastal Plain presents potential environmental concerns. The Borough intends to create a service area and landfill in the Coastal Plain.
ROP 2	Instead of referring to "Arctic Refuge subsistence users" and "Arctic Refuge recreationists," it would be more precise to use "Coastal Plain subsistence users" and "Coastal Plain recreationists."
ROP 3 to 4	No comment.

ROP 5	This ROP may already be required under federal law. The Environmental Protection Agency requires ultra-low sulfur diesel.
ROP 6	No comment.
ROP 7	The design and implementation of the monitoring study of contaminants in subsistence foods should be coordinated with the Borough's Department of Wildlife Management.
ROP 8	The Borough notes that fish in some streams have been observed to have fish mold. The ROP should be revised to require that streams be evaluated to determine if fish mold is present prior to any water withdrawals to prevent potential contamination of other streams during oil and gas activities.
ROP 9	For the guidelines on winter water use, the Integrated Activity Plan (IAP) for the National Petroleum Reserve Area in Alaska (NPR-A) includes a withdrawal limit of 35 percent for lakes with no fish present. BLM should provide an explanation for the proposed imposition of a 20 percent limitation on such lakes in the DEIS.
ROP 10	As part of Alternative B, BLM could include requirement (b) from Alternative D. This would be consistent with the NPR-A IAP and would provide adequate protection for the species. The other required measures included in Alternative D are overly restrictive and unnecessary.
ROP 11	Alternative B is preferred.
ROP 12-13	No comment.
ROP 14	Alternative B is preferred.
ROP 15-21	No comment.
ROP 22	BLM should also express a preference for overland pipeline crossings.
ROP 23-28	No comment.
ROP 29	The Borough has a significant amount of information on cultural and paleontological resources. Lessees/operators/contractors should coordinate with the Borough regarding these resources as additional surveys may not be necessary.
ROP 30-32	No comment.
ROP 33	GIS data of new infrastructure development should be provided to the Borough, in addition to BLM and the State of Alaska.
ROP 34	As explained below, we request that this ROP be strengthened and applied to all development related activities.
ROP 35	Alternative B is preferred. BLM should require lessees to post a bond to ensure adequate funding for spill response, cleanup, and eventual decommission, remediation, and removal (DR&R). DR&R must be addressed early, and negotiating appropriate DR&R measures with stakeholders should be an ongoing process throughout development and production as these activities will likely continue until late this century. DR&R measures should not be put in place at the planning phase only to be left unaddressed for decades.
ROP 36-37	No comment.
ROP 38	BLM should revise the ROP to also include a prohibition on fishing by lessees/operators/contractors.
ROP 39-46	No comment.

In general, with respect to all ROPs,¹ BLM must reassess the need for environmental studies that require aircraft, particularly helicopters. Aerial surveys are consistently the most voiced grievance associated with oil and gas development in our communities. These aerial surveys are believed to disturb waterfowl and caribou, altering their migration and deflecting them from our villages. It is unfortunate that stipulations and best management practices designed to mitigate the impacts of development by requiring scientific studies appear to create some of the most severe impacts on local residents. Thus, BLM must reduce and minimize the number of helicopter surveys, while still requiring the collection of adequate information about subsistence resources. There are likely novel methods that could be used, such as remote sensing, drones, etc., which would minimize disturbance but still allow for the collection of information. We encourage BLM to involve the Borough in discussions about those methods and others that could be employed for scientific studies.

2. No Action Alternative

As required by NEPA, BLM has included a “no action” alternative in the DEIS (Alternative A) to serve as the baseline for purposes of analyzing the action alternatives. The Borough concurs with BLM’s determination that Alternative A would not meet the purpose and need of the action and would not comply with the mandatory obligations of the Tax Act. BLM is required to establish and administer a competitive oil and gas program for the Coastal Plain. In addition, BLM is required to conduct at least two lease sales that offer a minimum of 400,000 acres each within established deadlines. Contrary to the opinions of some commenters, BLM is prohibited from selecting the “no action” alternative.

B. Comments on BLM’s Analysis and Interpretations in the DEIS

1. BLM’s Analysis of the Physical Environment

a. *Air Quality*

The DEIS addresses many of the sources of direct and indirect impacts on air quality associated with the proposed oil and gas activities on the Coastal Plain.² However, it appears that BLM has not considered the impacts of gas flaring associated with oil and gas exploration and production in its analysis of outdoor air quality. We suggest that BLM include and analyze the potential effects associated with this emissions source.³ In addition, BLM should consider

¹ In particular, we note that helicopters may be used for the contaminant monitoring study in ROP 7, the ecological mapping in ROP 28, and the cultural and paleontological study in ROP 29. As stated above, BLM should ensure that ROP 34 applies to any and all development related activity.

² DEIS at 3-13 to 3-16.

³ See, e.g., O.G. Fawole, X.M. Cai, and A.R. MacKenzie, *Gas Flaring and Resultant Air Pollution: A Review Focusing on Black Carbon*, 216 *Envtl. Pollution* 182 (2016) (<https://doi.org/10.1016/j.envpol.2016.05.075>); G.E. Umukoro and O.S. Ismail, *Modelling Emissions from Natural Gas Flaring*, 29 *J. of King Saud U. – Eng’g Sci.* 178 (2017) (<https://doi.org/10.1016/j.jksues.2015.08.001>); C.D. Elvidge, M.D. Bazilian, M. Zhizhin, T. Ghosh, K. Baugh, and F.C. Hsu, *The Potential Role of Natural Gas Flaring in Meeting Greenhouse Gas Mitigation Targets*, 20 *Energy Strategy Revs.* 156 (2018) (<https://doi.org/10.1016/j.esr.2017.12.012>).

potential emissions associated with wildfires in Alaska. BLM also should consider the relationship between outdoor air quality and any corresponding impacts on indoor air quality.

In addition, baseline air quality data are needed for Kaktovik and the Coastal Plain in order to monitor the effects of development on air quality. These baseline data must be obtained before construction activities begin. We suggest that monitoring stations be constructed in: (1) Kaktovik; (2) in the portion of the Coastal Plain where development might occur; and (3) downwind of possible development. We encourage BLM to require air monitoring for hazardous air pollutants, such as benzene, in addition to the criteria air pollutants, in order to more closely analyze possible effects of emissions on human health. We also suggest that a public agency or an independent third party operate these air monitoring stations to alleviate potential concerns raised by our residents regarding industry-sourced air monitoring data.

We suggest that the federal government increase funding to the Alaska Department of Environmental Conservation to allow this agency to set up monitoring stations in the Coastal Plain as part of the State of Alaska's Ambient Air Monitoring Network Plan. Considering the revenues the federal government will receive from the leasing and development of the Coastal Plain, it is only appropriate that they increase funding to the State of Alaska to conduct air quality monitoring on the effects of this development.

Finally, we note that BLM is working on a *Cumulative Alaska North Slope Air Quality Regional Model*, to assess the cumulative effects of BLM-authorized oil and gas development on the North Slope, including on the Coastal Plain. While the DEIS does not indicate when this study will be completed, we urge that any results (even if preliminary) be analyzed in the Final EIS or, if not available by that time, in any subsequent National Environmental Policy Act (NEPA) documents relating to BLM activities on the North Slope.

b. Geology and Minerals

In its discussion of geologic hazards, the DEIS acknowledges the impacts associated with coastal erosion and storm surge.⁴ We note that the analysis does not provide a temporal scale, which makes it difficult to evaluate the potential impacts. It is unclear whether the data reflect recent higher and increasing rates of coastal erosion associated with an absence of sea ice and more impactful weather events or more long-term, multi-decadal averages. Without this temporal reference point, it is difficult to determine whether the rate of coastal erosion is increasing in the short-term and should therefore be a consideration with respect to areas offered for leasing and the location of oil and gas infrastructure. Accordingly, for the lease of any lands in coastal areas, we request that BLM consider the site-specific rates of erosion and require that any lessee locate infrastructure outside the maximum distance of erosion that is projected to occur during the life of any proposed development.

⁴ DEIS at 3-31.

c. Water Resources

We recommend that BLM carefully review the analysis in this section to ensure that it accurately reflects the quantities of water available for withdrawal and the potential effects associated with those withdrawals. For example, the DEIS notes that there is an estimated 1.1 billion gallons of water in the 115 largest lakes on the Coastal Plain, 80 percent of which are concentrated in seven lakes in the Canning River Delta.⁵ The Borough suggests that BLM provide additional analysis to support its conclusion that, under all action alternatives, there are no anticipated potential long-term effects on lakes and ponds from ice roads, ice pads, or ice bridges, and that there is adequate water for withdrawal.⁶

In addition, the DEIS states that “[s]treams on the North Slope typically freeze in September and thaw in June.”⁷ BLM should provide additional information and support for this statement. We note that there are documented instances where North Slope streams have frozen later than in typical years, and this has become more prevalent in relatively recent years.

d. Solid and Hazardous Waste

In discussing the effects associated with solid and hazardous wastes, the DEIS does not address per- and polyfluoroalkyl substances (PFAS) or the emerging science regarding the health effects of these substances.⁸ PFAS are included in substances utilized by the oil and gas industry, most prevalently in firefighting foams. Because PFAS have been recognized as an emerging contaminant issue in the Arctic,⁹ we recommend that BLM include an analysis of the potential effects associated with these chemicals.

BLM should include an ROP requiring oil and gas operators to use firefighting foam that does not contain PFAS chemicals.

2. BLM's Analysis of Biological Resources

a. Vegetation and Wetlands

In evaluating the potential direct and indirect impacts of oil and gas leasing on vegetation and wetlands, the DEIS notes that:

impacts can still be measured up to 25 years after exploration (Jorgenson et al. 2010). Seismic vibrator lines and camp train trails on the North Slope were found to be generally visible in summer vegetation for about 5 years after disturbance,

⁵ *Id.* at 3-52 (one of these lakes is known to have salinity concentrations close to seawater).

⁶ *Id.* at 3-58; *see also id.* at 3-81.

⁷ *Id.* at 3-51.

⁸ *Id.* at 3-60 to 64.

⁹ State of Alaska, Division of Spill Prevention and Response, Aqueous Film Forming Foam (AFFF), <https://dec.alaska.gov/spar/csp/pfas/firefighting-foam/> (last visited Mar. 12, 2019).

and the longer-term impacts involved limited ground disturbance and ground subsidence where the trail became a wetter trough (Jorgenson et al. 2003).¹⁰

We recommend that BLM consider more recent studies and update its analysis to reflect that ground disturbance may persist for potentially longer periods than considered in the DEIS.¹¹

b. Fish and Aquatic Species

In discussing the effects of habitat alteration on fish and aquatic species, we recommend that BLM review and incorporate more recent studies on the distribution of dust and gravel spray. The DEIS states that “[r]oad dust accumulation is greatest within 35 feet of roads, but deposition may occur over a broader area. Roughly 95 percent of dust settles within 328 feet from the road surface (Myers-Smith et al. 2006; Walker and Everett 1987).”¹² In comparison, more recent studies along the Spine Road in Prudhoe Bay noted that 50 meters off the road “[c]lear surface mineral horizons up to 18 cm thick occur near the south west side of the road and up to 10 cm thick on the northeast side,” and that 200 meters from the road “the underlying organic material have a gray color indicating leached dust.”¹³ Based on this study, the Borough is concerned that the DEIS’s consideration of potential impacts may be overly conservative and not reflective of the most recent scientific information.

c. Birds

The Borough is concerned about the adequacy of the DEIS’s analysis regarding the potential impacts to bird species. We recognize, as acknowledged in the DEIS, that “detailed distribution and abundance data are lacking for many species.”¹⁴ However, we suggest that BLM review the available scientific information and update the analyses in relevant sections to include more recent studies. In addition, we suggest that BLM revise the DEIS’s evaluation of the impacts that may occur under each alternative and cumulatively to provide a more robust discussion of potential effects on bird species.

In the discussion of the common eider and king eider, the DEIS references outdated information regarding the species’ population status and trends.¹⁵ Instead of relying on scientific studies and data from the 1970s and 1980s, BLM should review and incorporate more recent population estimates which suggest that these bird populations may have declined nearly 50

¹⁰ DEIS at 3-71.

¹¹ See, e.g., D.A. Walker, M.K. Raynolds, M. Buchhorn, and J.L. Peirce (eds.), *Landscape and permafrost changes in the Prudhoe Bay Oilfield, Alaska*. Alaska Geobotany Center Publication AGC 14-01, 84 pp. University of Alaska Fairbanks, Fairbanks, AK (2014); D.A. Walker, M. Buchhorn, and M. Kanevskiy, et al., *Infrastructure-Thermokarst-Soil-Vegetation Interactions at Lake Colleen Site A, Prudhoe Bay, Alaska*. Alaska Geobotany Center Data Report AGC 15-01, 92 pp. Institute of Arctic Biology, University of Alaska Fairbanks, Fairbanks, AK. (2015).

¹² DEIS at 3-80.

¹³ D.A. Walker, M. Buchhorn, and M. Kanevskiy, et al., *Infrastructure-Thermokarst-Soil-Vegetation Interactions at Lake Colleen Site A, Prudhoe Bay, Alaska*. Alaska Geobotany Center Data Report AGC 15-01, 92 pp. Institute of Arctic Biology, University of Alaska Fairbanks, Fairbanks, AK (2015).

¹⁴ DEIS at 3-85.

¹⁵ *Id.* at 3-87.

percent since the publication of the Barry (1974) study.¹⁶ In addition, the DEIS references the annual surveys conducted by the U.S. Fish and Wildlife Service (FWS) on the North Slope. We note that these surveys do not include the eiders that migrate adjacent to the Coastal Plain between Canada and Alaska. The DEIS should reflect that eiders migrating past the Coastal Plain may be vulnerable to the potential impacts of spilled oil that reaches the marine environment.

We also suggest that BLM revise the analysis of effects associated with each of the identified alternatives to better explain the potential impact to bird species. While we recognize that more detailed information and analysis may not be possible at the pre-leasing stage, the DEIS provides the percentage of the program area where direct and indirect alteration of habitat and potential disturbance and displacement of breeding birds could occur.¹⁷ In addition to identifying these habitat impacts, we recommend that BLM assess whether there will be corresponding effects to the relevant bird populations.

Finally, we recommend that BLM improve the analysis regarding cumulative impacts to bird species.¹⁸ The DEIS does not identify the past, present, and reasonably foreseeable actions that were included for consideration. BLM should further expand its statement that there would be an “increase [in] the occurrence and intensity of these common impacts,” and provide a more robust analysis of the impacts to bird species associated with the Leasing Program on the Coastal Plain in conjunction with these other cumulative actions.

d. Terrestrial Mammals

The Coastal Plain of ANWR has historically been the principle calving area for the Porcupine Caribou Herd (PCH). However, we note that this herd is versatile in their calving and migration patterns across Northern Alaska and Northwest Canada. In some years, the PCH has calved to the east across the border in Canada (and not used the Coastal Plain) and, in other years, calving has not exclusively occurred within the Coastal Plain. BLM should acknowledge that the PCH displays some flexibility in calving locations, and that the calving area is much broader than the Leasing Program area.

In general, caribou have been successfully inhabiting and calving in areas of the North Slope and Canada that have development and infrastructure activities. During the development of Prudhoe Bay, the residents of Nuiqsut and the Borough were very concerned that industrial activities would have serious negative impacts on the Central Arctic Herd (CAH). Ultimately, Prudhoe Bay’s footprint split the core calving area into two concentrations that calve to the west and east of Prudhoe Bay. Despite this, the CAH population continued to grow, albeit at a slower rate than its neighboring herd, the Teshekpuk Lake Caribou Herd, whose calving range remains undeveloped. It remains unclear how development within the PCH calving range will impact the distribution or population status of the caribou. However, the PCH does migrate through

¹⁶ E.g., R.S. Suydam, D.L. Dickson, J.B. Fadely, and L.T. Quakenbush. *Population declines of King and Common Eiders of the Beaufort Sea*. Condor 102:219-222 (2000).

¹⁷ DEIS at 3-101 to 3-102.

¹⁸ *Id.* at 3-102.

Canada's Mackenzie River Basin and Eagle Plain Basin and cross the Dempster Highway, which suggests some habituation to infrastructure and development.

We believe that lessons learned from the greater Prudhoe Bay area will help to mitigate potential impacts to caribou. Reducing the footprint of infrastructure through directional drilling will greatly reduce impediments to caribou. In addition, development activities should be conducted following meaningful input from the Borough and the residents of Kaktovik when siting roads, pipelines, and infrastructure. Resource development and healthy populations of caribou and other wildlife are not mutually exclusive goals of the Borough and residents of Kaktovik.

e. Marine Mammals

In general, the DEIS's discussion of marine mammal species should be updated to include more recent scientific information. The Borough notes that there are a number of studies that should be included to further inform the analysis of potential impacts to marine mammals from the effects of industrial activities and climate change. To assist in this effort, the Borough is providing several relevant literature citations and suggests that BLM review and incorporate this information in the Final EIS.

The DEIS also appears to overstate the potential impacts of climate change on marine mammal species. Specifically, the DEIS states that "[t]he ongoing declines in the extent and duration of sea-ice cover present the greatest sources for possible population-level impacts on marine mammals over the next 20 years, although the impacts are not entirely clear."¹⁹ Contrary to this statement, it is clear that potential changes in sea ice in the next 20 years are not likely to have negative population level effects on the bowhead whale based, in part, on the long lifespan of the species. In addition, while there have been observed changes in sea ice extent and duration, there have been no detectable corresponding reductions in the population size or health of bearded and ringed seals.²⁰

1. Polar Bear

As noted in the DEIS, the polar bears most likely to occur on and adjacent to the Coastal Plain are individuals from the Southern Beaufort Sea (SBS) population. The Borough has significant concerns with the reliance on and use of the Bromaghin et al. (2015) paper's population estimate of 900 SBS polar bears in 2010 for purposes of informing leasing decisions.²¹ While this estimate suggests a significant population decline from prior studies conducted in 2006 and 1986, the authors' acknowledged that suspected biases may have affected their abundance estimate.²² Based on these biases, and other violation of assumptions, the Polar

¹⁹ *Id.* at 3-131.

²⁰ J.A. Crawford, L.T. Quakenbush, and J.J. Citta. *A comparison of ringed and bearded seal diet, condition and productivity between historical (1975-1984) and recent (2003-2012) periods in the Alaskan Bering and Chukchi seas*. *Progress in Oceanography* 136:133-150 (2015).

²¹ DEIS at 3-125.

²² The data used to formulate the estimate are nine years old and, pursuant to NMFS guidelines, should receive little weight in the decision-making process. Moore, J.E., and Merrick, R., editors. *Guidelines for Assessing Marine*

Bear Technical Committee has given this estimate little confidence in its status table.²³ Notwithstanding these issues, we note that the Bromaghin et al. (2015) paper indicated an increasing population trend at the end of the study period. While we are not aware of any population estimates for the years following 2011, a multi-year genetic mark-recapture study is scheduled to begin in March 2019 with a population estimate expected by 2021. We recommend that BLM review and incorporate these data in future leasing decisions when available.

The DEIS should also reflect that the oil and gas industry has a long history of conducting operations on the North Slope with minimal impacts to polar bears. For example, FWS has recognized that “oil and gas exploration, development, and production . . . appear to impose little risk to the long-term persistence of polar bears.”²⁴ Through robust mitigation measures established by the Borough, FWS, and BLM, resource development activities have reduced, minimized, and avoided the disturbance of polar bears to almost negligible levels.²⁵ The Borough is concerned with BLM’s emphasis on protecting “potential” polar bear denning habitat. While potentially suitable areas have been identified based on geographical and topographical criteria, in our experience, these mapped areas are overbroad and should not be relied on as an exclusive basis for determining development-related restrictions.

The DEIS notes that noise and light from industrial facilities could serve as an attractant for polar bears.²⁶ We suggest that BLM provide additional information, including descriptions of current polar bear behavior in areas with existing oil and gas facilities and in the area around the community of Kaktovik. In particular, BLM should consider whether concentrations of polar bears in and near Kaktovik—such as at the “bone pile,” an area frequented by tourists that contains the discarded remains of subsistence harvested bowhead whales which attracts polar bears—demonstrate that those animals are habituated to noise and light and are more likely to be attracted to human activity than polar bears in other areas.²⁷ In addition, we note that polar bears appear to be attracted to oil, anti-freeze, foam snow-machine seats, and other waste. BLM should include a discussion of mitigation measures that have been successfully used by industry to avoid or reduce attracting and habituating polar bears.

Mammal Stocks, Report of the GAMMS III Workshop, February 15 – 18, 2011, La Jolla, California. Dept. of Commerce, NOAA Technical Memorandum NMFS-OPR-47 (2011).

²³ Polar Bear Technical Committee (2017) Status Table.

²⁴ FWS, *Polar Bear Conservation Management Plan* at 11 (2016); see also *Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Polar Bear (Ursus maritimus) Throughout Its Range*, 73 Fed. Reg. 28,212, 28,266 (May 15, 2008) (“oil and gas exploration, development, and production activities do not threaten the species throughout all or a significant portion of its range.”).

²⁵ It should be noted that oil and gas infrastructure has the potential to create snow drifts that are favorable for polar bear denning, but operators should develop an action plan for monitoring and reducing anthropogenic disturbances to polar bears that may den in close proximity to infrastructure.

²⁶ DEIS at 3-138.

²⁷ BLM should also discuss whether a potential oil spill could impact concentrations of bears attracted to the noise and lights associated with spill response or at the carcass of an animal that succumbed to the spill.

2. Whales

The DEIS states that “no whale habitat is expected to be lost or altered under any of the action alternatives.”²⁸ BLM should review and revise this conclusion because it does not appear to be accurate, and is contradicted by other analyses in the DEIS. For example, we note that acoustic habitat is of significant importance to marine mammals because they relate to their habitat primarily through sound. If oil and gas activities on the Coastal Plain increase sound in areas used by whales—such as through vessel traffic or seismic surveys—those sounds could degrade whale habitat. While the DEIS references the National Marine Fisheries Service’s (NMFS) “Final EIS on Effects of Oil and Gas Activities in the Arctic,” we suggest that BLM review and incorporate additional information from that EIS to further inform the analysis of potential effects on whale species. Similarly, we note that BP, Shell, and ConocoPhillips have collected substantial amounts of data, including from areas of the Beaufort Sea adjacent to the Coastal Plain, that should be considered as part of the analysis on disturbance to whale species from industrial activities.

3. Seals

We suggest that BLM update the information regarding habitat preferences of certain seal species.²⁹ Young bearded seals regularly use river systems in the late summer and early fall.³⁰ They also have been observed using terrestrial haul outs, and are easily disturbed when hauled out.³¹ Similarly, spotted seals make extensive use of rivers, estuaries, lagoons, and bays, and they also haul out on land where they are easily disturbed.³² BLM should incorporate this information in its consideration of potential effects to these seal species.

3. BLM’s Analysis of Social Systems

a. Cultural and Subsistence Resources and Sociocultural Systems

Cultural and subsistence resources are of central importance to the Borough. The lands and waters of ANWR have sustained the Iñupiat for many generations, and our people’s continued existence is dependent on the maintenance of a healthy ecosystem and the subsistence resources it provides. We also recognize that responsible oil and gas development is necessary to provide for a sustained North Slope economy and for the economic, health, and other benefits it provides to our communities. These objectives are not mutually exclusive. As we have seen in other areas of the North Slope, through the use of modern technology and collaborative efforts between industry, our communities, and our subsistence hunters, development can occur without significant impacts to wildlife or the environment.

²⁸ DEIS at 3-135.

²⁹ *Id.* at 3-130, 3-131.

³⁰ NSB unpublished data.

³¹ *Id.*

³² *Id.*

The Borough agrees with BLM's conclusion in the Alaska National Interest Lands Conservation Act Section 810 analysis that only the community of Kaktovik may experience significant restrictions to subsistence uses.³³ The Borough respects that the Gwich'in people harvest caribou that migrate through and calve in the Coastal Plain. However, BLM acknowledges that the Leasing Program will not impose a significant restriction to subsistence users in the communities of Arctic Village and Venetie. While the DEIS includes a robust discussion of the history, culture, and way of life of both the Iñupiat and the Gwich'in, BLM should be mindful that it is the residents of Kaktovik that may be most impacted by development in the Coastal Plain. As such, BLM's analysis should focus on the community of Kaktovik, and the needs and concerns of its residents must be given greater consideration than other communities or groups that are not directly affected.

The Borough is concerned with the negative connotations that the DEIS applies to the impacts of roads on subsistence use.³⁴ On the North Slope, the additional access to subsistence areas and connectivity provided by roads is viewed by many residents as a benefit. For example, in Utqiagvik and Nuiqsut, the roads associated with industrial development are used to expand accessibility to otherwise low-use areas and improve the ability of our residents to pursue subsistence opportunities. BLM should more fully consider the benefits provided by road development, particularly for the residents of Kaktovik to gain greater access to areas within the Coastal Plain.

b. Visual Resources

The DEIS states that "[i]t is reasonable to characterize the program area using the Central Yukon Planning Area [Visual Resource Inventory] because there are negligible differences between the two areas."³⁵ BLM should provide additional justification for selecting this location as the basis for its analysis. It appears that the effects of the Alpine development near the community of Nuiqsut would be a more appropriate comparison. Notably, development of Alpine appears to have negligible differences when compared to development on the Coastal Plain, the locations are within the same Borough, and there has already been some analysis associated with the project. In the mid-1990s, no "cultural modifications" in the form of gas and oil development could be seen from Nuiqsut (i.e., viewshed). By 2009, oil and gas infrastructure (including the facilities at Alpine), pipelines, and ice roads were visible from Nuiqsut and other portions of the analysis area. This change in the viewshed of Nuiqsut should be included in the analysis of potential effects to visual resources.

c. Public Health

BLM should revise its analysis to include information on the positive health benefits associated with development on the Coastal Plain.³⁶ For example, life expectancy on the North Slope has increased significantly (by 13 years), and more than any other area in the United

³³ DEIS at E-19.

³⁴ *Id.* at 3-177, 3-190.

³⁵ *Id.* at 3-217.

³⁶ *Id.* at 3-239 to 3-248 (Section 3.4.11).

States, since the development of Prudhoe Bay.³⁷ This improvement can be attributed to the increased economic benefit provided to the Borough and the State of Alaska. Notably, resource development activities have contributed funds that allow for health clinics in each village, a hospital on the North Slope, increased sanitation, reliable sewer, water, and heat, and emergency services. BLM should recognize these benefits and acknowledge that the Leasing Program will provide additional opportunities to further improve public health on the North Slope.

The Borough disagrees with BLM's unsupported assumption that increased income and employment due to resource development has contributed to "an increased prevalence of social pathologies."³⁸ While these issues should not be minimized, there does not appear to be a correlation between social pathologies and resource development or a healthy local economy. The Borough and its residents have participated in the cash economy for decades, and we understand how resource-related economic development in our region can impact our way of life, both positively and negatively. We have worked closely with our communities, industry, and others to ensure that development on the North Slope can occur in harmony with our cultural traditions and values while providing necessary economic benefits.

Finally, we encourage BLM to review and incorporate data from the Health Impact Assessment conducted for the Point Thomson project and the Borough's Health Assessment.³⁹ In addition, it is important to conduct a baseline health assessment for the community of Kaktovik prior to leasing as it will inform both the BLM and industry's future activity in the area. These studies will provide a framework by which the health of the community can be carefully monitored throughout leasing and resource development.

d. Environmental Justice

The Borough recognizes the importance of maintaining a healthy ecosystem in the Arctic, and we believe that the establishment of safe and responsible resource development activities is consistent with that objective. BLM should recognize that Arctic leasing and development projects provide the source of revenue and resources that promote the continued stability of our local and regional economy, which in turn contributes to the preservation of our subsistence culture, technological advancements, scientific research, and infrastructure. Our residents have the right to economic self-determination, and to ensure their social, political, and economic welfare in the Arctic.

4. BLM's Assumptions Informing the Hypothetical Development Scenario

The analysis of potential effects in the DEIS relies on a hypothetical development scenario for oil and gas exploration, development, production, and abandonment in the Coastal

³⁷ Dwyer-Lindgren L, Bertozzi-Villa A, Stubbs RW, et al. *Inequalities in Life Expectancy Among US Counties, 1980 to 2014: Temporal Trends and Key Drivers*. 177 JAMA Intern. Med. 1003 (2017) (doi:10.1001/jamainternmed.2017.0918).

³⁸ *Id.* at 3-199.

³⁹ Baseline Community Health Analysis Report. North Slope Borough Department of Health and Social Services, July 2012.

Plain. The DEIS notes that the development scenario considers the environmental impacts of leasing and development over approximately 50 years.⁴⁰ However, the DEIS states that the time frame used for the development scenario is "the estimated minimum amount of time in which development of the Coastal Plain could reach the 2,000-acre threshold."⁴¹ The DEIS also states that "it could be 85 years or more after the first lease sale before all facilities described in the scenarios are abandoned and reclaimed."⁴² These statements appear to suggest that the contemplated activities ranging from exploration to abandonment will extend beyond the 50-year timeframe considered by BLM. We recommend that BLM provide additional explanation regarding the selection and application of the 50-year timeframe, and address some of the apparent inconsistencies associated with the underlying assumptions, to ensure that the potential environmental effects associated with leasing in the Coastal Plain are appropriately identified and evaluated.

III. Conclusion

Thank you for the opportunity to comment on the DEIS for the Coastal Plain Oil and Gas Leasing Program.

Sincerely,


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Mayor

cc: Governor Mike Dunleavy
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Senator Lisa Murkowski
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Senator Dan Sullivan
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Congressman Don Young
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⁴⁰ *Id.* at ES-3.

⁴¹ *Id.* at B-7.

⁴² *Id.*; see also *id.* at 3-6 (noting that Coastal Plain production could extend for perhaps as long as 50 to 100 years, and stating that "70 years is assumed for purposes of making annual GHG projections for this Leasing EIS").

Comments on Specific Text in the DEIS

Section	Page	Comment
2.2.5	2-7	Lease Stipulation 4, Requirement/Standard: Alternative B and C. Add requirement (b) from Alternative D. “Before conducting open water activities, the lessee/operator/contractor would consult with the Alaska Eskimo Whaling Commission, the NSB, and local whaling captains’ associations to minimize impacts....”
2.2.5	2-29	Required Operating Procedure 28, Requirement/Standard: “The map would be prepared in time to plan one field season....” This should be revised to state “two field seasons.”
2.2.5	2-30	Required Operating Procedure 32, Requirement/Standard: a 656 foot buffer around Steller’s and spectacled eider nests. To clarify the 656 foot distance, suggest adding a parenthetical that says (200 meters).
3.2.1	3-2	The DEIS refers to climate as “the most recent 30-year averages of meteorological parameters” (DEIS at 3-2), and as the “longer-term (30 years or more) variations in meteorological conditions” (<i>Id.</i> at 3-5). These statements should be clarified and further explained as they could be interpreted to suggest that BLM’s analysis may not have adequately captured or examined the climate-related effects at the relevant scale for purposes of assessing effects on the Coastal Plain.
3.2.1	3-2	Table 1-3 Kaktovik Airport Period of Record Monthly Climate Summary provides monthly averages for a timeframe of 1947 to 2016. The data are of little value when the most significant changes have occurred only in the most recent decades. More recent data, reflecting trends, would be more predictive of conditions likely to occur during the near-term and long-term industrial development of the Coastal Plain. The recent more frequent occurrence of weather severe enough to limit air travel at Kaktovik and in the region would be relevant, for instance, in assessing the likely effectiveness of oil spill and other emergency response measures.
3.2.1	3-4	The DEIS provides a link to the 2016 annual report of the DOI/Global Terrestrial Network for Permafrost Observing System, which began operations at some sites as early as 1998, and now has over

		10 years of data from each of 16 sites. The four Arctic Refuge stations include three in the current EIS program area: Marsh Creek, Camden Bay, and Niguanak. The complete findings of the decade of monitoring are important and should be summarized in the Final EIS, especially given that the 2016 report for the ANWR sites appears only to provide wind data.
3.2.1	3-7	<p>“Conversely, over 96 percent of the Coastal Plain oil production is projected to replace other US (and likely global) production that would not happen if development goes forward. The BOEM projections include production of both oil and natural gas from the Coastal Plain, . . .”</p> <p>Suggest clarifying whether the phrase “over 96 percent” relates to oil production or to “production of both oil and natural gas.” This relates to a series of tables within this section that describe “projected oil production.”</p>
3.2.1	3-9	<p>“GHG emissions disperse through the global atmosphere relatively quickly relative to the time scales of concern for climate The potential cumulative climate impacts of global development and associated GHG emissions have been discussed extensively in the published literature, . . . and therefore, are not repeated here (BLM 2018a; IPCC 2014; Melillo et al. 2014; ACIA 2005).”</p> <p>These sentences constitute a simplistic assessment of cumulative effects. Rather than simply citing literature, the Final EIS should provide an analysis on reasonable foreseeable activities that will contribute to cumulative impacts of GHG emissions.</p>
3.2.2	3-10 to 16	There are no state or federal air quality monitoring stations in or near the program area. Industry monitoring is the only available quantitative indicator of air quality on the North Slope. BPXA’s A-Pad Meteorological and Ambient Air Monitoring Station is approximately 60 miles west of the Coastal Plain boundary, and ConocoPhillips Alaska, Inc.’s Nuiqsut Ambient Air Quality and Meteorological Monitoring Station is approximately 110 miles west of the Coastal Plain boundary. Data available from both stations due to distance cannot be viewed as providing pre-development baseline air quality pollutant concentrations in the program area. Furthermore air quality (sensu concentration of air pollutants in a geographic region) are climate sensitive (wind, temperature, humidity) and ultimately cumulative. The interplay between specific Arctic meteorological conditions and air pollution is not well understood (for an Arctic perspective, see: https://doi.org/10.1029/2018EF000952). Thus, there is a need to establish baseline levels and regional study of behavior of airborne pollutants. To address the gap, a complimentary approach of surface, aircraft measurements, and satellite monitoring would

		provide the most comprehensive assessment.
3.2.3	3-21	The Coastal Plain serves as breeding habitat for a variety of birds. These birds may be impacted by noise from drill rigs if they are operating near and during the bird's breeding grounds, because birds use calls for a variety of behaviors such as mating, chick rearing feeding, etc.
3.2.10	3-52	Please list and map all of the lakes that are currently known to be of seven feet or greater in depth <u>and</u> have low to no salinity.
3.3.1	3-67	The common dandelion (<i>Taraxacum officinale</i>) has been found north of the Brooks Range and there has been observation of dandelion in the NPR-A (BLM 2012) and around Barrow (Johnson 1995). Dandelion is an invasive plant that is found at higher latitudes than the project area; therefore, one should amend the text as follows: "While higher-latitude regions which include the project area are considered to be invasion resistant due to the short growing season compared to that of known invasive species (Carlson et al. 2015), the common dandelion (<i>Taraxacum officinale</i>) has been found north of the Brooks Range and there has been observation of dandelion in the NPR-A (BLM 2012) and around Barrow (Johnson 1995)."
3.3.1	3-71	<p>"According to a long-term study on the effects of ice road construction and operation in the NPR-A, ice roads have a minimal effect on the vegetation, which would recover to pre-construction conditions after approximately 20 years."</p> <p>We request that a reference be provided for this long-term study and its conclusion of "minimal effect."</p>
3.3.2	3-78 to 79	BLM should incorporate results from E. Logerwell et al. <i>Progress in Oceanography</i> 136 (2015) 115–132 that "synthesized data from fish surveys conducted in five different habitats in the western Beaufort Sea: lagoon, beach, nearshore, benthic, shelf midwater and shelf benthic."
3.3.2	3-81	BLM should cite values provided earlier in this DEIS, such as on p. 3-52, Lakes and Wetlands: "The estimated volume of liquid water in these lakes is 1.1 billion gallons by the end of the winter season. Eighty percent of this volume is concentrated in seven lakes in the Canning River Delta. One of these lakes is known to have salinity concentrations close to that of seawater."
3.3.3	3-93	As stated above please include 200 meters in parenthesis after 656 foot.
3.3.4	3-103	BLM should include a discussion of herd mixing and emigration/immigration rates. It's known that a substantial number of collared CAH caribou joined the PCH prior to the 2017 census (unpublished Borough Department of Wildlife Management data).

3.3.4	3-105	In paragraph 2, the final sentence needs to be clarified. Does the author imply that the phenology of plants nearer to the coast is delayed (cooler temperatures/delayed snow melt) and therefore has increased digestible nitrogen? If so, please state something to that effect.
3.3.4	3-106	In paragraph 1, sentence 3, if pregnancy rates change less dramatically with changing fall body weights, it indicates there is less variation and not less vulnerability which actually suggests they are at some type of threshold if they are unable to accumulate less back fat than other herds.
3.3.4	3-106	The statement “PCH animals accumulate less back fat and get pregnant at higher fall body weights (indicating lower productivity) than other herds, but pregnancy rates change less dramatically with changing fall body weights (indicating lower vulnerability)” may be interpreted differently than “lower vulnerability.” Low back fat, higher body weight for pregnancy, and overall lower productivity probably should be interpreted as vulnerable. Pregnancy rates would be expected to change less dramatically with changing fall body weights (presumably lowering body weight) if the population was already at the lower end of its ability to be productive as the description seems to indicate. In other words, though the PCH is stable (at low productivity) this should not be interpreted as less vulnerability.
3.3.4	3-107	Some discussion about the recent vulnerability assessment of the PCH by Russel and Gunn (2019) should be presented in this section.
3.3.4	3-107	The variability of the growing conditions may effect more than calf survival in the year of study. For example, calves that do survive despite poor conditions during the previous winter (gestation) and/or the spring/summer growing period (lactation) may experience maternal effects that can have lifelong implications. Studies that take this into account should be able to better characterize the source of variability for productivity.
3.3.4	3-108	The statement “Red foxes are not known to inhabit sea ice” may be generally true. However, on more than one occasion, red foxes have been observed on the sea ice. One observation during polar bear capture work (2016) was of a red fox well out on the pack ice >75 miles from the coast. This was in Kotzebue Sound in the vicinity of the Red Dog Mine Port Facility. It would not be surprising if the niches of red and Arctic foxes begin to overlap more, particularly as red foxes adapt and the climate continues to moderate. Thus, competition between the two species may be expected to increase, with red foxes apparently able to out-compete Arctic foxes, especially when there are anthropogenic food sources available to support red fox populations.
3.3.4	3-109	As snowshoe hares expand their range into the Arctic Coastal Plain, there is likely to be more competition with moose. The dynamics of hare/moose forage, and small/large carnivores are complex,

		and efforts should be made to characterize the dynamics, particularly given the positive feedbacks that anthropogenic food sources, habitat alterations, and disturbances can have on these populations.
3.3.4	3-109	Concerning the statement about “Vegetative biomass in the arctic has generally increased...”, care should be taken in monitoring range quality in light of climate change and changes to the growth patterns of forage plants. As growing seasons change (temperature, precipitation, duration), unexpected results may occur as plants adapt. These adaptations can occur as increasing changes to the carbon-nitrogen ratio (thereby lowering forage quality) as plants allocate more structural carbohydrates (cellulose, lignin) to growth in height as inter- and intra-specific competition increases. This has been documented in other grazing systems (Hopcraft et al. 2010). Interpreting the long-term effect of progressive moderation of the climate on the Coastal Plain may not always be straightforward. J.G.C., Hopcraft, H. Olff, and A.R.E. Sinclair. 2010. Herbivores, resources and risks: Alternating regulation along primary environmental gradients in savannas. <i>Trends in Ecology & Evolution</i> 25(2):119-128.
3.3.4	3-112	Increased disturbance could also result in changes to predation rates (e.g., if cover habitat is less available, or if prey species are driven out of formerly productive hunting habitat). It may also be affected if certain species do better in disturbed regions than others, thereby changing the ecology of the region.
3.3.5	3-123	Table 3-20: The Beaufort Sea and Chukchi Sea stocks of beluga whales are NOT listed as depleted. Those are the two stocks that occur near the program area. Eastern North Pacific Gray whales are also not listed as depleted under the Marine Mammal Protection Act. BLM should revise this table accordingly.
3.3.5	3-125	The correct spelling is Inuvialuit.
3.3.5	3-125	It should be noted that this average is well below the voluntary quota agreed upon by the Inuvialuit-Inupiat Polar Bear Commission.
3.3.5	3-129	Bowhead whale: It is not clear what the significance of “the extent and duration of sea ice over the past 40 years has coincided with an increase in harvest by resident of Kaktovik.” Is there some type of cause and effect that is being suggested? If so, then the change in the quota from the International Whaling Commission must also be considered in this analysis.
3.3.5	3-130	Other whales: This section provides a listing of whales that might be encountered during transit from the

		Bering Sea to the Beaufort Sea. However, it does not provide information about other whales that may be encountered in the Beaufort Sea adjacent to the Coastal Plain. Those species include harbor porpoises, killer whales, and narwhals. A literature review will provide the appropriate references.
3.3.5	3-130	Ringed seals are also quite pelagic during the open water season and have been tracked using satellite tags quite far from shore (NSB unpublished data). There is also some seasonal migratory behavior in which ringed seals move to regions that are quite far from where they spend the winter (Crawford et al. 2012, Harwood et al. 2015).
3.3.5	3-131	<p>Climate change: There are some recent papers about the possible impacts to Chukchi and Beaufort beluga whales from changes in sea ice extent (see below). These references represent some of the best available science and should be included. There are likely other references that should be included and a literature review should be conducted and incorporated into the DEIS prior to it being finalized.</p> <p>References:</p> <p>D.D.W. Hauser, K.L. Laidre, H.L. Stern, S.E. Moore, R. S. Suydam, and P.R. Richard. 2017. Habitat selection by two beluga whale populations in the Chukchi and Beaufort seas. PLOS ONE 12(2):e0172755. doi:10.1371/journal.pone.0172765.</p> <p>D.D.W. Hauser, K.L. Laidre, S.L. Parker-Stetter, J.K. Horne, R.S. Suydam, and P.R. Richard. 2015. Regional diving behavior of Pacific Arctic beluga whales (<i>Delphinapterus leucas</i>) and associations with Arctic cod (<i>Boreogadus saida</i>). Marine Ecology Progress Series 541:245-264.</p> <p>G. O’Corry-Crowe, A. Mahoney, R. Suydam, L. Quakenbush, A. Whiting, L. Lowry, and L. Harwood. 2016. Genetic profiling links changing sea ice to shifting beluga whale migration patterns. Biology Letters 12: 20160404. http://dx.doi.org/10.1098/rsbl.2016.0404.</p> <p>K.M. Stafford, M.C. Ferguson, D.D.W. Hauser, S.T. Okkonen, C.L. Berchok, J.J. Citta, J.T. Clarke, E.C. Garland, J.Jones, and R.S. Suydam. 2016. Beluga whales in the western Beaufort Sea: current state of knowledge on timing, distribution, habitat use, and environmental drivers. Deep Sea Research II. (http://dx.doi.org/10.1016/j.dsr2.2016.11.017).</p>
3.3.5	3-135	Seals: There is inadequate evaluation of the possible impacts to seals from oil and gas activity associated with leasing on the Coastal Plain. The two paragraphs that evaluate impacts on seals mention

		possible impacts to benthic habitat, and possible lethal impacts from on-ice seismic that might impacts ringed seal dens. There is no analysis or indication whether BLM expects those impacts to be minor, moderate, or major. The Final EIS needs to have some indication how impacts might impact populations or subsets of the population.
3.3.5	3-132	The statement “The greatest declines in optimal polar bear habitat are expected to occur in those areas where reduced habitat would likely reduce polar bear populations (Durner et al. 2009; Regehr et al. 2016)” is confusing and requires clarification.
3.3.5	3-142	Last paragraph: BLM concludes based on a NMFS report that “the absence of collisions involving industry vessels and marine mammals in the Bering, Chukchi, and Beaufort seas, despite decades of spatial and temporal overlap, suggests that collision probabilities are low along the transit route from Dutch Harbor to the program area (NMFS 2013).” This statement is misleading as there has not been adequate monitoring of collisions of vessels with marine mammals. Industry has been unable to examine dead marine mammals they find floating or beached because they do not have the proper permits nor expertise to determine the cause of death, including from vessel collisions. There are very limited data for the Chukchi and Beaufort seas to support the statement referenced above or BLM’s conclusion that “potential ship strikes of marine mammals would be highly unlikely and are not expected to occur.”
3.4.11	3-240	Public Health – Accidents and Injuries: Injury is the third leading cause of death according to the North Slope Borough Baseline Community Health Assessment, p. 5.
3.4.11	3-243	Diet and Nutrition: Impacts to subsistence could result in residents changing their diet habits, leading to the development of chronic diseases such as diabetes.
3.4.11	3-244	Environmental Contaminants – Air Quality: Cancer is the leading cause of death on the North Slope according to the North Slope Borough Baseline Community Health Assessment, p. 5. There could also be increases in asthma and other chronic respiratory diseases.
3.4.11	3-245	Potential impacts to the health of the people in Kaktovik include any associated with increased contact with outside project workers, degradation of air and water quality, tainting or perceived tainting of fish or other resources (resulting in decreased consumption or decreased food security). For instance, the presence of mold on broad whitefish in the Nuiqsut area has led to a perceived tainting of fish. BLM should include measures to prevent any increased contamination of areas by fish mold associated with development activities.

3.4.11	3-245	Public Health Services: The influx of workers could bring more risk of seasonal flu and communicable diseases such as STIs, TB, etc.
3.4		To improve the presentation and analysis of potential cumulative effects on all area resources and current uses, BLM should provide cumulative effects maps that show development in this area over time, including other reasonably foreseeable exploration and development projects occurring during the duration of the Leasing Program.
3.6	3-248	<p>“Over the long term—several decades after completion of abandonment activities—natural environmental balances are generally expected to be restored, . . .”</p> <p>A citation should be provided for this statement, along with examples from the North Slope. We note that some studies have found that “[f]orty-six years after the discovery of oil at Prudhoe Bay, we are still learning about the ecological consequences of large-scale infrastructure expansion and the impacts of climate change in ice-rich permafrost environments.” See D.A. Walker, M.K. Raynolds, M. Buchhorn, and J.L. Peirce JL (eds.) (2014) <i>Landscape and permafrost changes in the Prudhoe Bay Oilfield, Alaska</i>. Alaska Geobotany Center Publication AGC 14-01, 84 pp. University of Alaska Fairbanks, Fairbanks, AK.</p>