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Section V

Preferred Alternative and Its Consequences

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V. PREFERRED ALTERNATIVE AND ITS CONSEQUENCES

Preview of this Section

This section examines how authorized activities under the Preferred Alternative, including oil and gas exploration and development, may impact the environment in and surrounding the Northwest NPR-A Planning Area. The effects of non-oil and gas activities are also considered. A range of reasonably expected oil and gas exploration and development activities has been projected for this alternative (Section IV.A.1). The analyses in this section discuss the potential environmental consequences of the projected activities. The analyses focus first on the potential direct and indirect impacts that may result from the first oil and gas lease sale under the Preferred Alternative, then on the potential impacts of multiple lease sales that may be authorized based on this IAP/EIS.

After reading this section, you will understand the potential environmental consequences of activities projected to occur under the BLM's Preferred Alternative.

A. Overview Of the Preferred Alternative

Under the Preferred Alternative (Map 18), all BLM-administered lands within the Northwest NPR-A Planning Area would be made available for oil and gas leasing, although leasing would be deferred for 10 years on approximately 1,570,000 acres (about 17%) of the Planning Area in the vicinity of Wainwright. Within the deferral area, Kasegaluk Lagoon would be subject to a no-surface-occupancy stipulation. Outside the deferral area, additional no-surface-occupancy stipulations would be imposed along coastal areas, key rivers and deep water lakes. In total, these restrictions would apply to approximately 1,515,000 acres, which is about 16 percent of the total Planning Area. Stipulations and required operating procedures (ROP's) (Section II.C.6 and Table II-03) provide clearly defined setbacks, restrictions (including seasonal restrictions), and guidance for all aspects of oil and gas and related operations. How the Preferred Alternative was developed is discussed in Section VI.D .

The Preferred Alternative stipulations and ROP's would impose restrictions on the establishment of permanent or temporary facilities on all deep waterlakes (lakes with depths greater than 7 ft) and prohibit permanent facilities within ¼ mi of such lakes. No permanent facilities would be permitted in the streambeds of rivers. A no-permanent-surface-occupancy setback of ½ mi would be imposed on all major rivers (measured from the centerline of the river as determined by current hydrology at the time of application). Along rivers or river segments where subsistence concerns have been raised, setbacks for no surface occupancy increase to ¾ mi. Along the Colville and the upper Ikpikpuk rivers, a 1-mi setback for no surface occupancy would be imposed to protect important raptor habitat.

Along the entire coastal area of the Planning Area, permanent support facilities would be located at least ¾ mi inland from the coastline to the extent practicable. When technological limitations, economics, logistics or other factors require that a facility be located within ¾ mi inland of the coast, the practicality of locating the facility at previously occupied sites such as the former Cape Simpson, Peard Bay, or Wainwright DEW-line sites would be considered. Use of existing sites within ¾ mi of the coastline would also be acceptable where it is demonstrated that use of such sites would reduce impacts to shorelines or otherwise be environmentally preferable. All lessees/permittees involved in activities in the immediate area would be required to coordinate the use of sites with other prospective users.

On Dease Inlet, Admiralty Bay, Elson Lagoon, and associated barrier islands, the Preferred Alternative would allow oil and gas exploration activities to take place only between October 15 and May 15 of each year. Special stipulations would be imposed for exploration and development, including a setback ¾ mi from shoreline seaward and around natural islands (excluding the barrier islands) within which no development could occur on or under the water. Standards that would have to be met before authorization would be granted for permanent facilities within the setback area would be intentionally set high, with the burden of proof resting with the lessee to demonstrate that approval by BLM is warranted. These standards address specific concerns raised by the North Slope Borough, local communities and residents about conflicts between oil and gas activities and seasonal concentrations of fish, wildlife, and waterfowl that frequent the area; associated subsistence uses and access on these important water bodies; navigation hazards; spill response capabilities; and special consultation procedures.

Multi-year surveys would also be required on a Planning Area-wide basis to prevent the taking of spectacled and Steller's eiders, which are listed as a threatened species under the Endangered Species Act, and yellow-billed loons,a BLM-designated sensitive species (Appendix 16). The Preferred Alternative identifies special study areas for brant and caribou where multi-year studies would be required before the authorization of development activities. Within the brant study area, studies would be directed at preventing the loss or alteration of habitat or disturbance of nesting and brood-rearing areas as a result of oil and gas activities. Within the caribou study area, the focus would be on avoiding conflicts with caribou movement through insect-relief habitat.

Under the Preferred Alternative, the 102,000-acre area of Kasegaluk Lagoon would be recommended for designation as a Special Area and no-surface-occupancy stipulations would be imposed. Geophysical exploration within the Special Area would be allowed subject to applicable ROP's.

Overland travel and associated activities for permitted uses would be guided by specific ROP's. The Preferred Alternative would designate the Planning Area as Limited, confining recreational off-highway vehicle (OHV) use to winter use of snow machines and other low-ground-pressure vehicles. Within NPR-A, no summer recreational use of OHV's would be permitted. The summer use of OHV's--including all-terrain vehicles (ATV's) and airboats--to support traditional subsistence activities and access would be allowed. The use of airboats during the summer would be limited to streams, lakes, and estuaries that are seasonably accessible by motorboat. To prevent impacts to soils, water quality, vegetation, and wildlife (in particular nesting waterfowl), airboat use in areas of seasonal flooding of tundra and temporary shallow waters adjacent to streams, lakes, and estuaries would be prohibited. Under the Preferred Alternative, the lands along the Colville River area would be designated Visual Resource Management (VRM) Class I.

Identifed estuarine areas and lands along the 21 rivers eligible for designation as wild and scenic rivers would be designated VRM Class III (Map 23). These VRM classes apply to all lands within 3 mi of the banks of all identified water bodies. The remainder of the Planning Area would be designated VRM Class IV.

B. Environmental Consequences Of the Preferred Alternative

This section examines how authorized activities under the Preferred Alternative may impact other resources on BLM-managed lands in the Northwest NPR-A Planning Area. A range of reasonably expected oil and gas exploration and development activities has been projected for this alternative (Section IV.A.1). Activities associated with oil and gas exploration and development are described in Section IV.A.1.b. Activities other than oil and gas exploration and development are described in Section IV.A.1.a. The analyses in this section discuss the potential environmental consequences of the projected activities. The analyses focus first on the potential direct and indirect impacts that may result from the first oil and gas lease sale under the Preferred Alternative, then on the potential impacts of multiple lease sales that may be authorized based on this IAP/EIS.

This section on environmental consequences should be read together with Section II, which explains the alternatives, and Section III, which describes the important resources and their occurrence and status within the Planning Area. The analyses of environmental consequences in this section build upon and relate to information presented in these earlier sections to identify which resources may be impacted and how and where impacts might occur under the Preferred Alternative. The maps of the different land forms, species, and other resources of the Planning Area and the tables and figures presenting the activities projected in the scenarios are contained in Volume 3 of the Final IAP/EIS.

The stipulations and required operating procedures (ROP's) for the Preferred Alternative can be found in Section II.C.6 and Table II-03. The effectiveness of stipulations and ROP's is evaluated for each resource in the analysis section. A summary of the effectiveness of the stipulations and ROP's is provided in Appendix 12.

The conclusions on the impacts of the various alternatives are compared in Appendix 2. The overall impacts under each alternative are summarized in Section II.D.

1. Soils

a. Effects of Non-Oil and Gas Activities

The types of activities and associated impacts that may affect soils under the Preferred Alternative include ground-impacting aircraft use (landing and take-off), OHV use, and other surface activities. If during any land use the vegetative cover remains unaltered, activities generally would have only a small impact. However, where these activities concentrate surface disturbance (e.g., foot traffic around a landing site or repeated snow machine crossing of a drainage channel at the same site), damage to the soils could result. If the insulating vegetative cover is disturbed or the surface organic mat is removed or worn, soil erosion is likely to occur.

Generally, disturbance of vegetation alters the thermal balance, and those soils containing large amounts of ice may lose volume when there is thawing. Subsidence, thermokarsting, and gullying may follow. Removal of the surface organic mat exposes the mineral portion of the soils to erosive forces. Wind and water would transport sediment from these soils, and this sediment may be deposited in sensitive areas. Soil excavation and removal activities are estimated at no more than one acre annually under the Preferred Alternative. In these instances, such as archeological excavations, the impacts are local and probably not widely distributed. When warmed, dominantly ice-rich permafrost soils may slump and release melt water, which would pond. The ponded water may absorb more radiant energy and increase the area of warming soils. The process of warming, melting, and

slumping can continue well beyond the area of initial disturbances and may take several years to stabilize.

Effects would be similar to those evaluated under Vegetation (Section V.B.7).

b. Effects of Oil and Gas Activities

(1) Effects of Disturbances

Snow trails, ice roads, snow roads, ice pads and runways, and other similar transportation and storage structures have little effect on soils.

Seismic operations affect soils primarily through the action of on-the-ground travel. Fundamental to the protection of frozen soil is prevention of disturbance to the insulating vegetative layer. Any activity using heavy vehicles has the ability to depress the vegetative layer and reduce insulation. All vehicle use has the risk of removing the vegetative mat. During the summer months, when seasonal thaw occurs, soils may be more susceptible to disturbance, as the active layer may contain large amounts of melt water and the saturated soils may not be capable of resisting the forces of vehicle traffic. In areas such as the foothills--where soils are thin or soils are well drained, or vegetation is otherwise underlain by materials containing less water--vehicle travel has occurred in summer months with little disturbance. Generally, winter months--when soils are frozen (especially the seasonal thaw layer)--compose the only time period when when soils are capable of supporting the weight of heavy vehicles.

Holes that are dug in the earth for construction of well cellars affect soils for 16 ft^2 of ground (0.006 acres). Small amounts of soil disturbance and thermokarsting would likely occur. For the projected 7 to 30 exploration and delineation wells from the first lease sale (Table IV-05), this could result in the disturbance of up to 1 acre of soil.

Development requires a long-term commitment of resources. Disturbance of soils through burial or truncation usually is part of this commitment. Embankments such as work pads, camp pads, roads, and pump stations made from sand, gravel, or rock fragments completely cover the natural soils. Working material sites, conventional pipeline construction, digging, scraping, and excavating destroy the pedogenic horizons. Off-pad traffic (including foot traffic) and other surface-disturbing activities damage the vegetative cover and surface organic mat. The exposed mineral portion of the soils may erode. These activities also alter the thermal balance, and the risk of thermokarsting increases. Thermokarsts, gullies, and sediment impact other resources and land uses. Examples are difficult surface travel and access across gullies and thermokarsts. The amount of soil erosion increases with the amount of surface disturbance. The most effective mitigation is to keep the areas of surface disturbance (i.e., alteration of the vegetative cover or damage to the surface organic mat) as small as possible using design approaches to minimize the effect to the surrounding area. The amount of soil loss, based on the estimated areal extent of vegetation destruction, should be similar to that discussed under Vegetation (Section V.B.7).

Aspects of development that could impact soils (just as they might impact vegetation) include construction of gravel pads, roads, and airstrips; potential construction of a pump station within the Planning Area; excavation of material sites; and construction of pipelines.

(a) Gravel Pads, Roads, and Airstrips

It is assumed that the gravel footprint for the average, mid-sized oil field development in the Planning Area would cover a total of 100 acres of a combination of pads, roads, and airstrips. Under the Preferred Alternative, up to 4 fields would be developed following the first lease sale (Table IV-04), resulting in an impact of up to 400 acres of soils.

(b) Material Sites

Excavations of material sites for gravel fill would destroy soils over the area of the excavation and probably affect soils near stockpiled overburden. Following the assumptions made for vegetation, it is assumed that there would be one material site within the NPR-A for each oil/gas development, each with a surface disturbance of 20 to 50 acres (average 35 acres). Under the Preferred Alternative, soil disturbance of up to 140 acres is projected.

(c) Pipelines

Areas of disturbance for soils would be similar to the areas of disturbance described under Vegetation (Section V.B.7). The area disturbed by the drilling of holes for vertical support members (VSM's) for pipelines and the deposition of the resulting spoil would amount to 0.03 acre per pipeline mile, or up to 6.2 acres within the Planning Area under the Preferred Alternative. Impacts from the remainder of the transport pipeline as it extends east of the Planning Area are evaluated under the cumulative case.

Additional pipelines that could be placed on the original VSM assembly would not increase the amount of soil disturbance. Buried pipelines, a common construction method for gas pipelines, would cause a dramatic shift for disturbed soils. The result would be an impact area of up to 45 acres along the assumed 25-mi route within the Planning Area, as described under Vegetation (Section V.B.7). Soils thus disturbed in the northern part of the Planning Area are more likely to experience thermal degradation as a result. In this case, the soils might not be lost completely, but soil horizons as well as the thermal regime would be completely confused. Melting of ice in the soils would result and the filled area, normally mounded immediately after fill, would level over time as melt water migrates. Ponding could occur.

(2) Effects of Spills

Oil spills may impact soils as the vegetation is altered. The oil alone would decrease vegetation growth, but oil spills probably would leave the surface organic mat intact. Spill cleanup is more likely to damage soils. Cleanups are not always well controlled; heavy traffic and digging are common, resulting in damaged soils. Oil-spill cleanup mitigates impacts of the oil on soils only if cleanup methods and operations are very carefully controlled and minimize surface disturbance. The area affected is limited to that area immediately adjacent to and covered by the spill and the cleanup activities.

c. Effectiveness of Stipulations and Required Operating Procedures

ROP C-2, by limiting vehicle use to winter months, would protect soils in the Planning Area. Limiting vehicle use to winter months has proven valuable as a technique for the protection of soils.

The E series ROP's (primarily ROP's E-1, E-5, E-6, and E-8) involve the design and construction of facilities that can be important to soil management as they provide the opportunity for design elements that may reduce erosion. For example, techniques can be implemented to allow for maintaining natural drainages.

d. Conclusion--First Sale

Soil stability depends closely on vegetative cover; where vegetation is disturbed, impacts on soils follow. Impacts to vegetation from activities other than oil exploration and development under the Preferred Alternative would be minor to negligible (see Section V.B.7) and unlikely to cause loss of soils. Any impacts to soils would be expected to be negligible.

Winter exploration operations resulting from the first sale would be unlikely to cause loss of soils. Well drilling would result in up to 1 acre of soils lost or disturbed from well cellars. Any impacts to soils would be expected to be minor to negligible.

Development resulting from the first sale would cause loss or disturbance to soils through the construction of gravel pads, roads and airstrips for each oil/gas development, excavation of material sites, and construction of pipelines. The combined effect of these activities would cause the loss or disturbance of up to 600 acres of soils. The duration of these impacts would be permanent. Oil spills would affect soils over an area similar to the area of vegetation affected (Section V.B.7), up to 5 acres within the Planning Area. Spills would be cleaned up immediately, causing minimal disturbance to soils.

Under the Preferred Alternative, the impacts to soils would be minor to low.

e. Multiple Sales

It is assumed that multiple sales under the Preferred Alternative would result in additional exploration activities. The annual level of seismic operations is assumed to stay the same. The number of exploratory and delineation wells is projected to be 21 to 72 wells (Table IV-07) drilled from ice pads, resulting in up to 1 acre of soils lost or disturbed from well cellars.

The multiple sales scenario assumes that up to 8 fields would be developed (Table IV-06). Because lost or disturbed soil follows direct impacts to vegetation, soil loss or disturbance would also be up to 1,530 acres (Section V.B.7). Soil loss or disturbance from material sites would increase to up to 350 acres. A projected 295 mi of VSM-supported pipelines would result in up to 9 acres of lost or disturbed soils. A buried pipeline might result in 90 acres of lost or disturbed soils. The incidences of spills would remain the same with the total acreage affected being up to 5 acres.

f. Conclusion--Multiple Sales

Soil stability depends closely on vegetative cover; where vegetation is disturbed, impacts on soils follow. Under

the Preferred Alternative, a range of area activities based on the price of oil and the probabilities of exploration and development is assumed. Although little impact to soils is expected from exploration activities, the impacts to soils from development activity under the Preferred Alternative would involve either disturbance or loss of relatively small- to moderate-sized areas. The duration of these impacts may range from several years, if the vegetation is disturbed, up to several decades if the soils are disrupted. The overall impact to soils of the Northwest NPR-A Planning Area would be negligible (with seismic) to moderate (with development).

2. Paleontological Resources

a. Effects of Non-Oil and Gas Activities

Under the Preferred Alternative, some paleontological research and excavation would be conducted annually by permit within the Northwest NPR-A Planning Area. While excavation is a destructive activity, it is necessary for the recovery of scientific data. Excavation and collection normally occur during the summer. Excavation may also be done for geological and archaeological research. Geological and archaeological researchers are trained to recognize and properly deal with paleontological resources. Most paleontological material is buried considerably deeper than cultural material and therefore not regularly encountered by chance. Some Pleistocene-age animal remains may be recovered in archaeological deposits, if the deposit is old enough. In such situations, the remains would represent subsistence use of the animal(s) by humans, and the faunal material would be considered part of the archaeological record as well as belonging to the regional paleontological record.

The temporary summer field camps commonly associated with scientific or resource assessment work generally impact relatively small areas. Therefore, such camps and the activities that are associated with them, such as aircraft use, on-the-ground survey and reconnaissance, hazardous- and solid-material removal and site remediation, and recreation, are not expected--in and of themselves--to have any significant effect on paleontological resources.

b. Effects of Oil and Gas Activities

Because seismic data gathering activity is permitted only during the winter using low-ground-pressure vehicles such as Rolligons (ROP C-2 a, c, and d), there is little chance that significant impacts to paleontological deposits could occur. Although a remote possibility, some impact to paleontological resources could occur along stream-bank exposures from the passage of vehicles. In such cases, impact would be isolated and minimal.

It is worth noting that paleontological resources are not ubiquitous in the Planning Area as are habitat and wildlife. As a result, it is quite possible that oil and gas exploration or development activities would have no impact on paleontological resources simply because oil and gas operations would occur where paleontological resources are not present.

(1) Effects of Disturbances

As previously mentioned, because most of the activity would occur during the winter months, the potential for impact to buried paleontological resources remains relatively low. The likelihood of impacting surface paleontological materials is also low because of their isolated and rare occurrence and because of stipulations governing oil and gas exploration activity.

Although the drilling of between 5 and 12 exploration wells and 2 to 18 delineation wells could occur under the Preferred Alternative (Table IV-05), because of the limited availability of drill rigs, no more than a few wells are expected to be drilled at one time. If 7 to 30 wells were to be drilled, drilling would certainly occur over the span of several winter seasons and drill pads, camp pads, roads, and airstrips made of ice and snow would be used. Because no permanent pads, roads, or airstrips would be constructed for exploratory drilling and, therefore, no gravel or rock needed, no significant disturbance of the ground would occur and buried paleontological resources would not be in jeopardy. The only significant subsurface disturbance that would occur as a result of exploratory drilling would be the creation of the drill hole itself. It is possible that drilling the hole could impact important accessible paleontological material, but the likelihood of that occurrence is minuscule.

The effects of disturbance from development; i.e. the construction of up to 6 production pads (connected by roads), an airstrip, a pump station, a staging base, and up to 205 mi of pipeline could occur under the Preferred Alternative. Surface disturbance resulting from this work would impact approximately 150 acres, but there would be little subsurface impact associated with these activities. The primary source of potential impacts to paleontological resources would result from the excavation of material for construction of the permanent facilities. If the pads/roads/airstrip material source is terrestrial, then extraction of material could impact paleontological resources. The extent of the impact would be dependent on the amount of gravel extracted, the areal characteristics of the material source and the identified presence of paleontological remains. For this analysis it is assumed that pipelines would not have associated all-weather roads or pads and would be constructed during the winter months from an ice road and/or pads. Therefore, the only significant impact resulting from pipeline construction would be associated with the placement of vertical support members (VSM's). Depending on the depth at which the VSM's are set, it is possible--but highly unlikely--that buried paleontological resources would be impacted. If buried pipelines were to be used, disturbance and impacts to paleontological resources could occur during excavation, construction and burial, depending on the depth, size, and location of the pipeline. The potential for impacts to surface paleontological resources under this alternative has been previously discussed.

(2) Effects of Spills

An estimated 65 to 80 percent of all spills are confined to a pad. Spills not confined to a pad usually are confined to an area adjacent to the pad. In the exploration stage, it is assumed that most spills would occur on an ice pad, ice road, or during winter conditions, where cleanup is less invasive than in a summertime terrestrial spill. In any case, paleontological resources usually are so deeply buried that they would not be affected by either a spill or subsequent spill cleanup. The effects of spills and spill cleanup associated with development would be similar to those associated with exploration activities except that they could occur during the snow-free months. Although cleanup from these spills might be more invasive because of the non-frozen surface environment, there is little chance that subsurface paleontological resources would be impacted. If present, surface paleontological remains could be impacted in the same manner as surface cultural material. However, since the occurrence of significant surface paleontological remains are far less common than cultural remains, the probability of any impact is remote.

c. Effectiveness of Stipulations and Required Operating Procedures

Under the Preferred Alternative, ROP C-2a, c, and e bear on paleontological resources. This ROP provides protection from seismic and overland move activities that could potentially disturb the vegetative mat and impact paleontological resources that are near the surface. In addition, ROP's A-3 and A-4 b, c, d and f help to prevent large fuel or crude-oil spills, and consequently reduce the small potential for impacts to paleontological resources from spill cleanup. Stipulations K-1 and K-6 provide ½-, ¾-, and 1-mi setbacks along the major rivers and streams and a ¾-mi setback along the coast providing additional protection for paleontological resources. The

NHPA requires that an archaeological resource survey be completed before any undertaking occurs on Federal lands. Ground disturbing activities such as the construction of buried pipelines are considered undertakings. If paleontological resources are identified during such a survey, BLM guidelines and policy require that all impacts to these resources be mitigated to the satisfaction of the land manager and the State Historic Preservation Office.

Additionally, it should be noted that any post-leasing ground-disturbing activity engaged in by a lessee would require another NEPA review tiered off this or other EIS's. In that event, the protection of paleontological resources in the Planning Area would follow the established and proven permitting procedures developed by the BLM as the result of past NPR-A activities.

d. Conclusion--First Sale

Under the Preferred Alternative, impacts to paleontological resources from management activities other than oil and gas exploration and development would be as previously stated. Impacts would include displacement and/or destruction of resources and are anticipated to be minimal regardless of the level of seismic activity. Under the Preferred Alternative, the potential impacts to paleontological resources from first sale oil and gas exploration and development would probably be minor because of the environmental constraints that would be in effect. These constraints would benefit paleontological resources because of the high probability of paleontological resources being located near lakes, streams, and rivers, which are afforded more protection from oil and gas exploration under Stipulation E-1.

e. Multiple Sales

Under the Preferred Alternative multiple-sales scenario, the potential for impacts to paleontological resources would continue to be relatively low. Although the scattered nature and deeply buried context of most paleontological deposits--and the fact that the locations of most remain unknown--make it somewhat difficult to assess the likelihood and severity of potential impacts, the environmental protection measures under the the Preferred Alternative are expected to significantly reduce the probability of any potential impacts.

f. Conclusion--Multiple Sales

Under the Preferred Alternative multiple-sales scenario, potential impacts to paleontological resources from management activities other than oil and gas exploration and development would be as previously described for the single-sale scenario. Overall, the probability of the occurrence of impacts would increase somewhat, simply because multiple sales would increase the amount of land that could potentially be impacted.

3. Water Resources

a. Effects of Non-Oil and Gas Activities

Non-oil and gas management actions within the Planning Area that may affect water resources include ground activities such as resource inventories, paleontological and cultural excavations, and research and recreational camps--all of which might occur during summer or early fall. The other principal activity is overland equipment

movement, which occurs during the winter on snow-covered, frozen tundra. Negligible impacts to water resources would occur, as discussed in Section IV.B.3.a.

b. Effects of Oil and Gas Activities

(1) Effects of Disturbances

Under the Preferred Alternative, seismic survey activities probably would double (Sec. IV.A.1.b(3)(b)) compared to that expected under the No Action Alternative, but these activities still would occur seasonally at transitory locations when the tundra is snow covered and lakes and rivers are frozen. As noted under the No Action Alternative (Section IV.B.3.b), modern seismic lines, with newer, low-ground-pressure equipment, have much lower impacts to the tundra than the older, outdated types, but impacts still could occur during the camp-move (WesternGeco, 2003). While extensive thermokarst erosion along recent winter seismic trails is seldom observed, impacts to vegetation and surficial compaction (precursors to thermokarst and water diversions) can still be found (Jorgenson et al., 2003). Adequate protection of the tundra requires a uniformly distributed snow pack with a hard surface crust. Often, the less than ideal snow conditions on the north slope, particularly where the snow pack is influenced by wind scour and drift, could expose tussock tundra to surface disturbance (Walker et al., 1987). Varying levels of disturbance have been documented even where the snow depth exceeded 2 ft (Felix and Raynolds, 1989).

While observations by the BLM and others (NRC, 2003) indicate that short-term, transitory impacts such as surficial compaction, diversions of shallow water tracks and limited ponding, can be estimated at about 1 percent of the proposed seismic lines per season (see seismic scenario in Sec. IV.A.1.b(3)(b)), newer, low-ground-pressure equipment could reduce this to about 8 acres under the Preferred Alternative. Since the tundra vegetative mat has been shown to recover in from 7 to 10 years where damage is not severe (Abele et al., 1984; Jorgenson et al., 2003), long-term impacts due to thermokarst erosion--such as permanent diversions of shallow-water tracks and extensive ponding--are estimated at only about 1 percent of the short-term impacts, or less than a tenth of an acre affected by seismic operations. These impacts are strongly influenced by snow depth and distribution, as noted above, and may only happen when seismic activities occur under less than ideal snow conditions (NRC, 2003). Where subsidence and thermokarst erosion do occur, it could take from several years to several decades for the effects to be ameliorated (Walker et al., 1987).

Because the projected exploratory drilling occurs during the winter (Section IV.A.1.b), the principal effects on water resources would be the construction of ice roads and pads. Construction of ice roads allows winter overland transport of the equipment and material used in exploration and delineation well drilling. Ice pads are constructed to support drill rigs and staging activities. While this is preferable to summer surface activities, the ice roads and pads require large quantities of water be available--an estimated 1.0 to 1.5 million gallons per mile of road, and 2 million gallons per pad. Water supply for drilling as well as for camp use also would be significant--up to 1.6 million gallons per site (Section IV.A.1.b). The estimated total winter water pumpage for the levels of activities (Section IV.A.1.b) under the Preferred Alternative could be up to 295 million gallons, or the equivalent of 905 acre/ft. While there are a multitude of lakes on the coastal plain of the Planning Area, many of these lakes are shallow and most either freeze solid or have very limited free water during the winter when exploration takes place (Sloan, 1987). Based on remote sensing (Mellor, 1987) and other surveys, a typical large tundra lake (about a mile or more in length and 8 to 10 ft deep) used as a winter water source could have from less than 10 acre/ft to more than 100 acre/ft of water available for pumping. ROP B-2 under the Preferred Alternative would limit water withdrawal to 15 percent of the under-ice water volume on fish-bearing lakes and would prohibit water withdrawal from riverine pools during winter (Section II.C.6). Depending on the areas leased and number of exploratory wells drilled, annual water usage for exploration under the Preferred Alternative could require pumping water from as few as 9 to as many as 90 or more lakes during a winter's exploration season. If more than 15 percent of the under-ice water volume is removed, then fewer lakes would be required, but less of the critical over-wintering habitat would remain in the pumped lakes.

Removal or compaction of snow cover can increase the depth of freezing, often a foot or more, greatly reducing the water quantity within a lake or river pool. Since the ice thickness may approach 7 ft on undisturbed lakes, significant amounts of additional water would be lost as the ice thickness increases from snow compaction or clearing. Altering travel to avoid crossing or clearing deep lakes and augmenting snow cover by using snow fences would reduce ice buildup on lakes and rivers, and melted snow could be used in camps and for drilling. Use of aggregate ice chips created from crushed lake ice could reduce water usage on ice roads but would greatly increase the depth of freezing in the lakes used in this process. Shallow lakes and ponds that normally would freeze to the bottom are the best source for this ice aggregate. Taking aggregate from the frozen areas of deep lakes could increase the ice thickness of the unfrozen area, reducing marginal aquatic habitat.

After each season of use, ice roads are abandoned and allowed to melt when spring snowmelt begins. Ice ramps or bridges that cross streams or lakes should be removed or breached before spring breakup. While some ponding might occur during a rapid onset of snowmelt, melt-water channels, similar to the spring breakup channels that cut through naturally occurring river aufeis (overflow icing), would develop in the ice-road surface and rapidly drain the impounded water (Sloan et al., 1975). If the location of ice roads is offset from year to year, the effects of these short-term impoundments should be negligible. Ice roads and pads created to last several years have a greater impact on the underlying tundra mat, compacting and killing larger areas of vegetation (Walker, 1996). Because this could cause more thermokarst subsidence and subsequent drainage alteration, multiple-year ice roads should be avoided. Multiple-year ice pads show fewer impacts, since their limited size results in less disruption of flow and subsequent ponding, so effects are usually limited to some vegetative impacts around the margins. These effects are discussed further in the vegetation section.

Overland ice-road construction becomes impractical over 50 mi. Due to the relatively short length of the winter season for construction and drilling, overland moves using low-ground-pressure vehicles and trailers (Rolligons) can be used to haul drilling rigs to ice pads without an ice road. In some cases, where distances are too great for drilling to be completed in one season, the ice pad is insulated and the drill rig stored over the summer. In these cases, the amount of water required is greatly reduced. However, hauling heavy loads on snow roads may adversely impact the tundra and stream and lake crossings.

The preferred and normal means of disposing of drilling wastes, including muds and cuttings, is reinjection into wells. Cuttings may be stored temporarily to facilitate reinjection and/or backhaul operations. Use of mud pits may be allowed by the AO. If mud and cuttings are stored on the surface, sediments and other contaminants could be flushed into the watershed. Requiring that wastes be stored in lined and bermed areas and disposed of before spring breakup, however, would reduce the potential for this.

The projected oil and gas development activities would involve constructing ice roads to haul equipment and gravel for the construction of production pads, connecting roads, and landing strips. The potential impacts of oil and gas development on the water resources in the Planning Area may include disturbance of stream banks or shorelines and subsequent melting of permafrost (thermokarst), blockages of natural channels and floodways that disrupt drainage patterns, increased erosion and sedimentation, and removal of gravel and water from riverine pools and lakes.

(a) Thermokarst

Thermokarst refers to ground subsidence that occurs when the removal or compaction of surface cover exposes ice-rich permafrost to a higher temperature regime and subsequent melting. The depth of subsidence is a function of the relative amount of ice present, the sub-surface materials, and topography (Lawson, 1986). Since fine-grained sediments are easily erodable, as well as the most likely to contain ice-rich permafrost, stream banks and lakeshores are often particularly vulnerable to thermokarst. With the exception of the Colville River, most of the streams and lakes in the Planning Area have banks or shorelines that consist largely of fine-grained sediments.

While a large number of activities have been linked to disturbances that result in thermokarst, limiting surface-disturbing activities to the winter greatly reduces the amount of thermokarst (Walker, 1987).

(b) Drainage Disruption

Natural drainage patterns can be disrupted when activities or structures divert, impede, or block flow in stream channels, lake currents, or shallow-water tracks. Blockages or diversions to areas with insufficient flow capacity, especially culverts blocked by snow and ice, can result in seasonal or permanent impoundments (NRC, 2003). The resulting inundation often negatively impacts the vegetation and, combined with dust blown from gravel roads and pads, can alter the thermal regime and lead to thermokarst (Walker, 1987). Diverting stream flow or lake currents also can result in increased bank or shoreline erosion and sedimentation as well as potential thermokarst. Proper siting and adequate design capacity of culverts, bridges, surface pipelines, and other structures, as well as keeping culverts free of snow and ice dams, would greatly minimize drainage problems.

(c) Erosion and Sedimentation

In addition to thermokarst and drainage alteration, erosion and sedimentation can be caused by construction or other activities that disturb the streambed and stream banks, or remove protective shoreline vegetation. Channelized meltwater can erode gullies--even in areas with limited slope--and deposit alluvial fans into streams and lakes (Lawson, 1986). Inadequate design or placement of structures, culverts, or bridges can alter natural sediment transport and deposition, creating scour holes or channel bars. Improper placement or sizing of gravel fill can result in erosion from pads or roadbeds adjacent to streams or lakes. Blockages or diversions due to insufficient flow capacity, especially culverts blocked by snow and ice, can lead to road washouts, a common occurrence on the Dalton Highway during breakup flooding. Winter or low-water construction and transport activities, adequate armoring of fill, and keeping culverts free of snow and ice dams would minimize erosion and sedimentation (Walker, 1987).

(d) Water Removal

Consumptive water use in the summer seldom is a problem on the coastal plain, as water generally is abundant. Exceptions would be in smaller coastal streams or most foothills streams during late summer, when shallow pools might be pumped dry. In the winter, however, all but the largest lakes and riverine pools are subject to dewatering if consumptive use is high. Depending on the areas leased and number of development wells drilled, annual water usage for development activities under the Preferred Alternative would vary considerably. Because of the continued need for ice roads, annual water use during development could be similar to that for exploration, requiring water from at least 9 to as many as 90 or more lakes, assuming the drawdown limit of 15 percent of the under-ice water depth that would be required by ROP B-2. If more than 15 percent is removed, then fewer lakes would be required, but less of the critical over-wintering habitat would remain in the pumped lakes. Removal or compaction of snow cover can increase the depth of freezing, greatly reducing the water quantity within a lake or pool. Augmenting snow cover by using snow fences not only would reduce ice buildup on lakes and rivers, but melting snow also could be used as a supplemental water source for camps and drilling (Sloan, 1987).

(e) Gravel Removal

While some of the gravel used for the construction of permanent facilities may be obtained from permitted sites outside of the Planning Area, some material sites would be required within the Planning Area. Improper siting of

gravel removal operations can result in changes to stream channel or lake configuration, stream-flow hydraulics or lake dynamics, erosion and sedimentation, and ice damming and aufeis formation. Locating gravel pits far enough away from streams and lakes to avoid channel braiding and erosion from breakup or storm flooding would greatly minimize impacts (NRC, 2003). Deep pits can be flooded after abandonment to create aquatic habitat. While gravel sources are scarce in the Planning Area, sand and silt are abundant. Composite or "all season" pad designs, using a mixture of gravel, sand, and silt layered with insulation and geotextiles can reduce gravel requirements significantly (Section IV.A.1.b).

Gravel construction of pads, roads, and an airstrip would cover about a 100-acre footprint per field, or a total of 400 acres for the four fields proposed under the Preferred Alternative. In the coastal plain of the North Slope where low surface gradients limit flow and permafrost is ubiquitous, gravel pad and road construction can create significant water impoundments and thermokarst erosion equivalent to twice the area directly covered by the gravel (Walker, 1987), or up to 800 acres. It is possible that a dock and staging areas would also be built under the Preferred Alternative. This could substantially increase the gravel requirement--depending on the size and number of pads and type of structures required--up to 100 acres per site. Borrow pits created by gravel mining could impound or divert water from an area of 20 to 50 acres per site, or from 80 to 400 acres total under the Preferred Alternative. Unlike the ice roads and pads, gravel structures and pits would create long-term impacts over the life of the field(s).

(f) Pipelines

If oil pipelines result from development under the Preferred Alternative, they could range up to 205 mi in total length and affect up to 500 acres of water resources, primarily through temporary impoundments, diversions, and sedimentation during the construction phase. After construction is complete, impacts from elevated pipelines are expected to be minimal. If gas pipelines are also constructed, potential impacts during construction could double--up to 1,000 acres--again primarily through temporary impoundments, diversions, and sedimentation during construction. Buried gas lines also have potential thermokarst, subsidence, and erosion problems that could persist beyond the construction phase. If all work on the pipelines is done during winter, these impacts would be greatly reduced.

(2) Effects of Spills

For the projected development activities, spills and spill cleanup would involve both crude oil and refined petroleum products, probably from fuel storage areas or handling operations. The types and amounts of spills estimated for the Preferred Alternative are discussed in Section IV.A.2. Storage of fuel in lined and bermed areas and the onsite availability of absorbents and removal equipment would help ensure that the size of any area affected by a spill is small and cleanup efforts kept to a minimum. A large crude-oil spill is possible with production operations and pipelines and could adversely affect streams and lakes. While the petroleum residue from a spill could be flushed from streams within a few years, impacts to lakes and ponds could persist for decades. Spill cleanup in a watershed would involve containing the spill, diverting or isolating it within the waterbody, skimming off the oil, and treating the remaining oil-contaminated water and sediments. While this methodology is effective during the summer, when open water is present, or during the winter when lakes and rivers are frozen, streamflow conditions during spring breakup or fall freezeup--when ice floes and ice dams can alter normal flow patterns--could greatly complicate cleanup operations. Prevention and rapid response with adequate removal equipment would minimize effects; spill-prevention and response measures are described in Section IV.A.4.

Spills of chemicals and saline waters would be rapidly diluted in a large lake or river. In small lakes, tundra ponds, and shallow water tracks, the impacts would be greater, with waters remaining toxic to sensitive species for several years. These spills could be pumped out of the water body, if confined, or neutralized and then diluted

with uncontaminated freshwater.

c. Effectiveness of Stipulations and Required Operating Procedures

Several stipulations and ROP's would protect water resources under the Preferred Alternative. ROP's A-1 through A-7 would regulate garbage, wastewater, drilling wastes, fuel, and chemical storage; fuel handling; and spill prevention and cleanup plans. ROP B-1 prohibits water withdrawal from rivers during winter and ROP B-2 regulates amounts of winter water withdrawals from lakes. ROP's C-2 through C-4 would regulate overland moves, seismic work, ice-road construction, and other heavy equipment travel during the winter to limit impacts to water resources. ROP D-1 would limit exploratory drilling in shallow lakes, streams, and floodplains, but does allow exceptions if there is no feasible or prudent alternative. ROP's E-2, E-3, E-6, and E-8 would limit certain facility, structure, and gravel mine site design and construction impacts near lakes and rivers, but does allow exceptions if there is no feasible or prudent alternative. Stipulation G-1 may require removal and reclamation of the developed site(s) upon field abandonment, which would eventually result in restoration of the natural drainage. Stipulation K-1 would protect aquatic, floodplain and riparian areas adjacent to rivers identified as having critical aquatic and riparian habitat, except in certain situations. Where the floodplain width exceeds the setback limit as measured from the centerline of the river (primarily in the lower reaches of the Meade and Ikpikpuk rivers), development could occur in the active floodplain. Stipulation K-2 should protect aquatic and riparian areas adjacent to deep-water lakes, but does allow exceptions if there is no feasible or prudent alternative.

d. Conclusion--First Sale

The impacts of activities other than oil and gas exploration and development under the Preferred Alternative are expected to be similar to those under the No Action Alternative, i.e., little, if any, impacts would occur. The most significant impacts of oil and gas development activities on the water resources in the Planning Area are from gravel roads, pads, and structures. These include disturbance of stream banks or shorelines and subsequent melting of permafrost (thermokarst) and blockages of natural channels and floodways that disrupt drainage patterns. While no long-term studies are available on the areas adjacent to NPR-A, a study of the impacts of oil-field activities in the Prudhoe Bay area (Walker, 1987) found that after 15 years, those areas adjacent to the road system still showed an increase in thermokarst growth and that flooding from impoundments and diversions was more than double that of the primary impact of gravel placement. Bridges are the preferred mode of stream crossings where water depths and flows during spring breakup are sufficient to cause ice floes and dams that alter normal flow patterns and block culverts. Since roads pose the single most significant impact (from thermokarst, impoundments, and increased sediment runoff), limiting the length of the roads would bring about the greatest single reduction in impacts to the water resources.

The potential short-term impacts from exploration and delineation would be water removal from up to 90 lakes, and during construction, increased water impoundments, diversions, thermokarst erosion and sedimentation of up to 2,000 acres. Long-term impacts from development of gravel roads, pads and pits could impact up to 1,000 acres. Pipelines--both above-ground oil pipelines (not including infield lines) and buried gas pipelines--could add up to an additional 1,000 acres of short term-impacts. After construction is complete, impacts from elevated pipelines should be minimal. Buried gas lines also have potential thermokarst, subsidence, and erosion problems that could persist beyond the construction phase, or about 500 acres of long-term impacts. If all work on gravel roads, pads, and pipelines were to be done during winter, impacts could be reduced. While any surface-disturbing activity could affect water resources, the stipulations and ROP's under the Preferred Alternative would protect most areas identified as critical aquatic habitat adjacent to streams and lakes, regulate under-ice water withdrawals, and prohibit unnecessary snow and ice removal from lakes and riverine pools.

The overall impact to water resources under the Preferred Alternative would be about 3,000 acres of short-term impacts and 1,500 acres of long-term impacts.

e. Multiple Sales

While oil and gas exploration and development activities from multiple lease sales may be up to several times greater than a single sale, impacts would not necessarily go up proportionally, since some facilities, such as roads, airstrips, and pipelines can be shared. Indirect impacts, such as thermokarst and erosion and sedimentation due to channel alteration or gravel removal, may continue for many years after the original development (Walker, 1987). While difficult to quantify, effects from multiple sales under the Preferred Alternative are assumed to be double those from a single sale. This could result in short-term impacts from winter water withdrawals of up to 1,800 acre/ft from 180 lakes during exploration and delineation drilling and from increased water impoundments, diversions, thermokarst erosion and sedimentation of up to 4,000 acres during construction activities. Long-term effects from development of gravel roads, pads, and pits could impact up to 2,000 acres from water impoundments, diversions, and thermokarst erosion.

Shared use of infrastructure such as airfields, roads, camps, and pipelines would significantly reduce the size of the impacted areas and adverse effects to the water resources. Since roads pose the single most significant impact (from diversions, impoundments, and increased sediments runoff), limiting the length of the roads would bring about the greatest reduction in impacts to the water resources. Bridges are the preferred mode of stream crossings where water depths and flows during spring breakup are sufficient to cause ice floes and dams that alter normal flow patterns and block culverts. If all work on gravel roads, pads, and pipelines were to be done during winter, impacts could be reduced. Where infrastructure is not shared, both long- and short-term impacts as noted above, and recovery times would increase.

f. Conclusion--Multiple Sales

Adverse impacts from multiple lease sales may be up to several times greater than impacts from a single sale, while indirect impacts may take years to develop. While shared infrastructure could reduce the adverse effects to water resources from multiple sales, short-term impacts include water removal of up to 1,800 acre/ft from 180 lakes in support of exploration and delineation drilling, and increased water impoundments, diversions, thermokarst erosion, and sedimentation of up to 4,000 acres in support of construction activities. Long-term impacts from development of gravel roads, pads, and pits could impact up to 2,000 acres of water resources from water impoundments, diversions, and thermokarst erosion. The area affected would depend on the number of leases issued, the amount of exploratory and development activity, and the locations of this activity.

4. Freshwater Quality

a. Effects of Non-Oil and Gas Activities

The only types of non-oil and gas activities in the Northwest NPR-A Planning Area that might affect freshwater quality are ongoing subsistence and recreational activities, primarily along rivers and lakes in the Arctic Coastal Plain (ACP). Although these activities have involved unregulated long-term campsites and cabins (all without adequate sewage disposal), adverse effects on freshwater quality appear to have been negligible.

b. Effects of Oil and Gas Activities

(1) Effects of Disturbances

Exploration activities within the Planning Area that may affect water quality under the Preferred Alternative are seismic survey activities, ice-road construction, ice-pad construction, and drilling-fluid storage and disposal. Spillage of crude oil or produced waters is attributed predominantly to development activities.

Under the Preferred Alternative, the estimated level of seismic survey activities probably would double (Section IV.A.1.b) relative to that expected under the No Action Alternative. Seismic operations would start in late fall or early winter after the top foot of the active layer freezes, at least 6 in of snow cover builds up, and lakes and rivers freeze.

As discussed under the No Action Alternative (Section IV.B.4.b), damage to the vegetative mat would most likely occur in tussock tundra and moist sedge-shrub tundra, especially in areas with limited snow cover, but probably not in lower, moist sedge vegetation. While extensive thermokarst erosion along recent winter seismic trails is seldom observed, impacts to vegetation and surficial compaction (precursors to thermokarst erosion) are still in evidence (Jorgenson et al. 2003). Where surface disturbance does occur, recovery of damaged seismic tracks takes many years (Walker et al., 1987). Thermokarst erosion and effects on water quality could occur in high impact areas if damage to the vegetative mat is persistent. Recovery of vegetative mat damaged during seismic activities, which is necessary to improve water quality impacts, could take from a few years to decades (Walker et al., 1987).

While the National Research Council (NRC, 2003) and others have indicated that short-term impacts such as compaction of the vegetative mat, diversions of shallow water tracks, and limited ponding can be estimated at about 1 percent of the proposed seismic lines per season (Section IV.A.1.b), newer low-ground-pressure equipment could reduce this significantly, to a total of about 8 acres under the Preferred Alternative. If it is assumed that 1 percent of the persistent high damage area results in thermokarst erosion, then less than about 0.1 acre would be affected. Persistent thaw settlement and thermokarst erosion can also result in the State turbidity standard being exceeded. This would be confined to rare cases over small areas, likely on the order of no more than a fraction of an acre. Total long-term impacts, including downstream water quality, would perhaps include up to twice this area, with the total area affected still being less than an acre.

Use of water for ice-road construction could affect water quality in four ways. Because ice roads would be rerouted every year to minimize tundra disturbance, effects on water quality from any of these ways would be short term, lasting generally one season in any area.

First, the winter extraction of water or ice from Northwest NPR-A waters could change the chemistry of those waters. Ice roads would require 1.0 to 1.5 million gallons per mile of road and 50 mi or more of ice roads are projected funder the Preferred Alternative. Ice-road construction on the North Slope generally starts no sooner than December to ensure that the tundra is solidly frozen to avoid disturbance and because ice building requires consistent, very cold temperatures. By December, shallow ponds and lakes (those less than about 3 ft deep) are frozen solid, therefore water would have to come from deeper lakes. Lakes less than 6 ft deep usually are frozen solid by the end of winter and, therefore, do not contain fish. Thus, ice-road builders could extract the maximum possible from such lakes, with most of the extraction being the water that still remains unfrozen by December in a 6-ft deep lake. Water could be extracted from deeper lakes, but these lakes are likely to contain fish that would be put at risk from water removal. Under the Preferred Alternative, the amount of water that could be removed from fish-bearing lakes is limited by Stipulation K-2.

As surface waters freeze, salts are extruded from the forming ice into the underlying water, increasing salinity. In coastal tundra waters, the alkalinity is associated with the salt content, and increases and decreases in alkalinity parallel those of salinity. Pumping water from a freezing lake would remove the more saline and more alkaline water from under the lake ice. During snowmelt, less saline, less alkaline runoff water would replace the removed waters. In lakes less than 6 ft deep, which freeze to the bottom, the salts normally would be frozen out of the entire water column and extruded into the sediment thaw bulb underlying the lake. These salts are then slowly and partially leached back into the water column the following summer. For such lakes, the early summer condition would be low salinity, low alkalinity water, regardless of whether or not water was removed for ice-road construction. Based on observed lake pH, these lakes are weakly--but still apparently adequately--buffered against acid snowmelt (Section III.A.2.b).

In lakes greater than 6 ft deep, the salts and alkalinity extruded during ice formation normally would remain in the unfrozen bottom water. These lakes start the summer with more saline, relatively strongly buffered waters underneath the melting ice. Winter removal of more saline water underneath the ice would result in less saline, less buffered lake waters in early summer following winter water extraction. Thus, following winter extraction of water, their early summer chemistry would be more similar to that of lakes less than 6 ft deep.

A second way that ice-road construction could affect water quality would be road construction over lakes deep enough not to freeze to the bottom. Many of these lakes are just a foot to a few feet deeper than the minimum 6-ft depth necessary to maintain some unfrozen bottom water in winter. An ice road across such an intermediate-depth lake would be designed to freeze the entire water column below the road, isolating portions of the lake basin and restricting circulation. With mixing thus reduced, isolated water pools with low oxygen could result. Dissolved oxygen concentrations could be reduced below the 5-ppm dissolved oxygen standard needed to protect resident fish (ADEC, 1997).

A third way that ice-road construction could affect water quality would be through changes in water chemistry along the roadbed during and after meltout. As described above, the water withdrawn from lakes to construct the roadway is relatively saline, more saline than typical snowmelt waters. In addition, the salts frozen into the ice road would leach out of the ice before its melting during snowmelt, increasing initial salt content of the meltwater. This effect may be measurable during initial snowmelt, but the effect on water quality should be minimal and local, most likely expressed as a slight buffering of pH during initial snowmelt.

A fourth way that ice-road construction could affect water quality would be through modification of the local hydrology along the ice road. The minimum ice-road thickness would be 6 in. Snowdrifts against the low-relief roadbed would extend a few feet beyond the roadbed with average water content of a fraction of an inch. However, the 6-in roadbed would dam waters upslope of the roadway, affect local drainage, and restrict water supply downslope of the roadway. Because snowmelt runoff is in excess of coastal tundra dead-storage capacity (Miller, Prentki, and Barsdate, 1980), the restricted water supply on the downslope side of the ice road should have a very local but otherwise negligible effect.

In Prudhoe Bay, flat, thaw-lake plains have been shown to be the land classification most vulnerable to hydrologic effects of road and pad construction (Walker et al., 1987, 1989; Robertson, 1989). In such terrain and despite drainage culverts, the area affected by impoundments (ponding) and thermokarst along gravel roads and pads was equal to twice the area covered by the pads and roads. Ice roads can persist through a considerable portion of the snowmelt period, for as much as a month. However, their ability to impound upslope waters is negligible and any impoundments only last a few days. Because the 6-in thickness of ice roads is 4 to 10 percent of the 5- to 13-ft thickness of a gravel road, the impoundments upslope of an ice road should be proportionately less in area than for a gravel road, or up to 10 percent of the area covered by the ice road. Ecology of these less-persistent impoundments along ice roads should be a cross between those of wet tundra and ponded tundra, with no effect on water quality.

The thermokarst erosion along roads and pads at Prudhoe Bay was considered by Walker et al. (1987) to be a delayed, synergistic impact that occurred primarily on thaw-lake plains. It did not occur on river floodplains at Prudhoe Bay because of minimal ground ice. Thermokarst erosion was attributed to vegetative disturbance and to thermal effects of road dust, flooding, and flaring operations. Thermokarst effects are likely to be negligible for one-time use winter ice roads because of the lack of vegetative disturbance, the lack of road dust, and minimal upslope impoundment.

Use of water for construction, drilling, and domestic (crew) needs could affect water quality, as discussed for ice-road construction. Effects during exploration on water quality from any of these mechanisms would be short term, lasting generally one season.

Annual ice-road and ice-pad construction could cover from 160 up to 320 acres during each year of exploration. This ice-road construction would require winter extraction of water up to 225 million gallons, or the equivalent of 690 acre/ft pumped from nearby lakes. Drilling and camp needs together would require up to an additional 70 million gallons, or the equivalent of 215 acre/ft. The areas affected would shift each year as the ice roads are realigned and shifted to avoid continued compaction of vegetation. In the unsuccessful exploration scenario, ice-pad and -road construction would occur only in one winter. Temporary upslope impoundment of snowmelt waters could cover another 30 acres for a few days, but with little effect on water quality.

The preferred and normal means of disposing of drilling wastes, including muds and cuttings, is reinjection into wells with no impacts to surface water quality. Mud pits and discharge of exploration drilling muds and cuttings would be prohibited. This analysis assumes direct reinjection of drilling fluids. Under this scenario, there likely would be no impact from drilling fluids used in exploration.

Nevertheless, cuttings may be stored temporarily to facilitate reinjection and/or backhaul operations and, in some cases, use of reserve pits may be allowed by the A.O. Such establishment of temporary reserve pits could degrade nearby water quality. Elevated levels of trace metals in water (zinc and chromium) and sediments (copper, chromium, and lead) have been found in ponds at least as far as 700 ft from reserve pits elsewhere on the North Slope (Woodward et al., 1988). Elevated levels of petroleum hydrocarbons also were found in water and sediment in the same study. Waters from the reserve pits and some ponds within 160 ft but not at greater distances were found in bioassays to be toxic to a sensitive zooplankton species. Spread of contaminants from these reserve pits was due to overflow of the pits during snowmelt, the practice of draining the snowmelt overflow from pits on to the tundra, and to seepage.

Requiring the pits to be lined and bermed would not necessarily protect tundra from this contamination. Berms increase snow drifting, increasing the overflow problem. Historically, because clay is the standard liner for waste pits, the clay in drilling muds has been assumed on its own to be adequate as a pit liner. However, the chemical formulation of drilling muds is designed to keep the drilling mud dispersed, which can eliminate its ability to act as a seal. The potential for impact from pit-stored drilling fluids would be reduced if fluids were properly disposed of before spring breakup.

Development activities within the Planning Area that may affect water quality under Preferred Alternative for the high-resource scenario are ice-road and pad construction and spills. There would be no impact from drilling fluids used in development. Mud pits and discharge of drilling fluids and produced waters would only be allowed in emergencies. Muds and cuttings would be either disposed of downhole or removed from public lands to ADEC-approved waste-disposal facilities. Produced waters would be reinjected. Some washed cuttings could be used in gravel-road or pad construction. Pipelines carrying crude oil or waterflood would be above ground, and their construction and physical presence would have a negligible affect on water quality.

Because of the annual rebuilding of ice roads, annual water use during development would be similar to that for

exploration, needing water to construct up to 320 acres of ice road. Winter water withdrawals could be up to 905 acre/ft from nearby lakes. During the seasonal construction phase, annual field-water demand would be on the order of 37 acre/ft. After major construction is finished, annual field-water demand would decrease to about 15 acre/ft/year. Some of this water likely would come from lakes less than 6 ft deep, because shallower lakes freeze solid by late winter. The areas affected would shift each year as the ice roads are realigned and shifted to avoid continued compaction of vegetation.

Construction of gravel pads and within-field roads with an airstrip would cover about a 100-acre footprint for a single field and require a million cubic yards of gravel. A total of up to 400 acres could be impacted for the four fields proposed under the Preferred Alternative. It is possible that a dock and staging areas would also be built under Preferred Alternative. This could substantially increase the gravel requirement--depending on the size and number of pads and type of structures required--up to 100 acres per site. The preferred sources for gravel are existing borrow pits on the east side of the Colville River. In recent decades, suction dredges have been used in the NSB to mine sand and gravel from the Colville River Delta at Nuiqsut; the Meade and Kokolik rivers; lakes at Atqasuk and Barrow; and lagoons at Barrow, Wainwright, and Kaktovik (Walker, 1994). Dredged holes took a few too many years to refill. Dredging increased upriver bottom erosion by increasing the steepness of river slopes in the Colville River, but the primary environmental effect attributed to NSB dredging has been expansion of fish overwintering areas. Water quality, as evidenced by the healthy fish populations, does not appear to be adversely affected by this dredging activity (Walker, 1994). Borrow pits created by gravel mining could impound or divert water from an area of 20 to 50 acres per site, or from 80 to 400 acres total under the Preferred Alternative. Because gravel is a scarce commodity, alternate construction technology could be refined to lessen gravel use and associated impacts, but such alternatives are not assumed.

The primary effect on water quality from construction and placement of gravel structures is related to upslope impoundment and thermokarst erosion (Walker et al., 1987). Thermokarst erosion can result in water features with high turbidity/suspended-sediment concentrations, as discussed under the No Action Alternative. The thermokarst erosion is partly because of the thermal effects of dust blown off the gravel onto the tundra. Thermokarst erosion could cause the State turbidity standard to be exceeded within and downflow of thermokarst features. In flat, thaw-lake plains on the North Slope, gravel construction can be anticipated to result in upslope water impoundment and thermokarst erosion equivalent to twice the area directly covered by gravel or over up to 1,000 acres for the development assumptions made in this alternative. Ecology of impounded waters appears to be similar to that of similarly sized ponds, but impoundments are more ephemeral (Kertell, 1996).

Although downslope drying of tundra from upslope impoundment is possible, spring snowmelt generally is expected to be in excess of watershed dead storage in coastal tundra and would limit the effect of downslope drying on water quality. Snowdrifts develop on the sides of elevated roads, which also limits downslope drying. In addition, most flowing water makes it across the road through culverts; the road-impounded waters are a small portion of the total flow. Standard North Slope practice in gravel road construction includes culverts to limit disturbance of drainage patterns (Robertson, 1989). In defined drainages, multiple culverts are constructed to accommodate breakup flow as well as summer flow. Where water depths and flows are sufficient to create significant ice jams upstream of the stream crossing, bridges would be preferable to culverts. In flatter tundra, single culverts are spaced at intervals to limit ponding of sheet flow during breakup.

If oil pipelines result from the development under the Preferred Alternative, they could range up to 205 mi in length and affect from up to 500 acres of water resources, primarily through temporary impoundments, diversions, and sedimentation during the construction phase. After construction is complete, impacts from elevated pipelines should be minimal. If gas pipelines are also constructed, potential impacts during construction could double--up to 1,000 acres--again primarily through temporary impoundments, diversions, and sedimentation during construction. Buried gas lines also have potential thermokarst, subsidence, and erosion problems that could persist beyond the construction phase. If all work on the pipelines is done during winter, these impacts would be greatly reduced.

(2) Effects of Spills

Spills are another impacting agent on water quality. A number of small crude spills (0 to 130) averaging 3 bbl and smaller fuel spills (0 to 323) averaging 0.7 bbl are projected to occur onshore (See Table IV-17). Roughly 65 to 80 percent of crude spills and likely all fuel spills would occur on pads or roadbeds off the tundra surface. Spill response would remove almost 100 percent of a spill from frozen tundra before snowmelt for two-thirds of the year. During one-third of the year, late May through late September, spills could reach and impact tundra waters before oil spill response is initiated or completed. Thus, at most, about 8 percent of crude spills could be reasonably anticipated to reach tundra waters. This calculation results in an estimate of up to 10 spills, averaging 3 bbl, reaching tundra waters.

Dissolved-oxygen concentrations in tundra waters could be affected by spilled oil in summer. In one NPR-A experiment (*Northeast NPR-A Final IAP/EIS*, USDOI, BLM and MMS, 1998:Sec. IV.A.1.b.(2)), 5 bbl of Prudhoe Bay crude was spilled into a 0.07-acre tundra pond. Dissolved-oxygen concentrations a week after the spill were reduced by about 4 mg/l below levels in a control pond, in some measurements to less than the 5 mg/l State standard for protection of wildlife. In 2 in of water underneath the spill, oxygen concentrations were measured at 0.7 to 0.9 mg/l versus 5 mg/l in the control pond. At the 3-in water depth, oxygen concentrations under the slick increased to 3.9 to 6.9 mg/l versus 8.2 to 10.7 mg/l in the control pond. At the 4-in water depth (average pond depth, Miller, Prentki, and Barsdate, 1980), outside the slick, oxygen concentration was within the expected normal range, 10.8 mg/l versus 11.4 mg/l in the control pond. The oxygen deficit under the slick (and also in shallower waters of the control pond) was attributable to decreased oxygen influx from the air and the relatively high rate of (natural) sediment respiration in coastal tundra ponds, not to oil-enhanced respiration in the pond.

In winter, even under ice, an oxygen deficit would not be expected to result from a small spill in most waters because sediment (and water column) respiration rates are negligible. In addition, sediment respiration has even less relative effect in the thicker water column of lakes deep enough not to freeze solid in winter. Such lakes, even those that hold fish, tend to be supersaturated with dissolved oxygen in winter, to levels above the State water-quality standard of 110 percent saturation (*Northeast NRP-A Final IAP/ EIS*, USDOI, BLM and MMS, 1998:Sec. III.A.2.b). An exception might be if a spill occurred underneath thick ice cover in very restricted waters holding a concentrated population of overwintering fish that already has depleted oxygen levels. Occasional low oxygen concentrations and kills of overwintering fish have been observed in North Slope waters in the past.

However, the primary effect of a small spill on tundra water quality would be from direct toxicity rather than from oxygen depletion or other secondary effects. Long-term toxicity (7 years) can result from a small spill, as shown in the NPR-A experimental pond spill. That spill killed the zooplankton, and the pond water remained toxic to more sensitive zooplankton species for 7 years.

In an actual spill event, response likely would recover the bulk of spilled oil, but sufficient oil could remain to promote long-term, local toxicity. Over the life of a field, spills could affect the water quality of about six ponds or small lakes, making their waters toxic to sensitive species for about 7 years.

As discussed in the *Northeast NPR-A IAP/EIS* (USDOI, BLM and MMS, 1998), the effects of a 325-bbl spill reaching the Colville River and Teshekpuk Lake in summer were analyzed and that discussion is hereby incorporated by reference. In the Colville River, the high rate of water flow would preclude any effects on dissolved oxygen concentrations. Direct toxicity in the water column would be minimal and limited to the first few reservoir pools downcurrent of where the spill entered the river. Some toxicity might persist in these initial reservoir pools for a few days to weeks, until toxic compounds were washed out of the oil trapped in the sediment or the oiled sediment was buried under cleaner sediment. Similar effects would be expected in the unlikely event that an oil spill were to reach any of the rivers in the Northwest NPR-A.

As noted in the *Northeast NPR-A IAP/EIS* (USDOI, BLM and MMS, 1998), a similar oil spill reaching Teshekpuk Lake also would result in a minimal effect on water quality. Dissolved oxygen levels would not be

affected. Direct toxicity would be minimal because of the much greater dilution volume in Teshekpuk Lake than in the small ponds and lakes discussed earlier and because of the relatively unrestricted movement of slick and underlying water. The spreading of the spill over about 60 acres (0.03% of the lake surface) could be considered an effect on water quality. This effect would exist for a few weeks, until the slick was either cleaned up or the oil stranded on the shoreline. Similar effects would be expected to any of the lakes in the Planning Area, if an oil spill were to occur.

Applicable ambient-water-quality standards for surface and ground waters of the State of Alaska are: (1) total aqueous hydrocarbons in the water column may not exceed 15 µg/l (0.015 ppm); (2) total aromatic hydrocarbons in the water column may not exceed 10 µg/l (0.010 ppm); and (3) surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration. The State of Alaska criterion of a maximum of 0.015 ppm of total aqueous hydrocarbons in surface waters, about 15-fold background concentrations, provides the readiest comparison and is used in this discussion of water quality. This analysis considers 0.015 ppm to be a chronic criterion and 1.5 ppm, a 100-fold higher level, to be an acute criterion.

Major crude oil spills generally result in peak dissolved-hydrocarbon concentrations that are locally and marginally at toxic levels. Effects of spills less than 1,000 bbl can be considered negligible. A spill greater than or equal to 1,000 bbl could temporarily (for about a month) contaminate water above the chronic criterion of 0.015 ppm in an area of a few hundreds of square miles. Concentrations above the 1.5-ppm acute criterion could occur over a few tens of square miles during the first several days of such a spill.

A saltwater spill, although unlikely, can be hypothesized. Such a spill would greatly exceed State water quality standards (ADEC, 1997), which prohibit:

- total dissolved solids or salinity from exceeding 1,500 mg/l (1.5 % salinity), including natural conditions; and
- increases in salinity exceeding one third of the concentration of the natural condition of the waterbody.

In a year with high rainfall, some of the salt would be diluted and flushed from the tundra in summer. Some of the salt water would settle into the deepest reaches of the contaminated waters. The freeze/thaw cycle in the Arctic and the depth of any lake reached by the spill would play a controlling role the fate of the remaining contaminating salts from a spill.

In winter, surface waters less than 6 ft deep freeze solid (Hobbie, 1984). In the event of a saltwater spill into such waters, the remaining salt from the spill water would be extruded from downward-freezing ice in fall and be forced into the underlying sediment (Prentki et al., 1980). Most of the salt would remain trapped in the sediment after the next spring's meltout, giving these waters an initial low salinity. During the summer, salinity slowly would increase as ice in the bottom sediment melts and the sediments compress (Miller, Prentki, and Barsdate, 1980).

In waters greater than 6 ft, freezing of ice would force salt from a spill into the deeper water below the ice, increasing salinity of that water proportionately. During snowmelt, the lakes form moats--a ring of water at the shoreline. For deeper lakes, the winter ice cover persists through spring snowmelt and would protect the more saline water below the winter-formed pycnocline (the plane separating two layers of different density). Snowmelt waters flow just below the ice (O'Brien et al., 1995) or along the moated margins of the lakes, but above the pycnocline. These snowmelt waters pass through and exit over flooded tundra in sheet flow or through shallow outlets without contributing to or diluting concentrations of dissolved solids in the lake. Only after peak snowmelt and waterflow does the protective ice cover of deeper lakes melt and allow the wind to mix the water column, destroying the pycnocline. The net result of this flow regime in deeper lakes would act to preserve the contaminating salts from removal or dilution from snowmelt waters. Salinity above State standards could persist for several years.

A waterflood pipeline could flow at 2.4 to 8.3 million gallons per day of Beaufort Sea water, equivalent to production rate from a single field (*Northeast NPR-A Final IAP/ EIS*, USDOI, BLM and MMS, 1998:Sec. IV.A.1.b and Table IV.A.1.b-3). If a spill were to result from catastrophic failure of the pipeline, it quickly would be noticed by instrumentation and flow stopped, with perhaps spillage equivalent to an hour's flow. Alternatively, spillage up to 10 percent of throughput from a smaller leak might not be detected from input/output balances for about a day. This less-than-catastrophic spill would spill greater volume, from 240,000 to 830,000 gallons. During summer, flat coastal tundra develops a dead-storage capacity averaging 0.5 to 2.3 inches (Miller, Prentki, and Barsdate, 1980), which would retain 13,000 to 63,000 gallons/acre. Thus, the spill would spread over 4 to 64 acres.

Storm surges along the NPR-A coast have flooded nearshore coastal tundra in the past, resulting in salt contamination of much greater magnitude than hypothesized here. The lake used as a supply of freshwater at the Naval Arctic Research Laboratory in Barrow was flooded in a fall storm surge in the early 1960's. The laboratory pumped some saline bottomwater out of the lake over the next few years, but a more saline taste and off-flavors affected the potability for several years. However, the water was still used for water supply.

(3) Summary

Primary affecting factors on water quality under the Preferred Alternative are water extraction, water impoundment, thermokarst around structures and roads, and spillage of oil and salt water.

During exploration, annual ice-pad and -road construction (320-acre footprint each year), drilling, and domestic needs for water could require winter extraction of unfrozen water from up to 905 acre/ft of nearby lakes. Most of this water use is for ice roads. If exploration continues more than 1 year, the areas affected would shift each year as the ice roads are realigned and shifted to avoid continued compaction of vegetation.

If development occurs (the high-resource scenario), because of the annual rebuilding of ice roads, annual water use during development would be similar to that for exploration, needing water to construct 320 acres of ice road, requiring water withdrawals from up to 905 acre/ft of nearby lakes. During the seasonal construction phase, annual field-water demand would be on the order of 37 acre/ft. After major construction is finished, annual field-water demand would decrease to about 15 acre/ft/yr. The areas affected would shift each year as the ice roads are realigned and shifted to avoid continued compaction of vegetation.

The primary water-quality effect from construction and placement of gravel structures is related to upslope impoundment and thermokarst erosion. The thermokarst erosion is due partly to the thermal effects of dust blown off the gravel onto the tundra. In flat, thaw-lake plains on the North Slope, gravel construction can be anticipated to result in upslope water impoundment and thermokarst erosion up to 1,000 acres for development. Unlike the situation for ice structures, the same 1,000 acres would be affected each year over the life of the field.

Over the life of a field, spills could degrade water quality of about six ponds or small lakes, with resultant toxicity persisting and eliminating sensitive species in their waters for about 7 years. Water quality could be degraded over a few weeks along a short stretch of nearby rivers, such as the Colville or Ikpikpuk rivers. The spreading of a similar-sized (325 bbl) spill over about 60 acres of nearby lakes for a few weeks could be considered an effect on water quality.

c. Effectiveness of Stipulations and Required Operating Procedures

Several stipulations and ROP's would protect water quality under the Preferred Alternative. ROP's A-1 through A-7 would regulate garbage, wastewater, drilling wastes, fuel and chemical storage, fuel handling, and spill prevention and cleanup plans. ROP B-1 would prohibit water withdrawal from rivers during winter and ROP B-2 would regulate amounts of winter water withdrawals from lakes. ROP's C-2 through C-4 would regulate overland moves, seismic work, ice-road construction, and other heavy equipment travel during the winter to limit impacts to water resources. ROP D-1 would limit exploratory drilling in shallow lakes, streams, and floodplains, but would allow exceptions if there were no feasible or prudent alternative. ROP's E-2, E-3, E-6, and E-8 would limit certain facility, structure, and gravel mine site design and construction impacts near lakes and rivers, but would allow exceptions if there were no feasible or prudent alternative. Stipulation G-1 may require removal and reclamation of the developed site(s) upon field abandonment, which would eventually result in restoration of the natural drainage. Stipulation K-1 should protect aquatic, floodplain and riparian areas adjacent to rivers identified as having critical aquatic and riparian habitat, except in certain large rivers. Where the floodplain width exceeds the setback limit as measured from the centerline of the river, (primarily in the lower Meade and Ikpikpuk rivers), this stipulation could allow development in the active floodplain. Stipulation K-2 would protect aquatic and riparian areas adjacent to deep-water lakes, but would allow exceptions if there is no feasible or prudent alternative.

d. Conclusion--First Sale

Short-term (year-or-more) effects on water quality could occur from annual ice-pad and ice-road construction (320-acre footprint each year), drilling, and domestic needs for water, which could require winter extraction of unfrozen water from over 900 acre/ft of nearby lakes. Gravel construction of pads, in-field roads, and a field airstrip would cover about a 100-acre footprint per field, or 400 acres total for the four fields projected for a single sale under the Preferred Alternative. A dock or staging areas could also be built--depending on the size and number of pads and type of structures required--up to 100 acres per site. In flat thaw-lake plains on the North Slope, gravel construction can be anticipated to result in upslope water impoundment and thermokarst erosion equivalent to twice the area directly covered by gravel. Long-term (decade-or-more) effects from development of gravel roads, pads and pits could occur on nearly a thousand acres. Unlike the situation for ice structures, the same locations would be affected by gravel structures each year over the life of a field. Oil spills could result in waters of about six ponds or small lakes remaining toxic to sensitive species for about 7 years. Water quality could be degraded from an oil spill over the course of a few weeks along a short stretch of nearby rivers and lakes.

e. Multiple Sales

Effects of seismic trails would be similar to those described for one sale, over about an acre. During peak exploration, annual ice pad and ice road construction, drilling, and crew usage could require water withdrawals of about 1,800 acre/ft. This ice road construction would require winter extraction of water from up to 180 nearby lakes.

Because of the continued need for ice roads during peak development, annual water use for ice-road construction, drilling, and crew usage would be similar to that for exploration, requiring water withdrawals of about 1,800 acre/ft. After major construction is finished, annual water demand would decrease to about 15 acre/ft/year for each field.

The primary water-quality effect from construction and placement of gravel structures is related to upslope impoundment and thermokarst erosion. Gravel construction of pads, roads, staging areas, and an airstrip are assumed to double, from that of a single sale, for the Preferred Alternative. In flat thaw-lake plains on the North

Slope, gravel construction can be anticipated to result in upslope water impoundment and thermokarst erosion equivalent to twice the area directly covered by gravel, or 2,000 acres. Unlike the situation for ice structures, the same locations would be affected by gravel structures each year over the life of the fields.

f. Conclusion--Multiple Sales

Short-term (year-or-more) effects of multiple sales would be similar to those for a single sale. Long-term (decade-or-more) effects of multiple sales are assumed to be double those of a single sale, while indirect impacts may take years to develop. Water quality could be affected on up to 2,000 acres from water impoundments, diversions, and thermokarst erosion, depending on the number of leases issued, the number of proposals for exploratory and development activity, and the locations of roads, pipelines, and infrastructure. Oil spills could result in waters of about eight ponds or small lakes remaining toxic to sensitive species for about 7 years.

5. Estuarine Water Quality

The Preferred Alternative would defer leasing in NPR-A estuarine waters within Peard Bay and Kasegaluk Lagoon for 10 years, but would allow leasing within Admiralty Bay, Dease Inlet, Elson Lagoon, and Walakpa Bay. This section assesses the effects of that leasing on estuarine water quality. The assessment is followed by an analysis of the effect of special mitigation measures (stipulations and required operating procedures). Leasing is proposed also on the Beaufort Sea Outer Continental Shelf (USDOI, MMS, Alaska OCS Region, 2003) and also might occur on the inner shelf in State lands and on Native in-holdings. These offshore leasing programs could influence water quality in NPR-A estuaries, as discussed in the cumulative effects section (Section IV.F.8.e).

a. Effects of Non-Oil and Gas Activities

Non-oil and gas activities that would affect estuarine water quality include ongoing subsistence and recreational activities in the Northwest NPR-A. In contrast to the Northeast NPR-A, the Northwest NPR-A Planning Area includes coastal villages near large estuaries, e.g., Barrow near Elson Lagoon and Wainwright near the Kuk River. Wastewater handling near these coastal villages could affect local estuarine water quality, although to date, adverse effects appear to have been negligible.

b. Effects of Oil and Gas Activities

Estuarine water quality would be affected primarily by three aspects of offshore oil and gas activities: discharges, construction, and accidental oil spills. This assessment is focused on the effects of drilling a few exploration wells from temporary ice islands, the construction of a gravel dock for staging onshore equipment, the barging of equipment and diesel fuel through estuaries, and the construction of a few gravel pads for drilling many production and service wells from onshore to offshore prospects. The assessment is focused also on the possible effects on Admiralty Bay because of its proximity to the tracts that were leased in the Northeast NPR-A. Map 9 shows that tracts were leased along a NW/SE-oriented trend of high geological potential; this geological trend extends into the Northwest NPR-A near Admiralty Bay.

In general, the Preferred Alternative would lead to slightly less offshore activity than Alternative A, as described

in "Differences in Activity Levels for Leasing Alternatives" (Sec.IV.A.1.b.7.b). Ice islands would probably be used for exploration in the shallow estuaries while development of any discoveries might require a gravel island or extensive drilling from shore, as explained in Section IV.C.5.b . Coastal staging facilities might be constructed also to support onshore operations (Map 18 and Map 107). The maps show possible staging sites (probably with short gravel docks and storage tanks for diesel fuel) at Cape Simpson and/or near Peard Bay. Although these particular staging sites are identified as part of a scenario, staging sites might be located elsewhere--including Dease Inlet or Admiralty Bay--so the effects on these estuarine waters are discussed. To summarize, the assessment is focused on Admiralty Bay, the possible drilling of a few exploration wells from temporary ice islands, the probable construction of a few permanent gravel structures for transportation and/or production, and the possible drilling from onshore to offshore of many production and service wells. The assessment is separated into an analysis of effects from disturbances, including discharges, and the effects of spills.

(1) Effects of Disturbances

Discharges of drilling and human waste would be prohibited or regulated by Preferred Alternative ROP's A-2c and A-7. With these ROP's, there could be only regulated discharges of domestic wastes, and drilling wastes (e.g., drilling muds, cuttings, and produced waters) could be discharged only in waters more than 10 m deep. The 10-m isobath is outside Admiralty Bay, Dease Inlet, Elson Lagoon, and Walakpa Bay, so there would be no unregulated discharges of produced water within the Northwest NPR-A estuarine waters.

The effects of other types of disturbances and discharges related to ice islands, ice roads, gravel islands, buried pipelines, and docks are assessed below.

(a) Ice Roads and Ice Islands

Exploration of prospects under narrow estuaries, such as Walakpa Bay, could be conducted from onshore using extended reach drilling techniques. In contrast, exploration of prospects under broad estuaries, such as Dease Inlet and Admiralty Bay, probably would be conducted from temporary ice islands and ice roads. Many ice roads and several ice islands have been constructed in the Beaufort Sea. For example, ice roads have been constructed each year to the Northstar Development Project and along the coast to the east and west from Prudhoe Bay. The roads are usually constructed by pumping seawater from below the ice cover up onto the cold ice surface. Ice islands are usually constructed by spraying seawater onto the ice surface until the thickened ice mound rests on the sea floor. Ice islands were constructed by this method at the Mars Prospect near Cape Halkett at the northeast corner of NPR-A (USDOI, MMS, 1985) and at the Karluk Prospect in inner Stefansson Sound (USDOI, MMS, 1988). The environmental assessments for these proposals focused mainly on the possible effect of thickened ice roads and ice islands on seafloor communities. The proposed ice road to Karluk was rerouted slightly to avoid shading the dense parts of the Boulder Patch kelp community. Kelp grows in only one NPR-A coastal bay--Peard Bay (Truett, 1984). Under the Preferred Alternative, leasing would be deferred for 10 years in Peard Bay, so there would be no immediate adverse effects on kelp from construction of ice islands or ice roads.

(b) Gravel Islands and Buried Pipelines

The sea floor across the inner shelf and in NPR-A estuaries is scraped and gouged frequently by sea ice, so there are only simple benthic communities. As noted above, a depression in the center of Peard Bay is the only place in the Northwest NPR-A in which a diverse kelp community has been found. Leasing in Peard Bay would be deferred for 10 years under the Preferred Alternative. Construction of gravel islands or the burial of pipelines in the remaining lease area would have no effects on this special benthic community.

Gravel island construction and pipeline burial would cause the release of suspended sediments, affecting water turbidity. Many gravel islands have been constructed in shallow bays near Deadhorse, including Sag 3, Niakuk 3 and 4, Resolution, Duck 3, Goose, Endicott, and NW Milne. Construction and abandonment of some of these islands has had a temporary affect on water turbidity; and concerns about long-term effects have been stated (NRC, 2003:p. 15). The effects on water quality from the construction of gravel islands and buried pipelines were assessed also in the Northstar and Liberty EIS's (U.S. Army Corps of Engineers, 1999; USDOI, MMS, Alaska OCS Region, 2002b). The latter concluded that "the greatest effect on water quality from gravel island and pipeline construction would be additional turbidity caused by increases in suspended particles in the water column" and that "turbidity increases from construction activities generally are temporary and expected to occur during the winter and end within a few days after construction stops." There were no reports from Northstar construction that the water-quality effects exceeded the minor expected effects. In summary, the water-quality effects of gravel-island construction and buried-pipeline construction in the Northwest NPR-A would probably be minor and temporary.

(c) Docks

Leasing would probably lead to the construction of a short dock at a staging site for the barging of heavy equipment to nearby onshore operations. The site would likely be located at Cape Simpson or near Peard Bay, but it might be located within an estuary such as Admiralty Bay (Map 17). A dock at any staging site probably would be short (i.e., a few thousand feet long), extending into about 10 ft (3 m) of water. An example of such a dock or jetty is East Dock in Prudhoe Bay; it is about 1,300 ft (400 m) long, extending into 4 ft (1.2 m) of water. Since its construction over 30 years ago, there have been no reports of adverse water-quality effects (e.g., circulation changes or temperature and salinity discontinuities). Most likely, a dock or short jetty in an NPR-A bay would not have measurable adverse effects on water quality. In contrast to docks or short jetties in bays, long docks and causeways have had measurable effects on water quality. The West Dock and Endicott Causeway near Prudhoe Bay extend more than 2 mi (3 km) into offshore water. These long offshore causeways had relatively short breeches and have affected the local water quality, creating cross-causeway differences in hydrologic conditions (e.g., water temperature and salinity) (USDOI, MMS, 1990). Enlarged breeches in West Dock have alleviated most of the cross-causeway differences, but enlarged breeches in the Endicott causeway have not alleviated the differences (Fechhelm et al., 2001). The hydrologic conditions have affected the near-shore distribution of anadromous fish, as discussed in Section IV.C.8.b on marine fish and in USDOI, MMS (1990). In summary, a short dock or jetty in NPR-A estuarine water probably would not affect hydrologic conditions, but a long causeway with inadequate breeches would probably have measurable, long-term impacts on hydrologic conditions.

(2) Effects of Spills

The present quality of the NPR-A coastal waters is pristine--like most of the arctic coast (Arctic Monitoring and Assessment Program, 1997)--in spite of natural oil seeps, such as the seeps at Cape Simpson in the Northeast NPR-A (Sec. III.A.2.b(5)) (Becker and Manen, 1988), and existing regulations would probably keep it that way. For example, before there could be any drilling or transportation of fuel, the ROP A-3 would require that hazardous-materials emergency-contingency plans be prepared and approved. The requirement might not reduce the likelihood of accidental oil spills but it would improve the responses to them. Several types of contingency responses would help to reduce the effect of a large offshore oil spill on estuarine water quality As noted above, the tactics of spill response organizations such as Alaska Clean Seas (ACS) for on-ice spills are relatively effective. The ACS maintains equipment also for spills in open water and broken ice, including booms, skimmers, igniters, pumps, ditch witches, storage tanks, etc. (USDOI, MMS, 2003:Sec. IV.A.6; Alaska Clean Seas, 1999a, b, and c). Some proposed tactics probably would (while removing much oil from the water) have indirect adverse effects on water quality. For example, in situ burning might leave a tarry residue in the water column.

The risk of spills that would affect Northwest NPR-A estuaries would be related partly to proposed oil leasing on the outer continental shelf (OCS), as noted in the cumulative analysis. The EIS for three proposed Beaufort Sea oil and gas lease sales (USDOI, MMS, Alaska OCS Region, 2002c) explains that "a large spill is unlikely to occur based on a mean spill number ranging from 0.08 to 0.11 for Alternative I for MMS Proposed OCS Lease Sales 186, 195, and 202." However, that EIS analyzed a 1,500 bbl spill from a production facility and a 4,600 bbl spill from an offshore pipeline.

This IAP/EIS analysis assumes a large spill of 500 or 900 bbl and a very large blowout of 120,000 bbl (Section IV.A.2, Table IV-19, and Tables App 9-10 to App 9-12). If a spill were to occur during the winter in a Northwest NPR-A estuary, the oil would probably be deposited on or under the ice cover. If a spill were under the ice, the relatively warm oil would probably rise to the ice cover, melt into the bottom of it, and become immobilized (USDOI, MMS, 2003:App. A, Sec. B.1). Water circulation under the ice cover is very slow (Weingartner and Okkonen, 2001) and so slow in shallow estuaries that brine accumulates as the ice cover freezes (Newbury, 1983;Sec. III.A.2.c) so dissolved hydrocarbons would probably accumulate also. In any case, on ice tactics of spill response organizations (Alaska Clean Seas, 1999a, b, and c) are generally effective, so almost all of a winter spill could probably be recovered. In contrast to winter spills, the effects and responses to a 500- or 900-bbl spill in broken ice or open water would have long-term consequences, as discussed below and in Section IV.J.3.

If the spill were to occur during the open-water season, it might form a slick or become dissolved in the water column. If it were to form a slick, the slick from a 500- to 900-bbl spill would probably sweep an estimated 40 to 55 mi^2 (100 to 140 km^2 ; Tables App 9-10 and App 9-11). If the spill occurred during the melt-out or broken-ice seasons, the slick might cover 50 to 70 mi^2 (35 to 180 km^2) and deposit oil on 22 mi of coastline (Table App 9-11). The largest estimated area (70 mi^2) would be slightly smaller than the area of a typical estuary like Admiralty Bay, and the 22 mi (35 km) of coastline would equal about half of the total Admiralty Bay coastline. Such an oil slick could measurably degrade NPR-A estuarine water quality and shorelines. Spilled oil would persist on some types of shoreline for many years, and possibly for more than a decade (Michel and Holton, 2002), as described in Section III.A.2.c above.

If a summer oil spill became dissolved in the water column, the effect can be estimated with calculations in the Liberty EIS (USDOI, MMS, Alaska OCS Region, 2002b). That EIS calculated the effect of similar sized spills in Foggy Island Bay--a bay that is about the same depth as Dease Inlet. It concluded that hydrocarbons dispersed in the water column from a large (greater than or equal to 500 bbl) crude oil spill could exceed the 1.5 parts per million (ppm) acute (toxic) criteria during the first day in the immediate vicinity of the spill (USDOI, MMS, Alaska OCS Region, 2002b:Sec. III-16.l). Further, the hydrocarbon concentration could exceed the 0.015-ppm chronic criteria for up to 30 days in an area that ranges up to 70 mi^2 (180 km^2) in size. Again, the 70 mi^2 is slightly smaller than a typical estuary like Admiralty Bay.

So, oil spills are very unlikely, but they would have definite effects on estuarine water quality, especially if they occur during summer or the broken ice seasons. Responses to large estuarine spills probably would be effective during the winter when a solid ice cover would restrict the spread of oil. However, during summer or in broken ice, even a moderate-sized spill would be difficult to clean up. A 900-bbl spill in broken ice is estimated to spread across an area slightly smaller than a typical estuary, such as Admiralty Bay, and could contaminate about two-thirds of its shoreline. Such a spill also could measurably degrade the water quality; for example, hydrocarbons dispersed in the shallow water column below a spill probably would exceed the 1.5-ppm acute (toxic) criterion during the first day in the immediate vicinity of an estuarine spill.

If such a spill occurred within an NPR-A estuary, the water-quality effects would probably not extend into deeper water outside the estuaries. However, if a large fuel spill occurred at a coastal staging site, such as Cape Simpson or Peard Bay, the effects could extend offshore slightly. For example, the chance of contact with offshore waters can be estimated with data from the oil spill model for a recent Beaufort Sea EIS (USDOI, MMS, 2003). The model includes data for a hypothetical pipeline on the inner shelf near Cape Simpson (USDOI, MMS, 2003:Map A-4a; Pipeline Segment 8). The model data includes estimates of the chance that a summer oil spill starting at that location would contact surrounding areas within 3 days (USDOI, MMS, 2003:Table A2-19). The chances of

contact indicate that such a spill would drift westward toward the Plover Islands (Environmental Resource Area #2), posing a risk to either the island shoreline or the adjacent offshore area (Environmental Resource Area #29).

c. Effectiveness of Stipulations and Required Operating Procedures

Three stipulations under the Preferred Alternative could influence the level of effects on estuarine water quality: Stipulation D-2 would limit exploratory drilling to temporary facilities such as ice pads; Stipulation G-1 would require the removal of all oil and gas related facilities during abandonment; and Stipulation K-3 would restrict exploration operations in Dease Inlet, Admiralty Bay, and Elson Lagoon to the solid-ice season when spill-response is most effective.

Stipulation D-2, which would limit exploratory drilling to temporary facilities, would mean the use of ice islands for exploratory drilling in NPR-A estuaries. Because they have been a relatively inexpensive and common type of facility for exploration in the nearshore Beaufort Sea (e.g., Mars and Karluk Prospects), ice islands might be the main type of exploration facility that would be used in NPR-A estuaries, even without the stipulation. In other words, the stipulation might have only a minor effect on the types of exploration facilities that are used--and minor beneficial effect on estuarine water quality.

Stipulation G-1, which would require the removal of all oil and gas facilities upon abandonment of the operations, would require the removal of, for example, offshore gravel islands even though--as described above in Section Section V.B.1.b--gravel islands specifically would not have long-term effects. In contrast, long docks and causeways with inadequate breeches would probably have measurable, long-term impacts on hydrologic conditions, as concluded in Section V.B.1.c. The removal of docks might be complicated by their connection to a road system and by their possible future use for non-oil activities. For example, West Dock has been used by subsistence hunters and could be used for general public shipping. So, there might be public objections to the removal of some facilities, moderating the stipulation's beneficial effects on water quality.

Stipulation K-3 could have the biggest effect on estuarine water quality, potentially moderating the effect of exploration spills in estuarine waters. As noted above, a 500- or 900-bbl spill during the open water season would form a slick and would partially dissolve in the water column. The hydrocarbon concentration might exceed the 0.015-ppm chronic criteria for up to 30 days in an area that ranges up to 70 mi^2 (180 km^2) in size. The stipulation could potentially moderate this effect because exploration operations might be limited to the solid-ice season--a period during which spill response tactics could recover most of the oil (USDOI, MMS, 2003:Sec. IV.A.6). However, the stipulation explains also (Sec. b) that the solid-ice restriction would end with, in part, demonstration of "adequate spill response capability to effectively respond during periods of broken ice and/or open water. . . ." The MMS, which has approval authority on oil spill contingency plans for offshore facilities, describes the existing response capabilities in the document above, noting that "offshore operators in the Beaufort Sea currently maintain spill response, containment, and collection equipment to respond to releases the entire year" (USDOI, MMS, 2003:Sec. IV.A.6.a). So, approval of spill-response capability during open-water and broken-ice season might occur upon initiation of Northwest NPR-A exploration operations. Because open-water spill responses generally recover about a third of the spilled oil, leaving some in the water column, approval of open-water responses could inadvertentl increase spill effects on water quality. If open-water and broken-ice spill plans were not approved, the chance of estuarine spills would still not be eliminated because a few operations could be conducted anyway. For example, the stipulation would restrict operations that are permitted, but would not apply to non-permitted operations, including the barging of fuel always conducted during the open-water season under U.S. Coast Guard-approved spill contingency plans.

In summary, Stipulations D-2 and G-1 and would probably moderate the effects of exploration facilities and long causeways on estuarine water quality, but would not eliminate the effects. The effectiveness of Stipulation K-3 is hard to assess without a more specific performance-based requirement of what would demonstrate "adequate spill response capability to effectively respond."

d. Conclusion--First Sale

This estuarine water-quality assessment concludes: 1) that disturbances from discharges of drilling and human waste would be prohibited within NPR-A estuaries; 2) that there would be no unregulated discharges of produced water; 3) that there would be no adverse effects on kelp or special benthic communities from construction of ice islands or ice roads; 4) that the water-quality effects of gravel-island construction and buried-pipeline construction in the Northwest NPR-A would probably be minor and temporary; and 5) that a short dock or jetty in NPR-A estuarine water probably would not affect hydrologic conditions but that a long causeway with inadequate breeches would probably have measurable, long-term impacts on hydrologic conditions. Further, if a 500- or 900-bbl spill were to occur during the open water season, it might form a slick or become dissolved in the water column. Such a spill could contaminate approximately two-thirds of the coastline in an estuary like Admiralty Bay, or the hydrocarbon concentration might exceed the 0.015-ppm chronic criteria for up to 30 days in an area that ranges up to 70 mi^2 (180 km^2) in size. The effects probably would not extend outside the estuaries unless the spill involved fuel at a coastal staging site, such as Cape Simpson. In summary, Stipulations G-1 and K-3 might be effective at moderating the effects of long causeways and estuarine spills.

e. Multiple Sales

Oil and gas activities are projected to increase with multiple sales under the Preferred Alternative (Table IV-07). Although it is not expected that a large amount of new information would become available after the first sale that would alter or refine the assessments, technology continues to improve. By such means, future spill response could become more effective. Also, the technology for extended-reach drilling is improving, making it easier to drill into nearshore prospects from safer, onshore locations. Therefore, the effects of each subsequent sale would probably be slightly lower than for the first sale.

f. Conclusion--Multiple Sales

The effects of each subsequent sale on estuarine water quality would probably be slightly lower than for the first sale because of technological developments in extended-reach drilling. The overall effects of multiple sales on estuarine water quality would probably be slightly less than twice that for the first sale.

6. Air Quality

a. Effects of Non-Oil and Gas Activities

Impacts to air quality would result from emissions. Emissions from non-oil and gas activities are extremely limited and generally related to the activities of the small resident population and their habitation and transportation activities. Supporting materials and discussions are presented in Section III.A.3.b (description of existing air quality on the North Slope of Alaska).

b. Effects of Oil and Gas Activities

Air pollutants discussed include nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM), and volatile organic compounds (VOC). Ozone (O_3) is not emitted directly by any source but is formed in a series of complex photochemical reactions in the atmosphere involving VOC and NO_x.

Nitrogen oxides consist of both nitric oxide (NO) and nitrogen dioxide (NO_2). The NO_x is formed from the oxygen and nitrogen in the air during combustion processes, and the rate of the formation increases with combustion temperature. Nitric oxide, the major component of the combustion process, slowly oxidizes in the atmosphere to form NO_2. The NO_2 and VOC perform a vital role in the formation of photochemical smog. Nitrogen dioxide breaks down under the influence of sunlight, producing NO and atomic oxygen, which then combine with diatomic oxygen to form O_3 or with VOC to form various gaseous and particulate compounds that result in the physiological irritation and reduced visibility typically associated with photochemical smog.

Carbon monoxide is formed by incomplete combustion. It is a problem mainly in areas having a high concentration of vehicular traffic. High concentrations of carbon monoxide present a serious threat to human health because they greatly reduce the capacity of the blood to carry oxygen.

Sulfur dioxide is formed in the combustion of fuels containing sulfur. In the atmosphere, SO_2 slowly converts to sulfate particles. Sulfates in the presence of fog or clouds may produce sulfuric acid mist. It is generally recognized that entrainment of sulfur oxides or sulfate particles into storm clouds is a major contributor to the reduced pH levels observed in acid rain precipitation.

Emissions of particulate matter associated with combustion consist of particles in the size range less than 10 microns (μ) in diameter (PM_{10}). Emissions of particulate matter associated with combustion, especially particles in the size range of 1 to 3 μ, can cause adverse health effects. Particulates in the atmosphere also tend to reduce visibility.

The type and relative amounts of air pollutants generated by oil and gas operations vary according to the phase of activity. There are three principal phases: exploration, development, and production. For a more detailed discussion of emission sources associated with each phase, refer to *Air Quality Impact of Proposed OCS Lease Sale No. 95* (Jacobs Engineering Group, Inc., 1989). Information from that report is relevant to operations that would occur within the Northwest NPR-A Planning Area. Although certain emission sources discussed obviously do not apply to operations occurring on land, the report does include a fairly comprehensive analysis of activities and emission sources that occur during oil and gas exploration, development, and production, regardless of the specific locations in which they may occur. Significant emission sources are summarized below.

Federal and State statutes and regulations define air-quality standards in terms of maximum allowable concentrations of specific pollutants for various averaging periods (see Table III-04). These maxima are designed to protect human health and welfare. However, one exceedance per year is allowed, except for standards based on an annual averaging period. The standards also include Prevention of Significant Deterioration (PSD) provisions for NO_2, SO_2, and PM_{10} to limit deterioration of existing air quality that is better than that otherwise allowed by the standards (an attainment area). Maximum allowable increases in concentrations above a baseline level are specified for each PSD pollutant. There are three PSD classes. Class I allows the least degradation and also restricts degradation of visibility. The entire NPR-A is Class II, which allows a moderate incremental decrease in the air quality of the area. Baseline PSD pollutant concentrations and the portion of the PSD increments already consumed are established for each location by the EPA and the State of Alaska before issuance of air-quality permits. Air-quality standards do not directly address all other potential effects, such as acidification of precipitation and freshwater bodies or effects on nonagronomic plant species.

Under the State Implementation Plan, the Alaska Department of Environmental Conservation (ADEC) has

jurisdiction for regulating and permitting air-quality emissions within the Northwest NPR-A Planning Area. Operators would be required to meet ADEC's requirements for air emissions, including the need to obtain construction and operating permits. Construction air-quality permits include prevention of significant deterioration requirements.

(1) Effects of Disturbances

During the exploration phase, emissions would be produced by: 1) vehicles used in gathering seismic and other geological and geophysical data; 2) diesel power-generating equipment needed for drilling exploratory and delineation wells; 3) vehicles in support of drilling activities; and 4) intermittent operations such as mud degassing and well testing. Pollutants generated would primarily consist of NO_x (these would consist of NO and NO_2; ambient air standards are set only for NO_2), CO, and SO_2. It is assumed that exploration activity would begin in the year following a sale. Emissions from exploration for the first sale would be from seismic surveys and from drilling 5 to 12 exploration wells and 2 to 18 delineation wells from 1 to 3 rigs.

During the development phase, including temporary construction operations and drilling, the main sources of emission would be the following:

- gas turbines used to provide power for drilling;
- reciprocating engines for electrical power, including rig generator (during construction phase only; standby only during commissioning);
- heavy construction equipment used to install facility and pipelines (including gravel-hauling dump trucks);
- construction and commissioning support equipment, including cranes, pumps, generators, compressors, pile drivers, welders, heaters, and flare;
- support vehicles; and
- drill-rig-support equipment, including boilers and heaters.

For all these operations, the best available control technology would be applied under the EPA air-quality regulations. The main emissions would be NO_x, with lesser amounts of SO_2, CO, and PM_{10}. Once in the atmosphere, nitric oxide gradually converts to nitrogen dioxide.

For the production phase, the main source of emissions would be from turbines for power generation and gas compression, and from power generation for oil pumping and water injection. The emissions would consist mainly of NO_x, with smaller amounts of CO and PM_{10}. Another source of emissions would be evaporative losses (VOC's) from oil/water separators, from pump and compressor seals and valve packing. Using seal systems designed to reduce emissions would minimize these sources. Produced water and slop-oil tanks would be equipped with a vapor-recovery system, which would recover emissions of VOC's from these tanks and return them to the process. Operators would probably have a flare available 24 hours a day, 365 days a year. If there were venting (unexpected), it would emit VOC's. However, flaring would burn up any emissions of VOC's, and they should not create a pollution problem. Flaring would produce some NO_x, SO_2, PM_{10}, and CO. Venting or flaring would probably produce only a very small amount of SO_2 (sulfur dioxide), because sulfur in the produced gas should be very low (but never completely absent).

Abandonment of facilities developed after the proposed sales would cause much higher vehicular traffic, and also more heavy equipment operations than during the production phase of operations, but effects probably would be quite similar to the construction portion of the development phase of operations. Because abandonment operations would last perhaps a maximum of 10 to 15 percent of total operations time and would include no activities that should affect air quality more significantly than previously discussed, these operations would cause insignificant effects on air quality.

Other sources of pollutants related to oil and gas operations are accidents such as blowouts and oil spills. Typical emissions from such accidents consist of hydrocarbons (volatile organic compounds); only fires associated with blowouts or oil spills produce other pollutants.

Emissions from development for the first sale under the Preferred Alternative proposal would be from the development of 4 fields and the installation of up to 135 mi of pipeline, and the drilling of a maximum of 232 production and service wells. Peak-year production emissions would result from operations producing about 50 million barrels of oil and from transportation of that oil.

Additional information and discussion from the EIS for Sale 144 provides some details relevant to the current analysis. Table IV.B.12-1 of the *Beaufort Sea Planning Area Oil and Gas Lease Sale 144 Final Environmental Impact Statement* lists estimated uncontrolled pollutant emissions for the peak-exploration, peak-development, and peak-production years from that sale proposal. That EIS also has additional relevant discussion, especially in the last paragraph of Section IV.B.12.(1). Information from the Beaufort Sea Sale 144 Final EIS is relevant for the Northwest NPR-A because the Sale 144 EIS analysis included the area immediately offshore of the Northwest and Northeast NPR-A. The Sale 144 EIS analyzed effects from a scenario that included greater projected oil development than is projected in this IAP/EIS for the Northwest NPR-A. Emissions analyzed for the Beaufort Sea also included some emission sources not applicable to operations on land in the NPR-A. Emissions from expected NPR-A operations would include no significant emission sources not analyzed for the Beaufort Sea. Therefore, effects analyzed and pollutants modeled are for the Beaufort Sea Sale 144 EIS are greater than those that would be expected for the Northwest NPR-A Planning Area. Modeling discussed in the Sale 144 EIS showed that NO_2 had the highest concentration of the modeled pollutants, but that all pollutant contributions would be well within the Prevention of Significant Deterioration increments and Federal ambient air quality standards.

Air-quality analyses were performed for the Northstar and Liberty projects. For those projects (which are probably somewhat smaller than a "typical" field that might be developed in NPR-A), the highest predicted concentrations for NO_2, SO_2, and PM_{10} occurred just outside the facility boundary and were close to the PSD Class II maximum allowable increments. The highest onshore concentrations would be considerably less because of the dispersion over distance. The combined facility concentrations plus background were well within the ambient air-quality standards (between 2 and 30 percent of the standards).

Because the Preferred Alternative should have air emissions that are similar to those predicted for Northstar or Liberty, it can be inferred that the expected pollutant contributions would also be well within PSD increments and Federal ambient air-quality standards.

(2) Effects of Spills

(a) Effects of an Oil Spill on Air Quality

Based upon modeling work by Hanna and Drivas (1993), the VOC's from offshore facility or pipeline oil spills likely would evaporate almost completely within a few hours after the spill occurred. The article cited discusses the rate of evaporation and ambient concentrations of 15 different VOC compounds. The EPA classifies several of these compounds--such as benzene, ethylbenzene, toluene, and n-xylenes--as hazardous air pollutants. The study results showed that these compounds evaporate almost completely within a few hours after the spill occurs. Ambient concentrations peak within the first several hours after the spill starts and are reduced by 2 orders of magnitude after about 12 hours. The heavier compounds take longer to evaporate and may not peak until about 24 hours after spill occurrence. Total ambient VOC concentrations are significant in the immediate vicinity of an oil spill, but concentrations are much reduced after the first day. In the event of an oil spill on land in the NPR-A, the

air-quality effects would be less severe than offshore (because some of the oil could be absorbed by vegetation or into the ground), but some effects might last longer before the VOC compounds were completely dissipated.

Diesel fuel oil could be spilled either while being transported or from accidents involving vehicles or equipment. A diesel spill would evaporate faster than a crude-oil spill. Ambient hydrocarbon concentrations would be higher than with a crude-oil spill, but would persist for a shorter time. Also, since a diesel spill would probably be smaller than some potential crude-oil spills, any air-quality effects likely would be even lower than for other spills.

Oil or gas blowouts may catch fire. In addition, in situburning is a preferred technique for cleanup and disposal of oil spilled into water (see the next paragraph). This type of burning would be less likely in case of oil spilled on land, but the effects on air quality if some of the oil should be burned would be similar. Burning could affect air quality in two important ways. For a gas blowout, burning would reduce emissions of gaseous hydrocarbons by 99.98 percent and very slightly increase emissions of other pollutants. If an oil spill were ignited immediately after spillage, the burn could combust 33 to 67 percent of crude oil or higher amounts of fuel oil (diesel) that otherwise would evaporate. On the other hand, incomplete combustion of oil would emit about 10 percent of the burned crude oil as oily soot (and minor quantities of other pollutants) into the air.

(b) Effects of Oil-Spill Cleanup Activities on Air Quality

In situ burning as part of a cleanup of spilled crude oil or diesel fuel would temporarily adversely affect air quality, but the effects would be low. For much greater detail, please see the article by Fingas et al. (1995). Extensive ambient measurements were performed during two experiments involving the in situ burning of approximately 300 bbl of crude oil at sea. During the burn, carbon monoxide, sulfur dioxide, and nitrogen dioxide were measured only at background levels and were frequently below detection levels. Ambient levels of VOC were high within about 100 m of the fire, but were significantly lower than those associated with a non-burning spill. Measured concentrations of polyaromatic hydrocarbons (PAH's) were found to be low, as it appeared that a major portion of these compounds were consumed in the burn. Effects of in situ burning for spilled diesel fuel would be similar to those associated with a crude-oil spill.

An oil spill could be set on fire accidentally or deliberately. Air pollution would be limited because of atmospheric dispersion. Also, large fires create their own local circulating winds--toward the fire at ground level--that affect plume motion. Accidental emissions likely would have a minimal effect on air quality.

If an oil spill were ignited immediately after spillage, the burn could combust 33 to 67 percent of the crude oil or higher amounts of fuel oil that otherwise would evaporate. On the other hand, incomplete combustion of oil would emit about 10 percent of the burned crude oil as oily soot, and minor quantities of other pollutants, into the air (USDOI, MMS, 1996:Table IV.B.12-4).

Additional work published in an article by McGrattan et al. (1995) reported that smoke plume models have shown that the surface concentration of particulate matter does not exceed the health criterion of 150 $\mu g/m^3$ beyond about 5 km downwind of an in situ burn. This is quite conservative, as this health standard is based on a 24-hour average concentration rather than a 1-hour average concentration. This appears to be supported by field experiments conducted off Newfoundland and in Alaska (McGrattan et al., 1995).

Other air-quality effects from cleanup activities would include emissions from vehicles and equipment used in the cleanup effort; these are expected to be very low.

(3) Effects of Accidental Emissions

Sources of air pollutants related to oil and gas operations include accidental emissions resulting from gas or oil blowouts. The number of blowouts on the U.S. outer continental shelf (OCS)--almost entirely gas and/or water--averaged 3.3 per 1,000 wells drilled from 1956 through 1982 (Fleury, 1983). Danenberger (1993) determined a frequency of 4.1 blowouts per 1,000 wells drilled from 1971 through 1991. Statistical information from outer continental shelf blowouts is relevant for Northwest NPR-A IAP/EIS because of possible activity in offshore coastal waters from leasing in the NPR-A. The statistical information for the OCS is recent enough that it may assist readers in becoming aware of how relatively infrequent such blowouts are in recent years. Please see also Section IV.A.2 , Section IV.A.3 and Section IV.A.4 of this IAP/EIS for a detailed discussion of oil spills. Table 4-19 and Table 4-20 referred to in that discussion show the estimates for large ($\geq$ 500 bbl) and small (<500 bbl) oil spills for the life of Northwest NPR-A oil and gas activities. Typical emissions from such accidents consist of hydrocarbons (volatile organic compounds); only fires associated with blowouts produce other pollutants, such as nitrogen oxides, carbon monoxide, sulfur dioxide, and particulate matter. Accidental emissions likely would have little effect on air quality.

A gas blowout could release 20 tons per day of gaseous hydrocarbons, of which about 2 tons per day would be nonmethane hydrocarbons classified as volatile organic compounds. The probability of experiencing one or more blowouts in drilling the wells projected for the Preferred Alternative multiple-sale proposal is estimated to be low. If a gas blowout did occur, it would be unlikely to persist more than 1 day, and it would very likely release less than 2 tons of volatile organic compounds. Since 1974, 60 percent of the blowouts have lasted less than 1 day; and only 10 percent have lasted more than 7 days.

Gas or oil blowouts may catch fire. In addition, in situ burning is a preferred technique for cleanup and disposal of spilled oil in oil-spill-contingency plans. For catastrophic oil blowouts, in situ burning may be the only effective technique for spill control. For a discussion of in situ burning, see Section V.B.6.b.2.b above.

Burning could affect air quality in two important ways. For a gas blowout, burning would reduce emissions of gaseous hydrocarbons by 99.98 percent and very slightly increase emissions--relative to quantities in other oil and gas industrial operations--of other pollutants (see Table IV.B.12-3 in *Beaufort Sea Planning Area Oil and Gas Lease Sale 144 Final Environmental Impact Statement*). For a major oil blowout, setting fire to the wellhead could burn 85 percent of the oil, with 5 percent remaining as residue or droplets in the smoke plume in addition to the 10-percent soot injection (Evans et al., 1987). Clouds of black smoke from a burning 360,000-bbl oil spill 75 km off the coast of Africa locally deposited oily residue in a rainfall 50 to 80 km inland. Later the same day, clean rain washed away most of the residue and allayed fears of permanent damage.

Based on qualitative information, burns that are 2 or 3 orders of magnitude smaller do not appear to cause noticeable fallout problems. Along the Trans-Alaska Pipeline, 500 bbl of a spill were burned over a 2-hour period, apparently without long-lasting effects (Schulze et al., 1982). The smaller volume Tier II burns at Prudhoe Bay had no visible fallout downwind of the burn pit (Industry Task Group, 1983).

Soot is the major contributor to pollution from a fire. This soot, which would cling to plants near the fire, would tend to slump and wash off vegetation in subsequent rains, limiting any health effects. Coating portions of the ecosystem in oily residue is the major--though not the only--potential air-quality risk. Recent examination of polycyclic aromatic hydrocarbons (PAH's) in crude oil and smoke from burning crude oil indicates that the overall amounts of PAH change little during combustion, but the kinds of PAH compounds present do change. Benzo(a)pyrene, which often is used as an indicator of the presence of carcinogenic varieties of PAH, is present in crude-oil smoke in quantities approximately 3 times greater than in the unburned oil. However, the amount of PAH is very small (Evans, 1988). Investigators have found that, overall, the oily residue in smoke plumes from crude oil is mutagenic but not highly so (Sheppard and Georghiou, 1981; Evans et al., 1987). The Expert Committee of the World Health Organization considers daily average smoke concentrations of greater than 250 $\mu g/m^3$ to be a health hazard for bronchitis.

Because of the dispersal of airborne pollutants by winds, accidental emissions likely would have a minimal effect on air quality.

(4) Other Effects on Air Quality

Other effects on the environment of air pollution from oil and gas activities and other sources not specifically addressed by air-quality standards include the possibility of damage to vegetation, acidification of nearby areas, and atmospheric visibility impacts. Effects may be short term (hours, days, or weeks), long term (seasons or years), regional (Arctic Slope), or local (near the activity only). Visibility may be defined in terms of visual range and contrast between plume and background (which determines perceptibility of the plume). For their proposed Liberty Project, BPXA had run the VISCREEN model and found noticeable effects on only a very limited number of days, ones that had the most restrictive meteorological conditions. No effects at all were simulated during average conditions. Those results would be expected to be typical of other development projects that could occur after any discoveries following the currently proposed lease sales.

A significant increase in ozone concentrations is not likely to result from exploration, development, or production scenarios associated with the Preferred Alternative. Photochemical pollutants such as ozone are not emitted directly; they form in the air from the interaction of other pollutants in the presence of sunshine and heat. Although sunshine is present in the NPR-A, temperatures remain relatively low for much of each day during the summer (Brower et al., 1988). Also, activities occurring as a result of field development are separated from each other, diminishing the combined effects from these activities and greatly increasing atmospheric dispersion of pollutants. At a number of air-monitoring sites in the Prudhoe Bay and Kuparuk areas, ozone measurements show that the highest 1-hour-maximum ozone concentrations generally are in the range of 0.05-0.07 parts per million (ppm), which is well within the existing maximum 1-hour-average ozone standard of 0.12 ppm. The highest 8-hour average ozone concentration is always somewhat lower than the maximum 1-hour average. Therefore, ozone levels are expected to be within the revised 8-hour average ozone standard of 0.08 ppm. (Note: The 8-hour Federal ozone standard currently is under litigation. The Environmental Protection Agency cannot enforce the standard until the legal issues are resolved.) Because the projected ozone precursor emissions from the Preferred Alternative multiple sale proposal are considerably lower than the existing emissions from the Prudhoe Bay and Kuparuk oil fields, the proposal should not cause any ozone concentrations to exceed the 8-hour Federal standard.

Olson (1982) reviewed susceptibility of fruticose lichen, an important component of the coastal tundra ecosystem, to sulfurous pollutants. There is evidence that sulfur dioxide concentrations as low as 12.0 micrograms per cubic meter ($\mu g/m^3$) for short periods of time can depress photosynthesis in several lichen species, with damage occurring at 60 $\mu g/m^3$. In addition, the sensitivity of lichen to sulfate is increased in the presence of humidity or moisture, conditions that are common on coastal tundra. However, because of the small size and number of sources of SO_2 emissions, the ambient concentrations at most locations may be assumed to be near the lower limits of detectability. Because of atmospheric dispersion and low existing levels of pollutant concentrations, the effect on vegetation under the Preferred Alternative multiple-sale proposal is expected to be minimal. For their proposed Liberty development project, BPXA had found that maximum modeled pollutant concentrations were well below levels that can damage lichens, according to laboratory studies. This likely would also apply to other development projects that could follow the currently proposed lease sales. Research at Prudhoe Bay from 1989 through 1994 showed no effects of pollutants there on vascular plants or lichens (Kohut et al., 1994). That research was conducted in areas typical of much of the Alaska North Slope area. Monitoring the vascular and lichen plant communities over the 6 years revealed no changes in species composition that could be related to differences in exposures to pollutants.

(5) Native Views on Air Emissions

Elder Bessie Ericklook from Nuiqsut maintained (Ericklook, 1979, as cited in USDOI, MMS, 1979a) that since the oil fields have been established at Prudhoe Bay, the foxes have been dirty and discolored in the area of Oliktok Point. Leonard Lampe, then Mayor of Nuiqsut, more recently reported further air-pollution problems and habitat concerns, asserting that Nuiqsut has been experiencing such effects for some time: "A lot of air pollution, asthma, bronchitis--a lot with young children. We see smog pollution that goes from Prudhoe Bay out to the ocean and sometimes to Barrow when the wind is blowing that way..." (Lavrakas, 1996:1, 5). Because of the distances from the most likely developments to Nuiqsut and the relatively small sizes of these projects in comparison with the Prudhoe Bay complex, the Preferred Alternative would be expected to have no significant effect with respect to these observations.

(6) Summary

The unlikely large oil spill from a facility or pipeline could cause a small, local increase in the concentrations of gaseous hydrocarbons (volatile organic compounds as a result of evaporation from the spill. The VOC concentrations would be very low and normally limited to only 1 or 2 km^2 (0.4 to 0.8 mi^2). Moderate or greater winds would further reduce the VOC concentrations in the air.

Effects on air quality from emissions likely would be only a very small percent of the maximum allowable PSD Class II increments. The concentrations of criteria pollutants in the ambient air would remain well within the air-quality standards. Consequently, there likely would be only a minimal effect on air quality with respect to standards. Because of the atmospheric dispersion of emissions, the other effects of air-pollutant concentrations caused by exploration and development and production activities or accidental emissions would not be sufficient to harm vegetation. A light, short-term coating of soot over a localized area could result from oil fires.

c. Effectiveness of Stipulations and Required Operating Procedures

None of the stipulations or ROP's is particularly applicable to air-quality impacts. Mitigation of adverse air-quality impacts would result from operators' use of the best available technology to control discharges.

d. Conclusion--First Sale

The air-quality analysis is based on the specific emission controls and emission limitations that facility operators would apply to meet the appropriate EPA regulations and permit requirements for development and production activities. The effects of all these activities would cause only small, local, temporary increases in the concentrations of criteria pollutants. Concentrations would be within the PSD Class II limits and National Ambient Air Quality Standards. Effects on air quality under the Preferred Alternative would be low.

e. Multiple Sales

Air-quality impacts are determined by atmospheric transport and dispersion patterns and the relative locations of the emission sources and receptors (points where impacts are evaluated). These characteristics vary to some extent in different locations within the NPR-A. Wind patterns are determined by large-scale circulation systems as well as by local topography and heat exchange between the atmosphere, ocean, and ice. Atmospheric dispersion

patterns are very complex as well. The air-quality modeling for the Outer Continental Shelf Lease Sale 144 and for the Northstar and Liberty projects used meteorological data from just a few stations, which are generally not representative of the whole Beaufort Sea area. Results for similar projects such as those that would result from the Preferred Alternative in the Northwest NPR-A are likely to vary from one area to another, depending on local meteorological and topographical conditions. The air-quality modeling for the projects mentioned is based on the best available information for the Beaufort Sea; they can be thought of as providing a best "first guess" of conditions anywhere in the Beaufort Sea and in the NPR-A. Since the predicted impacts are small, it can be reasonably assumed that the effects from facilities anywhere in the region would fall within the regulatory standards.

Because individual air masses move constantly with atmospheric circulation, the major differences in effects of the different alternatives upon air quality would be expected to be determined by which specific geographic areas could be affected by air emissions.

f. Conclusion--Multiple Sales

None of the sales would result in effects substantially different from or other than those discussed in Section V.B.6.b . The effects of all activities under all sales would cause only small increases in the concentrations of criteria pollutants. Concentrations would be within the PSD Class II limits and NAAQS. Therefore, effects on air quality from the multiple sale proposals under the Preferred Alternative would be low.

7. Vegetation

Ground-impacting management actions within the Northwest NPR-A Planning Area that may affect vegetation under the Preferred Alternative include those from non-oil and gas related activities and those related to the exploration and development of oil and gas resources.

a. Effects of Non-Oil and Gas Activities

These actions include point-to-point air traffic, aerial surveys, paleontological and archaeological excavations, camps for research and recreation, overland moves, and off-highway vehicle (OHV) (e.g. four-wheelers, snowmachines, and airboats) use. Most of these activities, except for overland moves, snowmachines, and some aerial surveys, occur from June to September.

Most off-runway landings during aerial surveys would be by fixed-wing aircraft using skis or floats; fewer would be by wheeled, fixed-wing aircraft. Only wheeled, fixed-wing aircraft have the potential to affect vegetation. Most wheeled-aircraft landings would occur on sand or gravel bars, or possibly on dry, gravelly ridges. These landings have the potential to cause minor, short-term damage to the scattered vegetation present on the bars or ridges. The specific locations, season, number of landings, weight of aircraft, etc. associated with these activities would affect the extent of the minor impacts expected.

Archaeological digs are most likely to occur on drier soils, where a sod layer has formed. In some archaeological digs, the sod may be removed and replaced, causing a temporary disturbance rather than vegetation destruction. However, the surface vegetation may be destroyed in some archaeological digs and in most or all paleontological digs. The combined extent of such activities is not expected to exceed 4 acres per year, the same level as in

Alternative B.

Camps can result in vegetation trampling from foot traffic and tent placement, and in small spills of stove or generator fuel. This can result in temporary (one to a few growing seasons) disturbance to vegetation. Most recreational camps are expected to occur on river bars, where vegetative cover is minimal. Large camps for research or resource inventory are likely to occur on existing gravel pads, which also have minimal vegetative cover. The total land surface affected by camps is not expected to exceed 10 acres per year (the same level as for all other alternatives) and would be scattered over several sites, with most containing little or no vegetation.

Most overland moves through the Planning Area--other than for oil and gas related activities--involve traffic between Deadhorse and Barrow, Barrow and Atqasuk, or Barrow and Wainwright. Moves would occur in winter only, when the ground is frozen and covered with snow. The impact to vegetation varies with vehicle type, vegetation type, and snow conditions. Low-ground-pressure wheeled vehicles have less impact than steel-tracked vehicles or sleds on skids. Less impact usually would be expected in the wetter tundra where the effect, if any, may be the compression of snow and dead matter leaving "green trails" visible for one to a few growing seasons (Sec. IV.B.20, Visual Resources). However, if a tracked vehicle makes a tight turn or drops its blade too deeply through the snow, surface vegetation may be disrupted. If this occurs in wet tundra, thermokarsting can cause impacts greater than those commonly experienced in drier tundra. Travel over low shrubs could cause plants to be broken, and travel over tussocks sometimes results in their tops being crushed or scraped off. Thus, overland moves may vary from having no observable effects in some situations to damaging vegetation and melting permafrost to the extent that it may take years or even decades (Emers and Jorgenson, 1997; Jorgenson and Martin, 1997) to heal. Trails within the Planning Area on the three routes mentioned above total about 225 mi in length. If a trail is 12 ft wide, the impact potentially could affect about 330 acres (the same acreage as for all other alternatives). See the discussion below for the effects of spills.

Use of OHV's would be primarily, or entirely, in support of subsistence activities. Snowmachines used in the winter when the ground is frozen and covered by snow would have no--or negligible--impact on vegetation. Use of four-wheel-drive vehicles, if the vehicle is heavy enough, can kill vegetation and result in thermokarst. However, most or all such use is likely to be in the immediate vicinity of villages on private lands and not on lands managed by the BLM. The impacts of airboats on vegetation would depend on how they are used. If they are kept in the river channels, airboats would have no impact on vegetation. If airboats are driven across very shallow marshes, they might disturb the sediments in which water sedge grows and damage these plants.

b. Effects of Oil and Gas Activities

(1) Effects of Disturbances

If it is assumed that impacts to vegetation from any of the disturbance factors below would occur to different land-cover classes in proportion to their occurrence in the Planning Area (with the exception of the three water classes, Table III-06), the percent chance of occurrence of these impacts to the various vegetation types is presented in Table IV-23. However, this assumption would be invalid under either of the two following potential scenarios.

As discussed in Section III, Description of the Affected Environment, more than 95 percent of the Planning Area may be classified as "wetland" by some definitions. There are, however, some general differences between the northern and southern portions of the Planning Area. The northern area lies in the coastal plain and has a higher frequency of "marsh wetlands" (aquatic, flooded tundra, and wet tundra land-cover classes on Table IV-23), whereas the southern area lies in the foothills and has a higher frequency of "tussock wetlands" (tussock tundra and dwarf shrub land-cover classes on Table IV-23). If it is assumed that exploration or development activity is more likely to be concentrated in the northerly portion of the Planning Area, then the "marsh wetland" would be

affected in greater proportion than suggested in Table IV-23 and the "tussock wetland" would be affected less. The comparative value of these two generalized wetland types depends on the context in which they are being evaluated. For instance, the "marsh wetlands" are generally of greater importance to waterbirds, whereas the "tussock wetlands" are generally of greater importance to some shorebirds and songbirds, and to caribou.

Development may be proposed for a location addressed by Stipulations E-2, K-1 through K-3 or K-6, or ROP K-7 (see below). If this were to occur, the location of the development may be shifted to some extent to avoid as much as possible the vegetation types considered of greater importance in that local area for the protection of specific resources. In this case, the vegetation would most likely be of either the "marsh wetland" type, or riparian shrubs (low or tall shrub on Table IV-23).

(a) Exploration

1) Construction of Ice Pads, Ice Roads, and Well Cellars

Activities with the potential to impact vegetation during exploration would be limited to the construction of ice pads for drilling exploratory or delineation wells, ice roads to access some ice pads, and well cellars. Because vegetation is dormant when frozen and the ice pads/roads melt during the spring thaw shortly after melt of snow and natural ice, this construction technique is more benign than building gravel roads. Observations by the BLM of ice roads and pads built in the Northeast NPR-A between 2000 and 2002 have shown that one common impact to vegetation is a green trail, where standing dead vegetation has been flattened. This occurs primarily in wetter areas. Another common impact is caused by the death of some plants, presumably from compression, resulting in a brownish hue in the first summer, followed by a gray hue in later summers. This occurs primarily in areas of tussocks or dwarf shrubs. Both green trails and brown/gray trails are apparent from the air at some angles, but sometimes difficult to observe from the ground. Additional damage observed to occur (though to a lesser extent) was the partial crushing of sedge tussocks and accidental scraping of the tundra surface. No studies have been carried on for long enough to know the duration of such impacts, but based on studies of impacts from seismic surveys (above) the effects could be visible for at least a few years. It is assumed here that 0 to 2 ice roads, 25 to 50 mi long, would be built per year for a total $\leq$ 100 mi of ice road per year. If ice roads were 35 ft wide, the acres affected would be less than 420 per year. These acreage figures are the same as those for Alternative B and up to one-third less than those for Alternative A. Ice road construction could continue for up to 10 years following the first lease sale; ice roads that are rebuilt in multiple years are likely to be built along the same route.

Under the Preferred Alternative, it is assumed that 5 to 12 exploration wells and 2 to 18 delineation wells would be drilled in the Planning Area as a result of the first lease sale, for a total of 7 to 30 wells on ice pads (same as Alternative B and up to one-fourth less than for Alternative A). Assuming that the average ice pad is 500 ft by 500 ft (5.7 acres), these pads would add another 40 to 170 acres of impacts similar to those of ice roads. Some pads may be rebuilt in subsequent winters. This may increase vegetation recovery time, but not the areal extent of impacts.

A different impact from ice construction would occur if an ice pad were insulated so it could be used for a second winter. The vegetation would thaw underneath the timbers placed around the pad's perimeter to hold the insulating cover down. Because that thawed vegetation, about 1 ft in width, would receive no sunlight, it would die (Hazen, 1997; McKendrick, 2000). Assuming that the average ice pad is 500 ft by 500 ft, this perimeter death would impact about 2,000 ft^2 or 0.05 acres. If it is assumed that 1 in 5 ice pads would be maintained over the summer, this scenario could result in the death of 0.05 to 0.3 acres of vegetation spread among 1 to 6 different sites and over about 10 years. The vegetation would take 1 to a few years to recover.

Holes are dug in the earth for construction of well cellars, causing the destruction of vegetation on the 16 ft^2 of ground involved and causing thermokarsting around them, which could change some vegetation cover to a wetter

type. For 7 to 30 wells, this could result in the destruction of less than 0.02 acres of vegetation.

2) Seismic Activities

Seismic exploration causes impacts to vegetation similar to those described for overland moves. Under the Preferred Alternative, it is assumed that two seismic surveys--in some combination of 2-D and 3-D format--would occur in the Planning Area during each winter season. This assumption and the resulting impact estimates below are the same as those for Alternative B and one-third less than those in Alternative A. The exterior dimensions of a typical 2-D survey area vary from about 960 to 1,920 mi^2 (614,400 to 1,228,800 acres) and the maximum area impacted by seismic lines is up to 19,400 acres (400 to 800 mi x 200 ft wide). This figure is presented as a maximum, not only because 800 mi is the higher end of the assumed range, but also because not all of the area within the 200-ft-wide path would actually be overrun by a vehicle. Trails also are made by camp-move vehicles, which traverse about the same distance as line-miles surveyed (Emers and Jorgenson, 1997). In addition, trails are made through the Planning Area while traveling to and from the survey area. A camp-move trail is about 12 ft wide, and it is assumed the camp train would involve two or three strings of trailers. These strings could use the same trail, but this could cause more severe, longer lasting damage than the use of separate trails. For this analysis, it is assumed that, on average, 2.5 individual camp-train strings would use different trails to decrease overall damage, so that camp-move trails effectively would impact a path 30 ft wide. With 800 or fewer mi of trail within the survey area and an additional 25 mi entering and leaving the Planning Area, this would impact a total of 3,100 acres or less. Thus, total area impacted by 2-D seismic surveys with up to two crews involved would be less than 45,000 acres. This acreage would be less if areas surveyed were to be smaller than maximum size, or if 3-D surveys were to conducted instead of 2D surveys. Impacts on lands east of the Planning Area from travel between there and Kuparuk are discussed in the cumulative analysis.

A study of tundra disturbance by winter seismic surveys on the eastern portion of Alaska's North Slope (Jorgenson et al., 1996) indicated that 1 to 2 years after a survey, the disturbance level to the affected tundra under seismic lines was little to none for 11 percent of the area, low for 64 percent, medium for 23 percent, and high for 2 percent. After 8 to 9 years, recovery had reduced the disturbance level to little or none on 97 percent of the affected area, and no areas of medium or high disturbance remained. The tundra under camp-move trails did not recover as rapidly. One to two years after the survey, the disturbance level to the affected tundra under camp-move trails was little to none for 22 percent of the area, low for 52 percent, medium for 24 percent, and high for 2 percent. After 8 to 9 years, recovery had reduced the disturbance level to little or none on 85 percent, with low on 10 percent, medium on 4 percent, and high on 1 percent.

The above study looked at the effects of seismic exploration that took place about 20 years ago and used some vehicle types that were developed 30 to 40 years ago. Presumably, newer equipment types have less impact on tundra vegetation. However, the above study represents nearly all of the available knowledge about long-term recovery from seismic exploration (NRC, 2003). For that reason, the results from the above study are used as assumptions in this document for further analyses of impact to vegetation. For comparison, results of a study of seismic exploration impacts near the Colville River delta in 2001 (Jorgenson et al., 2003) are presented here with several caveats. Besides comparing modern to older equipment, these two studies occurred in different winters when the snow cover probably differed, they occurred on two different areas of the North Slope with different terrain types, and the data (visual estimates) were collected by different observers. In the 2001 study, conducted in the summer following the seismic work, the disturbance level to affected tundra under seismic lines was little to none on 30 percent of plots, low on 66 percent and medium on four percent. No plots on seismic lines were estimated to show high disturbance. The disturbance level to the affected tundra under camp-move trails was little to none on 18 percent of plots, low on 54 percent and medium on 29 percent. No plots in the random sample displayed a high level of disturbance, but at least one occurrence of high disturbance was observed elsewhere in the study area. If the difference in results between the two studies was due entirely to advances in equipment design, this suggests that future seismic lines would see reduced levels of disturbance (primarily more area in the little to none class and less in the medium class) and camp-move trails would see levels of disturbance similar to those found in the earlier study.

Applying the data from the older study to the above scenario for 2-D seismic surveys in the Planning Area suggests that less than 11,300 acres per year would experience medium to high disturbance (if 2-D rather than 3-D surveys were done) and, after 9 years of recovery for any single year's activity, that level of disturbance would remain evident on less than 320 acres.

It is assumed that a 3-D seismic operation would cover a total area of 300 to 600 mi^2 (192,000 to 384,000 acres), or 31 percent of the total area covered by a 2-D survey. However, the number of line-miles covered within that area would be much greater, varying from 3,750 to 7,500. Thus, the tundra area impacted by seismic lines would be equal to or less than 182,000 acres (7,500 mi by 200 ft wide) for one survey. As for 2-D surveys, this figure is a maximum because it uses the higher end of the range of line-miles and not all of the area within the pair of 100-ft wide lines would be overrun by a vehicle. For 3-D surveys, the distance covered by camp-move vehicles would not be similar to line-miles of survey as is the case for 2-D surveys. It is assumed that camp-move trails would approximate 31 percent ($\leq$ 250 mi) of those for 2-D surveys, because the total area involved in a 3-D survey is 31 percent of that covered by 2-D. There still would be an average of an additional 25 mi traveled each way when entering and leaving the Planning Area. Thus, camp-move trails would impact up to 1,110 acres of tundra for one survey. Using the figures from Jorgenson et al., 1996, suggests there would be up to 45,800 acres of medium to high disturbance following a survey and up to 60 acres remaining after 9 years.

Under the Preferred Alternative, with up to two 3-D seismic surveys occurring in the Planning Area during each winter season, the total tundra area affected by 3-D seismic surveys would be less than 366,000 acres per year. Each year this would result in less than 92,000 acres of medium to high disturbance, with less than 120 acres remaining after 9 years. Overall for the Preferred Alternative, depending on the combination of 2-D and 3-D survey types implemented and the number of line-miles actually accomplished per survey, the range of areas impacted per year by all seismic operations would be 22,500 to 366,000 acres. The total area of tundra within the Planning Area that would be impacted by seismic surveys as a result of the first lease sale might be less than the product of these numbers times the number of years since the sale, because individual surveys may overlap one another among years. However, the decrease in acreage impacted might be countered by the higher level of disturbance possible in those areas of overlap.

(b) Development

There are four different aspects of development that could impact vegetation: 1) construction of gravel pads, roads and airstrips; 2) potential construction of a pump station within the Planning Area; 3) excavation of material sites; and 4) construction of pipelines.

1) Gravel Pads, Roads, and Airstrips

It is assumed that the gravel footprint for the average, mid-sized oil field development in the Planning Area would cover a total of 100 acres and that under the Preferred Alternative, 0 to 4 fields would be developed (Table IV-04). This assumption and the subsequent estimates are the same as those for Alternative B and up to one-fifth less than those of Alternative A, and would result in the destruction of $\leq$ 400 acres of vegetation.

The passage of vehicle traffic over gravel pads would result in dust and gravel being sprayed over vegetation within about 30 ft of the pad and a noticeable dust shadow out to about 150 ft or more. Beyond about 30 ft, the effects of dust on vegetation would be subordinate to those described below for changes in snow distribution and moisture regimes (Woodward-Clyde Consultants, 1983). Within 30 ft of pads, the dust and gravel may smother the original vegetation, altering the plant communities and at an extreme level eliminating all vascular plants (Jorgenson, 1997, personal communication; McKendrick, 2000). The buildup of dust and gravel could also cause thermokarsting, leading to the development of high-centered polygons with deep moats (Jorgenson, 1997, pers. comm.). For this analysis, it is assumed that the average oil/gas field development in the Planning Area would

consist of 5 mi of some combination of pads, roads, and airstrip with the potential for dust effects along a 10-mi perimeter. This could result in a total coverage of the above impacts over 36 acres per development, corresponding to ≤ 144 acres under the Preferred Alternative.

The type of material used for gravel fill also can impact vegetation if the material has a saline source. Sources for material to be used in the Planning Area currently are undetermined. If the material is saline, water draining off or leaching through the pad may pick up the salinity and cause the death of plants near the pad. The area of plant death eventually would be colonized by more halophytic species, resulting in a change from one plant community to another.

The construction of gravel pads can result in a change in moisture regime of the nearby tundra through the accumulation of snow by drifting and the blockage of normal flow of surface water in summer. The latter can cause a wetter soil regime on one side of a pad or road and drier soil on the other. Wetter regimes can cause an increase in the depth of the active layer (soil that thaws during summer), which leads to an increase in graminoid and bryophyte production in wet habitats or a decrease in shrub and lichen production in moist or dry habitats within 164 ft (50 m) of the pad (Woodward-Clyde Consultants, 1983). In the extreme case, shrubs may disappear altogether and the vascular plant community may become a *Carex aquatilis* monoculture (Jorgenson, 1997, pers. comm.). If all such effects occur within 164 ft of the pads, the total area impacted could be up to 200 acres per oil/gas development, or ≤800 acres under the Preferred Alternative.

Flooding caused the greatest indirect effect of construction on vegetation during the first 15 years (1968-1983) of development in the Prudhoe Bay area (Walker et al., 1986, 1987). Flooding resulted when roads and pads intercepted the natural flow of water and caused ponding. If lessees are not required to identify natural drainage patterns before construction--and maintain them during and after construction--then the land impacted would be the same land that was affected by dust and snow drifting, as described above. However, the change in vegetation type could be different than that caused by dust or snow drifting, resulting in more aquatic grasses and sedges.

2) Pump Stations

Depending on the number of fields produced, their location, and the diameter of pipe used to transport oil, pump stations may be needed within the Planning Area. A pump station with associated airstrip would result in about 40 acres of gravel fill. For this analysis, it is assumed that the perimeter of this gravel fill would be 3 mi, resulting in 11 acres of potential dust effect or 60 acres of moisture-regime change for each pump station.

3) Material Sites

Any need for gravel fill in support of development would likely be met by existing borrow sites east of the NPR-A. However, if excavation of fill material were to occur within the Planning Area, vegetation would be destroyed over the area of the borrow pit itself as well as where the overburden is stockpiled. For this analysis, it is assumed that there would be one material site within the NPR-A for each oil/gas development, each with a surface disturbance of 20 to 50 acres (average 35 acres). It also is assumed that all associated work would occur in winter, resulting in no dust. Any moisture-regime changes as a result of snow drifting would be confined to about 5 acres per material site. Under the Preferred Alternative, this would result in the destruction of ≤ 140 acres of vegetation and the alteration of the vegetation community on an amount ≤ 20 acres. If some or all of the gravel resources come from outside the Planning Area, the total acreage affected would be the same or less, but correspondingly distributed between the Planning Area and other lands to the east. Material sites outside the Planning Area would most likely be within the Colville River floodplain where vegetative cover may be naturally reduced or absent.

4) Pipelines

For this analysis, it is assumed that aboveground pipelines would involve a single VSM per pipe-supporting rack. The VSM's would have a diameter of 12 inches and would be placed 55 to 70 ft apart. Each VSM would have an approximately 20-inch-wide zone of disturbance around it in addition to the vegetation displaced by the VSM (Jorgenson, 1997, pers. comm.). The zone of disturbance would result from deposition of spoil material and thermokarsting and would result in a change in plant species composition. The total area disturbed by each VSM would be about 14 ft^2 , 6 percent of which would be vegetation destruction/replacement by the VSM. This would result in 0.03 acres being disturbed per pipeline mile, or < 2.1 acres within the Planning Area under the Preferred Alternative (up to 70 mi of field gathering and trunk pipelines; see Table IV-29). In addition, another 100 mi of trunk lines would be built on Federal lands outside the Planning Area and 35 mi of trunk lines on State lands to get produced oil from the Northwest NPR-A to existing oil transportation infrastructure. This 135 mi of pipeline outside the Planning Area would disturb about 4.1 ac of tundra vegetation.

Pipelines would be constructed in the winter, either from ice roads or vehicles driving on the snow-covered tundra. Assuming that this traffic would cover an area up to 30 ft wide over 70 mi within the Planning Area and 135 mi outside the Planning Area, about 255 acres and 490 acres, respectively, of tundra would receive impacts similar to those mentioned above for ice roads or seismic surveys.

Pipelines also could impact vegetation indirectly through snow drifting or shading. There is conflicting information about the occurrence of snow drifting associated with pipelines that have no parallel road. Jorgenson (1997, pers. commun.) has not seen drifting in such situations, but residents of Nuiqsut have said that it occurs. Insufficient information exists to describe any potential effects to vegetation.

Any vegetation under a pipeline would receive less direct sunlight during the growing season, potentially leading to a shallower active layer in the soil and reduced photosynthesis by the plants. No data exist to address this possibility. Many currently existing pipelines are associated with a parallel road, and any effects of snow drifting, gravel spray, or dust would mask an effect of shading.

Assumptions made for this analysis of impacts by pipelines would be invalidated by a decision to bury any portion of a pipeline under the tundra. Although not the preferred method for heated oil pipelines, burial is preferred for gas transport pipelines. Gas (field gathering) pipelines would be supported above ground by the same VSM's as the oil pipelines, and would represent no additional impact to tundra vegetation other than the possible effects of increased area shaded or affected by snow drifting. Gas trunk pipelines would likely be buried, and vegetation would be destroyed above the trench and altered in the adjacent areas due to temporary storage of earth on top of vegetation and impacts from earth-moving machinery. The latter impacts would be ameliorated by winter construction, but would still occur. If the zone of impacts from pipeline burial would be up to 15 ft wide, then the total impacts to vegetation would affect $\leq$ 1.8 acres per pipeline mile, or an amount $\leq$ 45 acres along the assumed 25 mi route within the Planning Area and about 310 acres along the 170-mi route beyond the Planning Area. With disturbed areas of this width, colonizing species would not be able to quickly reinvade the disturbed soil, suggesting a recovery time of several years or longer, though wetter areas would generally revegetate before drier areas (McKendrick, 2000).

(2) Effects of Spills

Most oil spills occur on gravel or ice pads. Consequently, their effects do not reach the vegetation. About 20 to 35 percent of past crude oil spills, both large and small, have reached areas beyond pads. The corresponding proportion for refined oil spills probably is much less, but for this analysis it is assumed that 27 percent of all spills (except blowouts; see below) occur on or reach the tundra vegetation. However, during 60 percent of the year there is sufficient snow cover that cleanup efforts would occur before spilled oil could reach the vegetation. So for this analysis, it is assumed that 11 percent of all oil spills (except blowouts; see below) would affect

vegetation.

Most oil spills would cover < 500 ft² (< 0.01 acres) with a maximum coverage of 4.8 acres if the spill is a windblown mist. For this analysis, it is assumed that the average spill would cover 0.1 acre (98% at 0.01 acre, 2% at 4.8 acres). Based on these assumptions, the total area of vegetation that would be impacted by spilled oil over the lifetime of oil/gas developments would be < 4.3 acres (390 spills x 11% chance of reaching tundra x 0.1 acre per spill). Overall, past spills on Alaska's North Slope have caused minor ecological damage, and ecosystems have shown a good potential for recovery with wetter areas recovering more quickly (Jorgenson, 1997; McKendrick, 2000).

The only reported blowout of crude oil on Alaska's North Slope occurred in 1950, and no crude oil was spilled off the pad during that blowout. The chance of a blowout occurring in the Planning Area--with subsequent damage to vegetation beyond the drill pad--is low (estimated at 1.5×10^{-5} per well drilled, or one in 67,000). See Section IV.J.5.g for the analysis of the potential effects of a large spill related to a blowout.

A pipeline spill of seawater used for waterflooding also has the potential to affect vegetation. The size of the area affected would depend on the terrain and land cover at the spill site and would be proportional to the amount of seawater spilled. If such a spill were to occur within a community of halophytic plant species, there could be little effect. Otherwise, depending on the specific situation under which the spill occurred, the result could vary from little impact to total plant death in the area affected with eventual replacement of the vegetation community by halophytic species.

(3) Summary

Under the Preferred Alternative, minor impacts to vegetation may occur from aircraft landings, archaeological or paleontological excavations, camps, and overland moves. The duration of these impacts would be short term--ranging up to 5 months--and recovery could vary from 1 year to decades. Impacts also would occur from seismic work, ice-road and pad construction, and the construction of well cellars during exploratory drilling. The duration and recovery for seismic work and ice roads/pads would be similar to those for overland moves. The effects of well-cellar construction would be permanent. The effects of development include the impacts of ice roads or off-road vehicles used for pipeline construction; the destruction of vegetation under gravel pads, material sites, pipeline VSM's, and spilled oil; and the alteration of vegetation communities resulting from dust, salinity of gravel fill, snowdrifts, and blockage of normal surface water flow. The impacts of gravel pads are considered permanent, while those of oil spills--which are cleaned up immediately--allow recovery within a few years to two decades.

c. Effectiveness of Stipulations and Required Operating Procedures

The Stipulations and Required Operating Procedures (ROP's) that would reduce the acreage of impacts to vegetation under the Preferred Alternative are those that would reduce the areal extent of gravel cover or alterations to tundra during exploration or development (ROP's E-5 and I-1) and those that would reduce the probability of oil spills reaching the tundra or spreading further once they reach the tundra (ROP's A-2c, A-3, A-4a-e, A-6, A-7a, E-4, and I-1). Stipulations E-2, K-1, K-2, K-6, and ROP K-7 would not reduce the acreage of vegetation impacted by an action, but might shift the impacts from more valuable wetland or riparian vegetation types to habitats perceived as lesser in value. Impacts to habitat farther from waterbodies rather than adjacent to them may affect fewer wetland, riparian or cliff habitat acres, or they may affect wetland or riparian habitats that contain fewer wildlife and fish species or individuals.

ROP's that would reduce the level of impacts to vegetation--but not the areal extent of impacts--are ROP's A-3 and A-4a (by providing better cleanup of spills), and ROP's C-2a-e and I-1 (by reducing impacts of off-road vehicles).

Stipulation G-1 and ROP E-8 may increase the probability that altered vegetation would eventually be returned to a natural (or at least more productive) state.

d. Conclusion--First Sale

Impacts to vegetation from activities other than oil exploration and development under the Preferred Alternative would involve either disturbance or destruction. Since destructive impacts would involve a small fraction of the 8.8-million-acre Planning Area, the overall impact to vegetation communities from these activities other than oil and gas exploration and development may be minor to negligible.

The impacts of oil exploration would include vegetation disturbance on 22,500 to 366,000 acres per year from 2-D and 3-D seismic surveys over the entire exploration period (10 years). About 25 percent of the disturbance would be at a medium to high level, and after 9 years recovery would be about 90 percent.

Exploration would also include construction of ice roads, with impacts on < 420 acres per year, and ice pads with impacts on < 170 acres. Exploration activities also would result in permanent, minor vegetation destruction and alteration from the construction of exploration well cellars.

The activities of development that would impact vegetation include construction of gravel pads, roads, and airstrips for each oil/gas development; potential construction of one pump station within the Planning Area; excavation of material sites; and construction of pipelines. The combined effect of these activities would cause the destruction of vegetation on $\leq$ 650 acres and the alteration in plant species composition of $\leq$ 1,915 acres, for a total of effects over $\leq$ 2,565 acres. The duration of most of these impacts would be permanent, assuming that the gravel pads would remain after oil production ends, but some plant species would be able to grow on the pads (McKendrick, 2000).

Since these impacts from development would affect less than 0.03 percent of the total area of the Planning Area, they would not be likely to adversely affect any plant species or communities. If a development facility were to be placed over a population of one of the rare plant species (see Sec. III.B.2.), the effects on that particular taxon could be severe, however it is expected that rare plants colonies would be avoided through careful siting at the facilities-approval stage. Oil spills are inevitable during exploration and development and would affect < 4.3 acres of vegetation within the Planning Area. Spills would be cleaned up immediately, causing minor ecological damage, and ecosystems would be likely to recover in a few years to 2 decades.

e. Multiple Sales

It is assumed that additional lease sales under the Preferred Alternative would result in additional exploration activities and another 0 to 4 oil/gas fields (total of 0 to 8 fields) being developed (Table IV-06). This assumption and those below are the same as those in Alternative B and somewhat less that those in Alternative A. The annual level of seismic operations is assumed to stay the same, and it is expected that recovery from at least 90 percent of the impacts from the earliest surveys would be complete before additional seismic operations would commence as a result of multiple sales. The total number of exploratory wells is assumed to increase from 5-12 to 15-36, and delineation wells from 2-18 to 6-36, for a total for all lease sales of 21 to 72 wells drilled from ice pads.

Vegetation destruction from well cellars would then increase to affect < 0.03 acres, and vegetation death around ice pad perimeters would increase to 0.2 to 0.7 acres. Tundra would recover from the latter in one to a few years. Since the number of exploratory and delineation wells is assumed to be greater after the second and subsequent sales than after the first sale, it may follow that the area affected per year by ice roads and pads would increase proportionally to < 1,940 acres.

With the assumption of another 0 to 4 oil/gas fields developed (total of 0-8 fields; Table IV-06), the total vegetation that might be destroyed by burial under gravel fill would double to < 800 acres. The area of vegetation around gravel pads that would undergo change from dust- or moisture-regime impacts would double to < 1,600 acres. The impacts of developing material sites would increase correspondingly to the number of oil/gas fields. This would mean the destruction of vegetation on a total of < 280 acres and effects of moisture regime changes on a total of < 40 acres. If additional pump stations would be needed, the area of vegetation affected would increase accordingly. The number of VSM-supported-pipeline miles within the Planning Area would more than triple under multiple sales, from 70 mi to 240 mi, and those outside the Planning Area would increase from 135 mi to 245 mi. The number of miles of buried gas trunk lines would increase from 25 mi to 125 mi within the Planning Area and from 170 mi to 270 mi outside of the Planning Area. Buried gas trunk lines would increase from 25 to 125 mi within the Planning Area and from 170 to 270 mi outside of the Planning Area. The resulting total for all sales, both inside and outside the Planning Area, would be 1,780 acres of vegetation destruction or alteration by off-road vehicle or ice road use and 720 acres by trenched gas transport lines. The incidence of oil spills also would double, raising the total acres affected to < 8.6. The probability of a blowout would remain low.

f. Conclusion--Multiple Sales

The impacts of oil exploration would include about double the vegetation disturbance from seismic work as those under a single-sale scenario. However, the extended period of time over which it would occur--coupled with the recovery time for disturbed areas--would result in a small increase in the amount of disturbance that would be evident at any one time. Exploration activities also would result in < 0.03 acres of permanent vegetation destruction around well cellars and alteration of < 1,940 acres per year around and under ice pads and roads.

The activities of development that would impact vegetation include construction of gravel pads, roads, and airstrips for each oil/gas field developed; potential construction of one pump station within the Planning Area; excavation of material sites; and construction of pipelines both within and outside the Planning Area.

The combined effect of these exploration and development activities over all lease sales would cause the destruction of vegetation on ≤ 1,260 acres and the alteration in plant species composition of ≤ 4,050 acres, for a total of effects on ≤ 5,310 acres. The duration of these impacts would be permanent, assuming that the gravel pads would remain after oil production ends, and recovery thus would be moot. These impacted areas within the Planning Area (3,920 acres) represent about 0.04 percent of the total land cover. As such, they would not be likely to adversely affect any plant species or communities. If a development were placed over a population of one of the rare plant species, the effects on that particular taxon could be severe, however careful siting of facilities after site-specific environmental analysis is expected to result in avoidance and protection of rare plant species. Oil spills would affect < 8.6 acres of vegetation within the Planning Area. Recovery from spills would take a few years to 2 decades.

8. Fish Resources

a. Freshwater and Anadromous/Amphidromous Fish

Activities within the Planning Area that may affect fish under the Preferred Alternative include non-oil and gas actions, activity related to seismic operations, and those activities related to exploratory drilling and development of oil and gas resources.

Fish found in the Planning Area that may be impacted by these activities include freshwater species such as lake trout, arctic grayling, Alaska blackfish, northern pike, longnose sucker, round whitefish, burbot, ninespine stickleback, slimy sculpin, and Arctic char and anadromous/amphidromous species including arctic cisco, least cisco, Bering cisco, rainbow smelt, humpback whitefish, broad whitefish, Dolly Varden, inconnu, and chum and pink salmon (Morrow, 1980). Many of these species are depicted in Figure III-25 . The discussion of fish species in Section III.B.3.d provides details on their distribution and habits. Since the activities listed above frequently have similar impacts on all of these species, the following analysis often discusses effects on arctic fish as a group.

(1) Effects of Non-Oil and Gas Activities

Actions associated with the Preferred Alternative that could cause disturbance to fish include camps for research and recreation and overland moves. Most of these activities, except for overland moves, occur during June to September.

Ground activities related to research include data collection activities and camp set-up. Camps vary in size from small mobile parties that remain at a site for a few days or move daily to larger camps that may be set up in one location for portions of the summer field season. Regardless of size, potential impacts to fish at these sites are related to fuel spills that would enter the water. Mobile camps are likely to have only small quantities of stove fuel needed for cooking or gas necessary for boat motors. Impacts from spills at these sites pose little risk to fish. Stationary camps often have fuel caches used for helicopters. Fuel is either stored in bladders, tanks, or drums with quantities of up to 5,000 gallons on site. Given this scenario, a fuel spill at a storage site could occur and potentially impact fish. Possible impacts are presented below in "Effects of Spills."

Recreation activities are similar to mobile research camps in that they are likely to be short term in nature with daily or frequent movements between sites. Impacts from this activity include potential fuel spills and sport fish harvest. Fuels in these camps are likely to be limited to stove fuel and possibly gas used in boat motors. The risk of water contamination by a spill is negligible given the types of containment used and the small amounts of fuel involved. Fishing activity is widely dispersed for float trip parties. Eight parties (Table IV-28) with four persons per party are expected to float or use boats in the Planning Area in any given year. Based on past BLM permitting experience, it is expected that almost all fish caught would be released. Similarly, fishing activities at research camps involve mostly catch and release. Therefore, impacts to fish from hook-and-line fishing are not expected.

Overland moves are permitted during the winter after the ground is frozen and there is sufficient snow cover. Common routes of travel include Prudhoe Bay or Oliktok to Barrow, Barrow to Wainwright, or Barrow to Atqasuk. Typical routes are over the sea ice between Prudhoe Bay and Barrow, and over upland terrain from Barrow to Wainwright and Atqasuk. An estimated 20 to 60 trips per year are anticipated. The most likely source of concern to fish and their habitat during this activity is a fuel spill. Most spills are expected to be small (< 5 gallons) and would occur during fuel transfer. A larger spill from a fuel tank is less likely, though possible. Impacts related to spills are discussed in this section under "Effects of Spills."

Non-oil and gas actions associated with the Preferred Alternative that could cause disturbance to fish are similar to those described under the other alternatives. Measurable effects on arctic fish populations in, and adjacent to, the Planning Area over the life of this plan are not expected.

(2) Effects of Oil and Gas Activities

The following discussion of impacts from oil and gas exploration and development encompasses impacts to fish found within and adjacent to the Planning Area. Waterways that border the Planning Area are included in this analysis because freshwater and anadromous/amphidromous species can migrate between connected rivers and lakes.

If there are impacts to fish outside the Planning Area, they would most likely occur near the borders of the Planning Area (e.g., Ikpikpuk River) during oil and gas development. Material site excavation, construction of pads, roads, and airstrips, and spills (oil, gas, sea water) could have direct and indirect impacts on fish. The effects would be the same those as discussed for species within and adjacent to the Planning Area.

(a) Effects of Disturbances

1) Exploration

a) Effects from Seismic Surveys

Seismic programs in the Northwest NPR-A Planning Area are expected to use Vibroseis as the technique for seismic data collection. Acoustical energy pulses emitted by this equipment can locate subsurface geological structures that might contain oil or gas. The energy pulses are generated by special vibrator equipment mounted on all-terrain, low-ground-pressure vehicles. The equipment used can collect either 2-D or 3-D data depending upon evaluation needs. A typical 2-D operation would be expected to cover 400 to 800 line-miles per season, while a 3-D operation covering a 30- x 15-mi survey area would contain approximately 5,625 line-miles of data.

Survey lines in both 2-D and 3-D seismic operations form a grid and pass over both land and water (ice-covered lakes) in the course of data collection. Some of the lakes can be expected to harbor fish. When a vibrator operates on floating ice, a considerable portion of the wave field travels horizontally within the ice and water layers. Possible impacts to local populations of fish from the pressure waves are a concern to consumptive users and biologists. In an effort to quantify pressure wave action, Nyland (2002) conducted a field test on an unnamed fish bearing lake in the Colville River Delta in northern Alaska. Average ice thickness was 1.8 m and average water depth was 1.6 m. Vibrators were used to emit pressure waves at distances from 7.3 to 1,000 m from a base point in the lake. Hydrophones in the water collected the sound pressure levels. Variation in sound levels with the distance from the source and peak particle velocities were measured. Though no fish were examined as part of this study, maximum sound pressures recorded were below the Alaska Department of Fish and Game (ADF&G) guidelines for instantaneous pressure changes allowed in the swim bladders of fish.

Under the Preferred Alternative, it is assumed that two 2-D or 3-D seismic operations would occur each year in the Planning Area. Arctic fish are likely to be adversely affected by seismic surveys located above overwintering areas. The effects of vibration on most overwintering fish are expected to be short term and sub-lethal. Likely effects would include avoidance behavior and short term stress.

Based on the study outlined above, the relatively small number of seismic surveys expected, the short time duration of the pressure impulses in any given spot (several seconds), and the low density of arctic fish in most of the Planning Area in the winter, seismic surveys are not expected to have a perceptible effect on populations of arctic fish.

Fuel spills associated with seismic surveys are likely to be small (less than 5 gallons) and are unlikely to reach fish habitat. Refueling and storage are stipulated to occur at least 500 ft from fish-bearing waterbodies. The only exception is refueling of light duty equipment. Likely sources of spills are from tanks and from transfer of fuel from storage systems to equipment. Most spills would be contained with onsite absorbents. Hence, fuel spills associated with the Preferred Alternative are expected to have the same overall effect on fish populations as discussed for the other alternatives (e.g., no measurable effect on arctic fish populations).

b) Effects from Construction

Construction-related activities that may affect arctic fish include water withdrawal for construction of drill pads, roads, and airstrips, and discharges related to exploratory drilling.

Under the Preferred Alternative, it is anticipated that 5 to 12 exploration wells and 2 to 18 delineation wells would be drilled in the Planning Area as a result of the first lease sale (Table IV-05), for a total of 7 to 30 wells on ice pads. Assuming that the average ice pad is 500 ft by 500 ft (5.7 acres), water needs would equate to approximately 2 million gallons for each drill pad for a total of 14 to 60 million gallons of water. Each mile of ice road requires up to 1.5 million gallons of water to construct. It is assumed that 0 to 2 ice roads, 25 to 50 mi long, would be built each season for a maximum annual water need of 150 million gallons. Water needed for 3 drilling rigs, associated camps and airstrips, and maintenance of roads, pads, and airstrips would add approximately another 85 million gallons to the annual water use budget. Total annual maximum water need is estimated at 295 million gallons. When compared to the other alternatives, the water needs for exploration activity in the Preferred Alternative are approximately 30 percent less than Alternative A, similar to Alternative B needs, and 240 percent more than Alternative C.

Drill pads, roads, and airstrips (if needed) would be constructed of ice. These activities occur in the winter and could adversely affect arctic fish depending on the location of the construction and the quantity of freshwater withdrawn. For example, estimates by Craig (1989a) suggest that substantially less than 5 percent of the stream habitat on the North Slope is available to fish at the end of the winter season. In the Northwest NPR-A Planning Area, fish, such as grayling and whitefish species, that inhabit rivers in the winter, are limited to deeper pools that do not freeze. These pools provide a much smaller habitable space for fish than lakes. The amount of available overwintering habitat in any given pool varies naturally each year depending on the severity of the air temperatures and the amount of snow cover. Colder temperatures and lack of snow cause increased ice formation. This condition decreases available water in any given pool and can restrict flow which forces water to the surface and eliminates flow to downstream pools. Given that fish are essentially "confined" to overwintering sites, the severity of the weather, and in turn, a decreased water supply, can cause stress and mortality from overcrowding and oxygen depletion. Reproductive success can also be affected if eggs are frozen on the spawning grounds. If water were to be withdrawn from rivers for exploration purposes, the conditions described above would be exacerbated. The concern lies in that although the amount of free water and oxygen conditions may be adequate for fish survival at the time water is withdrawn in December and January when water is needed for pads, roads, and other construction, the fish are dependent on suitable living conditions of a particular pool until spring break up. Not being able to predict the severity of the freeze down (which is weather dependent), and thus the living conditions from time of use until breakup, may cause increased or complete mortality at overwintering pools. Dissolved oxygen concentrations could be reduced below the 7 ppm dissolved oxygen standard needed to sustain fish species (ADEC, 1999) and the increase in metabolic by-products may be fatal. Schmidt et al. (1989) reported such a loss under natural conditions in the Sagavanirktok River. Adverse effects of dewatering pools are also known from the Sagavanirktok River during early development of the Prudhoe Bay oil field.

Total fish loss in a river would be dependent on how many pools are tapped. Assuming that the entire population of any given species in a drainage is spread out between overwintering sites in a river or adjacent lakes, the loss in any given pool would not eliminate a population. Tapping multiple pools increases losses and recovery times for populations. Though reproductive strategies for arctic species are known, recovery times are difficult to predict

given the uncertainty of the numbers associated with any given loss(es) as compared to the total population abundance in the system.

Concerns related to river water withdrawal have been alleviated in the Preferred Alternative. In an effort to maintain fish populations and habitat, the Required Operating Procedures for the Preferred Alternative prohibit winter water withdrawal from rivers.

Fish have also responded to habitat reductions in winter by adopting migration patterns that take them to deep lakes. Fish overwintering in these lakes have a restricted supply of fresh water. Under natural conditions, most lakes in the NPR-A coastal plain tend to be supersaturated with oxygen (USDOI, BLM, 1998).

Construction activities such as airstrip or road construction over a lake, or water withdrawal to build pads, roads and airstrips, have the potential to impact all Planning Area freshwater and anadromous/amphidromous fish that inhabit these overwintering sites. The construction of an ice road or airstrip over a lake with minimal free water could cause freezedown to the bottom and form a barrier to water circulation, resulting in reduced levels of dissolved oxygen. This could have lethal effects on the overwintering fish affected by the barrier. Also, freshwater withdrawals may adversely affect fish if the water is taken from areas where they are overwintering. Their survival at these overwintering sites depends on an adequate supply of freshwater and dissolved oxygen.

Sources of freshwater within the Planning Area vary greatly in the amount of under-ice water available for construction during winter. Many lakes along the coastal plain are relatively shallow (6 ft), do not support fish populations, and are frozen to the bottom in winter. These lakes are a possible source of ice chips for winter construction. Use of ice chips would lessen the need for fresh water withdrawal. Shallow lakes may also provide water for construction in December and January (before complete freezedown) since ice depths are likely to be approximately 3 ft at this time of the year. Withdrawals from these lakes would not impact fish.

Those lakes deep enough to permit under-ice withdrawals for construction are also likely to support overwintering fish. Under-ice withdrawals from areas having water levels that are barely to moderately sufficient to support overwintering fish could negatively change the water chemistry to a point where a fish kill is possible. "Best Management Practices" implemented by federal and state agencies commonly provide protection by monitoring withdrawals through a sampling program that ensures water quality standards are met and by limiting water withdrawal to 15 percent of the estimated free water volume (excluding ice) in lakes ($\geq$ 7 ft in depth). Additional draw down is possible if no fish are known to inhabit the lake or if the proponent demonstrates that use beyond 15 percent would cause no harm. Lakes (< 7 ft deep) that are interconnected with streams are also in need of protection when inhabited by fish.

Assuming the AO follows the above common practices when approving water withdrawals, lake water withdrawal associated with the Preferred Alternative might be expected to kill a small number of individual fish but is expected to have no measurable effect on arctic fish populations in the Planning Area.

Exploratory drilling on lakebeds and streams could also impact fish under the Preferred Alternative. Drilling fluids could cause impacts depending on storage and disposal. In most instances, drilling wastes are reinjected into the wells immediately. However, if cuttings were allowed to be temporarily stored to facilitate reinjection or backhaul, water quality could be degraded. The impact to fish is indirect. Results of past studies have shown toxicity to sensitive zooplankton, which, as a group, are prey species to fish (Woodward et al, 1988, in USDOI, BLM ,1998). Proper and immediate disposal would minimize impacts.

2) Development

Activities related to development that could impact fish include excavation of material sites, construction of pipelines, pads, roads, airstrips, and causeways; and water withdrawals.

Material sites (for gravel extraction) needed for construction of roads, pads, pipelines, and airstrips have not been identified in the Northwest NPR-A Planning Area. A likely source includes river drainages. Other possibilities include importing gravel from borrow sites east of the Colville River, extracting gravel from existing sites, processing bedrock, and using ice or composite pads. For this analysis, it is assumed that 4 oil and gas fields would be developed (Table IV-04). Each field is expected to have a footprint of 100 acres requiring one million square yards of gravel. Total gravel needs would equal four million cubic yards if 4 fields were developed. Using composite (blended mixtures of sand/silt/foam) could potentially reduce gravel needs by 33 to 50 percent. Decisions regarding future gravel use and location of pits would be made on a case-by-case basis.

From a broad perspective, gravel extraction from or near overwintering and spawning habitat is likely to adversely affect arctic fish by reducing the amount and quality of habitat available to them. Because overwintering and spawning habitat represents a small percent of the Planning Area, gravel removal from these areas would be likely to result in spawning failure (loss of suitable substrate) and mortality (loss of overwintering pools) for many fish within the affected area. Gravel removal from non-overwintering or non-spawning areas of low fish density would likely have little to no adverse effect on arctic fish populations. The same applies to gravel extraction activities that might occur outside of the Planning Area.

Direct and indirect impacts to fish from gravel extraction are most likely to occur within the floodplains of rivers. Detrimental effects could include: loss of spawning and overwintering habitat (if not identified before extraction); blocking and rerouting of stream channels; high silt concentrations resulting in reduced primary production, loss of invertebrate prey species, mortality of fish eggs and larvae, and disruption of feeding patterns for sight dependent feeders (USDOI, BLM, 1989).

Within the Planning Area, gravel has been mined from the Meade River, near Atqasuk, and from lagoons near Barrow and Wainwright. Impacts were reported by Sekerak et al. (1985) for dredging in the Meade River. They noted that size composition, not quantity of sediments, was the most important determinant in effects on water quality (the Meade River is heavily laden with clay deposits). Disturbance during dredging led to fine sediment draining from the stockpile and flowing in suspension at least 60 km downstream. Turbidities and suspended sediments were approximately 20 and 50 times greater, respectively, than background levels. The authors of this study reported that effects of dredging on turbidity and sediment loads were unusually high in the Meade River compared to other North Slope dredging operations. Differences were attributable to high amount of fine sediment (clay) in the mined product. Impacts to specific fish habitat and fish species from future gravel mining are difficult to predict at this time because the potential mining locations are unknown.

One of the beneficial aspects of gravel extraction mining in or near floodplains has been the creation of deep pits that can be used by fish as overwintering habitat. In one instance, two pits were connected to small tundra streams, Arctic grayling were introduced, and the fish developed reproducing populations (Hemming, 1995). Least cisco, grayling, and broad whitefish have been also been documented using abandoned gravel pits connected to streams (Hemming, 1988). Based on the documented successful use of reclaimed gravel pits by fish, future mitigation of gravel pits should incorporate prescriptions to create fish habitat when feasible.

During production operations, drill pads, roads, and airstrips would be constructed of gravel. One impact related to these structures is the potential to alter flow patterns to, and within, waterbodies. Bridges, culverts, and low-flow crossings are integral features to road development. They can also interfere with migrations to spawning, feeding, and overwintering sites if improperly designed. Examples of problems in maintaining adequate flows for fish passage from past oil field development include placement of under-sized culverts and perching of culverts. Current concerns related to pad and road placement include diverting or eliminating flow from small tributaries that connect lakes or connect lakes and rivers. Whitefish species found in the planning area that move between these habitat types are vulnerable to impact. Potential loss of migratory capacity could stress

or kill these fish if they are unable to migrate to food-rich habitat in the summer, reach spawning areas, or move into overwintering habitat. Proper placement of these structures is critical in minimizing impacts to fish.

A second impact related to drill pads, roads, and airstrip construction is erosion and subsequent in-stream sedimentation. Destructive effects are similar to those discussed in the gravel-mining portion of this section and would be prevalent in river systems. All members of the biotic community could be affected. Potential effects of sedimentation on benthic macroinvertebrates, which are prey species for fish, include interference with respiration and interruption of filter feeding insects' capability to secure food. A more important impact to benthic invertebrates would be smothering of physical habitat (the streambed) by heavy sediments. A loss of interstitial space in the substrate would be highly detrimental to burrowing species. A decrease in abundance could be expected in these situations. In arctic environs, where fish depend on summer food sources to grow and, if food is abundant, to reproduce, a reduced prey base may preclude fish from directing energy towards spawning.

Direct threats to fish from sediment include changes to physical habitat, subsequent decreased reproductive success and loss of rearing habitat. Physical habitat changes from sediments are most often attributed to finer size particles. Developing eggs can be smothered and newly hatched fry can be killed by suspended sediment that prevents emergence from spawning gravels and interferes with respiration. Embedded sediments fill interstitial spaces and essential winter habitat used by juvenile fish. Filling of pool habitat further limits overwintering sites for adult and juvenile fish. In instances where stream reaches are aggrading due to heavy sediment loading, physical habitat is further degraded when flows are redirected and erode channel banks.

Sub-lethal impacts to fish from sedimentation are a further concern in stream environs. Effects such as avoidance, reduced feeding, and lessened tolerance to disease can work in combination to reduce fitness and survival. Habitat fouling would be especially detrimental if it occurred in a critical habitat segment of a river.

To minimize impacts to fish from unwanted erosion and sedimentation construction activities require adequate controls. Proper road surfacing and drainage, adequate cross-drainage, minimal number of stream crossings, and armoring and vegetation planting are some of the key features needed to minimize sedimentation and subsequent impacts to fish. Overall, impacts from sedimentation and altered flow patterns related to construction of drill pads, roads, and airstrips should be minor if adequate controls are in place. Impacts from erosion should be short term and proper placement of these structures, in combination with adequate and properly sited drainage systems, should minimize fish loss.

During production, up to 205 mi of pipeline (Table IV-29) within and east of the Planning Area to the Kuparuk oil field are projected to be constructed as a result of developing leases sold during the first sale under the Preferred Alternative. It is assumed pipelines would be constructed in winter, either from ice roads or via vehicular travel on the tundra. Pipeline alignments would generally be routed to avoid crossing lakes, though small shallow lakes may have elevated VSM's across them. New pipelines constructed on land, and around the shoreline of deeper lakes, would be suspended on VSM's. Pipe crossing wide, deep rivers would be horizontally tunneled approximately 100 ft beneath the riverbed. Pipelines constructed in this manner are not likely to have an effect on arctic fish. New pipelines crossing wide, shallow rivers would be trenched and buried within the streambed during winter. Pipelines constructed in this manner could adversely affect fish if the trenching is done in or near overwintering or spawning habitats. Effects would be the degradation or loss of overwintering and spawning habitat, resulting in spawning displacement and mortality for those fish near the disturbance. Because overwintering and spawning habitats normally are located in deepwater environments, the trenching of shallow rivers during pipeline construction is not likely to adversely affect these habitats. Pipeline trenching through non-overwintering and/or spawning areas (> 95% of the Planning Area) is not expected to have a measurable effect on arctic fish populations.

The construction of overland gas pipelines through waters supporting fish is likely to displace small numbers of fish short distances. However, those affected would soon reoccupy that habitat upon completion of the activities and would be otherwise unaffected. For these reasons, natural gas exploration and development is not likely to

have a measurable effect on fish populations.

Given that construction activities are in the winter and overwintering habitats would be largely avoided, it is expected that pipeline construction under the Preferred Alternative would have no measurable effect on arctic fish populations in the Planning Area.

The Preferred Alternative could also result in the construction of a coastal docking facility to offload supply barges into the Planning Area. The effect of a docking facility on arctic fish would depend on its location, size, and design characteristics. The construction of a large docking facility in offshore waters and requiring a long access road could adversely affect the movement of some coastal marine and migratory fish. However, the construction of a facility that provides for the movement of these fish is not likely to adversely affect them. Because supply barges are shallow draft vessels, the docking facility is expected to be constructed in shallow nearshore waters. Additionally, the size of the facility is expected to be relatively small (up to several hundred feet), and to provide for the movement of coastal fish. Prohibiting causeways and docks in river mouths and deltas would offer further protection to migratory and marine fish species feeding in nearshore waters. Given the implementation of siting and design considerations discussed above, the construction of a coastal docking facility under the Preferred Alternative is not expected to have a measurable effect on arctic fish.

Water is needed during development for drilling, camp use, and ice roads for staging materials and equipment used in constructing new fields. Estimated quantities that may be required are derived from analysis of Alpine field development. Potable water demand (350-person crew) would be 35,000 gallons/day. Drilling water demand is estimated at 21,000 to 63,000 gallons/day. Since drilling locations are unknown, water demand for ice roads is not estimated. Impacts of water withdrawal are similar to those discussed in the exploration portion of this analysis.

(b) Effects of Spills

For the Northwest NPR-A Planning Area, the total estimate of oil spilled under the Preferred Alternative is given as a range based on an $18/bbl or $30/bbl scenario. No spills are assumed at $18/bbl. Assumed crude spill sizes at $30/bbl include 500 or 900 bbl for a large spill ($\geq$ 500 bbl) (Table IV-19) and 336 bbl for small spills (< 500 bbl) (Table IV-20). For small spills, an estimated 112 spills might occur at an assumed size of 3 bbl/spill (Table IV-17). Refined oil spill amounts are estimated at 194 bbl (Table IV-20). The oil spill analysis estimates that 65 to 80 percent of the crude oil spills associated with oil production in the Northwest NPR-A would occur on a drilling-pad. Most of the refined spills are likely to occur on pads. Because drilling-pad oil spills typically are small and easily cleaned up, they are not expected to come in contact with fish habitat and would have no perceptible effect on arctic fish. The oil-spill analysis also estimates that 20 to 35 percent of the oil spills would occur off drilling pads in the surrounding environment. Most of these cover a small area (about 500 ft^2). Impacts of these spills are discussed below.

The effects of oil spills on fish have been discussed in previous Beaufort Sea EIS's (e.g., Sale 144 final EIS [USDOI, MMS, 1996a]), which are incorporated here by reference and summarized. Oil spills have been observed to have a range of effects on fish (see Starr, Kuwada, and Trasky, 1981; Hamilton, Starr, and Trasky, 1979; and Malins, 1977, for more detailed discussions). The specific effect depends on the concentration of petroleum present, the length of exposure, and the stage of fish development involved (eggs, larva, and juveniles are most sensitive). If lethal concentrations are encountered (or sub-lethal concentrations over a long enough period), fish mortality is likely to occur. However, mortality caused by a petroleum-related spill is seldom observed outside the laboratory environment. Most acute-toxicity values (96-hour lethal concentration for 50 percent of test organisms [LC50]) for fish generally are on the order of 1 to 10 ppm. Concentrations observed under the slicks of former oil spills at sea have been less than the acute values for fish and plankton. For example, concentrations observed 0.5 to 1.0 m beneath a slick from the *Tsesis* spill (Kineman, Elmgren, and Hansson, 1980) ranged from 50 to 60 ppb. Extensive sampling following the *Exxon Valdez* oil spill (about 260,000 bbl in

size) also revealed that hydrocarbon levels were well below those known to be toxic or to cause sub-lethal effects in plankton (Neff, 1991). The low concentration of hydrocarbons in the water column following even a large oil spill at sea appears to be the primary reason for the lack of lethal effects on fish and plankton.

If a fuel spill of sufficient size were to occur in a small, fish-containing body of water with restricted water exchange, lethal and sub-lethal effects would be expected on most of the fish and food resources in that waterbody. Toxic concentrations of oil in a confined area would have greater lethal impacts on larval fish versus adults. McKim (1977) reviewed results from 56 toxicity tests and found that, in most instances, larval and juvenile stages were more sensitive than adults or eggs. Increased mortality of larval fish is expected since they are relatively immobile and are often found at the water's surface where contact with oil is most likely. Adults may be able to avoid contact with oiled waters during a spill in the open water season but survival would be expected to decrease if oil were to reach an isolated pool of ice covered water. An example of the impacts to fish food resources is provided by Barsdate et al. (1980), who studied the limnology of an arctic pond (490 m^2) with no outlet near Barrow after an experimental oil spill. They found that half of the oil was lost during the first year. The remaining oil was trapped along the edge of the pond with most of it sunk to the bottom by the end of summer. Researchers found no change in pH, alkalinity, or nutrient concentrations. Photosynthesis was briefly reduced and then returned to normal levels after several months. *Carex aquatilis*, a vascular plant, was impacted after the first year as a result of emerging leaves encountering oil. Certain aquatic insects and invertebrates that lived in these plant beds were reduced in numbers, presumably from entrapment in the oil on plant stems. Some of the insects were still absent 6 years after the spill. Since there were no fish in this pond the impact of the loss of a prey base to the fish could not be measured. However, reducing food resources in a closed lake, as described above, would decrease fitness and potentially reduce reproduction until prey species recovered.

Though lethal effects of oil on fish have been established in laboratory studies (Rice et al., 1979; Moles, Rice, and Korn, 1979), large kills following oil spills are not well documented. This is likely because toxic concentrations are seldom reached (Rice, 1985). For the Planning Area, most fuel spills are expected to occur on the pad where the fuel is stored and would not come in contact with fish habitat. In instances where oil does reach the water, sub-lethal effects are more likely to occur, including changes in growth, feeding, fecundity, survival rates and temporary displacement. Other possibilities include interference with movements to feeding, overwintering, or spawning areas, localized reduction in food resources, and consumption of contaminated prey. Areas of high fish concentration, including overwintering and estuarine feeding sites, provide the most potential for impact. Amphidromous species that inhabit planning area waters have a higher risk of impact due to their use of both of these habitat types.

Given the small size of the fuel spills anticipated and that occurrence is most likely on pads, fuel spills associated with the Preferred Alternative are not expected to have a measurable effect on arctic fish populations in the Planning Area over the life of this plan. Fuel spills occurring in a small, fish-containing body of water with restricted water exchange might kill a small number of individual fish, but are expected to have no measurable effect on arctic fish populations.

Natural gas exploration and development could adversely affect arctic fish from a natural gas blowout. In the unlikely event a natural gas blowout were to occur, some fish in the immediate vicinity might be killed. Natural gas and condensates that did not burn in the blowout would be hazardous to any organisms exposed to high concentrations. In general, very few fish are likely to be affected by a blowout, and any effects would not be measurable at the population level.

The effects of a seawater pipeline spill on freshwater fish populations would depend on the specific location, size, and timing of the spill. No effect would be expected during the winter period when the surface is already covered by ice. During the spring and summer large quantities of seawater entering a fish-bearing freshwater environment would have from no effect on freshwater fish to lethal effects, depending on the specific waterbody involved, the size of the seawater spill into that waterbody, and the rate of freshwater exchange within that waterbody. Migratory fish are less likely to be affected by seawater spills because of higher tolerance to seawater, and the probability that most would have already left the freshwater environment by spring in their migration to sea. In

large waterbodies seawater spills are expected to have from no effect to sub-lethal effects on freshwater fish. In small waterbodies with restricted water exchange, lethal effects are more likely to result from a medium to large seawater spill. Because of the small size of the seawater spills anticipated, and the low diversity and abundance of freshwater fish in most of the Planning Area, seawater spills are not expected to have a measurable effect on arctic fish populations in the Planning Area over the production life of the field.

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(c) Summary

The primary effects of the Preferred Alternative on freshwater fish would be from water withdrawal from rivers and lakes. The ROP's for this alternative limit potential loss of fish by precluding water withdrawals from streams in winter and limiting the volume of water withdrawn from lakes. Activities related to development that could impact fish include excavation of material sites and construction of pipelines, pads, roads, airstrips, and causeways. Gravel extraction has potential for habitat creation and enhancement. Impacts from sedimentation and altered flow patterns related to construction of drill pads, roads, and airstrips should be minor if adequate controls are in place. Given the small estimated size of the fuel spills and the fact that such spills are most likely to occur on drill pads, fuel spills associated with Preferred Alternative activities are not expected to have a measurable effect on the arctic fish populations in and adjacent to the Planning Area. Fuel spills occurring in a small fish-containing body of water with restricted water exchange might be expected to kill a small number of individual fish. In the event a natural gas blowout occurred, some fish in the immediate vicinity might be killed.

(3) Effectiveness of Stipulations and Required Operating Procedures

ROP's A-3, A-4, and A-5 would provide increased protection to fish and fish habitat during fuel use, handling, and storage. Stipulations B-1 and B-2 would provide protection for water withdrawals from rivers and lakes. ROP C-4 would protect rivers and lakes from additional freezedown. Stipulation D-1 would reduce impacts during oil and gas exploratory drilling. Stipulation E-3 would reduce the potential for disruption of fish passage. ROP's A-6, A-7, C-2, C-3, E-6, and E-8, and stipulations E-2, K-1, K-2, K-3, and K-8 would also be beneficial to fish habitat and fish.

(4) Conclusion--First Sale

Construction of pads, roads, and airstrips, and fuel spills associated with Preferred Alternative activities might be expected to kill a small number of individual fish, but are expected to have no measurable effect on arctic fish populations. Potential mortality from water withdrawals in lakes is also possible, although limits on withdrawal and monitoring of water quality should minimize concerns. Gravel extractions can lead to habitat enhancement under certain situations. Seismic surveys, non-oil and gas activities, causeways, and seawater spills under the Preferred Alternative are not expected to have a measurable effect on arctic fish populations over the production life of the oil fields. Potential mitigation measures address water withdrawal in rivers and lakes and gravel extraction.

(5) Multiple Sales

It is assumed that multiple sales under the Preferred Alternative would result in the development of an additional

4 oil/gas fields (Table IV-04 and Table IV-06), that exploratory well numbers would increase from 5 to 12 under a single sale to 15 to 36 for multiple sales, and delineation wells would increase from 2 to 18 under a single sale to 6 to 36 (Table IV-07). An additional 340 mi of pipeline is projected (Table IV-29). Seismic activity would remain the same.

Water withdrawals would increase in proportion to the activity level. Given the large number of lakes in the area likely to be developed, water withdrawal could be spread across a number of lakes. Increased water use is not expected to impact fish more severely than under a single sale. More production pads and roads for multiple sales are likely to have about twice the effect on arctic fish as the first sale (Table IV-05 and Table IV-07). It is estimated that the amount of crude oil spilled would double. The impacts would also double, though they would still be minor. However, if there were not enough time between activities to allow for full recovery, or if the level of activity of the selected alternative was to be significantly greater than that of the first sale, the effect of each additional sale on arctic fish populations would likely to be greater than estimated herein for multiple sales.

(6) Conclusion--Multiple Sales

Seismic surveys and pipelines associated with multiple sales are expected to have the same overall effect on arctic fish populations as with the first sale. Production pads and roads are expected to have about twice the effect as with the first sale. Fuel and oil spills are likely to have a greater, though still minor, effect on arctic fish populations than the first sale. Insufficient recovery time between sales and/or greater levels of activity would be likely to result in greater effects than estimated herein for multiple sales.

b. Marine Fish

Under the Preferred Alternative, all lands within the Northwest NPR-A Planning Area would be available for oil and gas leasing. However, leasing would be deferred for 10 years on approximately 1,570,000 acres (about 17%) of the Planning Area in the vicinity of Wainwright. Stipulations and Required Operating Procedures would provide clearly defined setbacks, restrictions (including seasonal restrictions) and guidance for all aspects of oil and gas and related operations. Additional site-specific/activity-specific prohibitions and restrictions would be provided to protect marine fishes and their habitat. Several species of marine fish (see Figure III-25) occur year round or seasonally in coastal or marine waters in or adjacent to the Planning Area. Under the Preferred Alternative, some marine fishes may be impacted by oil and gas exploration and development activities.

On Dease Inlet, Admiralty Bay, Elson Lagoon, and the Barrier Islands there would be stipulations for exploration and development including a setback of ¾ mi seaward from shore and around natural islands (excluding the barrier islands) where no development could occur on or under the water. No exploration could occur between May 15 and October 15. Lease stipulations and associated standards for exploration and development activities are set high with the burden of proof resting with the lessee to demonstrate that approval by BLM is warranted.

(1) Effects of Non-Oil and Gas Activities

Activities not related to oil and gas exploration and development are not likely to have a measurable effect on marine fishes.

(2) Effects of Oil and Gas Activities

Oil and gas industry activities likely to affect marine fishes stem from seismic surveys, coastal construction and development, vessel traffic, and chemical spills (including oil or diesel spills). Such activities could be adverse or beneficial--or both--to marine fishes and their habitat. Additional details on these activities and their potential impacts are discussed below and can also be found in the MMS Beaufort Sea EIS (USDOI, MMS, 2003).

(a) Effects of Disturbances

Marine fishes and their habitat may be affected by the following routine impact-producing factors: seismic surveys, coastal construction and development, and marine vessel traffic. Such routine activities may result in lethal and/or sublethal impacts to marine fishes. Some species may be adversely impacted, while others may benefit from the impact-producing factors, although those species benefiting and those suffering adverse impacts would depend on a suite of dynamic variables. For example, the construction of a coastal docking facility may temporarily displace individuals of a species (e.g., arctic flounder) from the seafloor where construction is occurring, however, after construction ceases, the underwater footprint and structure of the docking facility may offer new heterogeneity refugia or habitat that could be exploited and repopulated by the displaced species (e.g., arctic flounder), and/or utilized by other species (e.g., snailfishes, prey species).

Seismic surveys in coastal waters of the Planning Area may be conducted during colder months. Vibroseis is the commonly used sound source for siesmic surveying in the arctic. Vibroseis, if used on sea ice, may temporarily disturb marine fishes that are in the proximate area, however, such impacts are not regarded to be biologically significant.

Drilling inland is not expected to yield measurable impacts to marine fishes or their habitats. However, onshore and offshore coastal lands are available for leasing, thereby probably leading to exploration and development; drilling in coastal waters may impact marine fishes and their habitat. Drilling introduces noise into the coastal/marine environment that may temporarily disturb marine fishes (e.g., Arctic cod, fourhorn sculpin, or Arctic flounder) or their prey (e.g., mysids and amphipods). Such effects are not expected to be biologically significant or measurable. Such disturbance may be advantageous to some individual fishes or species, or adverse for some species--or both. The North Slope is a zero discharge area, hence, drilling muds and cuttings are not expected to be introduced into coastal/marine waters where they might impact early life stages of marine fishes or introduce constituents into the food web for bioaccumulation or biomagnification.

The construction of various facilities associated with the Preferred Alternative may impact marine fishes. Those construction projects most likely to impact marine fishes include: coastal staging facilities, particularly docking facilities; coastal drilling or production facilities; waterflooding intake and treatment plants; causeways; and pipelines. Construction of docking facilities and similar staging facilities, particularly if they are located in coastal/marine waters would diminish the area available as fish habitat, yet also possibly create new habitat (most notably refugia) Also like coastal drilling, construction in coastal/marine waters would introduce additional noise into marine fish habitat, thereby possibly disturbing fishes or their prey. Such acoustic disturbance is expected to be localized and limited to the periods of noise production. The impacts may be adverse or beneficial, depending on the species and life history assemblages present at the time of construction activity. If the amount of coastal/marine construction of facilities is restricted in scope and activity (i.e. one coastal staging facility of limited size) over the lifetime of the Preferred Alternative, the impacts are not expected to be biologically significant or measurable.

Waterflooding intake and treatment plants may entrap and impinge marine fishes, if the intake is located where such fishes occur. Approximately 1.5 million fish larvae of 9 fish species were estimated to have been entrained in the Prudhoe Bay facility in 1985 (NRC, 2003). The cumulative impacts to marine fish populations in the region as a result of constructing additional waterflood intakes from coastal waters is difficult to predict, since the

abundance and population dynamics of the various marine fishes inhabiting the Planning Area and adjacent waters is poorly known or understood.

Construction of causeways may impact marine fishes. Causeways in the Beaufort Sea are among the most intensively studied anywhere (NRC, 2003). According to the NRC (2003), causeway studies revealed that, when wind is from the east, a wake eddy forms on the west side of the causeways that allows cold, high-salinity water to reach the surface. The cell of cold water on the west side of West Dock (a causeway on the Beaufort Sea) is the mechanism that most likely impedes fish movements. However, the issue of whether such impedance of fish movements by causeways is biologically significant is heavily disputed. The NRC (2003) cited Gallaway and Fechhelm (2000) as concluding that fish populations in the region appear to be fluctuating in response to naturally occurring physical phenomena, and that effects of existing causeways have been at least partially mitigated with retrofitted breaches, thereby permitting fish movement through the causeways. If causeways are constructed they may impact some marine fish species, but their impacts may be mitigated by incorporating breaches that permit fish movement. Causeways may also provide new habitat and refugia to marine fishes and their prey.

The construction of pipelines in coastal/marine waters may temporarily disturb marine fishes and their prey. Emplacement of a pipeline in coastal waters may destroy habitat or result in lethal and sublethal impacts to prey. Such impacts are expected to be localized and limited to period of physical disturbance caused by pipeline construction. Marine fishes may scatter from the area of physical disturbance for a short period, and return following the abatement of disturbance. Some marine fish species may return to the disturbed area to scavenge on benthic invertebrates that are displaced, killed or injured by the placement of the pipeline (a beneficial impact to some marine fishes).

Decommissioning and abandonment of facilities involves the removal of equipment and restoration of the facility site. Associated abandonment activities may result in disturbances of coastal/marine waters (e.g. decommissioning of a docking facility). Abandonment operations may occur over a period of years, although timing and scope of actual disturbances as a result of the operations may vary. Decommissioning and abandonment operations may result in lethal or sublethal effects to marine fishes and their prey, as well as destroy marine fish habitat created by the structures being decommissioned and dismantled. Some marine fishes may be opportunistically consumed by various predators, including other marine fishes, as individuals are suddenly exposed as a result of destroying refugia (e.g. pipes, braces, pilings, etc.) during decommissioning operations. In such cases, decommissioning and abandonment operations may be beneficial to some individual marine fishes, and/or adverse for other marine fishes.

Inland and coastal oil and gas exploration and development operations are contingent on logistic supplies and equipment barged into the region. Marine vessel traffic introduces ancillary acoustic noise and physical disturbances into the coastal/marine environment. Such acoustic or physical disturbances may be adverse and/or beneficial to marine fishes and their habitats, however, the disturbances are not believed to be biologically significant or measurable.

(b) Effects of Spills

Hydrocarbon spills may adversely impact marine fishes of any life history stage. Such impacts may include sublethal and/or lethal effects. The intensity of the effects upon a marine fish population or assemblage of species is dependent on a suite of dynamic factors. The size of the spill does not necessarily directly relate to the number of individuals that may be impacted. Hydrocarbons may be introduced into the coastal/marine environment as a result of marine vessel overboard discharges or facility spills.

Oil spills can more specifically affect marine fishes and their habitat in many ways, including the following:

- cause unnatural mortality to eggs and immature stages, abnormal development, or delayed growth from acute or chronic exposures in spawning or nursery areas;
- impede the access of migratory fishes to spawning habitat because of contaminated waterways;
- alter behavior;
- displace individuals from preferred habitat;
- constrain or eliminate prey populations normally available for consumption;
- impair feeding, growth, or reproduction;
- contaminate organs and tissues and cause physiological responses, including stress;
- reduce individual fitness and survival, thereby increasing susceptibility to predation, parasitism, zoonotic diseases, or other environmental perturbations;
- increase or introduce genetic abnormalities within gene pools, and
- modify community structure that benefits some fisheries resources and detracts from others.

Concentrations of petroleum hydrocarbons are acutely toxic to finfishes a short distance from and a short time after a spill event (Malins, 1977; Kinney, Button, and Schell, 1969). However, the majority of adult finfish are able to leave or avoid areas of heavy pollution and thus avoid acute intoxication and toxicity. Evidence indicates that populations of free-swimming finfish are not injured by oil spills in the open sea (Patin, 1999). Conversely, floating eggs, and juvenile stages of many species can be killed when contacted by oil (Patin, 1999), regardless of the habitat. In coastal shallow waters with slow water exchange, oil spills may kill or injure demersal finfish, shellfish, and other invertebrates in addition to cultivated species.

The contact of aquatic organisms with oil most often results in the appearance of oil odor and flavor in their tissues (Patin, 1999). In the case of commercially valued fishery resources, this certainly means the loss of their value and corresponding fisheries losses. Experimental studies show that the range of water concentrations of oil causing the taint in fish, crustaceans, and mollusks is very wide. Usually these concentrations vary between 0.01 and 1.0 milligrams per liter, depending on the oil type, composition, form (dissolved, slick, emulsion), duration and conditions of exposure, kind of organism, and other factors (Patin, 1999). Migratory fishes (for example, salmon or herring) tainted by oil in one location may move well beyond the recognized boundaries of an oil spill, thereby becoming available for harvesting elsewhere. Patin (1999) drew the following conclusions from various studies devoted to the tainting of commercial organisms in oil-polluted areas:

- The contact of commercial fish and invertebrates with oil during accidental oil spills practically always leads to accumulation of oil hydrocarbons in their tissues and organs (usually within the ranges of 1 to 100 milligrams per kilogram). In most cases, the organisms acquire an oil odor and flavor. This fact is the main reason for closing fisheries in the affected area.

- Species reared in coastal mariculture/aquaculture facilities can be exposed to severe impact of accidental oil spills. Observations showed that several months after the spill, salmon cultivated at facilities still had elevated concentrations of oil hydrocarbons in their tissues and suffered diseases and increased mortality (citing MLA, 1993a).

While tainting of fisheries resources in some regions may not pose a real threat to consumers (for example, the North Sea), fish tainting can be a real problem, especially for coastal fishing and aquaculture (Patin, 1999).

The most serious concerns arise regarding the potential sublethal effects in fisheries resources (including commercially valued species) when exposed to chronic contamination within their habitats (Patin, 1999). It is striking that the toxicity of oil pollution to aquatic populations has been seriously underestimated by standard short-term toxicity assays, and the habitat damage that results from oil contamination has been correspondingly underestimated (Ott, Peterson, and Rice, 2001). Research studies show that intertidal or shallow benthic substrates

may become sources of persistent pollution by toxic polycyclic aromatic hydrocarbons following oil spills or from chronic discharges (Rice et al., 2000). Bivalves exposed to background contamination of polycyclic aromatic hydrocarbons may experience biological responses at the cellular level, disease, and histopathological changes (Patin, 1999). Finfish sublethal responses include a wide range of compensational changes (Patin, 1999). These start at the subcellular level and first have a biochemical and molecular nature. Recent research, mostly motivated by the *Exxon Valdez* oil spill, has found (1) polycyclic aromatic hydrocarbons are released from oil films and droplets at progressively slower rates with increasing molecular weight, leading to greater persistence of larger polycyclic aromatic hydrocarbons; (2) eggs from demersally-spawning fish species accumulate dissolved polycyclic aromatic hydrocarbons released from oiled substrates, even when the oil is heavily weathered; and (3) polycyclic aromatic hydrocarbons accumulated from aqueous concentrations of less than 1 part per billion can lead to adverse sequelae appearing at random over an exposed individual's lifespan (Rice et al., 2000). These adverse effects likely result from genetic damage acquired during early embryogenesis caused by superoxide production in response to polycyclic aromatic hydrocarbons. Therefore, oil poisoning is slow acting following embryonic exposure, and adverse consequences may not manifest until much later in life. The frequency of any one symptom usually is low, but cumulative effects of all symptoms may be considerably higher (Rice et al., 2000). For example, if chronic exposures persist, stress may manifest sublethal effects later in a form of histological, physiological, behavioral, and even populational responses, including impairment of feeding, growth, and reproduction (Patin, 1999). Chronic stress and poisoning also may reduce fecundity and survival through increased susceptibility to predation, parasite infestation, and zoonotic diseases. These can affect population abundance and subsequently community structure. For more information summarizing the various adverse effects (both individual and population level) to ichthyofauna or their habitats (see Tables 29 and 30 of Patin, 1999).

There is an estimated 0 to 33 percent chance of one or more spills occurring. For purposes of analysis the spill could be a 500- or 900-bbl spill under the Preferred Alternative (Table IV-19). If this spill were to occur near the Dease Inlet/Admiralty Bay/Elson Lagoon area, some of the oil could reach coastal/marine waters, thereby exposing marine fishes, their prey, and habitats to hydrocarbons.

A range of 0 to 83 crude-oil spills of <1 bbl and 0 to 28 crude-oil spills ≥ 1 bbl and < 500 bbl (total volume of 0 to 336 bbl) and 0 to 227 small fuel-oil spills with an average size of 29 gal are projected to occur onshore under the Preferred Alternative for the first sale (Table App 9-7 and Table App 9-9). These small onshore spills are expected to have little effect on marine fishes. However, some of these spills could enter the Dease Inlet/Admiralty Bay/Elson Lagoon area, thereby exposing some marine fishes, their prey, and habitats to contamination.

Modeling projections of spill movement after entering coastal waters and its subsequent fate are unavailable at this time. Marine fish species (particularly eggs, larvae, and juvenile fishes) inhabiting shallow intertidal and subtidal waters are believed most vulnerable to the acute and chronic effects of oiling, although fishes with early life stages that frequent the upper few meters of the water column also may be acutely and adversely impacted by spilled hydrocarbons. There is a low likelihood that an inland spill may reach coastal/marine waters of the Planning Area, hence, it appears unlikely that a spill would result in a biologically significant or measurable impact to marine fishes. If a spill adversely impacted a rare and native marine fish species or its habitat, it might constitute a biologically significant impact.

A variety of toxic chemicals is used for exploration and production operations. Chemical spills (other than hydrocarbons) may occur. However, their introduction into coastal/marine waters inhabited by marine fishes is regarded as unlikely, chiefly because most permanent facilities would be set back at least ¾ mi from the coastline and ½ mi from a stream or riverbed.

(3) Effectiveness of Stipulations and Required Operating Procedures

Stipulation K-3 would prohibit oil and gas exploration operations on Dease Inlet, Admiralty Bay, and Elson Lagoon (including natural and barrier islands) between the periods of May 15 and October 15 of each season. This greatly minimizes the window of possible impacts to marine fishes and their habitat from exploration operations. The stipulation includes a number of other requirements. However, these requirements include caveats to be applied on a case-by-case basis that may influence their effectiveness.

Stipulation K-6 would require permanent oil and gas facilities to be located ¾ mi inland from the coastline to the extent practicable. Stipulation K-1 would require facility setbacks of ½ to ¾ mi from stream and riverbeds (waterway specific). These stipulations would thereby reduce the potential for accidental spills to enter coastal/marine waters where marine fishes might be impacted. They would increase the opportunity for oil-spill response and cleanup well before they enter either riverine or coastal/marine fish habitats. Consequently, they reduce the potential for a spill to adversely impact marine fishes.

ROP's A-1 through A-7 dealing with waste prevention, handling and disposal and spill prevention reduce the potential for introducing fuel and oil spills into environments inhabited by marine fishes. Because accidental spills occur, the preparation for and response thereto has the potential to greatly mitigate the magnitude of potentially adverse effects of hydrocarbon spills on marine fishes. Hence, the stipulations and ROP's may reduce the number of individual fishes impacted by a spill and the intensity of lethal and sublethal effects upon them.

(4) Conclusion--First Sale

Based on the assumptions discussed in the text, exploration and production activities resulting from the Preferred Alternative are not expected to have a biologically significant or measurable effect on marine fish populations. Hydrocarbons spilled and introduced into coastal/marine waters may adversely impact marine fishes. If such a spill were to occur in coastal/marine waters, it would likely result in lethal and sublethal impacts to marine fishes, particularly eggs, larvae, and juveniles of species that inhabit impacted intertidal, subtidal, and pelagic waters near the coast. Spill residuals in nearshore habitats may adversely impact marine fish populations utilizing such habitat for more than a decade.

(5) Multiple Sales

The most likely events to affect marine fish as a result of multiple lease sales are seismic surveys, drilling, construction, vessel traffic, and chemical spills. Additional NPR-A lease sales would proportionally increase the levels of activities relative to the levels conducted for the first sale, and thereby increase the probability of disturbance or spills into marine fish habitat.

(6) Conclusion--Multiple Sales

Multiple sales may result in increased impacts to marine fishes over those anticipated for a single lease sale. Insufficient recovery time between sales and/or greater levels of activity may result in greater overall imapcts to marine fish.

c. Essential Fish Habitat (EFH)

As discussed in the No Action Alternative (Section IV.B.8.c), EFH is unlikely to be affected. The potential impacts to the few salmon that are present in the Northwest NPR-A Planning Area are much the same as those for all other fish species. Consequently, impacts on salmon, as part of EFH, are evaluated in the freshwater fisheries analysis for this alternative.

9. Birds

This section discusses potentially adverse effects of management actions on non-endangered birds within the Northwest NPR-A Planning Area under the Preferred Alternative. Such actions--including oil and gas exploration and development--potentially could result in: 1) altered distribution, abundance and/or behavior resulting from disturbance during the breeding, molting, or migration periods; 2) alteration of habitats; and 3) effects resulting from pollution of the environment by crude oil or refined products, wastewater, and solid/liquid wastes of various toxicity. This analysis assumes the stipulations and required operating procedures (ROP's) in Section II.C.6 are in place. Nearly all of the approximately 70 species of regularly occurring birds are migrants, seasonally occupying a variety of wetland, tundra, riverine, and marine habitats in or adjacent to the Northwest NPR-A portion of the Arctic Coastal Plain (ACP). Principal bird groups considered here include loons and waterfowl, shorebirds, raptors, passerines, and seabirds.

a. Effects of Non-Oil and Gas Activities

Effects from management actions other than oil and gas exploration and development under the Preferred Alternative are likely to be somewhat greater than those discussed under the No Action Alternative, Section IV.B.9 , summarized below. This is because several categories of anticipated non-oil and gas activities, including aircraft use and duration of summer camp occupation, increase under the Preferred Alternative (Table IV-28). Anticipated numbers of overland trips and Colville River float trips are the same. The No Action Alternative proposes no new protected areas, while the Preferred Alternative proposes the Kasegaluk Lagoon for designation as a Special area and deferral or oil and gas leasing for 10 years in the eastern Northwest NPR-A Planning Area (see discussion under Section V.B.9.b below).

Most ground transport activities occur in winter and thus would not disturb most bird species or affect their habitats. Ptarmigan, gyrfalcon, and snowy owl may be displaced temporarily from vehicle routes--a negligible effect.

Bird species are likely to display variable displacement from within 700 ft to about 3,000 ft of large summer encampments (Grubb et al., 1992; Johnson et al., 2003; Murphy and Anderson, 1993; Skagen, Knight, and Orians, 1991; Stalmaster and Newman, 1978), causing a local decline in nest attempts or nesting success. Of particular concern are species that are sensitive to disturbing activities and are uncommon and/or have shown general or ACP population declines, such as yellow-billed and red-throated loons and Sabine's gull. Local breeding pairs of affected species are likely to experience minor declines in breeding attempts or success from disturbance in summers when camps are occupied. This is likely to vary depending upon the availability of appropriate habitat in the vicinity. Under the Preferred Alternative (as well as Alternatives A, B, and C), occupation of large camps is anticipated to be 12 weeks rather than 6 weeks, as under the No Action Alternative (Table IV-28). However, this difference is not likely to substantially alter the disturbance effects on birds because, in the context of the short arctic breeding season, those that are displaced when the camp is first occupied probably would not return to the area to re-nest after 6 weeks any more than after 12 weeks since there is insufficient time remaining in either scenario to raise a brood. Also, those individuals that are tolerant of camp activity for 6 weeks probably would be tolerant for 12 weeks.

Effects of a few small camps that are in place for a period of 6 to 12 weeks are likely to be negligible for most activities and species, but potentially could cause a minor loss of productivity if larger numbers of camps affect a larger area of habitat occupied by some species that are uncommon, decreasing, or recently declined, as discussed above for large camps. If predators, such as foxes and ravens, are attracted to camps, they may decrease local breeding success of local bird communities--still a negligible population effect. Habitat loss from non-oil and gas activities in Northwest NPR-A, though somewhat greater under the Preferred Alternative than the No Action Alternative, is expected to be negligible. Solid material removal and fuel spill cleanup and remediation may disturb local nesting, brood rearing, or molting birds for varying periods, resulting in a few failed nests or some decreased productivity. However, spills of refined-oil products are likely to be contained and cleaned up before contacting birds. Small groups traveling on the Colville and other rivers at the frequency anticipated are expected to cause negligible disturbance of nesting raptors or passerines. The overall effect of ground-based activities is expected to be negligible, except for the presence of large camps (and small camps if occupied in numerous locations), which could result in minor impacts.

Effects of routine aircraft flights into large camps may range from causing avoidance of certain areas by birds to abandonment of nesting attempts or lowered survival of young--minor effects. Regardless of where they originate, such flights may pass over high-density areas of one or more species. Aerial survey flights for monitoring bird or caribou populations have considerable potential for disturbance of birds because they are flown at low altitude. However, in any given area they are of short duration, and cover only a small percentage of the ACP per season, so areawide disturbance effects are likely to be minimal. Other aerial surveys also cover small percentages of the Planning Area. For this reason, the increase from 2 weeks of wildlife surveys under the No Action Alternative to 3 weeks under the Preferred Alternative--or increase of other surveys from occasional to several 1 to 2 week periods--is not likely to increase disturbance in any given area substantially (Table IV-28). In isolated areas, aircraft effects are likely to be negligible.

Quantitative effects of most factors may be difficult to separate from natural variation in population numbers. Stipulations and ROP's would minimize disturbance from most factors, prevent spilled fuel from reaching surrounding habitats, and help prevent pollution and degradation of essential bird habitats.

b. Effects of Oil and Gas Activities

Oil and gas leasing, exploration, and development/production is anticipated for all BLM-administered lands in the Planning Area under the Preferred Alternative (Map 18). The proposed Kasegaluk Lagoon Deferral Area (approximately 17% of the Planning Area) would not be offered for leasing for 10 years. Exploration and development/production activity could vary substantially depending on the per-barrel price of oil (Table IV-05 and Table IV-07). Thus, for the first sale the number of exploration wells could range from 5 to 12, delineation wells from 2 to 18, exploration/delineation rigs from 1 to 3, production pads from 0 to 6, and staging bases from 1 to 2 (Table IV-05); an estimated 205 new pipeline miles would be constructed (Table IV-29). If only exploration were to occur, activities would be expected to take place over a period of 7 years. If development were to follow, 10 years would be required. Production is estimated to last 22 years. Development in the Planning Area is expected to involve relatively small, interconnected gravel structures.

(1) Effects of Disturbances

(a) Exploration

During the exploratory phase, seismic surveys to gather geological data are carried out during winter months (December-April) when nearly all birds are absent from the region. Under the Preferred Alternative it is assumed that three seismic survey operations would occur during each winter season in the Planning Area. A typical 2-D

operation consists of 10 vehicles with a crew of 40 to 60 people traversing 200-ft-wide gridlines 5 to 10 mi apart, and may cover about 500 line-miles (804.5 km) in an area of about 1,200 mi^2 (3,108 km^2), which represents about 8.8 percent of the Northwest NPR-A Planning Area. Such an operation could displace small numbers of ravens, ptarmigan, gyrfalcons, and snowy owls temporarily from within 700 ft (213 m) to about 3,000 ft (1 km or 0.6 mi) of the local activity area around each 5- to 10-mi segment of the survey grid as it is occupied in sequence during the winter season, as well as around the mobile camp (moved every 3 to 7 days) that houses the crew during the survey. At average snowy owl densities of 0.023/km^2 (Larned, Stehn, and Platte, 2003) for example (assuming most individuals stay in the same general area for most of the winter), a potential maximum of 71 owls could be disturbed temporarily in sequence along the survey route traveled during one winter season. A 3-D operation (involving a crew of 50 to 80 people collecting 2 to 4 mi^2 (5.2 to 10.4 km^2) of data per day can cover about 450 mi^2 (724 km^2) per winter season, and could displace a maximum of 23 owls in sequence along the survey route.

However, because the camp sites and survey areas are occupied for relatively brief periods, and most of these nonbreeding birds are dispersed in relatively low numbers over a large area, the duration of disturbance incidents is likely to be brief and infrequent. Thus, although there is likely to be a brief displacement of birds from each local area occupied (causing a slight momentary increase in energy requirement) this would not result in a substantial adverse effect, and the overall population effect from this activity is likely to be negligible. Disturbance from tanker trucks, other vehicles, and aircraft supplying seismic operations could displace individuals of these species from the immediate area of the route from Kuparuk or other fuel and supply depot, but this effect also is likely to be negligible. If a seismic operation were to extend into May (an unlikely scenario since they typically last about 100 days beginning in early December), disturbance of early breeding season activities of these species could occur, causing some negligible decline in breeding success by the snowy owl and gyrfalcon. Seismic crews are required by stipulation to implement a waste-management plan that incorporates precautions to avoid attracting predators to the area or providing conditions that would increase their populations. Crews are required to remove waste materials from BLM lands; hence this activity is not expected to enhance the survival of predatory arctic foxes or ravens.

(b) Development and Production

Responses to disturbance can be categorized as: 1) causing injury or death, 2) causing increased energy expenditures that affect physiological condition and rate of survival or reproduction, or 3) causing long-term changes in behavior including traditional use of habitats (Calef et al., 1976). The latter could be the most serious overall effect from oil and gas development and production in Northwest NPR-A, although careful planning and scheduling could avoid most serious effects. Depending on location and season, oil and gas activities in areas where waterfowl and other species occur could potentially cause increased disturbance from routine aircraft operations, gravel-mining operations, presence of gravel pads and facilities, and associated vehicle and foot traffic. Initial developments are likely to occur in the extreme northern portion of the Planning Area, generally surrounding the Dease Inlet/Admiralty Bay area and to Smith Bay and the Chukchi coast. Various species could be affected to some extent by disturbance events (e.g., passage of aircraft), although most incidents are expected to result in negligible effects from which individuals would recover within hours to one day. However, the cumulative effect of repeated disturbance could extend for longer periods and potentially may adversely affect physiological condition, molt, nest success, and productivity. Ultimately this could result in minor local and regional population-level effects although these usually are difficult to separate from natural variation in population numbers. The presence of facilities and construction of gravel structures would result in displacement of birds from favored habitats and associated energy costs which could result in short-term, negative effects during breeding, brood-rearing, or migration periods; however, the footprint of such structures is quite small, so effects are not likely to be evident at the regional population level.

1) Bird Concentrations

Disturbance effects may be particularly serious in areas where higher densities of several bird species that are sensitive to disturbance occur during breeding season, or whose populations have declined or are declining. Such

areas include east, south, and west of Dease Inlet/Admiralty Bay; the south-central portion of the Planning Area to its southern boundary; the western Planning Area in the vicinity of Peard Bay, Wainwright, and Icy Cape/Kasegaluk Lagoon; and to some extent, the area south and southwest of Smith Bay. Species at particular risk from disturbance effects in the Dease Inlet/Admiralty Bay area include red-throated loon, tundra swan, brant, long-tailed duck, king eider, and Sabine's gull (Map 39, Map 40, Map 42, Map 43, and Map 46); in the vicinity of Smith Bay, yellow-billed loon, tundra swan, and Sabine's gull (Map 39 and Map 46); in the south-central area, yellow-billed and red-throated loons, king eider, and Sabine's gull (Map 37, Map 43, and Map 46); and in the western area, red-throated loon, brant, long-tailed duck, common eider, and king eider (Map 40, Map 42, Map 43, and Map 44).

2) Air-Traffic

Air traffic is likely to be the most important source of disturbance associated with oil and gas development; helicopters are the most disturbing type of aircraft. Although quantitative studies of the short-term effects of aircraft disturbance on molting brant have been done in the Teshekpuk Lake Special Area (Derksen et al., 1992; Jenson, 1990; Miller et al., 1994; Ward et al., 1999), few comparable studies have been done of effects on other species at other phases of the annual cycle, or of long-term effects on populations. When exposed to helicopters at typical altitudes and take-off or landing, behavioral responses of brant to the aircraft passage persisted for about five minutes. Increased lateral distance from the aircraft flight path reduced the duration of response. Brant exposed to helicopter flights moved five times farther than those not exposed, and this effect persisted at least for the number of days that such flights were repeated. The authors of this study thought it likely that such increased patterns of movement ultimately could affect habitat use. Brant responded to each aircraft overflight equally, showing no evidence of habituation to this disturbance.

In studies at the Alpine Development on the Colville River delta, Johnson et al. (2003) found that distributions of most species relative to the airstrip did not show detectable differences when control and impacted areas were compared before and after construction. Only trends in abundance of white-fronted geese, and ducks as a group, suggested a decline from pre-construction (pre-1999) to construction (1999-2001), although cool weather during the latter period was a potentially influential factor. When high levels of air traffic supporting heavy construction activity occurred, waterfowl nest density--particularly of white-fronted geese--was lower within 1,000 m of the strip than at more distant sites. However, over the course of the study, densities occasionally were lower farther from the strip than closer, and higher closer to the strip than at greater distances, somewhat confounding conclusions regarding disturbance. These latter results may reflect differences between the areas sampled to some extent, since it was a requirement to include the area adjacent to the airstrip, for which closely comparable habitat areas may not have existed nearby. There was no significant difference in average distance of nests from the airstrip between 1996 and 1999-2001, when there was little or no construction activity. White-fronted goose nests were redistributed relative to the airstrip during heavy construction years, although their use of habitats remained the same. Neither aircraft nor vehicle activity appear to negatively affect goose nest attendance. Distance of tundra swan nests from the airstrip also did not differ significantly between pre-construction and construction. Nest densities of shorebirds and songbirds were higher nearer the airstrip. However, TERA (1993b) found reduced density of shorebird nests within 100 m of a heavily used road, and Troy and Carpenter (1990) found that birds displaced by pad construction nested in adjacent similar habitat. These results support both the assumption that birds generally would avoid areas with potentially disturbing activity to some extent, and that they are more tolerant of such activity than might be expected. Evidently, the response of birds to potentially disturbing factors is complex, representing a synthesis of competing habitat requirements and behavioral factors.

Aircraft routinely flying over areas of higher bird density in the Planning Area (see Map 36 Map 37 Map 38 Map 39 Map 40 Map 41 Map 42 Map 43 Map 44 Map 45 Map 46) are likely to cause minor effects in the local populations of several species. For example, disturbance associated with developments in the northern area (where the first are likely to occur) could affect higher concentration areas of red-throated loon, yellow-billed loon, tundra swan, brant, long-tailed duck, king eider, and Sabine's gull adversely. In the past, red-throated loon numbers have shown a significant decline, as have king eider; and yellow-billed loon and Sabine's gull currently are declining at a non-significant rate (Larned, Stehn, and Platte, 2003). In the western Planning Area, aircraft activity over Kasegaluk Lagoon could cause minor disturbance effects to large numbers of fall-staging brant,

molting king eiders, and/or nesting or staging common eiders present in summer or fall. The brant studies noted above suggest that effects of aircraft operations are likely to be reduced substantially if 1) aircraft are flown at higher altitude (e.g., 3,000 ft), 2) the frequency of flights is reduced during periods when serious effects from disturbance are most likely, and 3) known high-density/critical activity areas are avoided.

3) Structures

Heavy equipment would be transported to staging areas or development sites in winter, with the same potential effects on the three species: ptarmigan, gyrfalcon, and snowy owl. The presence of pads, short connecting roads, facilities, and drilling operations would displace individuals of species breeding locally from the affected site, and also probably all but the most tolerant from the immediate area. In succeeding breeding seasons, displaced individuals may relocate in nearby comparable habitat, as suggested by studies at Prudhoe Bay (Troy and Carpenter, 1990). Such displacements are not expected to cause long-term effects on population productivity given the relatively small areas likely to be involved at a particular site (TERA, 1993b; Troy and Carpenter, 1990), but would be a long-term or permanent local result. Overall population effect is likely to be negligible.

4) Raptors

Hawks, eagles, or falcons nesting along the Colville and other rivers could experience adverse effects under this alternative, principally because of potentially greater levels of activity in the general vicinity of nest sites during development. However, there is little reason to expect more oil and gas activity near rivers than in other areas, and location of the Colville at the southern Planning Area boundary probably economically limits the likelihood of its use as a transportation corridor for oil and gas development. Overall effect on raptors in the Northwest NPR-A is likely to be negligible.

5) Gravel

Gravel within the Planning Area is expected to be mined from river drainages in winter and transported to development sites via ice roads. This activity would displace any nesting species from the local area (up to 50 acres per gravel mine) to undisturbed habitats, although few species are expected to be nesting on gravel bars in rivers where most gravel extraction is likely to occur. Mining could cause local disturbance and temporary displacement of the three resident species along the ice road transport route and at the mine site in winter; other species are absent during this season. Because primary development is likely to be confined to the northern portion of the Planning Area, at least initially, raptor habitat areas in the southern NPR-A (e.g., Colville River, Ikpikpuk River) with high raptor populations are not expected to be disturbed by gravel mining. Depending on location and extent of the mine site, the overall effect of habitat loss is likely to be negligible for species with abundant, stable, or increasing populations. Potentially minor effects could result if mining were to become widespread and eliminate specific areas of habitat used by species that have small populations and/or are declining (e.g., buff-breasted sandpiper).

6) Pipelines

Because construction of pipelines east to connect with Kuparuk and TAPS is likely to take place entirely during winter, effects on the three resident species may be similar to those discussed above under seismic effects. Presence of an aboveground pipeline is not likely to represent a significant collision hazard since migrating birds fly well above pipeline elevation, and much of the movement during the breeding season is by swimming. A gas pipeline leak is likely to cause only minor effects on local bird populations, mainly from presence of response personnel and equipment (see below for effects of crude oil spills). Overall impact of pipelines is likely to be negligible.

7) Predation

Potential predator enhancement at the level of development envisioned for NPR-A is not likely to approach that of the Prudhoe Bay area. This is because: a) development sites are likely to be few (8 fields) and relatively small and scattered, b) practices that have allowed artificially enhanced predator populations in the past are expected to be tightly controlled through adherence to ROP's A-2 and E-9, which would require all feasible precautions to avoid attracting wildlife (i.e., predators) to food and garbage, and utilizing best technology to prevent facilities from providing nesting, denning, or shelter sites for predators. At the Alpine Development, Johnson et al. (2003) found that predator numbers remained stable from pre-construction through construction periods. They also found no clear evidence that predation rates by either foxes or avian predators changed during their study. Thus, predator populations in the vicinity of small footprint developments are not expected to increase significantly. In addition, few of the species present on the western ACP nest in colonies, which would make them prone to substantial losses if discovered by predators. Brant are present in 30 to 40 colonies, most averaging 10 or fewer nests, occur on the western ACP (Ritchie, Lovely and Knoche, 2002). White-fronted geese, nesting in small loose colonies or as single pairs, would not be as subject to high predation losses. Overall, effects of predators on regional populations of most species is likely to be negligible; effects on brant could be more substantial in some years and/or colonies, representing minor losses on a subjective scale. Species whose world populations are small, such as the buff-breasted sandpiper, would experience disproportionately large effects if predator populations were artificially enhanced.

(2) Effects of Spills

A 500- or 900-bbl crude oil spill, assumed for purposes of analysis (see Table IV-17 and Table IV-19), from a pad or pipeline onto tundra, would be likely to cause mortality of small numbers of shorebirds and passerines, and possibly a few individual waterfowl. If it were to enter local lakes or inter-connected wetlands, small numbers of loons and waterfowl--and possibly additional shorebirds--could be contacted. Numbers of oiled individuals would depend primarily upon wind conditions and numbers and location of birds following entry of the spill into the water. If the spill were to enter a river, a variety of loon, waterfowl and shorebird species could be present, particularly where the river empties into the marine environment. For most species, such losses would be likely to represent negligible impacts at both the local and regional population level. Effects could be elevated to a minor or moderate levels if species with small and/or declining populations were involved.

If gyrfalcons, peregrine falcons, or rough-legged hawks were nesting in the vicinity of a spill, they could become secondarily oiled by preying on oiled birds. Mortality of breeding falcons, for example, could represent a minor loss for the local population, but (as with the species listed above) still would likely represent a negligible effect on the regional population.

Because of the oil-absorptive capacity of tundra habitats, it is likely that only a small part of a spill would enter a river or the marine environment. Required setbacks of 100 or 500 ft from water bodies (Stipulation E-2)--unless approval grants otherwise, 1/2 mi from specified rivers (Stipulation K-1), and 1/4 mi from deepwater lakes (Stipulation K-2) would delay entry of spills into waterbodies by absorption and allow additional cleanup time before the spill reached water. As a result of their small average size, onshore oil spills reaching aquatic habitats could be expected to cause losses of only up to a few tens of individuals. However, a few hundred individuals potentially could be killed by cumulative mortality from many small spills. The effect of such losses might not be detectable above the natural fluctuations of the populations. Under the Preferred Alternative, the Northwest NPR-A coastline could be available for oil and gas leasing, although the proposed Kasegaluk Deferral Area would not be available for leasing for 10 years. If a spill were to move into a delta area or into Admiralty Bay, Elson Lagoon, Dease Inlet, Peard Bay, Kasegaluk Lagoon, or other coastal waters, additional waterfowl species that breed, molt, or stage before or stop during migration would be at risk. A spill entering a river in spring could contaminate overflow areas or open water where spring migrants of several waterfowl species concentrate before occupying nesting areas. If either of these scenarios were to involve yellow-billed or red-throated loons, brant,

king or common eiders, black guillemots, or Ross' gulls the effect could potentially elevate to a moderate level.

Loons and flocks of brant, long-tailed duck, and eiders staging before or stopping during migration in protected coastal habitats--as well as black guillemots year-round or Ross' gulls in fall--could come into contact with a crude-oil spill from an offshore site (however, offshore rigs may not be used) during August or September when ice cover is less than 50 percent. An onshore spill of crude from a pad near the coast or a fuel-oil spill that reaches the marine environment (e.g., Elson Lagoon, Dease Inlet, Smith Bay, Kasegaluk Lagoon, and nearby barrier islands). Likewise, a fuel spill from hypothetical onshore staging sites at Cape Simpson, Barrow, or Peard Bay (Map 107)--or from fuel barges supplying these sites--could contact these species with similar effects (see below). Because of numbers of birds present, risk would be greatest from June through October. The probability of escaping fuel contacting nearshore lagoon areas and barrier islands within 30 days is less than 22 percent in summer (USDOI, MMS, 2003;vol. IV, table A2-21). Physiological effects on individual birds would be the same as described in the Northeast NPR-A IAP/EIS (USDOI, MMS, 1998). Lethal effects would be expected to result from moderate to heavy oiling of any birds contacted. Light to moderate exposure could reduce future reproductive success as a result of pathological effects that interfere with the reproductive process caused by oil ingested by adults during preening or feeding.

Some brood-rearing, molting, or staging loons, brant, eiders, long-tailed ducks, or other waterfowl might also contact oil in coastal habitats. Large numbers of staging brant, molting king eiders and nesting or staging common eiders in Kasegaluk Lagoon would not be at risk under the Preferred Alternative. Mortality of molting long-tailed ducks from a spill entering protected areas could be substantial, but the population effect would be difficult to determine because numbers of that species are stable, declining, or increasing in various areas (Conant, et al., 1997; Larned, Stehn, and Platte, 2003). Flocks of staging eiders could contact oil in nearshore or offshore areas. The king eider population apparently declined about 55 percent between 1976 and 1996 (Suydam et al., 2000), with the result that substantial mortality from spills could have a significant impact on the population. Likewise, common eiders nesting on barrier islands and along the coast, whose population also has declined significantly, could be contacted by a marine spill causing substantial losses. Substantial mortality of yellow-billed or red-throated loons probably would represent a serious loss, but of unknown population consequences. Also, several thousand shorebirds could encounter oil in shoreline habitats (e.g., river deltas); and the rapid turnover of migrants during the migration period suggests that many more could be exposed. A spill that enters open water off river deltas in spring could contact migrant loons and eiders. Because relatively small areas of terrestrial or marine environments would be likely to be oiled, a spill would be likely to contact relatively small numbers of birds, primarily causing minor effects.

A pipeline spill of seawater used in the waterflood enhancement stage of production would kill salt-intolerant tundra vegetation near the pipeline. The amount of tundra habitat affected would be expected to be no more than a few acres; such a small area of degraded habitat would not be likely to result in loss of productivity by displaced breeders that could be detectable at the population level.

(3) Summary

Principal bird groups inhabiting the Northwest NPR-A Planning Area or nearby marine waters are loons, waterfowl, shorebirds, raptors, passerines, and seabirds. Most ground transport activities under the Preferred Alternative, including those associated with oil and gas development, occur in winter and thus would not disturb most bird species. Ptarmigan, gyrfalcon, and snowy owl might be displaced temporarily from vehicle routes. Effects from seismic exploration activity in winter and small camps in summer would likely be negligible. Most bird species would be likely to be displaced from within 700 to 3,000 ft of large encampments that are in place for up to twelve weeks during the summer, possibly causing a minor local decline in nest attempts and productivity in some species. Minor population effects most likely would occur through exposure of species that are uncommon, declining or recently declined, and/or particularly sensitive to disturbing activities. Of particular concern are species that have shown general or ACP population declines, or that have small vulnerable populations such as yellow-billed loon, red-throated loon, king eider, common eider, and Sabine's gull. Impacts

on regional populations of species not showing declines likely would be negligible.

Although predators attracted to camps might decrease breeding success of local bird communities, this is likely to be a negligible effect. Fuel spill cleanup could disturb birds in the local area. Small survey parties on the Colville and other rivers would be expected to cause negligible disturbance of nesting raptors, waterfowl, and passerines.

Frequent aircraft flights into large camps could result in minor effects ranging from avoidance of certain areas by birds to local abandonment of nesting attempts or lowered survival of young. Regardless of where they originate, such flights would be likely to pass over high-density areas of one or more species; however, the effect on regional populations would likely be negligible. Aerial survey flights for monitoring bird or caribou populations have potential for disturbance of birds because they are flown at low altitude. However, in any given area they are of short duration, and cover only a small percentage of the ACP per season, so areawide disturbance effects would likely be negligible. In isolated areas aircraft effects would likely be negligible. Altitude and distance of aircraft from individual birds determines the duration of adverse response. Helicopter traffic would probably be the greatest source of disturbance associated with oil and gas development. Regional populations of species such as loons, swans, brant, long-tailed duck, king eider, and Sabine's gull--all with high density areas in the northern Planning Area where oil and gas development may first occur--could experience potentially minor effects from frequent aircraft overflights.

Habitat eliminated by gravel mines, pads, roads, and airstrips would likely represent a negligible loss. An oil spill that reached tundra could cause mortality of small numbers of waterfowl, shorebirds and/or passerines, but spills are likely to be contained and cleaned up before contacting birds, resulting in a negligible overall effect. Oil entering ponds, lakes, or rivers could contact small numbers of loons and waterfowl, causing a negligible effect for most species other than red-throated loon, yellow-billed loon, brant, and king eider for which the effect could be minor. A large spill entering the marine environment or river delta areas could contact molting, staging, or migrating loons, brant, long-tailed ducks, king and common eiders--and possibly Ross' gulls--resulting in minor to moderate impacts depending on population status and extent of mortality of the particular species. Substantial mortality of king and common eiders and yellow-billed and red-throated loons would be effects of concern. In most instances, activities and actions would likely affect only a relatively small proportion of available habitat of the type indicated and/or a relatively small proportion of a given species' regional population. Quantitative effects might be difficult to separate from natural variation in population numbers. Stipulations would decrease disturbance from most factors for most species, prevent spilled fuel and oil from reaching surrounding habitats, and help prevent oil pollution and degradation of important bird habitats.

Several factors suggest that the overall effect of the Preferred Alternative on birds would be less than Alternative A. Most importantly, the elimination of leasing in the proposed Kasegaluk Lagoon Special Area reduces potential risk to vulnerable staging brant, molting king eiders, and nesting and staging common eiders in particular, both from disturbance and oil spill contact. In addition, leasing in the western portion of the Planning Area--areas of higher density of Pacific loon, red-throated loon, white-fronted goose, long-tailed duck, northern pintail, scaup, several shorebird species, arctic tern, glaucous gull, jaegers, and Sabine's gull--would be deferred for 10 years, delaying potential impacts for at least this period. Also, several ROP's and one stipulation specifically applicable to birds that are not contained in the mitigation package for Alternative A, are attached to the Preferred Alternative. The ROP's include: a) avoidance of human-caused increases of ground nesting bird predators, b) design of structures so birds are less likely to strike them, c) design and location of facilities to minimize disturbance to yellow-billed loons when their presence in areas proposed for development is indicated by required aerial surveys , and d) a measure to decrease bird predator nesting/denning sites on facilities. Also included is a stipulation requiring lessees to minimize disturbance and loss or alteration of habitat near brant colonies and brood-rearing areas determined by aerial survey. Finally, shorter periods of aerial survey are anticipated under the Preferred Alternative (several 1- to 2-week periods) than under Alternative A (several 2- to 3-week periods). By comparison to Alternative B, the Preferred Alternative offers the additional ROP's and Stipulation discussed above, and the deferral of the western Planning Area from oil and gas leasing for 10 years, as the principal differences. In comparison to the No Action Alternative, it offers the mitigating measures noted above, and slight differences in levels of activity as outlined in Table IV-28.

c. Effectiveness of Stipulations and Required Operating Procedures

The stipulations and ROP's could mitigate effects on birds of four types of problems that may result from oil and gas development activities: 1) disturbance from noise or activity, 2) adverse alteration of habitats, 3) contamination of waterbodies occupied by birds, and 4) mortality of fish that are prey for fish-eating birds.

ROP A-2, by controlling availability of food and garbage, could prevent artificial enhancement or concentration of bird predators; also, pollution of waterbodies by disposal of waste materials, which could cause toxic reactions in waterbirds or their prey, is prohibited.

ROP A-3, by preventing entry of fuel or other hazardous substances into waterbodies and wetlands through implementation of a Hazardous Materials Emergency Contingency Plan, could reduce contamination risk to birds from accidental spills.

ROP A-4, by preventing entry of fuel or liquid chemicals into waterbodies and wetlands through implementation of a comprehensive spill prevention and response contingency plan which includes specifications on clean-up, materials, storage containers, and liner materials, could reduce contamination risk to birds from accidental spills during oil and gas activities.

ROP A-5, by prohibiting the refueling of equipment within 500 ft of the active floodplain of fish-bearing and within 100 ft of the active floodplain of non-fish-bearing water bodies, could prevent spilled fuel from entering water bodies where fish prey of loons, mergansers, and terns, or individual water birds, could become contaminated and die, which could adversely affecting the breeding success of these water bird species.

ROP B-1, by prohibiting water withdrawal from rivers and streams in winter, could prevent winter die-off of fish prey of loons, mergansers, and terns, which could adversely affect the breeding success of these water bird species.

ROP B-2, by allowing only authorized water withdrawal from lakes could prevent winter die-off of fish prey of loons, mergansers, and terns, which could adversely affect the breeding success of these water bird species.

Stipulation E-2, by restricting approval for location of permanent oil and gas facilities within 500 ft of fish-bearing water bodies or within 100 ft of non fish-bearing water bodies to those that are likely to cause minimal impacts to wildlife, could reduce the loss (burial) of wetland habitats, important for breeding loons, waterfowl and shorebirds in particular.

ROP E-5, by requiring minimal facility footprint and reduction in air traffic, could minimize bird habitat burial and disturbance.

ROP E-7, by requiring that above ground pipelines be elevated an average of 7 ft above the surface, would increase the potential for bird collisions with pipelines.

ROP E-9, by requiring use of best available technology to prevent facilities from providing nesting, denning, or shelter sites for predators, could avoid artificial enhancement of bird predators.

Freshwater Quality (Section V.B.4)

Effects of First Sale: Seismic and exploratory activity would create short-term (usually one season) and localized effects on water quality. Short-term (year-or-more) effects from annual ice-pad and ice-road construction, drilling, and domestic needs for water could require winter extraction of unfrozen water from over 900 acre/ft of nearby lakes. Gravel construction of pads, within-field roads, and field airstrips would cover about 400 acres total for the four fields proposed. Docks or staging areas could cover up to 400 more acres. Gravel construction can result in upslope water impoundment and thermokarst erosion equivalent to twice the area directly covered by gravel. Long-term (decade-or-more) effects from development of gravel roads, pads and pits could occur on nearly 1,000 acres. Oils spills could degrade water quality over the course of a few weeks along a short stretch of nearby rivers and lakes and cause about 6 ponds or small lakes to remain toxic to sensitive species for about 7 years.

Effects of Multiple Sales: Short-term (year-or-more) effects of multiple sales would be similar to those for a single sale. Long-term (decade-or-more) effects of multiple sales are assumed to double over that of a single sale, while indirect impacts may take years to develop. Water quality could be affected on up to 2,000 acres from water impoundments, diversions, and thermokarst erosion, depending on the level of exploration and development activities, and the locations of roads, pipelines, and infrastructure. Oil spills could result in waters of about 8 ponds or small lakes remaining toxic to sensitive species for about 7 years.

Estuarine Water Quality (Section V.B.5)

Effects of First Sale: Discharges of drilling and human waste would be prohibited within NPR-A estuaries; no unregulated discharges of produced water would be allowed; and no adverse effects on kelp or special benthic communities from construction of ice islands or ice roads are expected. The effects of gravel-island construction and buried-pipeline construction would probably be minor and temporary. A short dock or jetty in estuarine waters probably would not affect hydrologic conditions, but a long causeway with inadequate breeches would probably have measurable, long-term impacts. If a 500- or 900-bbl spill occurred during the open water season, formed a slick or become dissolved in the water column, it could contaminate approximately two-thirds of the coastline in an estuary like Admiralty Bay, and the hydrocarbon concentration might exceed the 0.015-ppm chronic criteria for up to 30 days in an area that ranges up to 70 mi^2 (180 km^2). Effects probably would not extend outside the estuaries unless the spill involved fuel at a coastal staging site, such as Cape Simpson. Stipulations G-1 and K-3 might be effective at moderating the effects of long causeways and estuarine spills.

Effects of Multiple Sales: The effects of multiple sales on estuarine water quality would probably be slightly lower than for the first sale because of technological developments in extended-reach drilling.

one pump station, and the excavation of material sites, would cause the destruction of vegetation on < 650 acres and the alteration in plant species composition on < 1,915 acres, affecting a total of over < 2,565 acres. These impacts would be permanent assuming that gravel pads would remain after production ends although some plant species would be able to grow on the pads (McKendrick, 2000).

Effects of Multiple Sales: Impacts from oil exploration would include about double the vegetation disturbance from seismic work expected for a single-sale. However, the extended period of time over which it would occur--coupled with the recovery time for disturbed areas--would result in a small increase in the amount of visible disturbance. Exploration activities also would cause < 0.03 acres of permanent vegetation destruction around well cellars and alteration of < 1,940 acres per year around and under ice pads and roads.

Development activities would also impact vegetation, and the combined effect of exploration and development activities over all lease sales would cause the destruction of vegetation on < 1,260 acres and the alteration in plant species composition on < 4,050 acres, for a total of < 5,310 acres. These impacts would be permanent, assuming that the gravel pads would remain after oil production ends; recovery, thus, would be moot. Impacted areas (3,920 acres) represent about 0.04 percent of the total land cover, and, as such, they would not be likely to adversely affect any plant species or community. If a development facility were to be placed over a rare plant population, the effects on that taxon could be severe. However, careful siting of facilities after site-specific environmental analysis is expected to avoid and protect rare plant species. Oil spills would affect <8.6 acres.

Soils (Section V.B.1)

Effects of First Sale: Soil stability depends closely on vegetative cover; where vegetation is disturbed, impacts on soils follow. Impacts from activities other than oil exploration and development would be minor to negligible. Impacts from winter exploration and well drilling would be expected to be minor to negligible. Development would cause loss or disturbance of up to 600 acres of soils. The duration of these impacts would be permanent. Oil spills would be cleaned up immediately, causing minimal disturbance to soils. Impacts from development activities to soils would be minor to low.

Effects of Multiple Sales: Little impact to soils is expected from exploration activities; impacts from development activities would disturb or result in the loss of small- to moderate-sized areas. The overall impact to soils would be negligible (with seismic) to moderate (with development).

Water Resources (Section V.B.3)

Effects of First Sale: Seismic impacts are expected to be minimal. Impacts from oil and gas development activities on the water resources in the Planning Area are from gravel roads, pads, and structures. The potential short-term impacts from exploration and delineation would be water removal from up to 90 lakes, and during construction, increased water impoundments, diversions, thermokarst erosion and sedimentation of up to 2,000 acres. Long-term impacts from development of gravel roads, pads and pits could impact up to 1,000 acres. Overall impacts would be about 3,000 acres of short-term impacts and 1,500 acres of long-term impacts.

Effects of Multiple Sales: Seismic impacts are expected to be minimal. Impacts from oil and gas activities could be several times greater than impacts from a single sale, while indirect impacts might take years to develop. Short-term impacts include water removal of up to 1,800 acre/ft from 180 lakes for exploration and delineation drilling, increased water impoundments, diversions, thermokarst erosion, and sedimentation of up to 4,000 acres for construction activities. Long-term impacts from development of gravel roads, pads, and pits could impact up to 2,000 acres from water impoundments, diversions, and thermokarst erosion. Shared infrastructure could reduce the adverse effects to water resources from multiple sales.

Under multiple sales, a total of as many as 12 production pads and 685 mi of pipeline would be anticipated under this alternative. Although with the cessation of construction activities and closure of material sites, the intensity of impacts likely would be reduced from the development phase to the production phase, remaining structures and associated activities would have adverse impacts on visual quality. Because production could last for 30 years, impacts would be long term. These long-term, adverse impacts would be expected to be greatest within ½ mi of the pad sites (about 4,000 acres for each pad site). Pipelines would be expected to be elevated about 7 ft but could be placed up to 20 ft above ground level. Except during construction and repair, there would be no associated on-the-ground activity. Therefore, long-term impacts to visual resources from pipelines would be expected to be minimal beyond about ½ mi. This equates to about 640 acres/mi of pipeline. Under this alternative, production pads would impact up to 48,000 acres while pipelines would impact up to 438,400 acres.

Under this alternative, three staging bases and one pumping station would be expected to be built. Adverse impacts to visual resource values would be similar to those resulting from a production pad and its facilities about 4,000 acres per staging base. Accordingly, under this alternative, there would be long-term loss of visual resources over an area of approximately 12,000 acres for the staging bases and approximately 3,500 acres from the pumping station.

f. Conclusion--Multiple Sales

The types of impacts resulting from additional lease sales would be the same as described above for the first sale. Short-term impacts such as green trails and pads, and other ongoing activities would not accumulate. Impacts from long-term or permanent facilities such as roads, pipelines, gravel pads, and pits would accumulate to the extent that such facilities would be necessary to support exploration and production. It is anticipated that such facilities would impact about 6 percent of the Planning Area and would affect a total of approximately 505,500 acres.

21. Overview of Effects on Wetlands and Floodplains

In compliance with Executive Order 11990, Protection of Wetlands and Floodplains, the BLM has prepared a comprehensive impact analyses on those areas within Northwest NPR-A Planning Area that are considered to have the function and value of wetlands as described in Section III.B.2. Resources included in the overview discussion below would be classified as having the function and value of wetlands and floodplains on the Arctic North Slope.

Vegetation (Section V.B.7)

Effects of First Sale: Impacts from activities other than oil exploration and development would involve disturbance or destructive impacts to a small fraction of the Planning Area, and overall impacts would be minor to negligible.

Impacts from oil exploration would include vegetation disturbance on 22,500 to 366,000 acres per year from 2-D and 3-D seismic surveys over the entire exploration period (10 years). About 25 percent of the disturbance would be at a medium to high level, and, after 9 years, recovery would be about 90 percent. Ice road construction would have impacts on < 420 acres per year, and ice pads on < 170 acres. Exploration activities would cause permanent, minor vegetation destruction and alteration from the construction of exploration well cellars.

The combined effect of development activities, such as the construction of gravel pads, roads, airstrips, pipelines,

(Map 23). As Class I, the level of change to the landscape should be very low and must not attract attention. This class provides for the natural ecological changes; however, it does not preclude very limited management activities. The objective is to preserve the existing character of the landscape. The other 21 rivers identified as eligible for designation as Wild and Scenic Rivers and identified estuarine areas would be designated VRM Class III (Map 23). As Class III, the level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the landscape. The rest of the Planning Area would be designated VRM Class IV. As Class IV, the level of change to the characteristic landscape can be moderate. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements found in the predominant natural features of the landscape.

d. Conclusion--First Sale

As compared with the No Action Alternative, there would not be an increase in adverse, short-term impacts to visual resources from activities other than oil and gas exploration and development.

Short-term impacts from ongoing seismic activities would impact approximately 1,000 acres. The greening and ring effect of vegetation resulting from ice pads, roads, airstrips and compacted snow would impact up to 1,500 acres. Short-term impacts from exploratory drilling would encompass approximately 12,000 acres.

Oil and gas development would result in the long-term loss of visual resources of approximately 166,700 acres (or 2% of the Planning Area) for the life of production fields and pipelines.

e. Multiple Sales

For multiple sales, between 21 to 72 exploration and delineation wells are anticipated under this alternative. However, because of the limited number of drill rigs available, no more than three wells would be drilled at any one time. Drilling would occur over several winter seasons using ice pads, roads, and airstrips. Temporary on-site location of structures (e.g., drill rigs, bermed drill materials, equipment, and housing); vehicles, aircraft, human presence and associated activities would have adverse, short-term impacts on visual quality during the winter season. These impacts would be expected to be greatest within ½ mi radius of each drill site (50 acres)--a total area of approximately 4,000 acres impacted per well site. Accordingly, under this alternative, there would be a temporary loss of visual quality over an area of approximately 12,000 acres for the 3 wells being drilled at any one time.

In addition to the short-term impacts that would result from ongoing exploratory drilling operations, summer season visual concern would exist as a result of the greening of vegetation under vacated ice pads, airstrips, and roads (as described above). There is also a "ring effect" around ice pads, airstrips, and roads, where vegetation dies adjacent to these snow and ice structures. Assuming approximately 50 acres of ice pads, airstrips, and roads per drill site, as many as 3,600 acres (72 vacated sites x 50 acres per site) would be in various states of recovery from greening and ring effects.

Exploration wells also would leave behind a marker pipe, expected to be no larger than a square foot on the surface and 6 ft tall. This is essentially a permanent impact, but almost unnoticeable from several hundred feet away.

from the air during any one summer season.

For the first sale, between 7 and 30 exploration or delineation wells are anticipated under this alternative. However, because of the limited number of drill rigs available, no more than three wells would be anticipated to be drilled at any one time. These impacts would be expected to be greatest within a ½- to 3-mi radius of each drill site--an area of approximately 4,000 acres per well site. Accordingly, under the first sale in this alternative, there would be a temporary loss of visual quality over an area of approximately 12,000 acres.

In addition to the short-term impacts that would result from ongoing exploratory drilling operations, summer-season visual concern exists as a result of the greening of vegetation under vacated ice pads, airstrips, and roads. This direct impact to the area's naturalness is a result of the same conditions that create green trails--the greater availability of moisture and nutrients as ice or compacted snow melts. This greening of the vegetation does not necessarily develop wherever ice pads are constructed or snow is compacted but when it does, it can be very detectable from the air for 2 to 5 years or longer. There is also a "ring effect" around ice pads, airstrips, and roads, where vegetation dies adjacent to these snow and ice structures. Assuming approximately 50 acres of ice pads, airstrips, and roads per drill site, as many as 1,500 acres (30 vacated sites x 50 acres per site) would be in various states of recovery from greening and ring effects.

Exploration wells also would leave behind a marker pipe expected to be no larger than a square foot on the surface and 6 ft tall. This is essentially a permanent impact, but almost unnoticeable from several hundred feet.

Under the first sale,a total of as many as 6 production pads and 205 mi of pipeline would be anticipated under this alternative. Although with the cessation of construction activities and closure of material sites, the intensity likely would be reduced from the development phase to the production phase, remaining structures, and associated activities would have adverse impacts on visual quality. Because production could occur for 30 years, impacts would be long term. These long-term, adverse impacts are expected to be greatest within ½ to 3 mi of the pad sites (an area of about 4,000 acres per site). Pipelines would be expected to be elevated about 7 ft but could be placed up to 20 ft above ground level. Except during construction and repair, there would be no associated on-the-ground activity. Therefore, long-term impacts to visual resources from pipelines are expected to be minimal beyond about ½ mi. This equates to about 640 acres per mile of pipeline. Under this alternative, production pads would impact up to 24,000 acres while pipelines would impact up to 131,200 acres.

Under this alternative, 1 to 2 staging bases and one pumping station are also expected. Adverse impacts to visual resource values would be similar to those resulting from a production pad and its facilities, or about 4,000 acres per staging base. Accordingly, under this alternative, there would be long-term loss of visual resources over an area of approximately 4,000 to 8,000 acres from the staging bases and approximately 3,500 acres from the pumping station.

(2) Effects of Spills

Most spills (65 to 80%) would be confined to a pad. Spills not confined to a pad usually are confined to the limited area immediately around the pad or pipeline. Therefore, impacts on visual resources resulting from spills likely would be confined to the same area described above under development activities.

c. Effectiveness of Stipulations and Required Operating Procedures

The Colville River area would be designated Visual Resource Management (VRM) Class I under this alternative

activity.

a. Effects of Non-Oil and Gas Activities

Most impacts to visual resources would result from summer on-the-ground management activities such as aircraft landings and fuel caches; wildlife surveys; cultural and paleontological surveys with possible excavation activities; field camps; hazardous and solid material removal and remediation activities with possible gravel pads and roads; and in the winter, overland moves using OHV's. Between 20 and 60 overland moves may occur during a single season.

Temporary structures (e.g., sleds, tents), vehicles (e.g., rolligons, tractors), aircraft, human presence, and associated activities would have some minimal short-term impact on visual resources or scenic quality. These adverse, short-term impacts would be confined primarily to the activity site viewshed (approximately ½ mi in any direction from the site) and are expected to affect no more than approximately 500 acres in any one season. The number of camps would be 2 per season; however, only 1 camp would be operating at a time.

A longer lasting impact would be "green trails" resulting from winter overland moves. Green trails are created by vehicles compacting snow and dead vegetative material that, in turn, results in the greater availability of moisture and nutrients for underlying vegetation the following growing season. These trails do not necessarily develop over the entire route of the overland move, but where they do occur, they can be very detectable from the air for 2 to 5 years, and in some cases longer. They are usually difficult to recognize from the ground. Another impact along these trails that has occurred in the past is vegetation actually being damaged or the tops of tussocks being scraped off. Current operating procedures make this an infrequent problem but one that can occur in conjunction with overland moves. Because overland moves are a relative constant year to year and generally follow the same route(s), approximately 100 mi of intermittent green trails would be visible from the air during any one summer season.

b. Effects of Oil and Gas Activities

(1) Effects of Disturbances

Under this alternative, seismic-survey work would continue with two operations each winter season. This work would occur in winter using cat trains with low-ground-pressure vehicles supported by light aircraft. Seismic crews are housed in mobile camps consisting of a train of trailer sleds pulled by tractors. These moving camps and associated activities would result in a short-term adverse impact on visual resources or scenic quality of the area. These impacts would be confined primarily to the activity-site viewshed, or approximately ½ mi in any direction. Assuming two seismic 2-D or 3-D operations per season, seismic operations are expected to affect 1,000 acres annually.

A longer lasting impact would be "green trails" resulting from winter overland moves. Green trails are created by vehicles compacting snow and dead vegetative material that, in turn, results in the greater availability of moisture and nutrients for underlying vegetation the following growing season. These trails do not necessarily develop over the entire route of the overland move, but where they do occur, they can be very detectable from the air for 2 to 5 years, and in some cases longer. They are usually difficult to recognize from the ground. Another impact along these trails that has occurred in the past is vegetation actually being damaged or the tops of tussocks being scraped off. Current operating procedures make this an infrequent problem but one that can occur in conjunction with overland moves. Approximately 200 mi of intermittent green trails from seismic activities would be visible

Stipulations and required operating procedures A-1, A-2, A-3, A-4, A-5, A-6, A-7, B-1, C-2, C-3, C-4, D-1, E-1, E-2, E-3, E-4, E-6, E-8, H-1, H-2, and I-1 all limit the impacts that oil and gas exploration and development would have on river values. Without these stipulations, greater impacts from spills, damage to stream banks at river crossings, reductions in water quality, reductions in critical flows, obstruction to fish passage, loss of critical winter habitat, and declines in outstandingly remarkable values for fish, wildlife, and subsistence use would be expected.

ROP B-1 is essential for preserving instream flows in eligible rivers, and in protecting over-wintering habitat for fish.

The stipulations taken together contribute to the conclusions regarding the minimal anticipated impacts of development on fish, wildlife, and instream flows. This is a strong package of stipulations and ROP's, although there is still some risk to riparian areas and water quality because of unavoidably subjective language and the provision for exceptions to be granted.

d. Conclusion--First Sale

Under the Preferred Alternative, the impacts of the first sale on wild and scenic river values would be limited in scope. Impacts are expected to be minimized by the deferral area, coastal area, river buffers, and stipulations and ROP's that protect stream banks, and limit potential withdrawals of water. The Colville River would likely see the greatest negative impact to river values because it is not under BLM management, and would likely be crossed by access trails, ice roads, and pipelines. The Avak, Tunalik, Nokotkek, and Ongoravik rivers in the Kasegaluk Lagoon area are currently not impacted by oil and gas activities, and this situation is likely to continue because of low potential for development.

e. Multiple Sales

Multiple sales would have little additional impact on river values.

f. Conclusion--Multiple Sales

Multiple sales would have little additional impact on river values.

20. Visual Resources

Under the Preferred Alternative, the Colville River area would be designated Visual Resource Management (VRM) Class I to continue with the assigned class along the upper part of the river, i.e., upstream of Umiat (*Northeast National Petroleum Reserve-Alaska Integrated Activity Plan/Environmental Impact Statement* Record of Decision). The other 21 rivers identified as eligible for designation as Wild and Scenic Rivers and identified estuarine areas would be designated VRM Class III (Map 23). These two VRM classes extend 3 mi from the banks of all identified water bodies. The rest of the Planning Area would be designated VRM Class IV. Implementation of VRM prescriptions would take place in individual environmental analysis of each proposed

and use, fisheries, wildlife, and cultural resources--are described elsewhere in this section. The infrastructure and economic development in the area and local communities are expected to lead to some additional vehicular use for non-oil and gas activities, which might lead to some additional erosion of stream banks, particularly at subsistence use sites. More subsistence cabins are also expected. But some decline is expected in the time spent on subsistence activities if significant numbers of local residents obtain employment under this alternative.

The Avak, Tunalik, Nokotkek, and Ongoravik rivers in the Kasegaluk Lagoon area are currently not noticeably impacted by non-oil and gas activities although they are used for subsistence, and this situation is likely to continue because of the distance from local communities and difficulties of access.

Much of the area would be classified as "limited" or "closed" to off-highway vehicle use. OHV use would be expected to expand as vehicular technology improves and more cash comes into the economy, so limits on their use would mitigate potential negative impacts on river values including fish, wildlife, cultural, and fossil resources.

The Colville River riparian area is managed by the State of Alaska and the ASRC. These entities could authorize improvements such as airstrips, lodges, cabin sites, or storage facilities in the riparian area that would impact the scenic quality and primitive roadless nature of the river.

Under this alternative, the impacts of non-oil and gas activities to river values, including outstandingly remarkable values as well as water quality and free flow would be minimal, similar to those identified under the No Action Alternative.

b. Effects of Oil and Gas Activities

(1) Effects of Disturbances

The effects of seismic activity on outstandingly remarkable river values--including subsistence resources and use, fisheries, wildlife, and cultural resources--are described elsewhere in this section, as are the effects of seismic activity on water quality and instream flow.

The effects of disturbances related to oil and gas development on river values would be minimal, largely because of the deferral area, river buffer areas where facilities are prohibited, and the stipulations that limit disturbances along many rivers, lakes, and coastal areas. Perhaps the most critical stipulation is the prohibition of winter water withdrawals from streams. The exception to these statements of course, is the Colville, where BLM does not have management authority.

(2) Effects of Spills

The effects of spills under the Preferred Alternative on water quality, subsistence, fish, and wildlife values are described elsewhere in this chapter.

c. Effectiveness of Stipulations and Required Operating Procedures

be an area of approximately 203,200 acres (or 2.2% of the Planning Area) for the life of pipelines and production fields.

e. Multiple Sales

It is projected that additional lease sales under the Preferred Alternative would result in additional 0 to 4 oil/gas fields developed; exploratory well numbers would increase, as would delineation wells. An additional 480 mi of pipeline in and east of the Planning Area to the Kuparuk oil field is also projected. Total pipeline mileage for new oil, gas, and service lines could reach 685 mi, of which 340 mi would be new oil and gas pipelines in the Northwest NPR-A (Table IV-29).

The types of impacts resulting from additional lease sales would be the same as described above for the first sale. Short-term impacts such as green trails and disturbance resulting from noise, aircraft, and other on-going activities would not accumulate. Impacts from long-term or permanent facilities such as roads, pipelines, gravel pads, and pits would accumulate to the extent such facilities are necessary to support additional exploration and production. At $18/bbl for oil, there would be no production pads, no pipeline miles, and no staging areas and therefore, no real facility increase over that needed for a single sale. However, if oil were to reach $30/bbl, the affected area would total up to approximately 273,600 acres ([8,000 x 6 pads] + [8,000 x 1 staging area] + [640 acres x 340 mi of new oil and gas pipeline]). Some of the pipeline would be outside the Planning Area. The length of pipeline within the Planning Area is projected to be 340 mi; the length outside the Planning Area is projected to be 345 mi (Table IV-29).

f. Conclusion--Multiple Sales

Long-term impacts for multiple sales would be about the same as those of the first sale. Should oil sell for $30/bbl (2002$), long-term impacts would increase about 41 percent over those for the first sale, affecting a total of 494,400 acres. Approximately 273,600 acres would be within the Planning Area, about 3.4 percent of the Planning Area.

Restricting activities such as exploratory oil and gas operations and overland moves to winter months would considerably reduce impacts to recreation values. Few recreationists visit the area during winter months. On a relative scale, few recreationists visit the area summer or winter.

19. Wild and Scenic Rivers

Under the Preferred Alternative, no rivers would be found to be suitable for inclusion in the National Wild and Scenic Rivers System, although 22 rivers were identified as eligible. Other methods of river protection were chosen, as shown in Table V-01, and stipulations were crafted to protect key river values.

a. Effects of Non-Oil and Gas Activities

The effects of non-oil and gas activities on outstandingly remarkable river values--including subsistence resources

(2) Effects of Spills

Most spills (65 to 80%) would be confined to a pad. Spills not confined to a pad usually are confined to the area immediately around the pad or pipeline. Therefore, impacts on scenic quality, solitude, naturalness, or primitive/unconfined recreation resulting from spills likely would be confined to the same area described above.

A large spill that reaches a river and moves rapidly downstream would have disastrous short-term (and possibly long-term) impacts on recreation values. Fishing, boating, camping, scenic values, and other recreation pursuits would be severely impacted as a result of an oil spill in a riverine environment that is used by recreationists. The obvious short-term effects would be the oil residues in areas of use. The long-term effects would possibly be the loss of fishing, and diminished scenic value of the area, as oil residue may take a long time to dissolve and vanish.

(3) Impacts to Wilderness Values

Impacts to wilderness values of naturalness and outstanding opportunities for primitive recreation or solitude would be as described above and in the Visual Resources section (Sec. IV.C.20). Under the Preferred Alternative, no areas would be protected by Wilderness designation.

c. Effectiveness of Stipulations and Required Operating Procedures

ROP A-4 (b, c, and d) and A-5 under Waste Prevention, Handling, and Disposal and Spills would greatly increase the protection of wilderness and recreation resources. These ROP's would help reduce, if not eliminate, the possibilities of larger fuel spills in pristine areas, or areas that can ill afford any type of fuel spill. These two ROP's would not unduly restrict recreationists from using the area's resources for their endeavors and yet would adequately protect these resources from being impacted from fuel spills. In addition to the above, ROP's A-2 (a, b), dealing with the handling of garbage, would help protect the area's recreation/wilderness resources as well as the users.

Other ROP's that would benefit the recreation/wilderness resources and users of the area are ROP's C-2 (a), for wilderness only and ROP's A-1, A-4 (e), and C-2 (b-e), C-3 and C-4 (for both recreation and wilderness) and F-1 (a, b, e, and f) for wilderness values only.

d. Conclusion--First Sale

Under the Preferred Alternative, there would be an increase of approximately 2,000 acres in adverse, short-term impacts to recreation values from activities other than oil and gas exploration and development. Short-term impacts from ongoing oil and gas exploration drilling activities would impact 56,000 acres (at $18/bbl of oil) and 240,000 acres (at $30/bbl of oil).

Oil and gas development would result in the long-term loss of solitude, naturalness, or primitive/unconfined recreation over very few acres with oil at $18/bbl, however, if oil should go to $30/bbl, the long-term loss would

(1) Effects of Disturbances

(a) Exploration

Under the Preferred Alternative, seismic survey work would continue and increase from one operation (as under the No Action Alternative) to two seismic operations. This includes both 2-D and 3-D operations. Assuming two crews working per season, ongoing seismic operations are expected to affect no more than 1,000 acres (2 crews @ 500 acres impacted/crew) at a time or, about 500 acres more than the non–oil and gas activities. Linear green trails (see Visual Resources, Section V.B.20) resulting from these operations would increase in direct relationship to increased seismic operations.

A total of 7 wells (5 exploration wells and 2 delineation wells) are projected under the $18/bbl oil scenario; the projected number of exploration/delineation wells increases to 30 wells (12 exploration wells and 18 delineation wells) under the $30/bbl oil scenario. Because of the limited number of drill rigs available, no more than one rig is available with oil at $18/bbl and no more than four are available with oil at $30/bbl. Drilling would occur over several winter seasons using ice pads, roads, and airstrips. Temporary on-site location of structures (i.e., drilling rigs); noise from generators, vehicles, aircraft, etc.; human presence and associated activity--all would have adverse, short-term impacts on solitude, naturalness, or primitive/unconfined recreation during the winter season. These impacts are expected to be greatest within a 2-mi radius of a drill site, an area of approximately 8,000 acres per well site. Accordingly, under this alternative, there would be a temporary loss of solitude, naturalness, or primitive/unconfined recreation over an area of approximately 56,000 acres (7 wells @ 8,000 acres/well) assuming oil at $18/bbl and this would jump to 240,000 acres with oil at $30/bbl.

In addition to the short-term impacts that would result from exploratory drilling operations, summer season visual impacts to the area's naturalness would result from the greening of vegetation under vacated ice pads, airstrips, and roads (see Visual Resources, Section V.B.20).

Exploration wells also would leave behind a marker pipe expected to be no larger than one square foot on the surface and 6 ft tall. This is essentially a permanent impact but almost unnoticeable from several hundred feet away.

(b) Development

The following discussion assumes oil prices up to $30/bbl and gas prices up to $4.27/Mcf (2002$). Under such price scenarios, up to 6 production pads, a pump station, 205 mi of pipeline, and 2 staging areas could be constructed. Impacts would be the most intense at and around development and production facilities during construction. With the cessation of construction and closure of material sites, the remaining structures, human presence, and associated activity and noise would still have adverse impacts on solitude, naturalness, or primitive/unconfined recreation. Because production could occur for 30 years, these impacts would be long term. These long-term, adverse impacts are expected to be greatest within 2 mi of production or staging sites (an area of about 8,000 acres per site). Additionally, pipelines and associated facilities would impact recreation values. Pipelines would be elevated about 7 ft and, except during construction and repair, there would be no associated on-the-ground activity. Therefore, long-term impacts to recreation values from pipelines are expected to be minimal. This equates to about 640 acres per mile of pipeline. The long-term loss of solitude, naturalness, or primitive/unconfined recreation from all of these development aspects together would impact an area of up to approximately 203,200 acres ([8,000 acres/pad x 6 pads] + [8,000 acres/staging area x 2 staging areas] + [8,000 acres/pump station] + [640 acres/mi x 205 mi of pipeline]).

be addressed at the time each proposal is submitted to BLM for approval. No permit would be issued for activities having reasonably foreseeable effects on coastal uses or resources of the coastal zone unless the State concurs or the Secretary of Commerce overrides the State's objection.

f. Conclusion--Multiple Sales

The potential for conflict with the statewide standards of the ACMP and the enforceable policies of the NSB CMP is the same as for a single sale. No conflicts are anticipated.

18. Recreation Resources and Wilderness

a. Effects of Non-Oil and Gas Activities

The BLM issues Special Recreation Permits (SRP's) to commercial recreation operators such as hunting and float-trip guides, most of whom focus their activity along the Colville River and southern foothills. The BLM estimates that up to three of the permittees--accounting for at most six trips--may float from the headwaters area to Umiat. These trips would be for hunting and would take place in August or the first week of September. They would consist of about four persons who probably would not camp within the Planning Area (since the Colville River is outside the Planning Area). Up to two permittees, accounting for up to four parties of four persons each, may conduct trips in the Arctic Plain and Foothills of the Planning Area. This use would be during the summer to enjoy the scenic, wildlife, and paleontological resources of the area. Each party would camp up to three times each in the Planning Area. A very limited number of SRP's may be associated with other types of use. At least one permittee may operate on floats taking hunters or sightseers to lakes within the Planning Area. These flights may result in camping similar to that of fly camps or backpack camps.

Floating parties along the Colville would carry enough fuel for a small stove and their boat engines. They would camp for no more than one night in any one place, and their camping practices and likely impacts would be consistent with those of fly camps or backpack camps described above.

Under the Preferred Alternative, most impacts to recreation resources would result from activities such as archaeological collection efforts, field camps, survey work, and overland moves. Between June and September, two camps doing survey or collection efforts are anticipated at any one time. In winter months, several overland moves may occur during a single season.

Temporary structures (e.g., sleds, tents), vehicles (e.g., rolligons, tractors), noise from generators, aircraft, human presence, and associated activity all would have some minimal short-term impact on solitude, naturalness, or primitive/unconfined recreation. These adverse, short-term impacts would be confined primarily to the activity site (camp) view shed (i.e., approximately ½ mi in any direction from the site). Therefore, each site (camp) area would impact (on a short term basis) approximately 500 acres of land. Under the Preferred Alternative, the impacts are not expected to affect more than approximately 1,000 acres at a time (two camps @ 500 ac/camp). A longer lasting impact from overland moves would be from "green trails," which are discussed under Visual Resources (Section IV.B.20).

b. Effects of Oil and Gas Activities

categories (Section II.C.6):

- Waste Prevention, Handling, Disposal, Spills and Public Safety
- Water Use for Permitted Activities
- Winter Overland Moves and Seismic Work
- Oil and Gas Exploratory Drilling
- Facility Design and Construction
- Use of Aircraft for Permitted Activities
- Oil Field Abandonment
- Subsistence Consultation for Permitted Activities
- Orientation Programs Associated with Permitted Activities
- Area Specific

All of these require specific actions or restriction of actions that advance the likelihood of activities being conducted consistent with the ACMP statewide standards and enforceable policies of the district program. Energy facilities (6 AAC 80.070) are addressed in several of the ROP's under the heading of Facility Design and Construction. These procedures address concerns related to this statewide standard and related district policies. The statewide standard for subsistence (6 AAC 80.120) and related district policies are specifically addressed in the stipulation and ROP's under Subsistence Consultation for Permitted Activities. However, all of the stipulations and ROP's applicable to the Preferred Alternative would result in increased protection of subsistence species, maintaining their availability for subsistence uses, and reducing conflicts with subsistence activities. Similarly, several of the measures address concerns related to the statewide standard for "Habitats" (6 AAC 80.130). Specifically, the measures provided for Ice Roads and Water Use, Overland Moves and Seismic Work, and Facility Design and Construction would result in enhanced habitat protection. The statewide standard on Air, Land, and Water Quality (6 AAC 80.140) and related district policies are also addressed in several of the categories. ROP A-3 would address compliance with EPA, ADEC, and AOGCC regulations and procedures related to discharges and water quality. The remaining ROP's under this category relate to solid and liquid waste handling and hazardous material disposal and cleanup. All of these would provide protections to the quality of the air, land, and water in and adjacent to the Planning Area.

d. Conclusion--First Sale

There are no inherent conflicts between exploration and development activities envisioned under the Preferred Alternative and the statewide standards and enforceable policies of the NSB CMP. With mitigating measures and regulatory oversight, it should be possible to comply with all of the standards and policies relevant to oil and gas activities that have reasonably foreseeable effects on the coastal resources or uses of the coastal zone. Applicable policies can be more precisely addressed when specific proposals are brought forward by lessees. All plans that may have reasonably foreseeable effects must be accompanied by a consistency certification for State review and concurrence. No permit would be issued for activities having reasonably foreseeable effects unless the State concurs or the Secretary of Commerce overrides the State's objection. The proposal being analyzed at this time includes oil and gas lease sales. This proposal, does not conflict with the standards of the ACMP or the enforceable policies of the NSB CMP. As specific proposals for ground activities are presented, they would be subjected to further analysis. Consistency certifications would be required for activities determined to have foreseeable effects on any coastal use or resource.

e. Multiple Sales

Although the duration and extent of activities would increase, the type of activities would remain the same. The number, duration, and extent of activities does not change the applicability of the relevant policies of the ACMP and the district program--they remain the same regardless of the number of sales held. Applicable policies would

It is expected that oil and gas activities associated with the Preferred Alternative can be conducted in compliance with this standard and the NSB policies. At the time specific plans are submitted for approval by the BLM, activities that may have reasonably foreseeable effects on any coastal use or resource would be subject to consistency review.

(2) Effects of Spills

The likelihood of a future spill would be greatest for small spills, such as fuel spills. The oil spill analysis in Section IV.A.2 includes a discussion of small spills of crude or refined oil from facilities and pipelines both onshore and offshore. Under the Preferred Alternative, 112 small crude oil spills (averaging 3 bbl) and 194 small, refined oil spills (averaging 29 gallons) are hypothesized for analytical purposes. The ROP A-3 would require development and implementation of hazardous-materials contingency plans before transportation, storage, or use of fuel or hazardous substances. In addition, ROP A-4 would require development of a comprehensive spill prevention and response contingency plan. The ROP A-5 addresses requirements for refueling to minimize the impact of contaminants on fish, wildlife and the environment, ROP A-6 addresses minimization of impacts from contaminants associated with exploratory drilling, and ROP A-7 would require specific procedures for the disposal of produced fluids. Stipulation D-1 would protect fish-bearing rivers, streams, and lakes from blowouts, and ROP E-4 would minimize the potential for pipeline leaks.

An estimated 65 to 80 percent of all spills are confined to a pad. Spills not confined to a pad usually are confined to an area adjacent to a pad. For the exploration stage, it is assumed that most spills would occur on an ice pad, ice road, or during winter conditions, where cleanup is less invasive than in a summertime terrestrial spill. The effects of spills and spill cleanup associated with development would be similar to those associated with exploration except that they could occur during snow-free months. Cleanup from these spills might be more invasive because of the non-frozen surface environment. The analysis for small spills assumes that most spills are contained or cleaned up. The effects of such spills are expected to be minor and, given the mitigating measures addressing prevention and response assumed for Alternative A, no conflicts with any of the statewide standards or district enforceable policies are anticipated.

A large spill would have greater impacts on subsistence resources, habitats, and land and water quality than the small spills analyzed in this IAP/EIS. Winter is the predominant activity season in the Planning Area, making the unlikely event of an accidental large spill even more unlikely to occur during the summer months. If a spill occurs during the winter months, cleanup efforts would be conducted during the winter months and would be less likely to impact the resources or uses of the coastal zone. However, even if a large spill were to occur during the summer months, it is not anticipated that any species would become unavailable or unharvestable as a result of such a spill. While localized availability and harvestablility could be impacted, it is expected that subsistence activities would continue outside the localized spill area. Habitats would also be impacted locally if a spill were to occur during summer months or breakup. Water quality in the area of the spill could be compromised but the effect would be short term.

The oil spill analysis in Section IV.A.2.a addresses large spills and states that the most likely number of large spills ($\geq$ 500 bbl) is 0. The analysis of effects on coastal zone management is based on reasonably foreseeable effects. A large spill would be an accidental and unlikely event, and the limited analysis of effects on coastal management reflects those conclusions.

c. Effectiveness of Stipulations and Required Operating Procedures

Mitigating measures are assumed to be in place for this analysis. Stipulations and ROP's are grouped into 10

(j) Statewide Historic, Prehistoric, and Archaeological Resources (6 AAC 80.150)

The statewide standard requires that coastal districts and appropriate State agencies identify areas of the coast that are important to the study, understanding, or illustration of national, State, or local history or prehistory.

The NSB has developed additional policies to ensure protection of its heritage. The NSB CMP 2.4.3.(e) states that development that is likely to disturb cultural or historic sites listed on the National Register of Historic Places; sites eligible for inclusion in the National Register; or sites identified as important to the study, understanding, or illustration of national, State, or local history or prehistory shall 1) be required to avoid the sites; or 2) be required to consult with appropriate local, State and Federal agencies and survey and excavate the site prior to disturbance.

The NSB CMP 2.4.3 goes on to require that "development shall not cause surface disturbance of newly discovered historic or cultural sites prior to archaeological investigation." These NSB CMP policies clearly establish what is required.

Traditional activities at cultural or historic sites also are protected under the NSB CMP 2.4.3(f) (NSBMC 19.70.050.F) and 2.4.5.2(h) (NSBMC 19.70.050.K.8). As noted in the discussion of policies related to subsistence, the latter is a best-effort policy that requires protection for transportation to subsistence-use areas as well as cultural sites.

The analysis in Section V.B.2 states that paleontological resources are not ubiquitous in the Planning Area and it is quite possible that oil and gas activities would have no impact on these resources simply because those activities would occur where paleontological resources are not present. In addition, most activities would occur during the winter months and the impact to any buried paleontological resources would be low. The likelihood of impacting surface paleontological materials is also low because of their isolated and rare occurrence and because of guidance governing oil and gas exploration activities in the areas they are most likely to occur.

Section V.B.13 is a discussion of the cultural resources of the area and the potential for impacts as a result of activities described in the scenarios. Seismic data gathering activity is permitted only during winter using low-ground-pressure vehicles and there is little chance that significant impacts to below-ground cultural resources could occur. Impact to surface cultural resources could occur from passage of seismic vehicles under certain circumstances. In most cases, surface cultural resources, usually structures of some type, can be visually detected and subsequently avoided, even when snow covered. Surface cultural resources that are not structures are not easily detectable, but given the nature, are usually sufficiently protected from impacts by snow cover and frozen vegetation. The exception to this is human skeletal remains that may lie on the surface. Cultural resources are not ubiquitous in the Planning Area as are wildlife and habitat. Although cultural resources, because of their near-surface and surface contexts are more common than paleontological deposits, generally they are more easily recognized and therefore avoided. In most cases, oil and gas activities could be conducted to avoid the locations of cultural resources.

Several Stipulations and ROP's address protection of these resources as discussed in Section V.B.2.c and Section V.B.13.c. ROP C-2 would provide protection from seismic and overland moves. The ½-, ¾-, and 1-mi setbacks along major rivers and streams and the ¾-mi setback along the coast would provide additional protection. The National Historic Preservation Act requires that an archaeological resource survey be completed before any undertaking occurs on federal lands. If resources are identified, BLM guidelines and policy require that all impacts to these resources be mitigated to the satisfaction of the land manager and the State Historic Preservation Office. Additionally, any post-lease activity requiring a BLM permit engaged in by a lessee would require an action/site-specific NEPA document. In that event, the protection of cultural resources in the Planning Area would follow the established and proven permitting procedures developed by the BLM as a result of past NPR-A activities.

The air, land, and water-quality standard of the ACMP incorporates by reference all the statutes pertaining to, and regulations and procedures of, the ADEC. The NSB reiterates this standard in its district policies and emphasizes the need to comply with specific water and air quality regulations in several additional policies.

Water quality can be affected by accidental oil spills, deliberate discharges and emissions, and gravel operations. As a precaution against accidental spills, the NSB CMP requires the use of impermeable lining and diking for fuel-storage units with a capacity > 660 gal (NSB CMP 2.4.4[k] and NSBMC 19.70.050.I.11). In addition, development within 1,500 ft of a coast, lake, or river shoreline "that has the potential of adversely impacting water quality (e.g., landfills, or hazardous-materials storage areas, dumps, etc.)" must comply with the conditions of the best-effort policies (NSB CMP 2.4.5.1[e] and NSBMC 19.70.050.J.4). These conditions are: 1) there must be a significant public need, 2) the developer has rigorously explored and objectively evaluated all feasible and prudent alternatives and cannot comply with the policy, and 3) all feasible and prudent steps have been taken to avoid the adverse effects the policy was intended to prevent. Effects of oil spills are discussed in "(2) Effects of Spills" of this section.

Some discharges and emissions would occur during exploration and development, and the NSB CMP policy 2.4.4(c) (NSBMC 19.70.050.I.3) requires that "development resulting in water or airborne emissions comply with all State and Federal regulations." Discharges of muds, cuttings, and drilling fluids are closely regulated. Eight ROP's included under the category A. Waste Prevention, Handling, Disposal, Spills and Public Safety are included as part of the Preferred Alternative. Except as specifically provided BLM would require compliance with EPA, ADEC, and AOGCC regulations and procedures. The preferred and normal means of disposing of drilling wastes, including muds and cuttings, is reinjection into wells. Cuttings may be stored temporarily to facilitate reinjection and/or backhaul operations. If muds and cuttings were to be stored on the surface, sediments and other contaminants could be flushed into the watershed. The potential for this is reduced by requiring that wastes be stored in lined and bermed areas and disposed of before spring breakup. Oil spill contingency plans are required, and refueling operations are prohibited within 500 ft of the active floodplain of any fish-bearing water body and 100 ft from non-fish-bearing water bodies. Surface discharge of reserve pits is prohibited unless authorized by applicable NPDES, ADEC, and NSB permits (as appropriate) and approved by the Authorized Officer.

The ROP E-8 is designed to minimize impacts on air, land, and water resources by placing restriction on gravel site mine design and reclamation. Stipulation D-1 would prohibit exploratory drilling in rivers and streams, as determined by the active floodplain, and fish-bearing lakes, except where the lessee can demonstrate that impacts would be minimal or it is determined that there is no feasible or prudent alternative. Stipulation E-2 would place restriction on the design and location of permanent oil and gas facilities to protect water quality. Stipulation G-1 would require that upon abandonment or expiration of the lease, all oil- and gas-related facilities would be removed and sites rehabilitated to as near the original condition as practicable unless the Authorized Officer determines it is in the best interest of the public to retain some or all facilities.

Because discharges are carefully regulated, no conflict is anticipated with the statewide standard or NSB CMP policy 2.4.4(d) (NSBMC 19.70.050.I.4) that requires "industrial and commercial development be served by solid waste disposal facilities which meet State and Federal regulations." Air quality also must conform to Federal and State standards. (6 AAC 80.140, NSB CMP 2.4.3[i] and 2.4.4[c], and NSBMC 19.70.050.H and I.3) The analysis of air-quality effects under the Preferred Alternative in Section V.B.6 indicates that conformance is anticipated, and that no conflict between air quality and coastal policies should occur.

As site-specific proposals are presented to BLM for approval, they would be reviewed for reasonably foreseeable effects on the coastal zone and its uses and resources. If applicable, they would be required to undergo a consistency review as required by the Federal CZMA and Alaska's CMP.

The potential for impacts to habitats important to fish resources, birds, and mammals are analyzed in Section V.B.8, Section V.B.9, and Section V.B.10 , respectively. The discussions in paragraph "c. Effectiveness of Stipulations and Required Operating Procedures" in each of these sections provides evidence of the extent of the protections and restrictions developed to provide increased protection to habitats used by these species.

Gravel extraction from or near freshwater and anadromous/amphidromous fish over-wintering and spawning habitat is likely to adversely affect arctic fish by reducing the amount and quality of habitat available to them. However, gravel extraction also has potential for habitat creation and enhancement. Water withdrawals in lakes could cause adverse effects on habitats, but limits on withdrawal and monitoring water quality would minimize impacts. The proposed mitigation addresses water withdrawal in rivers and lakes and gravel extraction.

Marine fishes and their habitat may be affected by impact-producing factors such as seismic surveys, coastal construction and development and marine vessel traffic. It is also possible that some species may benefit from the impact-producing factors. Site-specific/activity-specific prohibitions and restrictions would be provided to protect marine fishes and their habitat, including seasonal restrictions and clearly defined setbacks.

For birds, habitat eliminated by gravel mines, pads, roads, and airstrips is likely to represent a negligible loss. The elimination of leasing in Kasegaluk Lagoon Special Area reduces potential risk to several species of birds. In addition, leasing in the western portion of the Planning Area would be deferred for 10 years, delaying potential impacts for at least this period. Several ROP's and one stipulation are specifically applicable to protection of birds. The stipulation would require lessees to minimize disturbance and loss or alteration of habitat near brant colonies and brood-rearing areas determined by aerial survey.

Terrestrial mammal habitat alteration may be brought about by the development of oil fields, an elevated pipeline, and buried pipeline. Near the oil fields, surface, air, and foot traffic is expected to displace some terrestrial mammals. Some caribou are expected to be disturbed; however, effects would be minimized by locating and designing oil and gas facilities to allow for free movement of caribou. Within a "Caribou Study Area" a study of caribou movements would be undertaken before facility development to assist in reducing impact on caribou movements. The NSB CMP policy 2.4.6.(e) emphasizes this practice and provides a set of guidelines and an intent statement for implementation of this policy. There is no inherent conflict between the crossing requirements and the assumed activities.

Several species of marine mammals occur year round or seasonally in coastal habitats within or adjacent to the Planning Area. Important spotted seal and beluga whale habitats such as Kasegaluk Lagoon and Peard Bay would be deferred from oil and gas leasing for 10 years under this alternative. No permanent or temporary facilities would be allowed within ½ mi of the bank of the Kuk River estuary, an important habitat of beluga whales. The effects of the Preferred Alternative on marine mammals are expected to be short term, with no significant adverse effects on populations.

The use of stipulations and ROP's and any other conditions that may be required for permit approval would provide protection against serious long-term loss of habitat.

Projects presented to BLM for approval would be reviewed for their potential to have reasonably foreseeable effects on any coastal uses or resources (including habitats). If applicable, the proposals would be subjected to an ACMP consistency review.

(i) Air, Land, and Water Quality (6 AAC 80.140)

Several NSB CMP policies address adverse effects on subsistence resources. The NSB CMP Policy 2.4.3.(a) related to "extensive adverse impacts to a subsistence resource" that "are likely and cannot be avoided or mitigated." In such an instance, "development shall not deplete subsistence resources below the subsistence needs of local residents of the Borough." Policy 2.4.5.1.(a) addresses "development that likely will result in significantly decreased productivity of subsistence resources or their ecosystems." Such development would not be allowed unless the requirements of the best effort policies are met: there is a significant public need for the proposed use and activity and the development has rigorously explored and objectively evaluated all feasible and prudent alternatives to the proposed use or activity and cannot comply with the policy.

Section V.B.14, Subsistence-Harvest Patterns, analyzes the potential for impacts to subsistence activities and resources. Evidence of the extent of the protections and restrictions developed to provide increased protection to the varied number of subsistence resources and subsistence-harvest patterns is provided in the discussion in Section V.B.14.c, Effectiveness of Stipulations and Required Operating Procedures.

The use of these stipulations and ROP's and any other conditions that may be required as a condition of permit approval would provide protection against impeding subsistence pursuits.

Projects presented to BLM for approval would be reviewed for their potential to have reasonably foreseeable effects on any coastal uses or resources. If applicable, the proposals would be subjected to an ACMP consistency review.

(h) Habitats (6 AAC 80.130)

Part (a) of the statewide Habitats standard lists 8 types of habitat that are subject to the ACMP, including offshore areas, estuaries, wetlands and tideflats, rocky islands and seacliffs, barrier islands and lagoons, exposed high-energy coasts, rivers, streams and lakes, and important upland habitat. Part (b) of the standard requires that these 8 habitats be managed to maintain or enhance the biological, physical, and chemical characteristics of the habitat. Part (c) provides management guidance for the first 7 of the habitats. Part (d) includes a provision to allow uses and activities to occur that do not conform to parts (b) and (c) of the standard if: (1) there is significant public need; (2) there are no feasible and prudent alternatives; and (3) all feasible and prudent steps to maximize conformance with the standard have been taken.

The ACMP statewide standard for habitats in the coastal zone requires that habitats "be managed so as to maintain or enhance the biological, physical, and chemical characteristics of the habitat which contribute to its capacity to support living resources" (6 AAC 80.130 [b]). This overall policy is supported by an NSB CMP policy requiring that development "be located, designed, and maintained in a manner that prevents significant adverse impacts on fish and wildlife and their habitat, including water circulation and drainage patterns and coastal processes" (NSB CMP 2.4.5.2.[b]). In addition, "vehicles, vessels, and aircraft that are likely to cause significant disturbance must avoid areas where species that are sensitive to noise or movement are concentrated at times when such species are concentrated" (NSB CMP 2.4.4.[a]).

Much of the uplands in the NSB is considered wetlands. Therefore, onshore development activities would need to be designed and constructed to avoid 1) adverse effects to the natural drainage patterns, 2) destruction of important habitat, and 3) the discharge of toxic substances (6 AAC 80.130 [c][3]). Rivers, lakes, and streams are managed to protect natural vegetation, water quality, important fish or wildlife habitat, and natural water flow (6 AAC 80.130 [c][7]). Pipeline and road construction (including gravel extraction) could affect these waterways and would need to be conducted in a manner that ensures the protection of riverine habitat and fish resources. Gravel extraction also is regulated under policies that are described in the section on mining.

This standard requires that routes for transportation and utilities be compatible with district programs and sited inland from shorelines and beaches. The NSB CMP contains several policies related to transportation. All but two of the policies are "best-effort policies." NSB CMP Policy 2.4.4.(h) requires offshore oil transport systems (e.g., pipelines) be specially designed to withstand geophysical hazards, specifically sea ice. NSB CMP Policy 2.4.4.(i) requires causeways to be sited and designed to allow free passage of fish, marine mammals, and molting birds; to prevent changes in water circulation patterns and to ensure adequate sediment transport.

ROP E-6 would require water crossings be designed and constructed to ensure free passage of fish, maintenance of natural drainage, and minimal adverse effects to natural stream flow. Additional protective measures include ROP E-1 and Stipulations E-2 and E-3. These measures would require minimal environmental impacts: protection of fish-bearing water bodies, water quality and aquatic habitats, and maintenance of free passage of fish.

No specific transportation or utility routes have been proposed. Proposals that are presented for BLM approval would be reviewed for consistency if they have reasonably foreseeable effects on the coastal uses and resources of the coastal zone.

(f) Mining and Mineral Processing (6 AAC 80.110)

Extraction of sand and gravel is a major concern on the North Slope. Gravel resources are needed for construction of docks, pads, roadbeds, berms and causeways to protect the tundra. The ACMP statewide standards require that mining and mineral processing be compatible with the other standards, adjacent uses and activities, State and national needs, and district programs. Sand and gravel may be extracted from coastal waters, intertidal areas, barrier islands, and spits when no feasible and prudent non-coastal alternative is available to meet the public need. NSB CMP 2.4.5.1.(j) prohibits substantial alternation of shoreline dynamics. If gravel is not obtained from inland sites, constraints may be placed on extraction activities to lessen environmental degradation of coastal lands and waters, and to ensure floodplain integrity (NSB CMP 2.4.5.2.(a) and (d).

Gravel mine site design and reclamation must be in accordance with a plan approved by the Authorized Officer (AO) and would be conducted in accordance with existing regulations and BLM management practices. ROP E-8 would require the plan consider locations outside the active flood plain, design and construction of gravel mine sites within active floodplains to serve as water reservoirs for future use, and potential use of sites for enhancing fish and wildlife habitat.

Applicability of these policies and standards would be determined on a case-by-case basis as proposals are presented to BLM for approval.

(g) Subsistence (6 AAC 80.120)

The statewide standard for subsistence guarantees opportunities for subsistence use of coastal areas and resources. Subsistence use of coastal resources and maintenance of the subsistence way of life are primary concerns of the residents of the NSB. The NSB CMP Policy 2.4.3.(d) requires that development not preclude reasonable subsistence user access to a subsistence resource. Development that would cause access to be reduced or restricted can occur only if no feasible or prudent alternative is available, and then it is subject to the conditions of the best effort policies.

stations would also impact recreational values. Pipelines would be elevated about 7 ft and, except during construction and repair, there would be no ground activity. Long-term impacts from pipelines are expected to be minimal. In the unlikely event of a large oil spill that reaches a river and moves rapidly downstream, a high short-term impact would be expected. Fishing, boating, camping, scenic values, and other recreational pursuits would be impacted if the spill occurred in a riverine environment used by recreationists. Short-term effects would be oil residues in areas of use. Long-term effects would possibly be the loss of fishing and diminished scenic values of the area.

ROP's A-4(b, c, and d) and A-5 under Waste Prevention, Handling, and Disposal and Spills would greatly increase the protection of wilderness and recreation resources. These ROP's would help reduce, if not eliminate, the possibilities of large fuel spills. These ROP's would not unduly restrict recreationists from using the Planning Area's resources and would adequately protect the resources from being impacted. In addition, ROP's A-2(a and b), dealing with the handling of garbage, would help protect the area's recreation/wilderness resources. Other ROP's that would benefit the recreation resources are C-1(b) and C-2(a) for wilderness only and A-1, A-4(e), C-2(b-e), C-4, and F-1(a, b, e, and f).

BLM-permitted activities having reasonably foreseeable effects on any coastal use or resource of the coastal zone would be reviewed for consistency at the time the activity is proposed. It is expected that with the requirements of the ROP's and any additional conditions that may be applied at the time permits are requested, oil and gas activities could proceed within the parameters of this policy.

(d) Energy Facilities (6 AAC 80.070)

The ACMP requires that decisions on the siting and approval of energy-related facilities be based, to the extent feasible and prudent, on 16 criteria within the energy facilities standard. These criteria are listed in Section III.C.6.b.1 . The NSB CMP also requires that "transportation facilities and utilities must be consolidated to the maximum extent possible" (NSB CMP 2.4.5.2(f) and NSBMC 19.70.050.K.6).

The ROP's related to facility design and construction address concerns related to this standard. Stipulation E-2 would require demonstration that impacts to fish, water quality, and aquatic and riparian habitats would be minimal prior to approving the design and location of permanent oil and gas facilities within 500 ft of fish-bearing, or 100 ft of non-fish-bearing water bodies. Stipulation E-3 would prohibit causeways and docks in river mouths or deltas. Artificial gravel islands and bottom-founded structures would be prohibited in river mouths or active stream channels on river deltas. All of these must be designed to ensure free passage of marine and anadromous fish and to prevent significant changes to nearshore oceanographic circulation patterns and water quality characteristics. A monitoring program is required to address the objectives of water quality and free passage of fish.

ROP E-5 would require development footprints be minimized to the extent practicable. ROP E-7 would minimize disruption of caribou movement and subsistence use along pipelines and roads. ROP E-12 would require the use of ecological mapping as a tool to assess wildlife habitat before development of permanent facilities to conserve important habitat types.

In addition, activities that have reasonably foreseeable effects on any coastal use or resource of the coastal zone would require a consistency review by the State and the NSB to determine whether the proposal meets the requirements of this State standard and related NSB enforceable policies.

(e) Transportation and Utilities (6 AAC 80.080)

The area identified as the Kasegaluk Lagoon Deferral Area would not be offered for leasing or petroleum exploration for 10 years under the Preferred Alternative. Stipulation K-3 would allow development in Dease Inlet, Admiralty Bay, and Elson Lagoon only under very strict criteria and consultation requirements. Permanent facilities would be prohibited within ¾ mi of the shoreline, with the exception of linear features such as pipelines. These provisions, with the added protections of the additional Stipulations and ROP's, would contribute to operations that are consistent with the ACMP and the NSB CMP, as applicable.

Setback restrictions would provide no-development buffers along major rivers, deep lakes, and most shorelines.

(b) Geophysical Hazard Areas (6 AAC 80.050)

This statewide standard requires coastal districts and State agencies to identify areas in which geophysical hazards are known and in which there is a substantial probability that geophysical hazards could occur. Development in these areas would be prohibited until siting, design, and construction measures for minimizing property damage and protecting against the loss of life have been provided.

Permafrost, faults and earthquakes, hydrates and shallow gases, and factors affecting the geotechnical characteristics of the Planning Area would be considered during the course of review and approval of specific plans. Onshore development would be sited in areas of permafrost. Development in these areas must "maintain the natural permafrost insulation quality of existing soils and vegetation" (NSB CMP 2.4.6[c] and NSBMC 19.70.050L.3). The use of BLM's current management practices and site-specific requirements would address these concerns at the time specific proposals are submitted for review and approval.

It is anticipated that activities associated with oil and gas exploration and development would be able to proceed in compliance with this policy.

(c) Recreation (6 AAC 80.060)

This statewide standard requires coastal districts to designate areas for recreational use if: 1) the area receives significant use by persons engaging in recreational pursuits or is a major tourist destination; or 2) the area has potential for high-quality recreational use because of physical, biological, or cultural features. High priority is given to maintaining and increasing public access to coastal waters.

The NSB has identified many areas within NPR-A as high recreational use areas. The BLM issues Special Recreation Permits (SRP's) to commercial recreation operators such as hunting and float-trip guides, with most activity along the Colville River and southern foothills. Oil and gas exploration activities could result in short-term impacts as a result of temporary on-site location of structures with related noise from generators, vehicles, aircraft, etc., and human presence. These impacts would be greatest within a 2-mi radius of a drill site and result in temporary loss of solitude, naturalness, or primitive/unconfined recreation in the immediate vicinity.

Development impacts would be most intense around the facilities during construction. With the cessation of construction and closure of material sites, the remaining structures, human presence, and associated activity and noise would still have impacts on solitude, naturalness, or primitive/unconfined recreations. Pipelines and pump

Within NPR-A, no summer recreational use of OHV's would be permitted. The summer use of OHV's, including all-terrain vehicles and airboats, to support traditional subsistence activities and access would be allowed. The use of airboats during summer would be limited to streams, lakes, and estuaries that are seasonably accessible by motorboat. Airboat use in areas of seasonal flooding of tundra and temporary shallow waters adjacent to streams, lakes and estuaries would be prohibited to prevent impacts to soils, water quality, vegetation, and wildlife (in particular nesting fowl).

The analysis of effects of non-oil and gas activities in Section V.B.14 Subsistence-Harvest Patterns indicates that disturbance reactions of terrestrial mammals are expected to be brief, lasting for a few minutes to less than 1 hour. Current management practices and stipulations attached to land-use authorizations for temporary facilities, overland moves, and recreation permits would be expected to mitigate impacts to terrestrial mammals. Effects on marine mammals, including bowhead whales and beluga whales are likely to be negligible.

It is expected that non-oil and gas activities under the Preferred Alternative would proceed consistent with the ACMP and the NSB CMP. If specific proposals have reasonably foreseeable effects on any coastal use or resource of the coastal zone, the proposed activities would be subject to a consistency review before approval by BLM.

b. Effects of Oil and Gas Activities

(1) Effects of Disturbances

In the following analysis, policies of the NSB CMP are assessed in conjunction with the most closely associated statewide standard.

(a) Coastal Development (6 AAC 80.040)

This standard gives priority to uses and activities in coastal areas that are water-dependent. The intent of this policy is to ensure that onshore development and activities that can be placed inland do not displace activities dependent upon shoreline locations, including marine, lake, and river waterfronts. Activities and uses that are neither water dependent nor water related would be given priority if there is no feasible or prudent alternative to meet the public need.

NSB CMP Policy 2.4.4(i) requires causeways to be sited and designed to allow free passage of fish, marine mammals, and molting birds. Several Best Effort Policies in NSB CMP 2.4.5 address development policies that must be complied with unless there is a significant public need for the proposed use and activity and the development has rigorously explored and objectively evaluated all feasible and prudent alternatives to the proposed use or activity and cannot comply with the policies. NSB CMP Policies for Minimization of Negative Impacts include NSB CMP 2.4.6(b) , which requires that the siting, design, construction, and maintenance of transportation and utility facilities (including ice roads) minimize alteration of shorelines, water courses, wetlands, and tidal marshes.

and Point Lay would further reduce sociocultural effects in these two communities by reducing potential effects to subsistence resources and practices. ROP H-1 that provides opportunities for local stakeholder participation in planning and decision-making to prevent unreasonable conflicts between subsistence uses and oil and gas and related activities and ROP H-2 designed to prevent unreasonable conflicts between subsistence activities and geophysical (seismic) exploration would both serve to further reduce subsistence conflicts and any consequent sociocultural impacts.

(3) Effects on Environmental Justice

The Environmental Justice E.O. includes consideration of potential effects to Native subsistence activities. The BLM's analysis indicates that the only substantial source of potential environmental justice related effects from the Northwest NPR-A Planning Area development under the Preferred Alternative to the Native villages would occur from long-term population and productivity effects to the Teshekpuk Lake caribou herd from development in critical insect-relief areas. Disproportionate, high adverse effects would be experienced by Point Lay, Wainwright, Barrow, Atqasuk, and Nuiqsut, communities which all harvest caribou from the Teshekpuk Lake herd.

ROP K-5, which provides for multi-year studies of caribou before authorization of development activities in identified TLH insect-relief areas, could help minimize potential effects to the TLH in the northern portion of the Planning Area. The deferral of estuarine areas along the western coast of the Northwest NPR-A Planning Area for the next 10 years, including the proposed Kasegaluk Lagoon Special Area, Peard Bay, and the Kuk River system (Wainwright Inlet), as well as important terrestrial subsistence harvest areas for the community of Wainwright and Point Lay would further reduce sociocultural effects and ensuing environmental justice effects in these two communities by reducing potential effects to subsistence resources and practices. ROP H-1 that provides opportunities for local stakeholder participation in planning and decision-making to prevent unreasonable conflicts between subsistence uses and oil and gas and related activities and ROP H-2 designed to prevent unreasonable conflicts between subsistence activities and geophysical (seismic) exploration would both serve to further reduce subsistence conflicts and any consequent sociocultural and environmental justice impacts.

17. Coastal Zone Management

a. Effects of Non-Oil and Gas Activities

The ground-impacting management actions for non-oil and gas activities are associated with:

- aircraft use to transport personnel, supplies, and equipment for fieldwork and to fly aerial surveys;
- excavation and collection of archaeological, paleontological, geological, and soil samples;
- ground activities associated with aircraft use and camps for field survey and recreational activities;
- hazardous- and solid-material removal and remediation;
- overland moves of equipment and supplies and seismic activities; and
- recreational activities.

Subsistence uses of the coastal resources in the NPR-A continue to be a very high priority for the Inupiat, given cultural and historic patterns of existence within NPR-A. Permitted uses are guided by specific ROP's. The Preferred Alternative would designate the Planning Area as Limited for recreational use of off-highway vehicles (OHV's). OHV use would be limited to winter use of snow machines and other low-ground-pressure vehicles.

subsistence users would be displaced and impacts would be expected to be far greater. The BLM expects its subsistence stipulations to mitigate potential exploration and development conflicts with subsistence cabins, camps, and use sites.

ROP K-5, that provides for multi-year studies of caribou prior to authorization of development activities in identified TLH insect-relief areas, could help minimize potential effects to the TLH in the northern portion of the Planning Area.

(3) Environmental Justice

The Environmental Justice Executive Order (E.O.) includes consideration of potential effects to Native subsistence activities. Our analysis indicates that the only substantial source of potential environmental justice related effects from the Northwest NPR-A Planning Area development under the Preferred Alternative to the Native villages would occur from long-term population and productivity effects to the Teshekpuk Lake caribou herd from development in critical insect-relief areas.

i. Conclusion -- Multiple Sales

(1) Effects on Subsistence Resources and Harvest Patterns

For the multiple sales under the Preferred Alternative, most resources would see increases in effects from increases in development activity although overall effects on terrestrial mammals (other than caribou), freshwater fish, marine fish, most birds, bowhead whales, beluga whales, and other marine mammals are still expected to be local and short term (generally < 1 year), and to have no regional population effects. These are the same effects levels expected for a single sale. The TLH would also see population effects and reduced productivity under the multiple sale scenario. Effects to subsistence harvest practices in the communities of Point Lay, Wainwright, Atqasuk, Barrow, and Nuiqsut would still be expected to be minor, as well. But if caribou experienced these population effects, elevate effects on community subsistence-harvest patterns would increase to high or very high effects, as one or more important subsistence resources would become unavailable, undesirable for use, or experience population reductions for a period up to 5 years or longer.

ROP K-5, that provides for multi-year studies of caribou prior to authorization of development activities in identified TLH insect-relief areas, could help minimize potential effects to the TLH in the northern portion of the Planning Area.

(2) Effects on Sociocultural Systems

Anticipated subsistence effects could cause chronic disruption of sociocultural systems for a number of years and although traditional practices for the harvesting, sharing, and processing of subsistence resources could be disrupted, subsistence impacts would not be expected to displace existing institutions or ongoing social systems.

The deferral of estuarine areas along the western coast of the Northwest NPR-A Planning Area for the next 10 years, including the proposed Kasegaluk Lagoon Special Area, Peard Bay, and the Kuk River system (Wainwright Inlet), as well as important terrestrial subsistence harvest areas for the community of Wainwright

For the multiple sales under the Preferred Alternative, most resources would see increases in effects due to increases in development activity although overall effects on terrestrial mammals (other than caribou), freshwater fish, marine fish, most birds, bowhead whales, beluga whales, and other marine mammals are still expected to be local and short term (generally < 1 year), and to have no regional population effects—the same effects levels expected for a single sale. On the other hand, some birds with limited habitat, limited tolerance to disturbance, or declining populations could experience long-term population effects. The TLH would also see population effects and reduced productivity under the multiple sale scenario and there would be a small increase in potential noise and disturbance effects on marine mammals expected along the coast, primarily in the Dease Inlet-Barrow area. Lease Stipulation K-3 could help minimize potential effects to these resources and to subsistence practices.

Industrialization clearly displaces subsistence users from traditional use areas even if no legal impediments to access are imposed (NSB, 2003). Therefore, if development occurred in areas containing concentrations of subsistence cabins, camps, and traditional use sites and subsistence resources experienced only minor impacts, subsistence users would be displaced and impacts would be expected to be far greater. The BLM expects its subsistence stipulations to mitigate potential exploration and development conflicts with subsistence cabins, camps, and use sites.

Effects to subsistence harvest practices in the communities of Point Lay, Wainwright, Atqasuk, Barrow, and Nuiqsut would still be expected to be minor, as well. But with more development taking place and with a potential southern pipeline route to TAPS Pump Station 2 being constructed, some disruption of CAH caribou during migration would be expected. A second gas pipeline from the southern part of the planning area would be constructed to Prudhoe Bay. An increase in the number or miles of roads and pipelines with development under multiple sales is expected to further impede movements of TLH caribou to insect-relief areas along the coast. This effect is expected to persist over the life of the project and may reduce productivity of the TLH. This level of effect on caribou would elevate expected effects on community subsistence-harvest patterns to high or very high effects as one or more important subsistence resources would become unavailable, undesirable for use, or experience population reductions for a period up to 5 years or longer. ROP K-5, that would provide for multi-year studies of caribou prior to authorization of development activities in identified TLH insect-relief areas, could help minimize potential effects to the TLH in the northern portion of the planning area. Under the Preferred Alternative, lagoons and estuaries along the western coast of the Northwest NPR-A Planning Area, including the proposed Kasegaluk Lagoon Special Area, Peard Bay, and the Kuk River system (Wainwright Inlet), as well as important terrestrial subsistence harvest areas for the community of Wainwright would be included in a large deferral area (approximately 17% of the Planning Area) where leasing would be deferred for 10 years. Deferring leasing in the deferral area would reduce for 10 years any potential disturbance from exploration and development on subsistence practices in the areas used by Point Lay and Wainright hunters.

(2) Sociocultural Systems

For the multiple sales under the Preferred Alternative, most subsistence resources would see increases in effects from increases in development activity although overall effects on most resources are still expected to be local and short term (generally < 1 year), and to have no regional population effects. These are the same effects levels expected for a single sale. The TLH would also see population effects and reduced productivity under the multiple sale scenario. Effects to subsistence harvest practices in the communities of Point Lay, Wainwright, Atqasuk, Barrow, and Nuiqsut would still be expected to be minor, as well. But with increased effects anticipated on TLH caribou, elevated effects would be expected on these communities because this important subsistence resource would become unavailable, undesirable for use, or experience population reductions for a period up to 5 years or longer.

Industrialization clearly displaces subsistence users from traditional use areas even if no legal impediments to access are imposed (NSB, 2003). Therefore, if development occurred in areas containing concentrations of subsistence cabins, camps, and traditional use sites and subsistence resources experienced only minor impacts,

experience population reductions for a period greater than 2 years.

(3) Effects on Sociocultural Systems

Effects would be the same or slightly reduced from Alternative A.As most subsistence resources are expected to experience local, short-term impacts with no resources becoming unavailable, undesirable for use, or experiencing overall population reductions, effects on subsistence harvest practices in the communities of Point Lay, Wainwright, Atqasuk, Barrow, and Nuiqsut would experience minor effects as well. But if development took place in critical insect-relief areas of the TLH, effects on subsistence-harvest patterns and on communities would elevate from low effects to moderate or high effects as one or more important subsistence resources would become unavailable, undesirable for use, or experience population reductions for a period greater than 2 years.

Effects on the sociocultural systems of the communities of Point Lay, Wainwright, Atqasuk, Barrow, and Nuiqsut could come from disturbance from oil exploration and development activities, from changes in population and employment, and from periodic interference with subsistence-harvest patterns from oil spills and oil-spill cleanup. Altogether, subsistence effects periodically could disrupt but not displace ongoing social systems, community activities, and traditional practices for harvesting, sharing, and processing subsistence resources.

(4) Effects on Environmental Justice

The Environmental Justice E.O. includes consideration of potential effects to Native subsistence activities. The BLM's analysis indicates that the only substantial source of potential environmental justice related effects from the NW NPR-A Planning Area development under the Preferred Alternative to the Native villages would occur from long-term population and productivity effects to the Teshekpuk Lake caribou herd if development occurred in critical insect-relief areas. Disproportionate, high adverse effects would be experienced by Point Lay, Wainwright, Barrow, Atqasuk, and Nuiqsut, communities which all harvest caribou from the Teshekpuk Lake herd.

ROP K-5, which provides for multi-year studies of caribou before authorization of development activities in identified TLH insect-relief areas, could help minimize potential effects to the TLH in the northern portion of the planning area. The deferral of estuarine areas along the western coast of the Northwest NPR-A Planning Area for the next 10 years, including the proposed Kasegaluk Lagoon Special Area, Peard Bay, and the Kuk River system (Wainwright Inlet), as well as important terrestrial subsistence harvest areas for the community of Wainwright and Point Lay would further reduce sociocultural effects and ensuing environmental justice effects in these two communities by reducing potential effects to subsistence resources and practices. ROP H-1 that provides opportunities for local stakeholder participation in planning and decision-making to prevent unreasonable conflicts between subsistence uses and oil and gas and related activities and ROP H-2 designed to prevent unreasonable conflicts between subsistence activities and geophysical (seismic) exploration would both serve to further reduce subsistence conflicts and any consequent sociocultural and environmental justice impacts.

h. Multiple Sales

(1) Subsistence Resources and Harvest Patterns

$3,280,000, Nuiqsut received 8 grants totaling $8,896,200, and the NSB received 10 grants totaling $15,624,800. Much of the award to the NSB went toward surveying fish resources, monitoring caribou, performing waterfowl surveys, and subsistence harvest research monitoring. The NE NPR-A Resale in June 2002 made another $33,000,000 available for community grants (See Section IV.C.16).

The NSB received almost $2 million from the State under the federally funded Coastal Impact Assistance Program. Industry local hire initiatives are increasing in terms of the variety of programs being offered to train and attract Inupiat workers for long-term employment on the North Slope. BLM cannot require local hire, but BLM and other Federal Agencies can inform the operator of Native concerns for more local employment from nearby oil and gas developments.

g. Conclusion -- First Sale

(1) Effects on Subsistence Species and Subsistence-Harvest Patterns

The overall effects of oil and gas activities under the Preferred Alternative on subsistence resources and harvest patterns are expected to be the same or less than those under Alternative A. If a field is developed in critical Teshekpuk Lake caribou herd (TLH) insect-relief areas, movements of caribou from coastal insect-relief areas to foraging areas would be adversely affected by pipelines and road corridors, and caribou movements within insect-relief areas may be disrupted with unknown levels of effects on the productivity of the herd.

Subsistence-harvest patterns effects are expected to be the same or somewhat less than those under Alternative A, with subsistence resources being periodically affected but no resource becoming unavailable, undesirable for use, or experiencing overall population reductions. Even with one fewer field being developed under the Preferred Alternative, moderate to high effects could still be expected on the productivity of TLH if development takes place in critical insect-relief areas. If the latter occurred, effects on subsistence-harvest patterns would elevate from low effects to moderate or high effects as one or more important subsistence resources would become unavailable, undesirable for use, or experience reduced availability for a period greater than 2 years. ROP K-5, which provides for multi-year studies of caribou before authorization of development activities in identified TLH insect-relief areas, could help minimize potential effects to the TLH in the northern portion of the planning area.

Industrialization clearly displaces subsistence users from traditional use areas even if no legal impediments to access are imposed (NSB, 2003). Therefore, if development occurred in areas containing concentrations of subsistence cabins, camps, and traditional use sites and subsistence resources experienced only minor impacts, subsistence users would be displaced and impacts would be expected to be far greater. The BLM expects its subsistence stipulations to mitigate potential exploration and development conflicts with subsistence cabins, camps, and use sites.

(2) Effects on Subsistence Communities

Effects to the communities of Point Lay, Wainwright, Barrow, Atqasuk, and Nuiqsut from impacts to subsistence resources and subsistence-harvest patterns from ground-impacting activities, small oil spills, and exploration and development are expected to be minor, with subsistence resources being periodically affected but no resource becoming unavailable, undesirable for use, or experiencing overall population reductions. Low to moderate effects on species of waterfowl and shorebirds with declining populations could be expected, and moderate to high effects could be expected on the productivity of TLH if development takes place in critical insect-relief areas. If the latter occurred, effects on subsistence-harvest patterns would elevate from low effects to moderate or high effects as one or more important subsistence resources would become unavailable, undesirable for use, or

social scientists who have written Environmental Justice analyses for MMS Lease Sales 144 and 170, the Liberty Project EIS, and the Beaufort Sea and Cook Inlet Multiple Sale DEIS's.

The Northeast NPR-A IAP established procedures and advisory bodies to address subsistence and research inventory and monitoring concerns. Stipulation 61 delineated a conflict avoidance procedure to address subsistence concerns with oil and gas exploration and development activities. Through it, lessees consult with the NSB, affected communities, and the Subsistence Advisory Panel, a special body created in 1998 to represent subsistence issues. Under the existing IAP for the Northeast NPR-A, representatives from Federal, State, and NSB agencies, oil industry, environmental groups, academia, and other interested parties have been invited to participate on a research and Monitoring team. This team, chartered under the Federal Advisory Committee Act, has been set up to coordinate research and monitoring projects related to the effectiveness of stipulations and surface resource impacts and seeks the advice of the Subsistence Advisory Panel.

Stipulation 59 directs industry to prepare subsistence plans that specify plans for monitoring the effects of oil industry drilling on subsistence activities (specifically Nuiqsut for drilling activities in the Northeast NPR-A). To date Phillips Alaska, BP, and Anandarko have prepared these plans and they have been accepted by the BLM. Plans require the lessee to hire local Subsistence Representatives (SR's) as points of contact with potentially affected villages. These SR's field local subsistence issues that arise from oil activities and communicate them to the lessee who resolves them. More complicated issues may involve monitoring and the lessee is tasked with establishing a monitoring plan that is approved by the BLM, the Subsistence Advisory Panel, the local and tribal governments, and the NSB Planning Commission. The Lessee also conducts public community meetings to field developing subsistence issues. Subsistence issues and other SR business is tracked by the SR in a log book. This log book is used to generate biannual reports that summarize issues gathered from individuals and public meetings and their resolutions, any required monitoring efforts and results, any lessons learned and steps taken to prevent future subsistence conflicts, and any ongoing and unresolved issues. No formal biannual reports have been prepared, but Phillips Alaska circulated an informal memorandum in March 2002 that identified its Nuiqsut SR's, their activities working at the Nanuq drilling site and as ice road monitors, permitting progress for the Puviag project, community meetings conducted, and the desire to publish a newsletter summarizing winter drilling activities.

The BLM has also fostered tribal government participation in the EIS planning process through the formation of the Subsistence Advisory Panel. The panel is made up of representatives from the communities of Anaktuvuk Pass, Atqasuk, Barrow, Nuiqsut, and Wainwright, as well as BLM decision-makers, and a representative from the North Slope Borough. Since its inception, the panel has met ten times in Barrow, Nuiqsut, and Wainwright and has developed an ongoing dialogue on the issues that will serve to guide the BLM in its decision-making on future exploration and development activities in the NPR-A Northwest area. In Nuiqsut, the oil industry, in coordination with the local community, has established and partially funded a Subsistence Oversight Panel to field the concerns of local subsistence hunters and to monitor local subsistence resources.

f. Benefits of the Preferred Alternative

For the development scenario for the Preferred Alternative, the revenue to the NSB would be about $30 million in the first year of production, tapering to $3 million in the latter years. This revenue is based on the Federal royalty rate of 16.67 percent. According to Law, the Federal Government must share 50 percent of this royalty with the State and the State must share a portion of its royalty with the affected local government. The affected local government is assumed to be the NSB and local North Slope communities.

Under the NPR-A leasing program, the BLM refunds a portion of the received lease fees to the State of Alaska. These funds are for the purpose of granting funds to communities that have experienced adverse effects from oil development. Local North Slope communities applied for and received a total of $28 million in grants from NE NPR-A leasing in 1999. Atqasuk received 2 grants totaling $199,000, Barrow received 4 grants totaling

As defined by the NSB Municipal Code, subsistence is "an activity performed in support of the basic beliefs and nutritional needs of the residents of the borough and includes hunting, whaling, fishing, trapping, camping, food gathering, and other traditional and cultural activities" (ADNR, 1997). This definition gives only a glimpse of the importance of the practice of the subsistence way of life in Inupiat culture, but it does underscore that it is a primary cultural and nutritional activity upon which Alaska Native residents of the North Slope depend. For a more complete discussion of subsistence and its cultural and nutritional importance, see Section III.C.3, Subsistence-Harvest Patterns. For statements of the traditional importance of subsistence practices, see Inupiat Traditional Knowledge Commentary in Section IV.C.13, Effects on Subsistence-Harvest Patterns, and Section IV.C.14, Effects on Sociocultural Systems. See also the Cumulative Effects and the Affected Environment sections for these resources for more traditional knowledge.

Potential effects focus on the Inupiat communities of Point Lay, Wainwright, Atqasuk, Barrow, and Nuiqsut within the NSB. The sociocultural and subsistence activities of these Native communities could be affected by disturbance to key subsistence species that leads to disruption, displacement, or long-term changes in species' populations. Communities could be affected by accidental oil spills, as well. Possible oil-spill contamination of subsistence foods is the main concern regarding potential effects on Native health (See Section IV.C.16).

d. Effectiveness of Stipulations and Required Operating Procedures

In general, the stipulations and ROP's articulate minimum protection against impeding subsistence pursuits as set down in ANILCA (P.L. 96-487) and protection of subsistence pursuits helps to guard against potential sociocultural disruptions that then fall under the purview of environmental justice. Stipulations E-1 and E-3 would protect subsistence use and access to traditional hunting and fishing areas. ROP E-5 addresses impacts of the development footprint so as to minimize environmental, economic, and social impacts and ROP E-7addresses the disruption of caribou movement by requiring pipelines and roads to be designed to allow the free movement of caribou and the safe and unimpeded passage of subsistence hunters. ROP E-12 would require ecological mapping of wildlife habitat before development of permanent facilities in order to conserve important habitat types during development. ROP F-1 would minimize the effects of low-flying aircraft on wildlife, traditional subsistence activities and local communities. ROP H-1 is subsistence-specific mitigation designed to provide opportunities for participation in planning and decision-making to prevent unreasonable conflicts between subsistence uses and oil and gas and related activities. ROP H-2 is further subsistence-specific mitigation designed to prevent unreasonable conflicts between subsistence activities and geophysical (seismic) exploration. This ROP would provide for additional consultation requirements for geophysical exploration beyond those required in ROP H-1. ROP I-1 would require the lessee to provide a cultural orientation program for all oil and gas workers involved in NPR-A activities in order to minimize cultural and resource conflicts with local inhabitants. See Section Section IV.C.16 for a detailed discussion of Environmental Justice in-place mitigation and on-going mitigation initiatives and an in-depth discussion of the consultation process (See also Section IV.E on Government-to-Government consultation).

e. In-Place Mitigation and On-Going Mitigation Initiatives

See Section IV.C.16.e for a detailed discussion of Environmental Justice in-place mitigation and on-going mitigation initiatives and an in-depth discussion of the consultation process (See also Section VI.E Government-to-Government consultation).

In evaluating potential sociocultural impacts, BLM has produced a substantial Environmental Justice analysis for Alaska as it relates to the Native Alaskan subsistence way of life. An Environmental Justice analysis was also prepared for the Northeast NPR-A IAP/EIS. It has also sought the expertise of Minerals Management Service

(1) Race

In 1993, the NSB conducted the North Slope Borough Census of Population and Economy. Of the Native population, 97.71% or 4,828 were Inupiat Eskimo. Of the 1998 Native population, 96.83%, or 5,285, were Inupiat Eskimo. For the Borough as a whole in 1993, the population was 74% Inupiat and 26.1% non-Inupiat; in 1998, the population was 72.24% Inupiat and 27.76% non-Inupiat (NSB, 1995, 1999). The 2000 Census counted 7,385 persons resident in the North Slope Borough; 5,050 identified themselves as American Indian and Alaska Native for a 68.4% indigenous population (U.S. Bureau of the Census, Census 2000).

In the potentially affected communities of Point Lay, Wainwright, Atqasuk, Barrow, and Nuiqsut, there are no significant "other minorities." In Point Lay "other minorities" composed 2.8% of a total population of 246 in 1998, in Wainwright 1.3% of a total population of 649, in Atqasuk 3.4% of a total population of 224 in 1998, and in Nuiqsut 1.4% of a total population of 420. In Barrow in 1998, "other minorities" constituted 16.8% of the total population of 4,641, but the Inupiat minority population is the only minority population allowed to conduct subsistence hunts for marine mammals. "Other minorities" are not allowed to participate in the subsistence marine mammal hunt and they do not constitute a potentially affected minority population (NSB, 1999). With the Borough's homogenous Inupiat population it is not possible to identify a "reference" or "control" group within the potentially affected geographic area to determine if the Inupiat are affected disproportionately. This is because a non-minority group does not exist in a geographically dispersed pattern along the potentially affected area of the North Slope (See Section IV.C.16).

(2) Income

According to the U.S. Department of Commerce, the average household income in 1993 for the State of Alaska was $64,652, and the average State per capita income was $23,000. The Borough figures determined an average household income of $54,645 and a per capita income of $15,218 in 1993. When figured for ethnicity, the average Inupiat household income was $44,551 compared with $74,448 for non-Inupiat. The average Inupiat per capita income was $10,765 and the non-Inupiat per capita income was $29,525. Of all the households in the North Slope Borough that were surveyed, 23% qualified as very low-income households and another 10% qualified as low-to-moderate-income households. Because 66% of the total households surveyed was Inupiat, it would appear that a large portion of those households falling into the very low- to low-income range is Inupiat. Poverty-level families in the NSB numbered 88, or 6% of all households. Poverty level thresholds used by the NSB were based on the U.S. Bureau of the Census, March 1996 Current Population Survey; low income is defined by the U.S. Census Bureau as 125% of poverty level (NSB, 1995; NSB, 1999).

The *North Slope Borough 1998/99 Economic Profile and Census Report* showed household income increasing from $54, 645 in 1993 to $63,884 in 1998. The average Inupiat household income increased by an average of $11,685, from $44,551 to $56,236. The average Inupiat per capita income rose from $10,765 in 1993 to $12,550 in 1998. One hundred five households qualified as poverty level and 37 qualified as very low income. This translates into a total of 381 individuals living below the poverty level--an increase of 12 individuals since 1993 (North Slope Borough, 1999). The 2000 Census found an average per capita income of $20,540 and a median household income of $63,173. The 2000 census found 132 Families (8.6% of a total 1,538 NSB families) in poverty status in 1999 (397 individuals 18 years and older) (U.S. Bureau of the Census, Census 2000) (See Section IV.C.16).

c. Consumption of Fish and Game

Wainwright would be included in a large deferral area (approximately 17 % of the Planning Area) where leasing would be deferred for 10 years. Not allowing leasing in Kasegaluk Lagoon and deferring leasing for 10 years in the deferral area would reduce any potential disturbance from exploration and development on subsistence practices in harvest areas used by Point Lay and Wainwright subsistence hunters.

f. Conclusion--Multiple Sales

Anticipated subsistence effects could cause chronic disruption of sociocultural systems for a number of years and although traditional practices for the harvesting, sharing, and processing of subsistence resources could be disrupted, subsistence impacts would not be expected to displace existing institutions or ongoing social systems.

The deferral of estuarine areas along the western coast of the Northwest NPR-A Planning Area for the next 10 years--including the proposed Kasegaluk Lagoon Special Area, Peard Bay, and the Kuk River system (Wainwright Inlet)--as well as important terrestrial subsistence harvest areas for the community of Wainwright and Point Lay would further reduce sociocultural effects in these two communities by reducing potential effects to subsistence resources and practices. ROP H-1 provides opportunities for local stakeholder participation in planning and decision-making to prevent unreasonable conflicts between subsistence uses and oil and gas and related activities and ROP H-2, designed to prevent unreasonable conflicts between subsistence activities and geophysical (seismic) exploration would further reduce subsistence conflicts and any consequent sociocultural impacts.

16. Environmental Justice

a. Introduction

Alaska Inupiat Natives, a recognized minority, are the predominant residents of the North Slope Borough, the area potentially most affected by activities in the Northwest NPR-A Planning Area under the Preferred Alternative. Effects on Inupiat Natives could occur because of their reliance on subsistence foods, and potential effects may affect subsistence resources and harvest practices. Potential effects from noise, disturbance, and oil spills on subsistence resources and practices and sociocultural patterns would focus on the Inupiat communities of Point Lay, Wainwright, Barrow, Atqasuk, and Nuiqsut within the North Slope Borough (NSB). The Environmental Justice Executive Order includes consideration of potential effects to Native subsistence activities. (For a detailed discussion of Environmental Justice effects, see Section IV.C.16 and the cumulative-effects analyses for subsistence-harvest patterns and sociocultural systems in Section IV.F.8.n and Section IV.F.8.o.)

As described in Section Section III.C.3, subsistence activities in the Planning Area are important to providing dietary sustenance to North Slope residents. As a consequence, impacts to subsistence resources and access to those resources have a direct relationship to the analysis of which alternatives may have a disproportionately adverse effect on the minority and low-income populations. Those alternatives identified in the ANILCA 810 analysis in Appendix 5 as having a potentially significant impact on subsistence also would have a significant impact on minorities and low-income populations and communities. Stipulations and other protective measures identified for the Preferred Alternative would help to mitigate impacts on these groups.

b. Demographics

d. Conclusion--First Sale

Effects would be the same or slightly reduced from Alternative A. As most subsistence resources are expected to experience local, short-term impacts with no resources becoming unavailable, undesirable for use, or experiencing overall population reductions, effects on subsistence harvest practices in the communities of Point Lay, Wainwright, Atqasuk, Barrow, and Nuiqsut would experience minor effects as well. But if development took place in critical insect-relief areas of the TLH, effects on subsistence-harvest patterns and on communities would elevate from low effects to moderate or high effects as one or more important subsistence resources would become unavailable, undesirable for use, or experience population reductions for a period greater than 2 years. ROP K-5, that provides for multi-year studies of caribou before authorization of development activities in identified TLH insect-relief areas, could help minimize potential effects to the TLH in the northern portion of the Planning Area.

Effects on the sociocultural systems of the communities of Point Lay, Wainwright, Atqasuk, Barrow, and Nuiqsut could come from disturbance from oil exploration and development activities, from changes in population and employment, and from periodic interference with subsistence-harvest patterns from oil spills and oil-spill cleanup. Altogether, subsistence effects periodically could disrupt but not displace ongoing social systems, community activities, and traditional practices for harvesting, sharing, and processing subsistence resources.

e. Multiple Sales

For multiple sales under the Preferred Alternative, most resources would see increases in effects from increases in development activity although overall effects on terrestrial mammals (other than caribou), freshwater fish, marine fish, most birds, bowhead whales, beluga whales, and other marine mammals are still expected to be local and short term (generally < 1 year) and to have no regional population effects--the same effects levels expected for a single sale. On the other hand, some birds with limited habitat, limited tolerance to disturbance, or declining populations could experience long-term population effects. The TLH would also see population effects and reduced productivity under the multiple sale scenario. Effects on subsistence-harvest practices in the communities of Point Lay, Wainwright, Atqasuk, Barrow, and Nuiqsut would still be expected to be minor. But with increased effects anticipated on TLF caribou, elevated effects would be expected on these communities because this important subsistence resource would become unavailable, undesirable for use, or experience population reductions for a period up to 5 years or longer.

Industrialization clearly displaces subsistence users from traditional use areas even if no legal impediments to access are imposed (NSB, 2003). Therefore, if development occurred in areas containing concentrations of subsistence cabins, camps, and traditional use sites and subsistence resources experienced only minor impacts, subsistence users would be displaced and impacts would be expected to be far greater. The BLM expects its subsistence stipulations to mitigate potential exploration and development conflicts with subsistence cabins, camps, and use sites.

ROP K-5--in providing for multi-year studies of caribou before authorization of development activities in identified TLH insect-relief areas--could help minimize potential effects to the TLH in the northern portion of the Planning Area. Under the Preferred Alternative, lagoons and estuaries along the western coast of the Northwest NPR-A Planning Area--including the proposed Kasegaluk Lagoon Special Area, Peard Bay, and the Kuk River system (Wainwright Inlet)--as well as important terrestrial subsistence harvest areas for the community of

1983). The survey identified notable increases in complaints about alcohol and drug use in all villages between 1970 and 1977. Health and social services programs have attempted to address these problems with treatment programs and shelters for abused wives and families, as well as well as enhanced recreational programs and services. More recently, a lack of adequate financing for city governments within the NSB has hampered the development of these programs, and declining revenues from the State have seriously impaired the overall performance of these city governments. In the last decade, all communities in the NSB have struggled with banning the sale, use, and possession of alcohol. The issue of whether a community will become "dry" or stay "wet" is constantly brought before local voters.

The baseline of the present sociocultural system includes change and strain. The very livelihood and culture of North Slope residents come under increasing scrutiny, regulation, and incremental alteration. Increased stresses on social well-being and on cultural integrity and cohesion come at a time of relative economic well-being. The expected challenges on the culture by the decline in CIP funding from the State have not been as significant as once expected. The buffer effect has come mostly through the dramatic growth of the Borough's own permanent fund, the NSB taking on more of the burden of its own capital improvement, and its emergence as the largest employer of local residents. However, Borough revenues from oil development at Prudhoe Bay are on the decline, and funding challenges (and subsequent challenges to the culture) continue as the Alaska State Legislature alters accepted formulas for Borough bonding and funding for rural school districts.

a. Subsistence Resources and Harvest Patterns

See Section V.B.14.d.2 for a discussion of effects on Subsistence-Harvest Patterns.

b. Effects on Subsistence Communities

See Section V.B.14.d.3 for a discussion of effects on Subsistence Communities.

c. Effectiveness of Stipulations and Recommended Operating Procedures

ROP I-1 would require the lessee to provide a cultural orientation program for all oil and gas workers involved in NPR-A activities in order to minimize cultural and resource conflicts with local inhabitants. This orientation program, as it relates to subsistence pursuits and cultural concerns would: 1) provide sufficient detail to notify personnel of applicable stipulations and required operating procedures, as well as inform them about specific types of environmental, social, traditional and cultural concerns that relate to the region; (2) address the importance of not disturbing archaeological and biological resources and habitats and provide guidance on how to avoid disturbance; 3) include guidance on the preparation, production and distribution of information cards on endangered and/or threatened species; 4) be designed to increase sensitivity and understanding of personnel to community values, customs, and lifestyles in areas where personnel will be operating; 5) include information concerning avoidance of conflicts with subsistence, commercial fishing activities, and pertinent mitigation; 6) include information for aircraft personnel concerning subsistence activities and areas/seasons that are particularly sensitive to disturbance by low flying aircraft. Of special concern is aircraft use near traditional subsistence cabins and campsites, flights during spring goose hunting and fall moose hunting seasons, and flights near North Slope communities.

See Section V.B.14.c for a discussion of the effectiveness of stipilations and recommended operating procedures as they relate to subsistence.

would be included in a large deferral area (approximately 17% of the Planning Area) where leasing would be deferred for 10 years. Deferring leasing in the deferral area would reduce for 10 years any potential disturbance from exploration and development on subsistence practices in the area by Point Lay and Wainwright hunters.

15. Sociocultural Systems

Under the Preferred Alternative, lagoons and estuaries along the western coast of the Northwest NPR-A Planning Area--including the proposed Kasegaluk Lagoon Special Area, Peard Bay, and the Kuk River system (Wainwright Inlet)--as well as important terrestrial subsistence harvest areas for the communities of Wainwright and Point Lay would be included in a large deferral area (approximately 17% of the Planning Area) where leasing would be deferred for 10 years. Special stipulations would apply to oil and gas exploration and development in the Dease Inlet/Admiralty Bay area and in Elson Lagoon.

The primary aspects of the sociocultural systems that could be impacted are: (1) social organization, (2) cultural values, and (3) social health. See Section IV.C.15 for additional discussion on potential stresses to Inupiat sociocultural systems.

The close relationship between the spirit of the Inupiat people, their social organization, and the cultural value of subsistence hunting may be unparalleled when compared with other areas in America where energy-development is taking place. The Inupiat's continuing strong dependence on subsistence foods, particularly marine mammals and caribou, creates a unique set of potential effects from onshore and offshore oil exploration and development on the social and cultural system.

One analysis of Inupiat concerns about oil development was based on a compilation of approximately 10 years of recorded testimony at North Slope public hearings for State and Federal energy-development projects. Most concerns centered on the subsistence use of resources, including damage to subsistence species, loss of access to subsistence areas, loss of Native foods, or interruption of subsistence-species migration. These four concerns were expressed in 83% of all the testimony taken on the North Slope (Kruse et al., 1983: Table 35; USDOI, MMS, 1994; Human Relations Area Files, Inc., 1992).

Other important factors in any analysis of sociocultural systems that will or already are affecting Inupiat society would include: changes in employment, increases in income, decreases in Inupiaq fluency, rising crime rates, substance abuse, and cumulative impacts. Statistics on homicides, rapes, and wife and child abuse present a sobering picture of some aspects of life in NSB communities. Violent deaths account for more than one-third of all deaths on the North Slope. The Alaska Native Health Board notes the "overwhelming involvement of alcohol (and drug) abuse in domestic violence, suicide, child abuse, birth defects, accidents, sexual assaults, homicide and mental illness" (Alaska Native Health Board, 1985). The lack of comparable data makes it impossible to compare levels of abuse and violence between aboriginal (prior to contact with Caucasians), traditional (from the time of commercial whaling through the fur trade), and modern (since World War II) Inupiat populations. Nonetheless, it is apparent that there has been a drastic increase in these social problems, although a study conducted in the early 1980's on the North Slope indicates that no direct relationship was found between energy development and "accelerated social disorganization" (Kruse, Kleinfeld, and Travis, 1982, cited in Impact Assessment, Inc., 1990b). Studies in Barrow (Worl and Smythe, 1986) detail the important changes in Inupiat society occurring in the last decade as a response to these problems. Services from outside institutions and programs have recently begun to assume a greater responsibility for functions formerly provided by extended families. Today, there is an array of social services available in Barrow that is more extensive for a community of this size than anywhere in the U.S. (Worl and Smythe, 1986).

In 1970 and 1977, residents of North Slope villages were asked about their state of well-being in a survey conducted by the University of Alaska Anchorage, Institute of Social and Economic Research (Kruse et al.,

sale scenario as development would be located in higher density habitats for these species. When compared to Alternative A, fewer oil fields would be developed but both the southern and northern pipelines would still be constructed. Impacts would be similar to that projected under Alternative A but somewhat lesser in extent as fewer fields would be developed.

Freshwater Fish: Seismic surveys and pipelines associated with multiple sales are expected to have the same overall effect on arctic fish populations as the first sale. Gravel pads and roads are expected to have about twice the effect as the first sale. Fuel and oil spills are likely to have a greater (though still minor) effect on arctic fish populations than the first sale. Insufficient recovery time between sales and/or greater levels of activity would be likely to result in greater effects than estimated here for multiple sales. The impacts under multiple sales are the same for Alternative A.

Marine Fish: Seismic surveys and oil or diesel fuel spills are likely to have a slightly greater overall effect on marine fish than under the single sale for the Preferred Alternative. Insufficient recovery time between sales and/or greater levels of activity would be likely to result in greater oil-spill-related effects than estimated for multiple sales.

Birds: Although the projected level of activity is somewhat less under the Preferred Alternative than under Alternative A, and additional protective stipulations applied to marine and riverine areas and elsewhere in the Planning Area, and no leasing allowed in the extreme western portion, the probable concentration of development in the northern portion is likely to result in negligible to minor levels of disturbance and minor to moderate levels of oil-spill mortality among the species of varying sensitivity and vulnerability affected--that is, no significant reduction in overall effect. Effects of multiple sales over a longer period in the northern (or other areas) could elevate the overall probability of disturbance and spill occurrence in that area, thereby increasing the potential for disturbing breeding birds, and for spilled oil to reach waterfowl or other water bird concentration areas that could cause mortality well above that of the first sale.

Bowhead Whales: Effects to bowhead whales are not expected to increase under the multiple sale scenario.

Beluga Whales and Other Marine Mammals: The effect of oil and gas activities under the Preferred Alternative with multiple sales is expected to be about the same as that for the single sale, but the duration and extent of activities would occur over a longer period of time, as would potential disturbance effects.

Subsistence Resources and Harvest Patterns: For the multiple sales under the Preferred Alternative, most resources would see increases in effects from increases in development activity although overall effects on terrestrial mammals (other than caribou), freshwater fish, marine fish, most birds, bowhead whales, beluga whales, and other marine mammals are still expected to be local and short term (generally < 1 year), and to have no regional population effects--the same effects levels expected for a single sale. On the other hand, some birds with limited habitat, limited tolerance to disturbance, or declining populations could experience long-term population effects. The TLH would also see population effects and reduced productivity under the multiple sale scenario. Effects to subsistence harvest practices in the communities of Point Lay, Wainwright, Atqasuk, Barrow, and Nuiqsut would still be expected to be minor as well. But if caribou experienced these population effects, elevated effects on community subsistence-harvest patterns would increase to high or very high effects, as one or more important subsistence resources would become unavailable, undesirable for use, or experience population reductions for a period up to 5 years or longer.

ROP K-5, providing for multi-year studies of caribou before authorization of development activities in identified TLH insect-relief areas, could help minimize potential effects to the TLH in the northern portion of the Planning Area. Under the Preferred Alternative, lagoons and estuaries along the western coast of the Northwest NPR-A Planning Area, including the proposed Kasegaluk Lagoon Special Area, Peard Bay, and the Kuk River system (Wainwright Inlet), as well as important terrestrial subsistence harvest areas for the community of Wainwright

Beluga Whales and Other Marine Mammals: If several lease sales occur under the Preferred Alternative, considerably more exploration activity is expected to occur in the southern and central part of the Planning Area, with the number of exploration wells drilled, increasing to 10 to 24 for multiple sales from the projected 5 to 12 wells for one sale. The amount of development also is expected to increase. The number of production pads would be the same for multiple sales as for one sale, and pipeline miles would increase to 0 to 220-270 mi for multiple sales from 0 to 195-250 mi for one sale. The number of small crude-oil and refined-oil spills is estimated to be about the same as under Alternative A. Only a small increase in potential noise and disturbance effects on marine mammals is expected along the coast, primarily in the Dease Inlet-Barrow Area, and these effects are expected to be local and short term (generally < 1 year).

Subsistence Resources and Harvest Patterns: For the multiple sales under the Preferred Alternative, most resources would see increases in effects from increases in development activity although overall effects on terrestrial mammals (other than caribou), freshwater fish, marine fish, most birds, bowhead whales, beluga whales, and other marine mammals are still expected to be local and short term (generally < 1 year), and to have no regional population effects--the same effects levels expected for a single sale. On the other hand, some birds with limited habitat, limited tolerance to disturbance, or declining populations could experience long-term population effects. The TLH would also see population effects and reduced productivity under the multiple sale scenario. and there would be a small increase in potential noise and disturbance effects on marine mammals expected along the coast, primarily in the Dease Inlet-Barrow Area. Stipulation K-3 could help minimize potential effects to these resources and to subsistence practices.

Industrialization clearly displaces subsistence users from traditional use areas even if no legal impediments to access are imposed (NSB, 2003). Therefore, if development occurred in areas containing concentrations of subsistence cabins, camps, and traditional use sites and subsistence resources experienced only minor impacts, subsistence users would be displaced and impacts would be expected to be far greater. The BLM expects its subsistence stipulations to mitigate potential exploration and development conflicts with subsistence cabins, camps, and use sites.

Effects to subsistence harvest practices in the communities of Point Lay, Wainwright, Atqasuk, Barrow, and Nuiqsut would still be expected to be minor as well. But with more development taking place and with a potential southern pipeline route to TAPS Pump Station 2 being constructed, some disruption of CAH caribou during migration would be expected. A second gas pipeline from the southern part of the Planning Area would be constructed to Prudhoe Bay. An increase in the number or miles of roads and pipelines with development under multiple sales is expected to further impede movements of TLH caribou to insect-relief areas along the coast. This effect is expected to persist over the life of the project and may reduce productivity of the TLH. This level of effect on caribou would elevate expected effects on community subsistence-harvest patterns to high or very high effects as one or more important subsistence resources would become unavailable, undesirable for use, or experience population reductions for a period up to 5 years or longer. ROP K-5, providing for multi-year studies of caribou before authorization of development activities in identified TLH insect-relief areas, could help minimize potential effects to the TLH in the northern portion of the Planning Area. Under the Preferred Alternative, lagoons and estuaries along the western coast of the Northwest NPR-A Planning Area, including the proposed Kasegaluk Lagoon Special Area, Peard Bay, and the Kuk River system (Wainwright Inlet), as well as important terrestrial subsistence harvest areas for the community of Wainwright would be included in a large deferral area (approximately 17% of the Planning Area) where leasing would be deferred for 10 years. Deferring leasing in this area would reduce for 10 years any potential disturbance from exploration and development on subsistence practices in the area by Point Lay and Wainwright hunters.

f. Conclusion--Multiple Sales

Terrestrial Mammals: The effect of multiple sales under the Preferred Alternative is expected to cause disruption of TLH caribou movements to insect-relief areas along the coast and cause some disruption of CAH and WAH caribou. Impacts to grizzly bears, wolves and wolverines would be higher than those under the single

Freshwater Fish: It is assumed that additional lease sales under the Preferred Alternative would result in an additional 0 to 4 oil/gas fields developed, exploratory well numbers would increase from 5 to 12 wells to 10 to 24 wells, and delineation wells would increase from 2 to 18 wells to 4 to 18 wells. An additional 200 to 270 mi of pipeline would be added. Seismic activity would remain the same. Water withdrawals would increase in proportion to the activity level. Given the large quantity of lakes in the area likely to be developed, increased water use is not expected to impact fish more severely than under a single sale. Gravel pads and roads for multiple sales are likely to have about twice the effect on arctic fish as the first sale. Doubling the miles of pipeline would not in and of itself increase the measurable effect on arctic fish populations in the Planning Area. It is estimated that the amount of crude oil spilled would double. The impacts would also double, though they would still be minor. However, if there were not enough time between sales to allow for full recovery, or if the level of activity of the selected alternatives were significantly greater than that of the first sale, the effect of each additional sale on arctic fish populations is likely to be greater than estimated here for multiple sales.

Marine Fish: The most likely events to affect marine fish for the first lease sale, and any subsequent sale, include seismic surveys, fuel spills, and oil spills. Additional NPR-A lease sales would add to the seismic surveys from the first sale, and thereby would increase the probability of seismic activity occurring above over-wintering habitat. However, such events are likely to be infrequent. Seismic surveys associated with multiple sales in the Preferred Alternative are expected to have the same overall effect on marine fish as discussed for the first sale. If several lease sales occur under the Preferred Alternative, considerably more exploration activity is expected to occur in the Planning Area. It is estimated that up to 476 bbl of crude oil would be spilled for multiple sales, or about 1.4 times that of the first sale. On the basis of this estimate, crude-oil spills for multiple sales are expected to have a slightly greater effect on marine fish than those under the first sale. However, if there were not enough time between sales to allow for full recovery, or if the level of activity of the selected alternatives were significantly greater than that of the first sale, the effect of each additional sale on marine fish populations is likely to be greater than estimated here for multiple sales.

Birds: If multiple sales occur under the Preferred Alternative, it is likely that disturbance from development activity and any oil-spill effects would be concentrated in the northern portion of the Planning Area, as under Alternative A, where stipulations governing various activities apply. Disturbance associated with multiple sales is likely to result in a substantial increase of local effects, and potentially at a regional level for species that are uncommon and/or decreasing in numbers, over that expected from the first sale, especially if sales are concentrated in the northern Planning Area. However, the overall effect of routine oil and gas activities at the regional population level is likely to be negligible for most activities and species because there still is a relatively low level of activity projected, and most species populations are scattered over a large area. Effects could be elevated to the minor level for species that are uncommon, decreasing, or recently declined. Effects of gravel mining are likely to remain at the minor level because some sites probably would be used for several projects. Effects of air traffic with multiple sales, particularly if developments are concentrated in a limited portion of the Planning Area, could be elevated to a moderate level especially in the case of species with limited habitat preferences, small and/or declining populations (red-throated loon, yellow-billed loon, king eider, common eider, Sabine's gull, gyrfalcon, peregrine falcon, snowy owl). Effects could extend to regional populations and involve long-term changes in distribution.

The stipulations applied to marine areas and rivers also could reduce the probability that an oil spill would reach areas where birds concentrate (e.g., waterfowl in marine waters or rivers) by providing setbacks from aquatic habitats and prohibiting permanent facilities in marine waters. However, multiple sales in the northern area, for example, even though reduced somewhat from Alternative A, could elevate the overall probability of spill occurrence in that area, thereby increasing the potential for oil to reach waterfowl concentration areas, and causing substantial mortality well above that for the first sale. Effects from pipelines required to transport oil to existing eastern pipelines are likely to be considerably less that for the first sale because only shorter accessory lines would be constructed to individual successive projects.

Bowhead Whales: Effects to bowhead whales are not expected to increase under the multiple sale scenario.

They must not know we use those camps" (City of Nuiqsut, 1995). Locally oil development impacts are believed to be the cause of reduced numbers of arctic cisco, smaller whitefish (Woods, 1979; Dames and Moore, 1996b; Brower and Opie, 1997; Ahtuangaruak, 1997).

Concerns about access restrictions have been voiced by local residents. Sarah Kunaknana, talking about local subsistence hunters, observed that others have stated that they don't hunt near Prudhoe Bay anymore because of oil development (S. Kunaknana, in Shapiro, Metzner, and Toovak, 1979). Nuiqsut's present Vice Mayor Mark Ahmakak, when asked in 1982 if people had been turned back from hunting and fishing areas, answered: "Oh, yes. I have experienced that myself in going out towards Nuiktuk [?] over toward DEW Line station. We have been told by oil company officials that we can't hunt near development area" (Kruse et al., 1983; Ahvakana, 1990; Dames and Moore, 1996c).

In Northeast Area NPR-A scoping meetings in the village, Thomas Napageak elaborated on the issue of lost access noting that oil development at Prudhoe Bay and Kuparuk had already cut off Nuiqsut residents from nearly one-third of their traditional subsistence harvest areas (Napageak, 1997; Lampe, 1997).

A major issue with the NPR-A development has been the velocity of the environmental assessment process and the way it has taxed the resources of the Native community. Nuiqsut residents believe it precludes them from having a meaningful involvement with the planning process and a thorough compilation of the vast cultural knowledge the Inupiat have gained over millennia (Lampe, 1997; Adams, 1997:5, 9; Ahtuangaruak, 1997; Napageak, 1997; Hepa, 1997). Oil spills also are an identified threat. Thomas Napageak stated in his testimony at the Nuiqsut NE Area NPR-A scoping meeting that: "The oil industry still does not have adequate technology for oil spill clean up in the Arctic, particularly in rivers, lakes, and the Beaufort Sea. Adequate spill response must be part of any development." (USDOI, BLM, 1997a)

(f) Other Subsistence Communities

Because overall impacts to migratory birds in the Northwest NPR-A Planning Area, except eiders, are expected to be minor and these birds in general disperse over large migration and wintering areas, effects on stakeholders (including subsistence hunters) are also expected to be minor. Some mortality to subsistence waterfowl species in the Northwest NPR-A would be expected, but the mortality rates are expected to be low. There is no realistic way to translate this potential impact in the Northwest NPR-A Planning Area into a level of measurable effect on more distant subsistence users.

e. Multiple Sales

Terrestrial Mammals: If several lease sales were to occur under the Preferred Alternative, considerably more exploration activity would be expected to occur in the habitat of the TLH and WAH caribou, with twice as many exploration wells being drilled. Up to 8 oil fields would be developed and the number of pipeline miles would be slightly less than those under Alternative A. A southern pipeline route to TAPS Pump Station 2 may be constructed, resulting in some disruption of CAH caribou. An increase in the number or miles of roads and pipelines with development under multiple sales is expected to further impede movements of TLH caribou to insect-relief areas along the coast. This effect is expected to persist over the life of the oil fields and may reduce productivity of the TLH. The number of spills, either small or large, is not expected to increase. However, the location of the spills may change. Small, chronic spills are expected to have about the same effect on terrestrial mammals and their habitats as under the single sale scenario but with a higher likelihood of impacts to WAH caribou.

ditch was created that lowered the lake's water level and ruined fishing there. After the War, Navy exploration continued and Thomas Brower, Sr., remembers having to negotiate with the Navy so their planes wouldn't buzz his reindeer herd (Arundale and Schneider, 1987).

After World War II, seismic exploration was a problem to the reindeer in other ways, and Brower remembers the seismic wire catching in the hooves of the reindeer and making them lame (Arundale and Schneider, 1987). Fifty years later, seismic activity still is a problem. Karen Burnell, then NSB Planning Director, indicated at the March 1997 Atqasuk Northeast NPR-A Scoping Meeting that inspection of seismic crews is necessary to keep their activities in line with permitting guidelines that require them to adequately clean up small spills and pick up debris left behind (USDOI, BLM, 1997a).

Access issues are viewed as critical in view of the areas near Prudhoe now off limits to subsistence. Arnold Brower, Jr., NSB NE Area NPR-A Coordinator, said that similar firearm restrictions to those already exisiting around Prudhoe Bay oil-development sites would create additional detours for subsistence hunters. Thomas Brower, Jr. expressed concerns about drilling contaminants because he has seen wildlife dying from drilling wastes left behind by past drilling activity (USDOI, BLM, 1997a).

(d) Barrow

Community residents have concerns over pipeline construction restricting subsistence access and have told BLM that it must identify stipulations to protect subsistence-hunting sites, traditional fish camps, and access routes from development impacts (C. Brower, 1986; Hepa, 1997). The issue of BLM's failure to resolve local allotment claims is a serious long-term concern. There are also concerns about past contamination and potential new contamination of watersheds from oil exploration (Leavitt, 1980; Aiken, 1997) and seismic impacts on fish and other wildlife (Itta, 1997, H. Brower, 1997).

(e) Nuiqsut

Pipelines can create physical barriers to subsistence access, making subsistence hunters' pursuit of caribou more difficult (Kruse et al., 1983). Fourteen years later, this same concern was still being expressed by Nuiqsut officials Leonard Lampe and Thomas Napageak, who recounted how designed caribou crossings of pipelines did not seem to work (USDOI, BLM, 1997a).

Elder Bessie Ericklook and others from Nuiqsut maintain that since the oil fields have been established [at Prudhoe Bay], the foxes have been dirty and discolored in [the] area of Oliktok [Point] (USDOI, MMS, 1979a; Brower and Opie, 1997). Leonard Lampe, past Mayor of Nuiqsut, and other local residents have expressed further concern for air-pollution and habitat problems, asserting that Nuiqsut has been experiencing these effects for some time (Lavrakas, 1996:1, 5; USDOI, BLM, 1997a; Ahtuangaruak, 1997; Brower and Opie, 1997). Seismic activity that leaves trails and sometimes wire cable has caused problems with winter subsistence travel; seismic activity has also threatened traditional sites and is suspected of altering the caribou food chain (Lavrakas, 1996:1, 5; Napageak, 1997). Some believe that increased traffic on the Dalton Highway might be interfering with caribou migrations by spooking the animals (Lampe, 1997; Adams, 1997:5, 9).

Ruth Nukapigak recounted that seismic activity has repeatedly trespassed onto her allotment on the Itkillik River, and that she has been trying unsuccessfully to get compensation since 1974 (USDOI, BLM, 1997a).
Oil-exploration crews have been a constant problem to villagers. A cultural plan (*Nuiqsut Paisanitch: A Cultural Plan*) drafted by the village in 1979 noted these objections to field crews by a Nuiqsut resident: "Those oil exploration crews wreck our camps. They tore up our ice cellars at Oliktok and left meat and fish around to rot.

Beluga whales are a prized subsistence resource, and for this reason Point Lay residents object to nearshore or offshore noise disturbances (Tukrook, 1987; Tucker, 1996). Hunters believe such nearshore or offshore development and oil spills would disturb migrating whales, change migration routes, and make them impossible to hunt or adversely affect their population (Huntington and Mymrin, 1996). Point Lay residents have expressed concern about the overall health of caribou, beluga whales, polar bears, brown bears, wolves, and wolverines in the area (Stalker, 1998). Hunters believe health problems of caribou are related to contaminants (Tucker, 1998). Dorcas Neakok, interviewed in 1988 and 1989, reflected on her difficult interactions with Point Lay DEW-Line and oil exploration workers (Neakok, 1989).

(b) Wainwright

Wainwright residents object to nearshore or offshore disturbances of any kind because of the displacement of game they have already observed (Aveoganna, 1987; Oktullik, 1996). Residents expressed concerns about potential contamination from oil and about oil-spill cleanup capabilities (Aveoganna, 1987; Kagak, 1987). Local residents state explicitly that there are no viable substitutes for subsistence food resources (Ahmaogak, 1987). Hunters have observed waste sites and contamination and the changes that have occurred to fish, caribou, and polar bear behavior and to local ocean conditions (Peetook, 1998; Angashuk, 1998; D. Tagarook, 1998; G. Tagarook, 1998). There is a local concern that BLM, in its planning protocol for NPR-A, would designate certain areas off limits to subsistence (Peetook, 1998). Also of concern to the community is the ongoing issue of impact assistance to local communities from oil activity impacts (Agnasagga, 1986).

The ongoing "Human and Chemical Ecology of Arctic Pathways by Marine Pollutants" collaborative project between the Wainwright Traditional Council and University of Calgary researchers that produced the report entitled *"Passing on the Knowledge: Mapping Human Ecology in Wainwright, Alaska"* revealed a number of observations by local hunters concerning changes in subsistence resource behaviors and populations. Community members noted changes in the skin color of beluga whales "from the normal white to a yellowish tinge." Changes in ice conditions have produced major changes to polar bear behavior. In recent years, the late formation of sea ice "has left many bears trapped on the land." Because they are not able to reach the ice and hunt for seals, many polar bears appear to be starving. Caribou migration corridors have changed, as well. In the last 50 years, local hunters report that more caribou are staying closer to the community rather than following the herd on its migration. Shorter, thinner fur on small furbearers has been reported, especially wolverine. Villagers attribute this change to unusually warm fall and winter seasons. Hunters have reported that "birds harvested in the fall have enlarged livers and gizzards and white (rather than yellow) fat." A number of changes to fish have been observed. A greater number of salmon and a greater number of salmon types have been reported. Fewer fish are reported when boats travel the rivers, and more fish have been found with open sores. Finally, mature grayling seem to be smaller than in the past (Kassam and the Wainwright Traditional Council, 2000).

(c) Atqasuk

Community members of Atqasuk have expressed concern for areas critical to calving caribou and nesting waterfowl and have suggested that special management zones be established for these populations. Hunters believe oil development has affected animal migrations and duck populations near Prudhoe Bay and recommend that development should not occur any closer than 15 to 20 mi to their habitats (Kagak, 1997). Arnold Brower, Sr. remembers returning from World War II and noticing the extensive environmental damage left by the Navy. He believed that damage done by the Navy near Imagruaq Lake damaged the tundra to such an extent that a drainage

regional population effects.

If a field were to be developed in critical Teshekpuk Lake caribou herd (TLH) insect-relief areas, movements of caribou from coastal insect-relief areas to foraging areas would be adversely affected by pipelines and road corridors, and caribou movements within insect-relief areas could be disrupted, with unknown levels of effects on the productivity of the herd. Effects of crude-oil spills on birds could range from minor--when confined to terrestrial and freshwater aquatic habitats where the mortality of few waterfowl, shorebirds, raptors, and passerines is likely to be relatively low--to moderate if a spill were to enter a river delta or nearshore marine habitat occupied by loons, large numbers of seaducks whose populations have declined, black guillemots, or Ross' gulls.

Effects on subsistence-harvest patterns are expected to be the same or somewhat less than those for Alternative A, with subsistence resources being periodically affected but no resource becoming unavailable, undesirable for use, or experiencing overall population reductions. Low to moderate effects on species of waterfowl and shorebirds with declining populations could be expected, and even with one fewer field being developed under the Preferred Alternative, moderate to high effects could still be expected on the productivity of TLH caribou if development were to take place in critical insect-relief areas. If the latter were to occur, effects on subsistence-harvest patterns would elevate from low to moderate or high as an important subsistence resource would become unavailable, undesirable for use, or experience reduced availability for a period greater than 2 years. ROP K-5, providing for multi-year studies of caribou before authorization of development activities in identified TLH insect-relief areas, could help minimize potential effects to the TLH in the northern portion of the Planning Area.

Industrialization clearly displaces subsistence users from traditional use areas even if no legal impediments to access are imposed (NSB, 2003). Therefore, if development were to occur in areas containing concentrations of subsistence cabins, camps, and if traditional use sites and subsistence resources experienced even minor impacts, subsistence users would be displaced and impacts would be expected to be far greater. The BLM expects its subsistence stipulations to mitigate potential exploration and development conflicts with subsistence cabins, camps, and use sites.

(3) Effects on Communities

Effects to the communities of Point Lay, Wainwright, Barrow, Atqasuk, and Nuiqsut from impacts to subsistence resources and subsistence-harvest patterns from ground-impacting activities, small oil spills, and exploration and development are expected to be minor with subsistence resources being periodically affected but no resource becoming unavailable, undesirable for use, or experiencing overall population reductions. Low to moderate effects on species of waterfowl and shorebirds with declining populations could be expected, and moderate to high effects could be expected on the productivity of TLH if development takes place in critical insect-relief areas. If the latter occurred, effects on subsistence-harvest patterns would elevate from low effects to moderate or high effects as one or more important subsistence resources would become unavailable, undesirable for use, or experience population reductions for a period greater than 2 years.

Below is a brief summary of community traditional knowledge of effects on resources and harvests, A fuller discussion of traditional knowledge and quoted statements from North Slope residents in the following potentially affected communities can be found in Section IV.C.14.d.3.

(a) Point Lay

of terrestrial mammals but impacts would not be significant at the population level.

Freshwater Fish: Construction of pads, roads, and airstrips, and fuel spills associated with the Preferred Alternative might be expected to kill a small number of individual fish but are expected to have no measurable effect on arctic fish populations. Increased mortality is anticipated when water withdrawals occur in river pools. Potential mortality from water withdrawals in lakes is also possible, although limits on withdrawal and monitoring of water quality should minimize concerns. Decreased exploration activity under the Preferred Alternative (as compared to Alternative A) represents a corresponding 30 percent decreased water budget. This would also lessen the potential for fish kill in lakes. Gravel requirements for oil and gas field pads in the Preferred Alternative are 20 percent less than those in Alternative A. Gravel extractions can lead to habitat enhancement under certain situations. Seismic surveys, non-oil and gas activity, causeways, and seawater spills associated with the Preferred Alternative are not expected to have a measurable effect on arctic fish populations in the Planning Area over the production life of the field. These last conclusions mirror those from Alternative A.

Marine Fish: Seismic surveys, and oil or diesel fuel spills associated with the Preferred Alternative are not expected to have a measurable effect on marine fish populations.

Birds: Under the Preferred Alternative, disturbance effects from non-oil and gas activities, winter seismic surveys, and routine oil and gas activities for most species are likely to be negligible, or minor for uncommon/decreasing species, as under Alternative A. Effects of air traffic and gravel mining are likely to remain at the minor level under the Preferred Alternative. Effects of a large spill for most species are likely to remain at the minor level; moderate effects where waterfowl or other birds concentrate may be reduced by stipulations covering marine waters and major rivers that drain into this habitat.

Bowhead Whales: Both disturbance and oil spill effects could be somewhat less than those for Alternative A as a result of removal of Kasegaluk Lagoon from oil and gas leasing and protections in Dease Inlet, Admiralty Bay, and Elson Lagoon.

Beluga Whales and Other Marine Mammals: For the Preferred Alternative, the effects of activities other than oil and gas, on marine mammals--particularly polar bears and spotted seals--along the coast of the Planning Area are expected to be local and occur within about 1 mi of resource-inventory-survey activities, survey and recreational camps, and overland moves. The effects of oil and gas activities are expected to result in a small increase in potential noise and disturbance along the coast, primarily in the Dease Inlet-Elson Lagoon Area, and these effects are expected to be local and short term (generally < 1 year). Under the Preferred Alternative, seals and polar bears could be affected by possible oil exploration offshore from an ice island and subsequent oil development on the coast of the Northwest NPR-A. Effects of these activities would be local and are not likely to affect marine mammal populations.

A small number of spotted seals (perhaps 10 to 30 animals) and no more than a few polar bears might be adversely affected or killed by a 500- or 900-bbl crude-oil spill occurring onshore and possibly contaminating Dease Inlet, but these losses would not be significant to marine mammal populations. The effects of the Preferred Alternative are expected to be short term, with no significant adverse effects on marine mammal populations.

(2) Effects on Subsistence-Harvest Patterns

The overall effects of oil and gas activities under the Preferred Alternative on subsistence resources and harvest patterns are expected to be the same or less than those under Alternative A. Effects on terrestrial mammals (other than caribou), freshwater fish, marine fish, most birds, bowheads whales, beluga whales, and other marine mammals are expected to range from negligible to local and short term (generally less than 1 year), and have no

activity(s) taking place (including the use of aircraft); a description of how the lessee/permittee would minimize and/or deal with any potential impacts identified by the AO during the consultation process; a detailed description of the monitoring effort to take place, including process, procedures, personnel involved and points of contact both at the work site and in the local community; information on how the applicant would keep potentially affected individuals and communities up to date on the progress of the activity and locations of possible, short-term conflicts (if any) with subsistence activities; procedures necessary to facilitate access by subsistence users to conduct their activities; recognition that the AO would resolve conflict between the lessee and subsistence hunters; during development, monitoring plans would be established for new permanent facilities, including pipelines, to assess an appropriate range of potential effects on resources and subsistence as determined on a case-by-case basis; the scope, intensity, and duration of such plans would be established in consultation with the AO and Subsistence Advisory Panel.

ROP H-2 is further subsistence-specific mitigation designed to prevent unreasonable conflicts between subsistence activities and geophysical (seismic) exploration. This ROP provides for additional consultation requirements for geophysical exploration beyond those required in ROP H-1. Specifically, geophysical operators: 1) would notify in writing all potentially effected long-term cabin and camp users; 2) operators would use as their source the North Slope Borough's most current inventory of cabins and campsites; 3) a potentially affected cabin or campsite is defined as any camp or campsite within the boundary of the area subject to proposed geophysical exploration and/or within 1,200 ft of actual or planned travel routes used to supply the seismic operations while it is in operation; 4) a copy of the notification letter and the list of potentially affected users would be provided to the office of the appropriate Native Tribal Government; 5) based on this consultation, the AO may prohibit seismic work up to 1,200 ft from any known, long-term cabin or campsite. Generally, the AO would allow wintertime seismic work to be conducted within 300 ft of a long-term cabin or campsite that is not in use.

ROP I-1 requires the lessee to provide a cultural orientation program for all oil and gas workers involved in NPR-A activities in order to minimize cultural and resource conflicts with local inhabitants. This orientation program, as it relates to subsistence pursuits and cultural concerns would: 1) provide sufficient detail to notify personnel of applicable stipulations and required operating procedures, as well as inform them about specific types of environmental, social, traditional and cultural concerns that relate to the region; 2) address the importance of not disturbing archaeological and biological resources and habitats and provide guidance on how to avoid disturbance; 3) include guidance on the preparation, production and distribution of information cards on endangered and/or threatened species; 4) be designed to increase sensitivity and understanding of personnel to community values, customs, and lifestyles in areas where personnel would be operating; 5) include information concerning avoidance of conflicts with subsistence, commercial fishing activities, and pertinent mitigation; and 6) include information for aircraft personnel concerning subsistence activities and areas/seasons that are particularly sensitive to disturbance by low flying aircraft. Of special concern is aircraft use near traditional subsistence cabins and campsites, flights during spring goose hunting and fall moose hunting seasons, and flights near North Slope communities.

d. Conclusion--First Sale

(1) Effects on Subsistence Species

Terrestrial Mammals: The effects of oil and gas activities on terrestrial mammals would be similar to but somewhat less than those projected under Alternative A. Habitat alteration would include the development of up to 4 oil fields and a northern pipeline to the TAPS. Some TLH caribou are expected to be disturbed and their movements delayed along the pipeline during periods of air traffic and construction. Near the oil fields, surface, air, and foot traffic is expected to increase significantly and to displace some terrestrial mammals. If a field is developed in critical TLH insect-relief areas, movements of the TLH caribou from coastal insect-relief areas to foraging areas may be adversely affected by pipelines and road corridors. There may be increased energetic costs to caribou. Extensive development in this area could result in the loss of some insect-relief habitat for TLH caribou. The number of small, chronic crude-oil and fuel spills is expected to result in the loss of small numbers

Stipulation K-3 would apply specifically to bowhead whales, and some protection from disturbance of the few bowhead whales that rarely occur in nearshore areas potentially could be accomplished if aircraft flying in coastal or nearshore areas were operated in a manner to minimize exposure of whales to noise, and if personnel in coastal or nearshore areas conducted activities using procedures designed to avoid disturbing wildlife that are presented in orientation program briefings. Effective mitigation for marine mammals would be Stipulation K-6 and ROP's A-3, A-4, C-1, E-4, and E-12.

Subsistence Resources and Harvest Patterns: Stipulations articulate minimum protection against impeding subsistence pursuits as set down in ANILCA (P.L. 96-487). Specifically for subsistence, Stipulations E-1 and E-3 protect subsistence use and access to traditional hunting and fishing areas, specifically areas adjacent to waterbodies with identified subsistence values. Stipulation K-1 specifically identifies the waterbodies of prime importance to subsistence and the setback requirements: the Colville, Alaktak, Chipp, Oumalik, Ikpikpuk, Titaluk, Kigalik, Topagoruk, Meade, Usuktuk, Nigisaktuvik, Avalik, and Inaru rivers, and Kucheak, Maybe, Ishuktak, and Pikroka creeks. Stipulation K-3 protects subsistence resources and access in Dease Inlet, Admiralty Bay, and Elson Lagoon. This stipulation specifies: 1) a ¾-mi coastal shoreline and natural island setback that would exclude development on or under the water; 2) no exploration occurring between May 15 and October 15; 3) requirements to prevent operational and siting conflicts with traditional subsistence activities; 4) spill response capabilities in broken ice conditions; 5) consultation requirements with the Alaska Eskimo Whaling Commission to minimize impacts to fall and spring subsistence whaling activities; and 6) that the burden of proof rest with the lessee to demonstrate that BLM approval of exploration and development plans is warranted.

ROP E-5 addresses impacts of the development footprint so as to minimize environmental, economic, and social impacts; ROP E-7addresses the disruption of caribou movement by requiring pipelines and roads to be designed to allow the free movement of caribou and the safe and unimpeded passage of subsistence hunters. Specifically: 1) ground pipelines would be elevated an average of at least 7 ft to facilitate wildlife passage and subsistence passage and access; 2) the requirement of ramps--after consultation with appropriate Federal, State, and North Slope Borough regulatory and resource management agencies--where facilities or terrain funnel caribou movement; and 3) a minimum separation of 500 ft between pipelines and roads to reduce disturbance to caribou movements. ROP E-12 would require ecological mapping of wildlife habitat prior to development of permanent facilities, in order to conserve important habitat types during development. ROP F-1 would minimize the effects of low-flying aircraft on wildlife, traditional subsistence activities and local communities. This ROP is designed to minimize aircraft disturbance of caribou, moose, and bird populations and sensitive habitat areas, especially near known subsistence camps and cabins or during sensitive subsistence hunting periods (spring goose hunting and fall moose hunting) should be kept to a minimum.

ROP H-1 is subsistence-specific mitigation designed to provide opportunities for participation in planning and decision-making to prevent unreasonable conflicts between subsistence uses and oil and gas and related activities. Consultation is considered to be in-person meetings, teleconferences, videoconferences, and exchanges of written documents. It does not include public meetings that are primarily for the purpose of information distribution, unless it is explained at the beginning of the meeting that there is an open dialogue, and that comments, concerns or other information are being actively solicited. The specific terms of consultation include: 1) the lessee consulting with directly affected subsistence communities, the North Slope Borough, and the NPR-A Subsistence Advisory Panel to discuss the siting, timing, and methods of proposed operations. Through this consultation, the applicant shall make every reasonable effort, including such mechanisms as conflict avoidance agreements and mitigating measures to ensure that proposed activities would not result in unreasonable interference with subsistence activities; 2) the lessee submitting documentation of their consultation efforts as part of their operations plan. The proposed plan of operations would provide an adequate time for review and comment by the NPR-A Subsistence Advisory Panel and allow time for formal government-to-government consultation with Native Tribal Governments. The applicant shall submit documentation of their consultation efforts and a written plan that shows how its activities, in combination with other activities in the area, would be scheduled and located to prevent unreasonable conflicts with subsistence activities. Operation plans must include a discussion of the potential effects of the proposed operation, and the proposed operation in combination with other existing or reasonably foreseeable operations; 3) the lessee's subsistence plan would provide a detailed description of the

occurring in Dease Inlet is expected to disperse before it reaches migration routes and offshore habitats where bowhead could potentially be exposed to the spill.

Beluga Whales and Other Marine Mammals: There is an estimated 0 to 33 percent chance of a 500- or 900-bbl pipeline spill occurring under the Preferred Alternative. If this spill were to occur near the Dease Inlet area, some of the oil could reach the marine environment. Some of the several hundred spotted seals that congregate in Dease Inlet/Admiralty Bay near the mouths of streams flowing into the inlet could be exposed to the spill. Such an event could result in the contamination and possible loss of a small number of spotted seals (perhaps 10 to 30 seals) out of a population of about a thousand animals. The population is likely to replace this loss within 1 year. The 500- or 900-bbl pipeline spill is not likely to affect many ringed seals, bearded seals, walruses, polar bears, beluga whales, or gray whales because these species tend to occur offshore of Dease Inlet/Admiralty Bay during the summer open-water season and the 500- or 900-bbl spill is expected to disperse before it reaches migration routes and offshore habitats where these species could be exposed to the oil. Few if any ringed seals, bearded seals, walruses, polar bears, beluga whales, or gray whales are likely to be exposed to the spill and suffer sublethal or lethal effects. A small fraction of the spill (1 to 5%) is expected to be widely dispersed in the water column and to be weathered and degraded by bacteria. The amount of benthic prey killed or contaminated by the spill is likely to be very small and represents an insignificant proportion of the prey and benthic habitat available to walruses, bearded seals, and gray whales. Thus, the 500- or 900-bbl spill is not likely to have any food-chain effects on marine mammals.

Polar bears would be most vulnerable to a spill if it were to reach the barrier islands of Elson Lagoon to Point Barrow. However, the number of bears likely to be contaminated or to be indirectly affected by a local contamination of seals probably would be small. Even in a severe situation where a concentration of perhaps 10 bears (such as at a whale-carcass site) were to be contaminated by a 500- or 900-bbl pipeline spill and all the bears died (a worst case), this one-time loss is not expected to significantly affect the polar bear population of 2,272 to 2,500 bears.

A total of 0 to 83 crude-oil spills (< 1 bbl) and 0 to 28 crude oil spills ($\geq$ 1 bbl and $\leq$ 500 bbl) with total volume of 0 to 336 bbl and a total of 0 to 277 small fuel-oil spills with an average size of 29 gal (less than half a barrel) are estimated to occur onshore under the Preferred Alternative for the first sale. These small onshore spills are expected to have little effect on seals, walruses, and polar bears. However, if some of these spills occur in or contaminate streams in the Dease Inlet area that drain into marine waters, small numbers of seals, polar bears, and other marine mammals might be exposed to contamination in nearshore habitats and suffer lethal or sublethal effects. A small number of breeding ringed seals and their pups could be contaminated by any of these spills that reach the marine environment during early winter, resulting perhaps in the death of some pups (perhaps 10 to 30 animals, because of the small size of these spills and the sparse distribution of pupping lairs). If some of the spills reach Dease Inlet during the summer open-water season, some spotted seals that frequent the inlet could be exposed to the oil and suffer sublethal and possibly lethal effects. Perhaps as many as a few hundred seals could be exposed to the contamination with heavily oiled individuals suffering lethal effects (perhaps 10 to 30 animals). Smaller numbers of polar bears are expected to be exposed to and affected by these small spills. The losses of small numbers of seals, and possibly a few polar bears, are not expected to affect seal and polar bear populations. These spills are not likely to affect walruses and beluga whales that occur offshore of Dease Inlet.

c. Effectiveness of Stipulations and Required Operating Procedures

Stipulations D-1, K-3, and K-6 and ROP's A-1, A-2, A-4, A-5, C-1, E-1, E-4, E-7, E-12, F-1, and K-5 would all provide increased protection for terrestrial mammals. Stipulations E-2, E-3, K-2, and K-3 and ROP's A-3, A-4, A-5, A-6, A-7, B-1, B-2, C-2, C-3, C-4, E-4, E-6, E-8, and E-12 would all provide increased protection to fish and fish habitat during fuel use, handling, and storage, gravel mining and reclamation of fish habitat, protection for water withdrawals from rivers and certain lakes, disruption of fish passage, and effects of fuel and oil spills. The Preferred Alternative incorporates the following protective measures for birds: Stipulations K-1 and K-6 and ROP's A-3, A-4, A-5, A-6, A-7, E-1, E-8, E-9, E-10, E-11, E-12, F-1, and K-4.

Under the Preferred Alternative, seals and polar bears could be affected by possible oil exploration offshore drilling from an ice island on the coast of the Dease Inlet/Admiralty Bay area. Most of the exploration activities are assumed to occur onshore across the Northwest NPR-A.

(2) Effects of Spills

Terrestrial Mammals: Under the Preferred Alternative, an estimated 112 small crude-oil spills (averaging 3 bbl in size) and 277 small, refined oil spills (averaging 29 gal) are assumed to occur over the production life of the Planning Area. A maximum of 1 large spill (500 or 900 bbl) could occur. The extent of environmental impacts would depend upon the type and amount of materials spilled, the location of the spill, and effectiveness of the response. The general effects of spills on terrestrial mammals would be the same as those discussed under Alternative A, but somewhat lesser in frequency or extent, as fewer spills are anticipated.

Freshwater Fish: The individual effects of oil on fish from the Preferred Alternative are the same as those discussed for Alternative A. The oil-spill assessment estimates that the amount of crude oil spilled during the life of the field would be up to 336 bbl for the Preferred Alternative versus 393 bbl for Alternative A. Large spill volumes are identical for both Alternatives (500 or 900 bbl). Refined spill estimates under the Preferred Alternative would be up to 194 bbl versus 226 bbl in Alternative A. The reductions in small crude and refined spills are not expected to alter the overall effect of oil spills on arctic fish. Hence, oil spills associated with the Preferred Alternative are expected to have the same overall effect on arctic fish as those discussed for Alternative A (no measurable effects on arctic fish populations in the Planning Area over the production life of the field). The effects of a seawater pipeline spill on arctic fish populations are expected to be similar to those of Alternative A (no measurable effects on arctic fish populations in the Planning Area over the production life of the field).

Marine Fish: The absence of marine construction in coastal areas would reduce the probability that an oil or diesel spill associated with the Preferred Alternative would adversely affect marine fish. This is due to the fact that the only way a spill could enter nearshore marine waters under the Preferred Alternative would be for it to enter from a river as a result of an onshore oil or diesel spill. Based on the size and number of the spills assumed for the Preferred Alternative, and the distance a spill is likely to have to travel to get to the ocean, that would be a highly unlikely event. Nevertheless, if an onshore oil or diesel spill did contact nearshore waters, it would be likely to have even less of an effect on marine fishes than that of Alternative A (no measurable effect).

Birds: Like Alternative A, one large spill is assumed for the Preferred Alternative. Because areas of higher probable oil and gas resources and development in the northern portion of the Planning Area are not deleted from this alternative, an oil spill is likely to contact approximately the same areas as under Alternative A, and, thus, produce about the same adverse effects. There would be a reduction in probability of offshore spill occurrence because permanent facilities would not be allowed in these waters; thus, these areas would be accessed from onshore facilities. Stipulations applied to all marine areas, the northeastern portion of the Planning Area surrounding Dease Inlet to south of Smith Bay, major river corridors, and other areas, could reduce somewhat the chance of spilled oil entering aquatic habitats, and thus, the chance of contacting loons, waterfowl, and shorebirds. These additional protective measures are not likely to reduce most effects of an oil spill under the Preferred Alternative below the minor level as determined for Alternative A, but could reduce spill effects in marine waters or river delta areas, where concentrations of waterfowl or other species occur, to below the moderate level. Small crude/refined oil spills are reduced somewhat from 130/323 assumed for Alternative A to 112/277 assumed for the Preferred Alternative; this reduction is not likely to reduce the already small effect (negligible) anticipated from small spills.

Bowhead Whales: Pad or pipeline spills are not expected to impact migrating bowhead whales whose migration route typically is well offshore of onshore locations where oil and gas development is likely to occur. A spill

result in a measurable change in their effects on marine fish populations. Effects from seismic surveys are likely to be similar to those of Alternative A, i.e., no measurable effect.

Birds: One seismic operation is expected to occur each winter under the Preferred Alternative, as compared to alternate winters under Alternative A. It is not likely that this increased frequency would result in substantially greater effects than the negligible effects indicated under Alternative A. This is because camps and survey areas are occupied for only brief periods and wintering bird species are present in low densities, thus disturbance incidents are likely to be few and of short duration. All routine oil and gas exploration, development and production activities under this alternative are somewhat less than those under Alternative A, thus it is likely that local disturbance effects would be somewhat less unless most or all developments occurred in a limited portion of the Planning Area (i.e., the Dease Inlet area). Designating Kasegaluk Lagoon as a Special Area could exclude a small proportion of the higher density areas for Pacific loon, white-fronted goose, and long-tailed duck. This is not likely to result in significant reduction of effects where most potential effects already are quite low. Impacts to nesting and brood rearing brant habitat in the Brant Study Area are expected to be reduced under the Preferred Alternative's K-4 ROP. This ROP would require a 2-year study by lessees to survey brant nesting and brood-rearing areas so as to keep facilities at least ½ mi away from identified brant habitat. Overall effects of routine oil and gas activities at the regional population level are likely to be negligible for most activities and species, but could be elevated to minor for species that are uncommon, decreasing, or recently declined. Effects of air traffic and gravel mining are likely to remain at the minor level.

Bowhead Whales: The bowhead whale migration route typically is well offshore, so it is unlikely whales would experience intense or frequent disturbance from noise originating from Northwest NPR-A activities that modify normal behavior.

Beluga Whales and Other Marine Mammals: Some potential noise and disturbance from aircraft traffic and seismic activities could occur along the coast, primarily in the Dease Inlet/Admiralty Bay area, and these effects are expected to be local and short term (generally < 1 year). The primary source of noise and disturbance would come from air traffic along the coast of the Planning Area, specifically from helicopters associated with the projected oil exploration activities. Aircraft traffic (several helicopter round trips/day during exploration centered out of Deadhorse-Prudhoe Bay, traveling to and from NPR-A exploration facilities) is assumed to be a potential source of disturbance to ringed or spotted seals hauled out on the ice or beaches along the coast and to polar bears using coastal habitats. Although air-traffic disturbance would be very brief, the effect on individual seal pups could be severe. Aircraft disturbance of small groups of spotted and ringed seals hauled out along the coast is not likely to result in the death or injury of any seals although increases in physiological stress caused by the disturbance might reduce the longevity of some seals if disturbances were frequent.

Under the Preferred Alternative, special stipulations would apply to oil and gas exploration and development in the Dease Inlet/Admiralty Bay area and in Elson Lagoon, specifically: (1) a ¾-mi coastal shoreline and natural island setback that would exclude development on or under the water; (2) no exploration occurring between May 15 and October 15; (3) requirements to prevent operational and siting conflicts with traditional subsistence activities; (4) spill response capabilities in broken ice conditions; (5) consultation requirements with the Alaska Eskimo Whaling Commission to minimize impacts to fall and spring subsistence whaling activities; and (6) requiring that the burden of proof rest with the lessee to demonstrate that BLM approval of exploration and development plans is warranted.

Exploratory drilling is assumed to occur during the winter (December to mid-April) over about 9 years using 1 to 2 drill rigs. If exploratory drilling activities occurred near the coast, polar bears could be attracted to the oil field camps by food odors and curiosity. Some polar bears could be unavoidably killed to protect oil workers. Under the Marine Mammal Protection Act, the oil companies would be required to have a permit to take or harass polar bears. Consultation between the companies and the FWS on this matter is expected to result in the use of nonlethal means of protection in most cases. In any event, the number of bears lost as a result of such encounters is expected to be very low.

populations).

Construction-related activities that may affect arctic fish include water withdrawal related to the construction of drill pads, roads and airstrips, and discharges related to exploratory drilling. Under the Preferred Alternative, it is anticipated that 5 to 12 exploration wells and 2 to 18 delineation wells would be drilled in the Planning Area as a result of the first lease sale, for a total of 7 to 30 wells on ice pads. Assuming that the average ice pad is 500 ft by 500 ft (5.7 acres), water needs would equate to approximately 2 million gallons for each drill pad for a total of 14 to 60 million gallons of water. Each mile of ice road requires up to 1.5 million gallons of water to construct. It is assumed that 0 to 2 ice roads, 25 to 50 mi long, would be built each season for a maximum annual water need of 150 million gallons. Water needed for 3 drilling rigs, associated camps and airstrips, and maintenance of roads, pads, and airstrips would add approximately another 85 million gallons to the annual water use budget. Total annual maximum water need is estimated at 295 million gallons. Decreased exploration activity under the Preferred Alternative (as compared to 420 million gallons in Alternative A) represents a corresponding 30 percent decreased water budget. Assuming that a typical large tundra lake (1 mi long and > 6 ft deep) has approximately 20 to 40 million gallons available for pumping, the decreased water need would equate to about 4 fewer lakes being pumped. Assuming water needs are reduced, potential impacts to fish in relation to water withdrawal in rivers and lakes are slightly reduced from Alternative A to the Preferred Alternative.

Water pumping could still adversely affect arctic fish, depending on the location of the withdrawal and the quantity of freshwater withdrawn. Withdrawals from rivers are of greater concern than lakes because of the smaller habitable space in over-wintering pools. Regardless of the amount of water pumped, withdrawals would be monitored through a required operating procedure that would ensure that water quality standards are met. Given the current regulations and proposed management practices, lake water withdrawal associated with the Preferred Alternative might be expected to kill a small number of individual fish but is not expected to have a measurable effect on arctic fish populations in the Planning Area. Exploratory drilling on lakebeds and streams could also impact fish under the Preferred Alternative. Impacts are the same as those described in Alternative A.

Activities related to development that could impact fish include excavation of material sites, construction of pipelines, pads, roads, airstrips, and causeways, and water withdrawals. Material sites (for gravel extraction) needed for construction of roads, pads, pipelines, and airstrips have not been identified in the Northwest NPR-A Planning Area. One likely source includes river drainages. Other possibilities include importing gravel from borrow sites east of the Colville River, extracting gravel from existing sites, processing bedrock, and using ice or composite pads. Under the Preferred Alternative, it is assumed that from 0 to 4 oil and gas fields would be developed rather than 0 to 5 for Alternative A. Each field is expected to have a footprint of 100 acres, requiring 1 million square yards of gravel. Total gravel needs for 4 fields would equal 4 million yds^2 . This represents a 20 percent decrease in gravel needed for pads from Alternative A. Using composite (blended mixtures of sand/silt/foam) could potentially reduce gravel needs by 33 to 50 percent. Decisions regarding future gravel use and location of pits would be made on a case-by-case basis. Direct and indirect impacts to fish from gravel extraction are similar to those under Alternative A, though fewer in-river sites should reduce overall impacts to fish. As was the case in Alternative A, beneficial aspects of gravel extraction are available in the form of deep pits that can be used by fish as over-wintering habitat. Based on the documented successful use of reclaimed gravel pits by fish, future mitigation of gravel pits should incorporate prescriptions that create fish habitat when feasible.

Impacts from sedimentation and altered flow patterns related to construction of drill pads, roads, and airstrips should be the same as those under Alternative A. Impacts from erosion should be short term and proper placement of these structures, in combination with adequate and properly sited drainage systems, should lead to minimal fish loss. Impacts of water withdrawal needed during development are similar to those discussed in the exploration portion of this analysis and remain the same as described in Alternative A. Up to 250 mi of pipeline could be constructed during production activities under the Preferred Alternative. This compares to 275 mi of pipeline constructed in Alternative A. Impacts are expected to be similar to Alternative A with no measurable effect on arctic fish populations in the Planning Area.

Marine Fish: While the Preferred Alternative differs from that of Alternative A, these differences would not

Beluga Whales and Other Marine Mammals: Effects under the Preferred Alternative would be similar to those for the No Action Alternative and Alternative A--local and short term, with no significant adverse effects to the marine mammal populations as a whole.

b. Effects of Oil and Gas Activities

(1) Effects of Disturbances

Terrestrial Mammals: Two seismic operations would occur in the Planning Area each winter. Impacts to terrestrial mammals would be similar to those discussed under the Seismic Option of the No Action Alternative but would be greater in frequency and extent. A greater number of individual animals would likely be exposed to human activities. Aircraft traffic would more often pass overhead of caribou and other terrestrial mammals during flights to or from seismic camps. The disturbance reactions of caribou and other terrestrial mammals are expected to be brief. Some terrestrial mammals may avoid seismic camps, while bears and foxes may be attracted to the camps by food odors. The potential for disturbance of hibernating bears would be greater because of the increased level of seismic activity occurring in the Planning Area. A greater number of lemmings and voles may be killed or disturbed by surface vehicles. These impacts are not expected to be significant on a population level. Under the Preferred Alternative, 15 to 36 exploration wells and 6 to 36 delineation wells would be drilled. Impacts to terrestrial mammals would be the same as those discussed under Alternative A, but may be lesser in extent as fewer fields would be developed.

Under this alternative, 4 to 8 oil fields may be discovered and developed. Primary effects on terrestrial mammals would come from construction of facilities such as roads and pipelines; motor-vehicle traffic; foot traffic near facilities and camps; aircraft traffic; small, chronic crude-oil and fuel spills contaminating tundra, stream, and coastal habitats; and from habitat alteration associated with gravel mining and construction. The greatest potential for significant impacts to caribou is through disruption of the movement of mosquito-harassed TLH caribou between insect-relief habitat and foraging areas. Impacts to caribou would be the same as those discussed under Alternative A but would generally be lesser in extent as fewer fields would be developed. Infrastructure and activities in oil fields could still delay or deflect movements of TLH caribou between coastal insect-relief areas and foraging habitat further inland. If an oil field or fields are developed near the coast, production pads, pipelines, within-field roads, and other facilities (housing, airfields, processing plants) could be located within important TLH insect-relief habitat. Movements of the TLH caribou from coastal insect-relief areas to foraging areas further inland during the mosquito season (late June- mid-July) would be adversely affected by pipelines and roads with vehicle traffic. There may be increased energetic costs to caribou. Extensive development in this area could result in the loss of some insect-relief habitat for TLH caribou. Impacts to the WAH and CAH would be the same as those discussed under Alternative A, although under the Preferred Alternative's K-5 ROP authorization for construction within the Caribou Study Area (TLH insect-relief habitat), would be based on a 3-year study by lessees to construct facilities so as not to disturb caribou migration to insect-relief areas. Impacts to moose, muskoxen, grizzly bears, wolves, wolverines, foxes, and small mammals would be the same as those discussed under Alternative A but may be lesser in extent as fewer fields would be developed.

Freshwater Fish: Under the Preferred Alternative, it is assumed that two 2-D or 3-D seismic operations would occur each year in the Planning Area. While the Preferred Alternative is likely to involve more seismic surveys than the No Action Alternative--thereby increasing the probability of seismic activity occurring above overwintering habitat--such events are likely to be infrequent. As a result, seismic surveys associated with the Preferred Alternative are expected to have the same overall effect on fish as those discussed for the No Action Alternative (i.e., no measurable effect on arctic fish populations). While the Preferred Alternative is likely to involve more fuel spills than the No Action Alternative, the amount of fuel entering fish habitat is not expected to significantly increase since spills are anticipated to be small (< 5 gallons) and are likely to occur on developed pads. Fuel spills associated with the Preferred Alternative are expected to have the same overall effect on fish populations as those discussed for the No Action Alternative (i.e. no measurable effect on arctic fish

a. Effects of Non-Oil and Gas Activities

Effects to subsistence-harvest patterns result from effects on subsistence resources. The effects of disturbances from non-oil and gas activities under the Preferred Alternative on terrestrial mammals, freshwater fish, marine fish, birds, bowhead whales, beluga whales, and other marine mammals (ringed, spotted, and bearded seals; walruses; polar bears; and gray whales) were analyzed earlier in this section (Sec. V.B) and are summarized below.

The fall and winter harvest seasons are times when subsistence resources are available well past coastal areas and rivers accessible in the summer. Winter allows access to an expanded harvest area for ungulates and furbearers and can lead to greater potential industry and hunter contact and consequent disruption of harvest activities. Winter also is a time when wildlife are more vulnerable to natural environmental stresses limited forage, severe cold, high winds, and compacted snow cover. The effects on certain subsistence resources and their harvest from stresses produced from seismic activities may actually be more pronounced during winter.

Terrestrial Mammals: Kasegaluk Lagoon would be proposed for designation as a Special Area and the northeast portion of the Planning Area would be a designated caribou study area. Over the long-term, this would result in protection of some terrestrial mammals and their habitat from development.

Air traffic, excavation, and the presence of resource-inventory-survey camps are expected to increase somewhat under the Preferred Alternative, as compared to the No Action Alternative, but would be slightly less than under Alternative A. Impacts would be similar to those under the No Action Alternative but could be more frequent, greater in extent, or longer in duration. A greater number of individual animals would likely be exposed to human activities. Aircraft traffic would more often pass overhead of caribou and other terrestrial mammals during flights to or from the camps and along aerial-survey routes. The disturbance reactions of caribou and other terrestrial mammals are expected to be brief, lasting for a few minutes to less than 1 hour. Some terrestrial mammals may avoid inventory-survey and recreation camps during the 6 to 12 weeks of activities, while bears and foxes may be attracted to the camps by food odors. Impacts from recreation and overland moves would be the same as the No Action Alternative. Current management practices and stipulations attached to land use authorizations for temporary facilities, overland moves, and recreation permits would be expected to mitigate impacts from these activities to terrestrial mammals.

Freshwater Fish: Actions and impacts associated with the Preferred Alternative which could cause disturbance to fish are similar to those described under the No Action Alternative.

Marine Fish: Activities other than oil and gas exploration and development are not likely to have a measurable effect on marine fishes.

Birds: Effects from management actions other than oil and gas exploration under the Preferred Alternative are likely to be about the same as those discussed under Alternative A. This is because the anticipated level of activity in all categories except number of acres disturbed by excavation and collection (4 vs. 2) is the same.

Bowhead Whales: Bowhead whales may be present in the Beaufort Sea off the northern portion of the Planning Area boundary primarily from August through October during their westward fall migration from Canadian waters to wintering areas in the Bering Sea. They may be present in the Chukchi Sea off the western portion of the Planning Area in April to early June during their northward spring migration. Under the Preferred Alternative, only under exceptional circumstances--when whales migrate near the coast coincident with the presence of barge traffic, or possibly air traffic to supply a shoreline camp--is it likely that bowhead whales would be disturbed by activities associated with the management plan. Effects from such exposure are likely to be negligible.

f. Conclusion--Multiple Sales

Under the Preferred Alternative, the overall potential impacts to cultural resources from management activities other than oil and gas exploration and development would be as previously described. Overall, the probability of the occurrence of impacts would increase somewhat simply because multiple sales would increase the amount of land that could potentially be impacted.

14. Subsistence-Harvest Patterns

Under the Preferred Alternative, lagoons and estuaries along the western coast of the Northwest NPR-A Planning Area--including the proposed Kasegaluk Lagoon Special Area, Peard Bay, and the Kuk River system (Wainwright Inlet)--as well as important terrestrial subsistence harvest areas for the community of Wainwright, would be included in a large deferral area (approximately 17% of the Planning Area) where leasing would be deferred for 10 years.

Special stipulations would apply to oil and gas exploration and development in the Dease Inlet/Admiralty Bay area and in Elson Lagoon, specifically: (1) a ¾-mi coastal shoreline and natural island setback that would exclude development on or under the water; (2) no exploration occurring between May 15 and October 15; and (3) the burden of proof rests with the lessee to demonstrate that BLM approval of exploration and development plans is warranted.

A set of setbacks and restrictions (including seasonal ones), and site-specific/activity-specific prohibitions would protect important habitats and subsistence and natural resources. There would be no temporary or permanent facilities on lakes and no permanent facilities within ¼ mi of a lake. There would be no permanent facilities in river beds (as defined by the 100-year floodplain) and there would be a ½-mi setback on all rivers for permanent facilities. There would be ¾-mi setbacks on segments of rivers designated particularly important for subsistence, specifically the Alaktak, Chipp, Oumalik, Ikpikpuk, Topagoruk, Meade, Usuktuk, Nigisaktuvik, and Inaru rivers, and Kucheak and Pikroka creeks. Other portions of the Ikpikpuk, Oumalik, Titaluk, Kigalik, Topagoruk, Meade, and Avalik rivers, and Maybe and Ishuktak creeks would have designated ½-mi setbacks. There would be a 1-mi setback for development on the portion of the Colville River within the Planning Area and on the upper Ikpikpuk River. There would also be restrictions on where and how facilities could occur within ¾ mi of the entire coastline managed by BLM. No permanent facilities would be allowed within ¼ mi of deepwater lakes and no temporary or permanent facilities would be allowed on deepwater lakes.

Multi-year studies for brant and caribou are required before authorization of development activities in identified study areas in the northern portion of the Planning Area. There would be no restrictions on subsistence use of all-terrain vehicles (ATV's), except that summer use of airboats would be limited to streams, lakes and estuaries that are seasonally accessible by motorboats. Airboat use would be prohibited in seasonally flooded tundra and shallow waters with land vegetation adjacent to streams, lakes and estuaries.

Exploration and development/production activity for the first sale could vary depending on the per barrel price of oil. Thus, the number of exploration/delineation wells could vary from 5/12 to 12/18 from 1 to 3 drilling rigs. The number of staging bases projected is 1 to 2, the number of production pads 0 to 6, and pipeline miles 0 to 195-250. If only exploration occurs, it is expected to take place over a period of 7 years. If development occurs, it is expected to require 10 years. Production is estimated to last 22 years. We expect that any development in the Planning Area would involve relatively small, interconnected gravel structures.

resources could occur during excavation, construction and burial--depending on the depth, size, and location of the pipeline. The potential for impacts to surface cultural resources under this alternative have been previously discussed.

(2) Effects of Spills

An estimated 65 to 80 percent of all spills are confined to a pad. Spills not confined to a pad usually are confined to an area adjacent to the pad. In the exploration stage, it is assumed that most spills would occur on an ice pad, ice road, or during winter conditions, where cleanup is less invasive than in a summertime terrestrial spill and resulting impacts to cultural resources would be minimal if they occurred at all. Surface cultural resources would be more at risk than would those in a subsurface context. Spills and spill cleanup associated with development could have a greater effect on both surface and subsurface cultural resources because they could occur during the snow-free months when cleanup procedures are more invasive.

c. Effectiveness of Stipulations and Required Operating Procedures

Under the Preferred Alternative, ROP C-2a, c, and e bear on paleontological resources. This ROP provides protection from seismic and overland move activities that could potentially disturb the vegetative mat and impact cultural resources that are near the surface. In addition, ROP's A-3 and A-4 b, c, d and f help to prevent large fuel or crude-oil spills, and consequently reduce the small potential for impacts to paleontological resources from spill cleanup. Stipulations K-1 and K-6 provide ½-, ¾-, and 1-mi setbacks along the major rivers and streams and a ¾-mi setback along the coast providing additional protection for paleontological resources. The NHPA requires that an archaeological resource survey be completed before any undertaking occurs on Federal lands. Ground-disturbing activities such as the construction of buried pipelines are considered undertakings. If paleontological resources are identified during such a survey, BLM guidelines and policy require that all impacts to these resources be mitigated to the satisfaction of the land manager and the State Historic Preservation Office.

d. Conclusion--First Sale

Under the Preferred Alternative, impacts to cultural resources from management activities other than oil and gas exploration and development would be as previously stated. Impacts would include displacement and/or destruction of resources and are anticipated to be minimal regardless of the level of seismic activity. Under the Preferred Alternative, the overall potential impacts to cultural resources from first sale oil and gas exploration and development would probably be minor because of the environmental constraints that would be in effect. These constraints would benefit cultural resources because of the high probability of cultural resources being located near lakes, streams and rivers, which are afforded more protection from oil and gas exploration under Stipulation E-1.

e. Multiple Sales

Under the Preferred Alternative, the potential for impacts to cultural resources should be relatively low. While the scattered nature of cultural deposits and the fact that the locations of most remain unknown--making it somewhat difficult to assess the likelihood and severity of potential impacts--the environmental constraints present in the Preferred Alternative are expected to significantly reduce the probability of potential impacts.

b. Effects of Oil and Gas Activities

Because seismic data gathering activity is permitted only during the winter using low-ground-pressure vehicles such as Rolligons (ROP C-2 a, c, and d), there is little chance that significant impacts to below-ground cultural resources could occur. Impact to surface cultural resources could occur from the passage of seismic vehicles under certain circumstances. In most cases, surface cultural resources--usually structures of some type--can be visually detected and subsequently avoided, even when snow covered. Surface cultural resources that are not structures are not easily detectable, but given their nature, are usually sufficiently protected from impacts by snow cover and frozen vegetation. The exception to this is human skeletal remains that lie on the surface.

It is worth noting that cultural resources are not ubiquitous in the Planning Area as are wildlife and habitat. Although cultural resources, because of their near-surface and surface contexts (as well as other factors), are more common than paleontological deposits, generally they are more easily recognized and therefore avoided. As a result, it is quite possible that oil and gas exploration or development activities would have limited impact on cultural resources simply because in most cases oil and gas activities could be conducted so as to avoid the locations of cultural resources.

(1) Effects of Disturbances

Under the Preferred Alternative the level of activity in the Planning Area could be fairly high. However, because most of the activity would occur during the winter months, the potential for impact to buried cultural resources remains relatively low.

The likelihood of impacting surface cultural materials is also low because of their isolated occurrence and because of a variety of stipulations and ROP's governing oil and gas exploration activities.

Although the drilling of between 8 and 12 exploration wells and 12 to 18 delineation wells could occur under the Preferred Alternative, the limited availability of drill rigs would provide for no more than a few wells to be drilled at one time. If 20 to 30 wells were to be drilled, drilling would certainly occur over the span of several winter seasons, and drill pads, camp pads, roads, and airstrips made of ice and snow would be used. Because no permanent pads, roads, or airstrips would be constructed--and, therefore, no gravel or rock needed--no significant disturbance of the ground would occur and buried cultural resources would not be in jeopardy. The only significant subsurface disturbance that would occur as a result of the actual drilling would be the creation of the drill hole itself. It is possible that drilling the hole could impact important accessible cultural material, but the likelihood of that occurrence is minuscule.

The effects of disturbance from development (i.e., the construction of 4 to 6 production pads connected by roads, an airstrip, a pump station, a staging base and approximately 205 mi of pipeline) could occur under the Preferred Alternative. Surface disturbance resulting from this work would probably impact between 150 and 200 acres. However, there would be little subsurface impact associated with these activities. The primary source of potential impacts to cultural resources would result from the excavation of material for the construction of the permanent facilities. If the pads/roads/airstrip material source is terrestrial, then extraction of material could impact cultural resources. For this analysis it is assumed that pipelines would not have associated all-weather roads or pads and would be constructed during the winter months from an ice road and/or pads. Therefore, the only significant impact resulting from pipeline construction would be associated with the placement of vertical support members (VSM's). Depending on the depth at which the VSM's are set, it is possible, though highly unlikely, that buried cultural resources would be impacted. If buried pipelines were to be used, disturbance and impacts to cultural

d. Conclusion--First Sale

The Preferred Alternative, at $30/bbl, would generate a 24 percent increase in NSB revenue above the no-development level of NSB revenues in the early years of development, tapering to a 5 percent increase in the latter years. The Preferred Alternative in the early years of production would generate increases in revenues to the State of Alaska of 3.1 percent above the no-development level that would taper to less than 0.3 percent in the latter years of production. For the NSB, Southcentral Alaska and Fairbanks, the increase in total employment and personal income during exploration, development and production would be less than 1 percent over the 1999 baseline (except for NSB personal income during development phase, which would be 3.1 percent). The Preferred Alternative, at $18/bbl (assuming 6 years of exploration), would generate a 1-year (lease year), 9 percent NSB revenue increase and less than 0.1 percent increase in employment and personal income for the NSB, South Central Alaska, and Fairbanks.

e. Multiple Sales

The effect of multiple sales for the Preferred Alternative would likely heighten the economic effect in any given year, as exploration, development, and production resulting from subsequent lease sales occur in the same years. Multiple sales would lengthen the period of economic impact as lives of new fields extend beyond those fields resulting from the earlier lease sales.

f. Conclusion--Multiple Sales

The effect of multiple sales for the Preferred Alternative is projected to be approximately twice that of the first sale.

13. Cultural Resources

a. Effects of Non-Oil and Gas Activities

Archaeological research/excavation is conducted by BLM and by permit within the Northwest NPR-A annually. While excavation is a destructive activity, it is necessary for the recovery of scientific data, such as for geological and paleontological research. Excavation and collection normally occur during the summer. Geological and paleontological researchers are trained to recognize cultural resources and respond to such encounters accordingly. Because of the surface and near-surface contexts of cultural resources they are often encountered by chance. Some Pleistocene-age animal remains are occasionally recovered in archaeological deposits. In such situations, the bones would represent subsistence use of the animal(s) by humans, and the faunal material would be considered part of the archaeological record as well as belonging to the regional paleontological record.

The temporary summer field camps commonly associated with scientific or resource assessment work generally impact relatively small areas. Therefore, such camps and the activities that are associated with them, such as aircraft use, on-the-ground survey/reconnaissance, hazardous- and solid-material removal and site remediation, and recreation, are not expected--in and of themselves--to have any significant effect on cultural resources.

enclave-support facilities in and near the Prudhoe Bay complex for approximately half of the days in any year.

For activities projected with $30/bbl oil prices, the increase in total employment and personal income is shown in Table IV-31. The difference is less than 1 percent above the 1999 baseline for the NSB and the rest of Alaska (except for NSB personal income during the development phase, which would be 3.1% above baseline).

Note: These activities also generate employment and personal income in the rest of the U.S., but the percent contribution to the overall U.S. economy is so small that it is negligible.

For activities projected with $30/bbl oil prices, exploration phase would occur between 2005 and 2014, development phase would occur between 2011 and 2018, and production phase would occur between 2013 and 2034. To simplify analysis, data for employment and personal income are presented as annual averages for the three main activity phases.

"Direct employment" refers to jobs that are actually in the fields of oil and gas exploration, development, and production. "Indirect employment" refers to jobs that support exploration, development and production activities. For example, jobs involved with providing food to workers while they are working on the North Slope would be "indirect employment." Helicopter pilots and mechanics on the North Slope are another example of indirect workers. Both direct and indirect workers spend a part of their earnings for food, housing, clothing, etc. The aggregate of jobs associated with providing those goods and services is termed "induced employment." Compensation derived from direct, indirect, and induced employment is defined as "personal income" in Table IV-30 and Table IV-31 .

As another example, through the development (or the continued use) of facilities that are taxable by the NSB, the NSB would have additional revenues available that most likely would be used for its ongoing operations. This in turn results in NSB government jobs. This is in large part how the indirect and induced jobs are generated in the NSB.

(3) Employment Related to Spills

No employment would be generated from cleanup of small spills of less than 500 bbl, large spills of 500 bbl from a pipeline, or a 900-bbl crude or diesel spill from a facility. On-site workers doing other operations would clean up spills of these sizes.

(4) Subsistence as a Part of the NSB Economy

The predominately Inupiat residents of the NSB have traditionally relied on subsistence activities. Although not fully part of the cash economy, subsistence hunting is important to the NSB's whole economy and even more important to its culture. For effects on these aspects, see Section IV.C.14 Subsistence-Harvest Patterns, and Section IV.C.15 Sociocultural Systems.

c. Effectiveness of Stipulations and Required Operating Procedures

Stipulations and ROP's of the Preferred Alternative would not alter the economic effects.

The activities projected with $30/bbl oil prices ($4.27/Tcf for gas) would, in the early years of production, generate an increase of 24 percent in revenues from royalties to the NSB above those projected for the no-development scenario. In the latter years of production, royalty revenues would taper to 5 percent above the level they would have been without development. The assumption for this analysis is that the State would allocate half of its share of royalty revenues to the NSB--$30 million in the first year of production, tapering to $3 million in the latter years. These are percentages of the NSB budget, estimated at $120 million in 2013 (hypothetical first year of production) and $60 million in latter years.

The activities in the early years of production would generate increases in revenues from royalties to the State of Alaska of 3.1 percent above the level they would have been without development. The increases would taper to less than 0.3 percent above the no-development level in the latter years of production. In this analysis, these numbers represent revenue expressed as a percentage of the State budget ($4.3 billion in 2000) and are assumed to be constant in real dollars for future years. The royalty revenue to the State would be about $60 million in the first year of production, tapering to $6 million in the latter years. This figure is based in turn on the Federal royalty rate of 16.67 percent. According to law, the Federal Government must share 50 percent of the Federal royalty rate with the State; and the state must share a portion of its royalty with the affected local government (see Section III.C.1). The affected local government in this case is assumed to be the NSB. The State can collect severance tax of 12.5 percent for the first 5 years and 15 percent for the following years. The average annual State severance tax is estimated to be $101 million in the early years declining to $10 million in the latter years.

Production activities would generate increases in revenues from royalties to the Federal Government of less than 0.004 percent above the no-development level of the Federal budget--about $60 million in the first year of production, tapering to $6 million in the latter years, based on the Federal royalty rate of 16.67 percent.

(Note **:** These figures represent the Federal Government's 50 percent share of the projected royalty.)

(2) Employment and Personal Income (Not Related to Oil Spills)

With long-term oil prices at $18 or lower per barrel (with corresponding gas prices at or below $2.56 per Tcf)--and with the expectation that long-term oil prices will remain at or about $18/bbl--employment and personal income are shown in Table IV-30 . The difference would be less than 0.1 percent above the 1999 baseline for the NSB and for the rest of Alaska. Employment and personal income would be generated during the 6 years of exploration, as shown in Table IV-30.

For employment and personal income, the potential economic effects of development would occur in three major phases: exploration, development and production. In general, employment and associated personal income are at relatively low levels in exploration, peak during development, and drop to a plateau in production phase. This pattern of economic effect is reflected in the exploration and development scenario described in Table IV-02 and Table IV-03 and in Section IV.A.1.b. All direct workers are assumed to stay in enclaves on the North Slope during their work time and commute to residences elsewhere in their time off. Their places of residence during the time they are not in an enclave are assumed to be in NSB villages or in South Central Alaska or the Fairbanks area as indicated in Table IV-31 .

Note: Approximately 30 percent of current North Slope workers in the classification of oil and gas commute to residences outside Alaska (Hadland, pers. comm., 2002; Hadland and Landry, 2002). The workers who commute to residences outside Alaska would not generate the economic effects of indirect and induced employment--or expenditure of income in the State--and would have a negligible effect on the economy of the rest of the U.S.

All workers would be present at a new enclave staging base somewhere in the Northwest NPR-A or in associated

populations and involve long-term changes in distribution. Although most effects that would be likely to occur throughout the Planning Area are expected to be short-term and negligible to minor, moderate effects could occur if concentrations were contacted more frequently by the likely increased number of crude and refined oil spills under the multiple sale scenario. The likely increase in numbers of small crude oil and refined oil spills (over single sale projections) would be expected to elevate losses of eiders somewhat during the period of development resulting from multiple sales. Although in any losses and subsequent recovery of cumulative lost productivity and recruitment may not be detectable above the natural population fluctuations given the survey methods/data available, they are considered significant for these ESA-listed species. Effects of oil and gas developments resulting from lease sales following the first sale are expected to be additive to those of the first, and may range from a slight increase to a doubling or tripling of effect. This would depend on whether the later developments were concentrated or scattered through areas of low or high density of eiders that may, through time, vary in their vulnerability to development activities. If subsequent developments are more scattered, they may occur by chance in areas of low eider vulnerability and thus add little to the effects of earlier sales.

12. Economy

a. Effects of Non-Oil and Gas Activities

For the Preferred Alternative, recreation-field employment would be generated by 30 one-week float-trip parties per year. This is equal to 1 person working for 8 months each year (Delaney, 2002, pers. comm.).

b. Effects of Oil and Gas Activities

The Preferred Alternative lease sale would generate economic activity manifested primarily in revenues to: 1) government, 2) employment, and 3) personal income. The economic effects would occur in the North Slope Borough (NSB), South Central Alaska, and Fairbanks. The exploration and development projections shown in Table IV-06 and discussed in Section IV.A.1.b. form the basis for analysis of potential economic effects in this section. The reader should refer to these sections for a description of timing of activities including wells, rigs, production pads, pipelines, and staging bases. The activities and construction and operation of infrastructure described in the exploration and development scenario generate economic activity. A description of the Preferred Alternative, including deferrals and limitations on oil and gas leasing and development of all lands administered by BLM in the Northwest NPR-A Planning Area, is in Section II.C.5 and Section II.C.6 .

(1) Revenues

With long-term oil prices at $18 or lower per barrel--with corresponding gas prices at or below $2.56 per Tcf and with the expectation that long-term oil prices will remain at or about $18/bbl--projected revenues could be expected to be similar to those accruing from the 1999 Northeast NPR-A Lease Sale, i.e., the NSB would show a 1-year, 9 percent revenue increase, and the State and Federal governments would show a negligible revenue increase. In the 1999 sale, the State of Alaska received $38 million in bonus bids, of which it transferred $28 million to the NSB in grants. The Federal Government also received $38 million in bonus bids. The State and Federal governments each receive approximately $2 million per year in rentals. (Note: for details of the distribution of revenues from the 1999 Northeast NPR-A lease sale, see Section III.C.1.) Because the NSB cannot collect property tax on infrastructure or improvements on Federal lands, no property taxes would accrue to the NSB from any oil or gas activity on NPR-A.

birds are less likely to strike them, c) approval of design and location of facilities minimize disturbance of eiders if their presence is indicated, and d) a requirement to develop an ecological map to be used in siting structures with minimum adverse effect. The stipulation is one prohibiting oil and gas structures within the Kasegaluk Lagoon Special Area. Finally, somewhat shorter periods of aerial survey are anticipated under the Preferred Alternative (several 1- to 2-week periods) than under Alternative A (several 2- to 3-week periods). In comparison to Alternative B, the Preferred Alternative offers the additional ROP's and stipulation discussed above and the deferral of the western Planning Area from oil and gas leasing for 10 years as the principal differences. In comparison to the No Action Alternative, it offers the mitigating measures noted above, and slight differences in levels of activity as outlined in Table IV-28 .

f. Multiple Sales

If multiple sales were to occur under the Preferred Alternative, construction activity could last 15 to 30 years, tapering off as existing infrastructure is used for each succeeding development. Under the multiple-sale scenario, depending on the oil price, 2 to 3 times the number of exploration and delineation wells could be drilled (21 to 72 for multiple sales versus 7 to 30 for the first sale; see Table IV-07 and Table IV-05); the number of fields developed could increase from 4 for a single sale to as many as 8 for multiple sales (Table IV-04 and Table IV-06); and the number of production pads is projected to increase from 0 to 6 for the first sale to 0 to 12 for multiple sales (Table IV-05 and Table IV-07). Total pipeline mileage would be likely to increase (driven by the price of oil, which dictates whether any development would occur) from 70 to 340 mi (Table IV-29). Effects from disturbance factors and habitat alteration or loss from each development are likely to be short term and negligible to minor over most of the Planning Area (see discussion for the first sale). Habitat buried or excavated in the vicinity of development and production facilities or at gravel mine sites essentially would be lost to species present before development. Surface, air, and foot traffic could increase substantially in some areas if oil-field facilities associated with multiple sales are grouped in high resource interest areas. If these are located in higher concentration areas, as appears to be likely in the vicinity of Dease Inlet, greater numbers of individuals are expected to be displaced than with a single sale. Multiple sales likely would result in increased vessel traffic over a longer period of years, although the general effects on bowhead whales and eiders are likely to be similar to those described above. Such effects could alter the eider populations of these local areas substantially, and effects could extend to regional populations and involve long-term changes in distribution. With multiple developments concentrated in a limited region, population effects on eiders could be elevated to a moderate level. Effects of multiple sales on the bowhead population is expected to be negligible.

The estimated number of onshore oil spills of 500 or 900 bbl is expected to stay constant (0 for the $18/bbl no development scenario, 1 for the $30/bbl development scenario) for both first sale and multiple sales (Table IV-19). Also, the number/volume of small crude- or refined-oil spills--estimated at 112 crude/277 refined under the first sale (average size 3/0.7 bbl; 126/29.4 gal.)--is expected to remain constant if multiple sales occur (Table IV-20). These small, chronic spills generally are contained and cleaned up on pads and roads. Habitat contamination is expected to increase locally at the spill sites and along any streams contaminated by these spills. Any habitat contamination that is not effectively cleaned up is likely to persist for several years but is expected to result in negligible to potentially minor effects. Recovery of cumulative lost productivity and recruitment may not be detectable above the natural fluctuations of the population and survey methods/data available.

g. Conclusion--Multiple Sales

Under the Preferred Alternative, displacement of eiders by disturbance and habitat alteration or loss is expected to increase substantially if development and production facilities are concentrated in limited regions with higher resource potential (i.e., northern Planning Area). This could occur in several portions of the Planning Area if multiple sales are held and development occurs in areas where higher density of eiders occurs. Such development potentially could alter local populations in these areas. For Steller's eider that may be particularly vulnerable to habitat changes or disturbance in the vicinity of the nesting area south of Barrow, effects could extend to regional

ROP K-7, by prohibiting, within 15 mi of raptor nest sites significant alteration of high quality raptor foraging habitat, particularly in waterbody, wetland, and riparian habitats, could reduce impacts on important habitats of eiders occupying the Colville River Special Area.

Stipulation K-8, by prohibiting permanent oil and gas facilities within the boundary of the Special Area, could protect eiders using Kasegaluk Lagoon.

These stipulations and ROP's would minimize disturbance of eiders from most factors, minimize adverse alteration of habitats, and could help prevent spilled fuel or other toxic materials from reaching waterbodies where eiders (including nesting or brood-rearing eiders occupying adjacent habitats) could become contaminated. In most cases, the stipulations and ROP's are likely to affect only a relatively small proportion of available habitat of the type indicated, and/or a relatively small proportion of a regional population of eiders.

e. Conclusion--First Sale

Under the Preferred Alternative, only if bowhead whales were to migrate exceptionally near the coast coincident with the presence of vessel or low altitude aircraft traffic is it likely they would be disturbed by activities associated with either non-oil and gas transport activities or oil and gas transport and seismic activities discussed in the IAP/EIS. Bowheads may exhibit temporary avoidance behavior in the presence of vessels. Effects from such exposures are likely to be short-term and negligible.

Disturbance of eiders from non-oil and gas survey aircraft operations, small summer camps, waste/fuel spill removal, river transport activity, habitat loss, aerial surveys, winter ground transport, oil and gas seismic exploration and gravel mining activities on spectacled and Steller's eiders are likely to be short term and localized, and result in negligible effects. Aircraft overflight effects on eiders are likely to be temporary and non-lethal, probably lasting less than an hour. Gravel mines, pads, roads, airstrips, and pipelines that would eliminate breeding habitat are likely to result in negligible population effects. Elevated activity and air traffic in the vicinity of large summer camps may result in minor impacts on both local and regional populations of these two species. Routine helicopter traffic to oil and gas development sites in summer, especially over higher density areas, is likely to result in minor impacts. Depending on the nature and duration of behavioral changes caused by disturbance, such effects could be considered a "take" under the ESA.

Effects from crude-oil spills would be expected to be minor when confined to terrestrial and freshwater aquatic habitats where mortality of these eiders is likely to be relatively low. Minor to moderate effects are likely for these eider populations if a spill were to enter a river delta or nearshore marine habitats during a period when occupied by substantial numbers of brood-rearing, staging or migrating individuals. There is a potential for a significant impact as a result of an oil spill in these circumstances. Quantitative effects may be difficult to separate from natural variation in population numbers. Stipulations would decrease disturbance from most factors for threatened eiders and help prevent fuel and oil pollution and degradation of important bird habitats.

Several factors suggest that the overall effect of the Preferred Alternative on birds could be somewhat less than Alternative A. The elimination of leasing in the proposed Kasegaluk Lagoon Special Area could reduce potential risk to any eiders that use this area prior to proceeding to molting areas in fall. In addition, leasing in the proposed Kasegaluk Deferral Area would be deferred for 10 Years, delaying potential impacts for at least this period. This area contains substantial areas of medium-high and high spectacled eider density and possibly higher Steller's eider density as well. Also, several of the ROP's and one stipulation specifically applicable to birds are contained in the mitigation package for the Preferred Alternative but not those applied to Alternative A. The ROP's include: a) a measure to decrease bird predator nesting/denning sites on facilities, b) design of structures (e.g., lighting) so

Stipulation E-2, by restricting approval for location of permanent oil and gas facilities within 500 ft of fish-bearing water bodies or within 100 ft of non-fish-bearing water bodies to those that are likely to cause minimal impacts to wildlife, could reduce the loss (burial) of wetland habitats (important for breeding eiders).

ROP E-5, by requiring minimal facility footprint and reduction in air traffic, could minimize eider habitat burial and disturbance.

ROP E-7, by requiring that above ground pipelines be elevated an average of 7 ft above the surface, could increase the potential for eider collisions with pipelines.

ROP E-9, by requiring use of best available technology to prevent facilities from providing nesting, denning, or shelter sites for predators, could avoid artificial enhancement of eider predator numbers.

ROP E-10, by requiring that exterior lights be directed inward and downward, may reduce collisions of eiders with oil and gas facilities during low light conditions.

ROP E-11, by requiring aerial surveys to identify breeding pairs of eiders in areas proposed for development, and consultation with FWS and BLM concerning the design of structures before approval of any construction if listed eiders are present in such areas, could minimize take of ESA-listed eiders.

ROP E-12, by requiring development of an ecological land classification map for use in siting facilities, could help conserve important habitat types.

ROP F-1, by requiring that aircraft maintain an altitude of at least 1,500 ft AGL when within ½ mi of raptor nesting sites from April 15 to August 15, or gyrfalcon nest sites from March 15 to August 15, 2,000 ft AGL over the Caribou Study Area from June 15 to July 31, and 2,000 ft AGL over the caribou coastal insect-relief areas from June 15 to July 31, and minimizing the number of takeoffs and landings at all airstrips, could mitigate aircraft disturbance of eiders nesting in the vicinity of raptor nest sites, Caribou Study Area or insect-relief areas, and airstrips.

ROP I-1, by providing all personnel with information concerning applicable required operating procedures and stipulations, and importance of not disturbing biological resources, habitats, and bird colonies, could help reduce disturbance of eiders.

Stipulation K-1, by prohibiting permanent oil and gas facilities within setback zones of ½ to 1 mi of listed waterways, could mitigate disturbance of eiders nesting in or occupying listed waterways or adjacent corridors, as well as avoiding destruction of eider habitat.

Stipulation K-2, by prohibiting permanent oil and gas facilities within ¼ mi of deep water lakes with depth less than 4 m, could minimize the loss of eider habitats (which could adversely affect their breeding success).

Stipulation K-3, by prohibiting oil and gas exploration activity from May 15 to October 15, requiring adequate year round spill response capability (including during periods of broken ice) or alternate methods to prevent oil spills, requiring that facilities minimize impacts to seasonally concentrated birds, and requiring that daily activities are conducted to minimize impacts to seasonally concentrated eiders, could protect eider habitats and avoid disturbance of seasonally concentrated eiders.

Dease Inlet, or other coastal waters, eiders staging before fall migration would be at risk, with the potential to elevate effects to moderate. However, it is possible that most spectacled eiders nesting in the western part of the Planning Area migrate overland directly to the Chukchi Sea, thereby avoiding potential spills into the Beaufort from the northern Planning Area. As a result of their small average size, onshore oil spills reaching aquatic habitats are expected to cause losses of fewer than 20 individuals--a minor effect--but potentially tens of individuals could be killed by cumulative total mortality from many small spills. Onshore spill cleanup involving personnel, equipment, and aircraft could result in displacement of pre-nesting birds, or nest abandonment if it were to occur later in the season. Most spills would be contained on the pads where they occur, and would affect a small area. Because of the relatively small average size of spills, the limited area affected by a spill, and the limited likelihood for a spill to occur near an eider-nesting area, it is likely only a few eiders would be displaced from favored habitats or otherwise be affected by these activities. The effect of such losses may not be detectable above the natural fluctuations of the population.

Physiological effects of oil on individual birds would be the same as those described in the Northeast NPR-A IAP/EIS (USDOI, BLM and MMS, 1998). Lethal effects are expected to result from moderate to heavy oiling of any birds contacted. Oiled individuals may lose the water repellency and insulative capacity of their feathers and subsequently die from hypothermia. Light to moderate exposure could reduce future reproductive success as a result of pathological effects on liver or endocrine systems (Holmes, 1985) that interfere with the reproductive process and that are caused by oil ingested by adults during preening or feeding. Stress from ingested oil can be additive to ordinary environmental stresses such as low temperatures, and metabolic costs of breeding or migration. Oiled females could transfer oil to their eggs, which at this stage could cause mortality, reduced hatching success, or deformities in the young. Flocks of staging eiders could contact oil in nearshore areas. Food resources could be adversely affected by oil, causing indirect, sub-lethal effects that decrease survival, future reproduction, and growth of the affected individuals. Because the spectacled eider population has declined 50 percent or more, even relatively low mortality still is likely to represent a minor to moderate effect.

d. Effectiveness of Stipulations and Required Operating Procedures

The stipulations and ROP's could mitigate the effects on eiders of three types of problems that may result from oil and gas development activities: disturbance from noise or activity, adverse alteration of habitats, and contamination of waterbodies occupied by eiders. No stipulations specifically apply to bowhead whales.

ROP A-2, by controlling availability of food and garbage, and also by prohibiting pollution of waterbodies by disposal of waste materials, which could cause toxic reactions in eiders or their prey, could prevent artificial enhancement or concentration of eider predators.

ROP A-3, by preventing entry of fuel or other hazardous substances into waterbodies and wetlands through implementation of a Hazardous Materials Emergency Contingency Plan, could reduce contamination risk to eiders from accidental spills.

ROP A-4, by preventing entry of fuel or liquid chemicals into waterbodies and wetlands during oil and gas activities through implementation of a comprehensive spill prevention and response contingency plan, which includes specifications on cleanup, materials, storage containers, and liner materials, could reduce contamination risk to eiders from accidental spills.

ROP A-5, by prohibiting the refueling of equipment within 500 ft of the active floodplain of fish-bearing and within 100 ft of the active floodplain of non-fish-bearing water bodies, could prevent spilled fuel from entering water bodies where individual eiders could become contaminated and die (adversely affecting the breeding success of these eiders).

pipelines are constructed, and most movement during the breeding season is by swimming. Disturbance from onshore construction and maintenance of pads, facilities, and roads is likely to be minimal beyond a kilometer from the activity.

d) Predation

Potential predator enhancement at the level of development envisioned for NPR-A is not likely to approach that of the Prudhoe Bay area. This is because: a) development sites are likely to be few (12 drilling pads at 8 fields) and relatively small and scattered; and b) practices that have allowed artificially enhanced predator populations in the past are expected to be tightly controlled by ROP's A-2 and E-9 that would require operators to avoid attracting wildlife to food and garbage, and preventing facilities from providing nesting, denning or shelter sites for predators. At the Alpine Development, Johnson et al. (2003) found that predator numbers remained stable from pre-construction through construction periods. They also found no clear evidence that predation rates by either foxes or avian predators changed during their study. Thus, predator populations in the vicinity of small footprint developments are not expected to increase significantly. In addition, spectacled eiders only occasionally nest in semi-colonial groupings, which could make them subject to elevated losses if discovered by predators. Overall, effects of predators on regional eider populations is likely to be negligible to minor on a subjective scale.

(2) Effects of Spills

Crude oil released during development or production could cause adverse effects on listed species, either through direct contact or indirectly as a result of effects on prey populations or important habitats. Oil prices of $30/bbl are likely to stimulate development and production sufficient to result in one large (500 or 900 bbl) crude oil spill (38% chance of 1 or more occurring) over the production life of Northwest NPR-A Planning Area (Table IV-19) though the most likely number of spills is 0 (see Section IV.A.2). At $18/bbl no spills are likely. Small crude or refined oil spills could number 130 crude (average size $\geq$ 3 bbl) and 323 refined (average size = 0.7 bbl) if the price of oil is at $30/bbl (Table IV-17 and Table IV-20). Approximately 65 to 80 percent of all crude oil spills occur on a pad. The remaining approximately 20 to 35 percent occur on or reach the surrounding environment. These spills generally remain on a limited area of tundra unless they reach a river, stream, or waterbody where they can affect aquatic environments. Off-pad spills generally cover a small area (less than 500 ft^2 [46.5 m^2]). Larger contamination areas may occur as a result of wind blowing a fine oil mist (e.g. from a pipeline leak) over a larger area.

An oil spill is not likely to occur in the marine environment, or to reach typical bowhead migration habitat from onshore locations at concentrations that would cause adverse effects. Small spills are not likely to reach marine habitats, and thus have a low probability of affecting bowheads. Short-term exposure to spilled oil is likely to have negligible effects on bowheads (St. Aubin, Stinson, and Geraci, 1984) or their prey (Bratton et al., 1993. Spill containment and cleanup in the marine environment could cause minor diversion of migrating bowheads if they involve vessels operating beyond the nearshore zone; this is still likely to have a negligible effect. A detailed discussion of potential effects of oil on whales can be found in *Beaufort Sea Planning Area Final EIS* (USDOI, MMS, 2003:Sec. IV.C.5.a).

A crude oil spill from a pad or pipeline onto tundra and then into local lakes or other inter-connected wetlands could cause mortality of small numbers of eiders, especially during the brood-rearing period later in summer. Numbers of individuals oiled would depend primarily upon wind conditions, and numbers and locations of birds following entry of the spill into the water. It is likely the above effects would be negligible to minor with regard to proportion of regional population involved. Because of the oil-absorptive capacity of tundra habitats, probably only a small proportion would enter a river and, subsequently, the marine environment. Under the Preferred Alternative, much of the western coast of Northwest NPR-A may not be available for oil and gas development if leasing in the proposed Kasegaluk Deferral Area is deferred. If a spill were to reach a delta area or Elson Lagoon,

at relatively low density in most of the Planning Area and females with their broods are scattered. Some displacement of Steller's eiders in the vicinity of pipeline corridors could occur as a result of aircraft overflights. Relatively few nest sites are expected to be affected, because nest sites are scattered at relatively low density over much of the Planning Area, as with the spectacled eider. Oil and gas activity would be deferred for 10 years in the Deferral Area under the Preferred Alternative; potential impacts also would be deferred.

There may be some transportation of equipment and supplies through the marine environment during the summer open water season (mid-July to early October). Because of logistics problems associated with moving materials over the long distances from existing infrastructure, barges may be used to transport heavy equipment and supplies. Staging areas may be established along the coastline and materials transported and stockpiled during the summer months (mid-July-early October) for operations at inland sites during the winter months. Vessel traffic generally would be limited to routes in shallow nearshore waters between staging areas near existing infrastructure (such as West Dock or Oliktok Point) and staging areas along the coastline in the Planning Area (e.g., Cape Simpson, Barrow, or Peard Bay). Spectacled and Steller's eiders that are accompanying young, or are staging or migrating in coastal or offshore waters during the relatively brief staging/migration periods (late June/early July, late August/September) and that encounter a few vessels associated with oil and gas activities in the Planning Area during their fall migration are expected to experience negligible disruption of foraging because of the low probability of disturbance by vessel activities.

b) Gravel

Gravel within the Planning Area is likely to be obtained from river drainages and transported to a site on ice roads during winter. Gravel mining is not likely to affect eiders since they are absent from the area during winter and are not often found in riverine areas, potentially the major gravel sources, except immediately following spring migration. Habitat burial by pad/road/airstrip construction would displace any nesting individuals from the local area (up to 50 acres) to undisturbed habitats, with potential for lowered productivity. Depending on location and extent of each material site, overall effects could range from negligible to minor in cases in which mining eliminates breeding habitat of the spectacled eider, whose coastal plain population is declining at a non-significant rate.

The presence of pads and short connecting roads is expected to displace local breeding individuals from the affected sites, and probably also from the immediate area. In succeeding breeding seasons, displaced individuals may relocate in nearby comparable habitat as suggested by studies at Prudhoe Bay (Troy and Carpenter, 1990). Such displacements are not expected to cause long-term effects on population productivity given the relatively small areas likely to be involved at a given site (TERA, 1993; Troy and Carpenter, 1990), but could constitute a local long-term or permanent result. Overall effect, particularly at the regional level, is likely to be negligible. Permanent roads connecting to infrastructure to the east may be considered.

c) Structures, Facilities and Drilling Operations

The presence of facilities (including pipelines) and drilling operations is expected to displace local breeding individuals from affected sites, and probably also from the immediate area. In succeeding breeding seasons, displaced individuals may relocate in nearby comparable habitat. Such displacements are not expected to cause long-term effects on population productivity given the relatively small areas likely to be involved at a given site, but could constitute a local long-term or permanent result. If a commercial discovery is made, drilling activity during the summer is likely to increase, and a small number of nesting or brood-rearing individuals could be affected. Disturbance from a drilling operation is likely to be limited to within a kilometer of the activity; a few eiders may experience temporary, non-lethal effects which may continue through the summer. Affected eiders may respond to drilling disturbance or other activities by relocating before or during the nesting phase, abandoning a nest, or relocating the brood at a more distant area once hatching is completed. Overall effect of these factors, particularly at the regional level, is likely to be negligible. The presence of an aboveground pipeline is not likely to represent a significant collision hazard since migrating eiders generally fly at greater elevation than

of the Planning Area. Virtually all development and production drilling activity is likely to occur on shore and thus would not affect bowhead whales. Likewise, most construction of pipelines and other structures would occur in winter and/or away from marine waters.

2) Effects on Eiders

Most nesting occurs west from the Sagavanirktok River. The highest densities of nesting spectacled eiders in the Planning Area occur in areas south of Barrow and in the west-central Planning Area (Map 62). Females are present in the breeding area from May to September, males from May to late June. Steller's eiders are sparsely distributed, primarily west of the Colville River. Females with broods are present in the breeding area from early June to late August or early September.

Manmade noise and activities, as well as human presence, may result in disturbance of some spectacled eiders in the Planning Area. Noise-producing activities, including aircraft traffic and marine vessel traffic, are the activities most likely to affect spectacled and Steller's eiders. Seismic surveys would be conducted in winter so would not affect eiders except under exceptional timing circumstances; typically, eider early arrival dates are 1 to 2 months or more beyond the end of seismic activities, as noted in the exploration discussion above.

Disturbance effects may be particularly serious in areas where higher densities of spectacled eiders occur. Such areas are west of Dease Inlet; south of Barrow; the southwest-central portion of the Planning Area; and the western Planning Area south of Peard Bay, east of Wainwright, and east of the Kuk River (Map 62). Steller's eiders usually are sparsely scattered across the northern Planning Area (Map 63), with a somewhat greater concentration south of Barrow.

a) Air Traffic and Vessel Effects

Air traffic is likely to be the most important source of disturbance associated with oil and gas development; helicopters are the most disturbing type. Although quantitative studies of the short-term effects of aircraft disturbance on molting brant have been done in the Teshekpuk Lake Special Area (Derksen et al., 1992), few comparable studies of effects on other species at other phases of the annual cycle--or long-term effects on populations--have been done. Also, it is not clear whether eiders and brant are at all comparable in this regard. In studies at the Alpine Development on the Colville River delta, Johnson et al. (2003) found distributions of most species relative to the airstrip did not show detectable differences when control and impacted areas were compared before and after construction (see discussion at Section V.B.9.b.1.b). Numbers of nests of some species did decline between non-construction and construction years, but because cooler temperatures coincided with heavy construction activity, it was not possible to show a direct link between nest declines and level of disturbance. In general, these investigations found waterfowl nest densities lower within 1,000 m of the airstrip during the period when construction air traffic was high. However, there was no significant difference in average distance of nests from the airstrip. White-fronted geese nests, and probably nests of other species as well, were redistributed relative to the airstrip to nearby comparable habitat during heavy construction.

Aircraft routinely flying over the areas of higher density in the Planning Area noted above are likely to cause minor effects in the local eider populations. For example, disturbance associated with development in the northern area where the first development is likely to occur could adversely affect higher concentration areas of both eiders south of Barrow. Aircraft support of winter seismic operations would not affect eiders since they are absent from the area during this season. It is likely there would be minimal aircraft flights over the marine environment during the open water season as a result of oil and gas activities in the Planning Area. In the event of a commercial discovery, drilling operations and other activities may continue through the summer months and would be supported by aircraft. Pipelines are likely to be constructed aboveground, and aircraft likely would be used to look for leaks in the pipeline. Although Balogh (1997) indicated that fixed-wing aircraft flying at an altitude of 150 ft (45.7 m) often cause spectacled eiders to flush, few nest sites are expected to be affected, because nest sites occur

and young is not expected to occur. Some eiders may experience temporary, non-lethal effects, probably lasting less than an hour. Also, because it is unlikely that the primary Alaskan nesting area for Steller's eiders--located south and southeast of Barrow--would be overflown by aircraft associated with oil and gas activities, substantial disturbance of nesting or brood-rearing Steller's eiders is not expected to occur.

(b) Effects of Development and Production

Activities during development and production may result in disturbance and altered habitat effects on behavior, distribution, and abundance of individuals and local or regional populations in or adjacent to the Planning Area. Potentially disturbing factors can be categorized as: 1) causing injury or death, 2) causing increased energy expenditures that affect physiological condition and rate of survival or reproduction, or 3) causing long-term changes in behavior, including traditional use of habitats (Calef et al., 1976). The latter could be the most serious overall effect from oil and gas development and production in Northwest NPR-A, though careful planning and scheduling could avoid most serious effects. Effects on bowhead whales could result from vessel traffic and aircraft overflights. Depending on location and season, oil and gas activities in areas where eiders occur potentially could cause increased disturbance from routine aircraft or vessel operations, construction activities, presence of gravel mines, pads, and roads, facilities, associated vehicle and foot traffic, and drilling activities. Although regular seismic surveys would not disturb either bowheads or eiders (because they are conducted in winter when these species are not present), a commercial discovery could result in seismic surveys being carried out when these species are present in or near the Planning Area, possibly causing disturbance.

Initial developments are likely to occur in the extreme northern portion of the Planning Area, generally surrounding the Dease Inlet/Admiralty Bay area to Smith Bay, and possibly westward to the Chukchi coast. Substantial numbers of spectacled eiders (Map 62) could be affected to some extent by potentially disturbing isolated events (e.g., passage of aircraft), though most incidents are expected to result in negligible effects from which individuals would recover within hours to one day. However, the cumulative effect of repeated disturbance could extend for longer periods and potentially may adversely affect physiological condition, molt, nest success, and survival of individuals. Ultimately this could result in redistribution of individuals in local populations, though such effects usually are difficult to separate from natural variation in population distribution unless it involves substantial numbers of individuals. The construction of gravel structures and facilities that displace eiders from favored habitats could result in short-term negative effects during breeding, brood-rearing, or migration; however, the footprint of such structures is small enough that effects are not likely to be evident at the regional population level. Assuming that the current protocol of smaller facility footprints would be followed, it is unlikely that the amount of habitat removed would represent a significant loss. Information on development and production activities is found in Section IV.A.1.

1) Effects on Bowhead Whales

The bowhead whale migration route typically is well offshore (median 32.2 km) of where any oil and gas development is likely to occur (Treacy, 2002). Noise-producing aircraft and marine vessel traffic are the activities most likely to affect bowhead whales during development and production. Only under exceptional circumstances--if whales migrated near the coast coincident with the presence of barge traffic or air traffic to supply a shoreline staging area--is it likely they would be disturbed by these activities (see discussion under exploration, above). Thus it is unlikely whales would experience intense or frequent disturbance from noise originating from Northwest NPR-A activities that would modify normal behavior beyond a negligible extent. If a commercial discovery were made, transport of equipment and supplies by barge to the Planning Area would increase, although it still would occur shoreward of the bowhead migration route.

Seismic activity would likely occur entirely during winter months when most whales are absent from the vicinity

The effect of vessel traffic on bowheads is likely to be temporary and negligible.

Aircraft flying at low altitude (below 300 m or 984 ft) often cause hasty dives by bowheads, but they generally are not affected by overflights above this altitude. Flights supporting oil and gas operations in the Planning Area are not likely to occur over marine waters beyond the nearshore zone, and then only when approaching a shoreline staging base, well outside the typical whale migration corridor. Effect on bowhead behavior from any aircraft or vessel exposure is likely to be temporary and negligible.

2) Effects on Eiders

Spectacled eiders are widely distributed throughout the coastal plain portion of the Planning Area in summer and are essentially absent from the area from late October to May. Manmade noise and activities--as well as human presence--may result in disturbance of some eiders in the Planning Area. Noise-producing activities, including aircraft traffic and marine-vessel traffic, are the activities most likely to affect spectacled and Steller's eiders. Because of the relatively low density of eiders in the Planning Area during the summer breeding season, substantial disturbance may not be expected to occur. Such short-term and localized disturbances are not expected to cause significant population effects. Disturbance, depending on its nature and duration, could be considered a "take" under the ESA.

a) Seismic Activity and Exploratory Drilling

Seismic surveys and drilling activities occur during winter months (December-April) when eiders are absent from the region. If a seismic operation were to extend into May (an unlikely scenario since they typically last about 100 days beginning in early December), disturbance of early-arriving eiders could occur, causing negligible increases in energy use.

b) Vessel and Aircraft Activity

There could be some transportation of equipment and supplies through the marine environment during the summer open water season (mid-July to early October). Because of logistics problems associated with moving materials over the long distances from existing infrastructure, barges may be used to transport heavy equipment and supplies. Staging areas may be established along the coastline and materials transported and stockpiled during the summer months (mid-July-early October) for operations at inland sites during the winter months. Vessel traffic generally would be limited to routes in shallow nearshore waters between staging areas near existing infrastructure (such as West Dock or Oliktok Point) and staging areas along the coastline in the Planning Area (e.g., Cape Simpson, Barrow, Peard Bay). Spectacled and Steller's eiders that are accompanying young or are staging or migrating in coastal or offshore waters during the relatively brief staging/migration periods (spectacled eider males: late June/early July, females w/juveniles: late August/September) could encounter a few vessels associated with oil and gas activities in the Planning Area during their migration. These birds are expected to experience negligible disruption of foraging activity because of the low probability of disturbance by vessel activities.

Because spectacled and Steller's eiders are absent from the Planning Area during winter, winter aircraft flights associated with seismic surveys and drilling operations during exploration would have no effects on these species. Aircraft activity over the marine environment during the open water season as a result of exploration operations in the Planning Area is likely to be minimal. Because of the low probability that these areas would be overflown by support aircraft, spectacled or Steller's eiders staging or migrating in coastal or offshore waters during the relatively brief staging/migration periods (late June/early July, late August/September) are not expected to experience significant disruption of foraging. Because spectacled eider nest sites are scattered at relatively low density over the northern half of the Planning Area, substantial disturbance of nesting or brood-rearing females

(a) Effects of Exploration

Exploration may result in noise and disturbance and altered habitat effects that may affect behavior, distribution, and abundance of individual eiders or populations occurring in or adjacent to the Planning Area. The discussion of potential effects in this section is based on activities projected to occur under the Preferred Alternative. Contaminants such as drilling muds and cuttings would not be released during exploration activities, and no adverse effects should result to individuals either through direct contact or indirectly as a result of effects on their prey populations or important habitats. Based on industry's record, the probability of crude-oil release during exploration is assumed to be zero. Seismic activity and exploration drilling would be conducted entirely during the winter months. Information on drilling operations and logistical support for them is found in Section IV.A.1.

1) Effects on Bowhead Whales

Bowhead whales move through the Beaufort Sea offshore of the NPR-A during their fall migration to wintering areas in the Bering Sea. No drilling activities would occur in OCS waters under this IAP/EIS, and potential offshore exploration effects would be limited to noise-producing activities. Noise-producing aircraft and marine vessel traffic are the activities most likely to affect bowhead whales during exploration. Other noise-producing activities, including seismic surveys and drilling activities, would take place in winter (early December to mid-April) when most bowheads are absent from the area. A detailed description of these activities and their potential effects on bowhead whales in the Beaufort Sea OCS and the NPR-A can be found in the *Beaufort Sea Sale 144 Final EIS* (USDOI, MMS, 1996a:Sec. IV.B.6), the *Beaufort Sea Multiple Sale Final EIS* (USDOI, MMS, Alaska OCS Region, 2003:Sec. IV.C.5), and in the *Biological Evaluation for Beaufort Sea Sale 170* (USDOI, MMS, 1998).

a) Seismic Activity and Exploratory Drilling

Seismic and drilling activities would be far removed from the typical bowhead migratory corridor and may occur in winter using all-terrain vehicles supported by light aircraft when few or no whales are likely to be present. Thus these activities are not likely to expose whales to underwater noise or cause any disturbance effects.

b) Vessel and Aircraft Activity

Only under exceptional circumstances--when whales migrate near the coast coincident with the presence of barge traffic in support of shoreline staging areas--is it likely that bowheads would be disturbed by these exploration activities. For example, in 2000, when median distance of migrating whales offshore was just 11.0 km and several individuals in the vicinity of Dease Inlet were near shore, the potential for some disturbance of those individuals from underwater or airborne noise or visual presence would have existed. There may be some barge transport of heavy equipment during the summer open water season (mid-July to early October) to staging areas along the coast where it would be stockpiled for operations at inland sites during the winter months. Bowheads react to the approach of vessels at greater distances than they react to most other industrial activities. Most bowheads begin to swim quickly away when vessels approach rapidly and directly. Avoidance usually begins when a rapidly approaching vessel is 0.62 to 2.5 mi (1 to 4 km) away. A few whales may react at distances from 3 to 8 mi (4.8 to 12.8 km), and a few whales may not react until the vessel is less than 0.62 mi (1 km) away. Received noise levels as low as 84 dB re 1 μPa or 6 dB above ambient noise may elicit strong avoidance of an approaching vessel at a distance of 2.5 mi (4 km) (Richardson and Malme, 1993, as cited in USDOI, MMS, 1996a). Fleeing from a vessel generally stops within minutes after the vessel passes, but scattering may persist for a longer period. In some instances, bowheads return to their original locations. Bowhead whales could encounter a few vessels associated with oil and gas activities in the Planning Area during their fall migration through the Alaskan Beaufort Sea, although most of the vessel activity would be in shallow, nearshore waters, probably shoreward of the main, fall whale migration route. Vessel traffic generally would be limited to routes between staging areas near existing infrastructure (such as West Dock or Oliktok Point) and staging areas along the coastline in the Planning Area.

Both fixed-wing aircraft and helicopters could be used to transport personnel, supplies, and equipment into summer field camps and to fly aerial surveys. Helicopter traffic in particular, may potentially cause substantial disturbance of eiders, although Balogh (1997) indicated that fixed-wing aircraft flown at 150 ft often caused spectacled eiders to flush while helicopters flown at similar altitudes in the vicinity of Prudhoe Bay did not. Also, behavioral reactions of pre-nesting birds to aircraft overflights may not represent the behavior of incubating or brood-rearing birds. It is possible that some eiders may be disturbed by these activities and experience temporary, non-lethal effects lasting less than an hour. Effects of routine aircraft flights into large camps may range from causing avoidance of certain areas by eiders to abandonment of nesting attempts or lowered survival of young. Regardless of where they originate, such flights may pass over areas where eiders occur at higher density. There is a potential for displacement of some nesting eiders near routinely used aircraft landing sites as a result of numerous overflights, landings and takeoffs. However, although the reaction of eiders to aircraft overflights is unpredictable, there is a potential for habituation to routine air traffic by spectacled eiders. In the Prudhoe Bay area nests are regularly located in wetlands within 1 km of the Deadhorse Airport (TERA, 1995b), including one less than 250 m from the runway (Martin, 1997), suggesting that some individuals are tolerant of aircraft activity in the vicinity of nests.

Aerial survey flights for monitoring bird or caribou populations also have considerable potential for disturbance of eiders because they are flown at low altitude. However, in most areas they are of short duration, and cover only a small percentage of the ACP per season, so areawide disturbance effects are likely to be minimal. In the northeastern portion of the Northwest NPR-A Planning Area, wildlife survey activity may be more frequent during a 3-week period in June and July (Table IV-28), thus disturbing larger areas or certain areas more intensively, than elsewhere in the Planning Area. Also, eiders may be disturbed by helicopters used in studies in which caribou are captured for attachment of radio collars. Other aerial surveys and point-to-point transport air traffic are likely to cover a small percentage of the Planning Area. Also, relatively few nest sites are expected to be affected because eider nest sites generally are scattered at relatively low density over much of the northern half and west-central portion of the Planning Area, and even lower density in the remainder. For these reasons (and with the possible exception of the northeastern portion of the Planning Area noted above), the increase from an estimated 14 days of aerial surveys under the No Action Alternative to 21 days under the Preferred Alternative, or increase of other surveys from occasional to several 1 to 2 week periods, may not increase disturbance in any given area significantly (Table IV-28). In isolated areas, aircraft effects are likely to be negligible, although potentially minor effects could occur in the vicinity of large camps. Areas suspected of containing hazardous material may be surveyed initially from aircraft, with the potential for disturbance to eiders as noted above. Quantitative effects resulting from most factors are likely to be difficult to separate from natural variation in population numbers.

c. Effects of Oil and Gas Activities

(1) Effects of Disturbance

Oil and gas leasing, exploration, and development/production is anticipated for all BLM-administered lands in the Planning Area under the Preferred Alternative (Map 18). The proposed Deferral Area (approximately 17% of the Planning Area) would not be offered for oil and gas leasing for 10 years. Thus, the Preferred Alternative is likely to result in lower effects from oil and gas activities than Alternative A. Exploration and development/production activity for the first sale could vary substantially depending on the per-barrel price of oil (Table IV-05 and Table IV-07). The number of exploration/delineation wells for the first sale ranges from 5/2 to 12/18, exploration/delineation rigs from 1 to 3, production pads from 0 to 6, staging bases from 1 to 2, and 205 new pipeline-miles (Table IV-05 and Table IV-29). If exploration alone were to occur, activities would be expected to take place over a period of 7 years. If development were to follow exploration, it is expected to require 10 years, plus 4 years for additional production well drilling. Production is estimated to last 22 years. It is expected that any development in the Planning Area would involve relatively small, interconnected gravel structures.

Effects from such exposure are likely to be negligible.

(2) Effects on Spectacled and Steller's Eiders

Spectacled eiders are widely distributed near lakes or coastal margins throughout much of the Planning Area in summer (Larned et al., 2001; Larned, Stehn, and Platte, 2003; Ritchie and King, 2002) and are essentially absent from the area from October to May. Highest densities occur in several areas from Dease Inlet west to the Chukchi coast and west of the village of Atqasuk to Peard Bay and Kuk River/Wainwright Inlet (Map 62). Females with broods typically are found offshore later in summer. Steller's eiders are sparsely distributed in the Planning Area, particularly in the northwest portion between Dease Inlet/Admiralty Bay and the Chukchi coast, and nest attempts apparently are relatively infrequent. They are absent from the area from late October to May. Effects of management actions on spectacled and Steller's eiders are likely to be similar to those discussed for other rare and/or declining waterfowl species in Section IV.B.11.a but their ESA-listed status is assumed to lend greater significance to a given level of effect.

(a) Effects of Ground Activities

Most ground transport activities occur in winter and thus would not disturb eiders or affect their habitats. However, during the summer breeding season, noise and visual presence of personnel resulting from various activities may disturb eiders. Eiders are likely to be displaced from within 700 ft to 0.6 mi of large summer encampments, causing a local decline in nest attempts and success (Grubb et al., 1992; Johnson et al., 2003; Murphy and Anderson, 1993; Skagen, Knight, and Orians, 1991; Stalmaster and Newman, 1978). Under the Preferred Alternative, occupation of large camps is anticipated to be 12 weeks rather than 6 weeks as under the No Action Alternative (Table IV-28). However, this difference is not likely to alter the disturbance effects on birds significantly because--in the context of the short arctic breeding season--those that are displaced when the camp is first occupied probably would not return to the area to renest after 6 weeks any more than 12 weeks because of insufficient time remaining in either scenario to raise a brood. Lack of mate availability at the end of these periods also would limit success. Those individuals that are tolerant of camp activity for 6 weeks probably would be tolerant for 12 weeks. Local eider populations may experience minor declines in breeding success from disturbance in summers when camps are occupied, although this may not be as relevant to Steller's eiders with their scattered distribution. Habitat loss in Northwest NPR-A, though greater under the Preferred Alternative than the No Action Alternative from potential for oil and gas activities, is expected to be negligible. Predators attracted to camps may decrease breeding success of local nesting eiders. Effects of small, frequently moved camps are likely to be negligible; those in place for 6 to 12 weeks (Table IV-28) may cause minor local loss of nest success and productivity. Small groups of travelers on the Colville and other rivers at the frequency anticipated are expected to cause minimal disturbance of eiders.

Hazardous material, fuel spill, and solid-material removal and remediation may disturb local nesting birds for varying periods, resulting in lowered nest success or failure for those at the site. Because these activities may be conducted during summer months, they could disturb or displace eiders that are brood rearing in the area; nesting eiders probably would abandon their nests. Assessment of the nature and extent of contamination of the site and cleanup might involve the use of drill rigs, hydropunches, or backhoes. Removal and remediation activities may continue for as long as 3 to 4 weeks. Females with broods would move out of the area immediately, as would those not yet sitting on eggs. Spills of refined oil products are likely to be contained and cleaned up before contacting eiders. If contact occurs, effects probably would be similar to those described for an oil spill below (Section V.B.11.c.2).

(b) Effects of Aircraft

In accordance with the Endangered Species Act (ESA) Section 7 regulations governing interagency cooperation, the early consultation process was initiated when BLM requested notification from the U.S. Fish and Wildlife Service (FWS) (memorandum dated June 10, 2002) and the National Marine Fisheries Service (NOAA Fisheries) (letter dated June 10, 2002) of the listed and proposed species and critical habitat to be referenced in the memorandum and letter to follow requesting initiation of formal consultation for this project. The FWS responded (memorandum, dated July 24, 2002), specifying the threatened spectacled and Steller's eiders as the species to be included in the IAP/EIS for the Planning Area; and NOAA Fisheries responded (letter, dated July 26, 2002), specifying the endangered bowhead whale as the species to be included. These letters are reproduced in Appendix 10. No critical habitat is located within the Northwest NPR-A Planning Area.

The endangered bowhead whale may occur seasonally adjacent to or in the Planning Area, and the threatened spectacled and Steller's eiders occur seasonally in the Planning Area; each of these species may be exposed to activities associated with the Northwest NPR-A management plan. Sections 4(d) and 9 of the Endangered Species Act (ESA), as amended, prohibit taking of listed species of fish and wildlife without a special exemption. "Take" is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. "Harass" is further defined as an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behaviors that include, but are not limited to, breeding, feeding, or sheltering. "Harm" is further defined as an act that may include significant habitat modification or degradation to the point at which it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. NOAA Fisheries agreed that the proposed project was unlikely to adversely affect the bowhead whale and found that formal consultation was not required, as noted in their July 26, 2002 letter (Appendix 10). Section 7 consultation with FWS was reinitiated in September 2003 to address the BLM's Preferred Alternative developed for the Final IAP/EIS. Additional and updated information and analysis on the potential impacts of selected factors on spectacled and Steller's eiders can be in the *Biological Assessment for Threatened and Endangered Species with Respect to the Proposed Northwest National Petroleum Reserve-Alaska Integrated Activity Plan* (Appendix 10) prepared for the reinitiation of the Section 7 consultation with FWS.

b. Effects of Non-Oil and Gas Activities

Under the Preferred Alternative, effects of management actions within the Planning Area on bowhead whales potentially could include minimal changes in nearshore behavior and/or distribution. For spectacled and Steller's eiders, such actions may include altered distribution, abundance, and/or behavior resulting from disturbance. Such changes may be associated with aerial surveys (including wildlife surveys), human presence and activities such as summer camps and hazardous- and solid-material removal and remediation during breeding, staging, or migration periods, and alteration and pollution of eider habitats. Effects of non-oil and gas activities on eiders may be somewhat greater than those discussed under the No Action Alternative, Section IV.B.11.a. This is because several categories of anticipated non-oil and gas activities, including aircraft use for aerial surveys and duration of camp occupation, are increased under the Preferred Alternative (Table IV-28).

(1) Effects on Bowhead Whales

Bowhead whales may be present in the Beaufort Sea offshore of the northern Planning Area primarily from August through October during their westward fall migration from Canadian waters to wintering areas in the Bering Sea. They may be present in the Chukchi Sea off the western Planning Area in April to early June during their northward spring migration. Under the Preferred Alternative, only when exceptional circumstances prevail is it likely bowheads would be disturbed by activities associated with the management plan. This could occur when whales migrate near the coast coincident with the presence of barge traffic, or possibly air traffic to supply a shoreline camp, or aerial surveys along barrier islands or offshore areas. For example, in 2000 when median distance of migrating whales offshore was just 11.0 km, and several individuals in the vicinity of Dease Inlet approached shore, the potential for some disturbance from underwater or airborne noise would have existed.

Impact Statement (IAP/EIS) to fulfill BLM's responsibility for managing lands in the Northwest NPR-A Planning Area (the Planning Area). The IAP/EIS includes various management activities that may affect endangered and threatened species, such as aircraft use, hazardous- and solid-material removal and remediation, overland moves, seismic activities, and oil and gas exploration and development. Such activities--particularly oil and gas exploration and development/production activities, and aircraft traffic associated with wildlife studies and other surveys--may result in noise and disturbance, altered habitat, and spilled oil or other contaminants that could adversely affect the behavior, distribution, and abundance of individuals or populations occurring in or adjacent to the Planning Area.

If a sale were to be held in the Northwest NPR-A, it would be the seventh sale in the NPR-A since January 1982. The first two oil and gas lease sales were held in January and May 1982. Two subsequent sales followed in 1983 and 1984, and a fifth lease sale was canceled. Sales in the Northeast NPR-A were held in 1999 and 2002. In all, approximately 129 wells have been drilled in the NPR-A (including shallow core test wells, those on ASRC lands, and wells outside the current NPR-A boundary). Twenty-four exploration wells have been drilled in the Northwest NPR-A Planning Area since 1944, and 13 have been drilled from 2000 to 2002. Of 688 leases issued in various federal offshore Beaufort Sea sales, 52 are still active, and 30 exploration wells have been drilled, plugged and abandoned. Nine offshore wells were considered producible but uneconomic for development and production at current oil prices, and one offshore production well (Northstar) is in operation east of the NPR-A.

This section discusses potentially adverse effects of management actions, including proposed oil and gas exploration and development/production, on endangered and threatened species within the Northwest NPR-A Planning Area under the Preferred Alternative. Potential mitigating measures to reduce adverse effects on listed species conclude the analysis. This document provides adequate information for the consultation on the Northwest NPR-A Planning Area that has concluded with an opinion regarding the reasonable likelihood of leasing and exploration violating Section 7(a)(2) of the Endangered Species Act (ESA), as amended. Because of the uncertainty of development and production at this time, this section provides less detail on these activities. However, sufficient general information on development and production is available to provide an adequate basis for a generalized impact analysis. Should commercially producible quantities of oil be discovered and development and production be proposed, consultation would be reinitiated regarding these activities. The need for further consultation also would be considered if: 1) additional species were listed; 2) critical habitat were designated; 3) the proposed action were substantially modified; or 4) significant new effects-related information were developed. A detailed description of the endangered and threatened species within the Planning Area and an analysis of the effects of similar proposed actions are found in the Northeast NPR-A Final IAP/EIS (August 1998) and the Biological Opinion issued for that project. Details concerning the consultation process are included below and in Appendix 10.

A description of the threatened and endangered species that occur in or near the Planning Area is provided in Section III.B.6 of this document, the Biological Opinions for the *Northeast NPR-A Final IAP/EIS* (USDOI, BLM and MMS, 1998), the *Arctic Region Biological Opinion* (USDOC, NOAA, NMFS, 2001), and the Biological Opinion for this *Northwest NPR-A Final IAP/EIS* . No critical habitat in or near the Planning Area has been identified for these species.

Primary effects on bowhead whales would result from disturbance during their semiannual migration past the Planning Area. Primary effects on spectacled eider and Steller's eider exposed to such activities would be: 1) altered distribution, abundance and/or behavior resulting from disturbance during the breeding, staging, or migration periods; 2) alteration of habitats; and 3) effects resulting from pollution of the environment by crude- or refined-oil products, wastewater, and solid/liquid wastes of varying toxicity. This analysis assumes the stipulations and required operating procedures (ROP's) in Section II.C.6 and Table II-03 are in place.

a. Consultation Assumptions

(4) Conclusion--First Sale

For the Preferred Alternative, the effects of activities other than oil and gas on marine mammals--particularly polar bears and spotted seals along the coast of the Planning Area--are expected to be local and occur within about 1 mi of resource-inventory survey activities, survey and recreational camps, and overland moves. The effects of oil and gas activities are expected to result in an increase in potential noise and disturbance along the coast, primarily in the Dease Inlet-Elson Lagoon Area, and these effects are expected to be local and short term (generally <1 year or intermittent during construction periods). Under the Preferred Alternative, seals and polar bears could be affected by possible oil development offshore from a production island and subsequent oil development on or along the coast of the Northwest NPR-A in the Dease Inlet Area. Effects of these activities would be local and are not likely to affect marine mammal populations. Potential oil spills are likely to affect small numbers of marine mammals with population recovery expected within 1 year.

A small number of seals and polar bears might be adversely affected or killed by a 500- or 900-bbl crude-oil spill occurring onshore if such a spill were to contaminate Dease Inlet, or by small fuel spills occurring in and contacting Dease Inlet and Elson Lagoon, but these losses would not be significant to marine mammal populations. The overall effects of the Preferred Alternative are expected to be short term, with no significant adverse effects on marine mammal populations.

(5) Multiple Sales

If several lease sales were to occur under the Preferred Alternative, considerably more exploration activity is projected to occur in the southern and central part of the Planning Area, with the number of exploration wells drilled increasing to 15 ($18/bbl) to 36 ($30/bbl) for multiple sales from the 5 ($18/bbl) to 12 ($30/bbl) wells for one sale. The amount of development also is projected to increase. The number of production pads would double for multiple sales as compared to those projected for the 1 sale (12 pads, up from 6 pads), and pipeline mi would increase to 685 mi for multiple sales from the 205 mi for one sale (Table IV-05, Table IV-07, and Table IV-29). The number of small crude-oil and refined-oil spills is estimated to be about the same for multiple sales as for the first sale (Table App 9-7 and Table App 9-9). Only a small increase in potential noise and disturbance effects on marine mammals would be expected along the coast, primarily in the Dease Inlet-Admiralty Bay and Elson Lagoon Area, and these effects are expected to be local and short term (generally < 1 year, intermittent during construction periods).

(6) Conclusion--Multiple Sales

The overall effects of oil and gas activities under the Preferred Alternative with multiple sales would be expected to be about the same as they would be for the single sale, but the duration and extent of activities would be over a longer period of time, as would potential disturbance effects.

11. Endangered and Threatened Species

The U.S. Department of the Interior (USDOI), Bureau of Land Management (BLM) initiated the process for the Northwest National Petroleum Reserve-Alaska (Northwest NPR-A) Integrated Activity Plan/Environmental

seals and beluga, and gray whales. Thus, the 500- or 900-bbl spill is not likely to have any food-chain effects on marine mammals.

Polar bears would be most vulnerable to a spill if it were to reach the barrier islands from Elson Lagoon to Point Barrow (Map 51). However, the number of bears likely to be contaminated or to be indirectly affected by a local contamination of seals probably would be small. Even in a severe situation where a concentration of perhaps 10 to 30 bears (such as at a whale-carcass site) were contaminated by a 500- or 900-bbl spill and many of the bears died (a worst case), this one-time loss would not expected to significantly affect the polar bear population of 2,272 to 2,500 bears (USFWS, 2002).

2) Effects from Small Onshore Spills

A range of 0 to 83 crude-oil spills of < 1bbl and 0 to 28 crude-oil spills ≥ 1 bbl and < 500 bbl (total volume of 0 to 336 bbl) and 0 to 227 small fuel-oil spills with an average size of 29 gal are estimated to occur onshore under the Preferred Alternative for the first sale (Table App 9-7 and Table App 9-9). These small onshore spills are expected to have little effect on seals, walruses, gray and beluga whales, and polar bears. However if some of these spills occur in or contaminate streams in the Dease Inlet area that drain into marine waters, small numbers of seals, polar bears, and other marine mammals might be exposed to contamination in nearshore habitats and suffer lethal or sublethal effects. A small number of breeding ringed seals and their pups could be contaminated by any of these spills that were to reach the marine environment during early winter, resulting perhaps in the death of some pups (10 to 30 animals, because of the small size of these spills and the sparse distribution of pupping lairs). If some of the spills were to reach the Dease Inlet area during the summer open-water season, some spotted seals that frequent the inlet could be exposed to the oil and suffer sublethal and possibly lethal effects. Perhaps as many as a few hundred seals could be exposed to the contamination, with heavily oiled individuals suffering lethal effects (perhaps 10 to 30 animals). Smaller numbers of polar bears would be exposed to and affected by these small spills. The losses of small numbers of seals, and possibly a few polar bears, would not be expected to affect the seal and polar bear populations in the Beaufort and Chukchi Seas. These spills are not likely to affect bearded seals, walruses and beluga and gray whales that occur offshore of Dease Inlet.

(3) Effectiveness of Stipulations and Required Operating Procedures

Oil and gas activities in Dease Inlet-Admiralty Bay, Elson Lagoon, and on barrier islands would be under special stipulations for exploration and development (see Stipulation K-3). Oil and gas exploration operations would not be allowed on Dease Inlet, Admiralty Bay, and Elson Lagoon including natural and barrier islands, between May 15 and October 15 of each season. This measure would avoid disturbance of spotted seals and other marine mammals during the open water season. There would be a ¾-mi setback seaward the shore and around natural islands (excluding the barrier islands) where no development could occur on or under the water. This setback would include Oarlock Island in Admiralty Bay, an important haul-out area for spotted seals. This stipulation would minimize disturbance and habitat effects on spotted seals in the Dease Inlet-Admiralty Bay area. Stipulation K-3 measures would include oil spill cleanup capability, and oil-spill response activities that could help to minimize effects on marine mammals in the Dease Inlet-Admiralty Bay and Elson Lagoon areas.

Stipulations on waste prevention, handling and disposal and on spill prevention and cleanup are expected to reduce potential marine pollution and effects on marine mammals in the Dease Inlet/Admiralty Bay area where oil exploration and development may occur under the Preferred Alternative. Stipulations on waste prevention, handling and disposal such as handling of food and garbage are expected to prevent the attraction of polar bears to camp sites that could result in human/bear interactions and the taking of polar bears. Under Overland Moves stipulations and BLM/operators planned winter activities including seismic operations within 25 mi of the coast shall consult with USFWS to prevent disturbance of denning polar bears. Activities would be prohibited within 1 mi of known bear dens. This consultation is expected to prevent some disturbances of denning polar bears under the Preferred Alternative.

of any seals, although increases in physiological stress caused by the disturbance might reduce the longevity of some seals, if disturbances were frequent.

Exploratory drilling is projected to occur during the winter (December to mid-April) over about 9 years using 1 or 2 drill rigs (Table IV-05). If it occurred in Dease Inlet-Admiralty Bay, or Elson Lagoon, or near the coast, polar bears could be attracted to the oil field camps by food odors and curiosity. Some polar bears could be unavoidably killed to protect oil workers. Under the Marine Mammal Protection Act, the oil companies would be required to have a permit to take or harass polar bears. Consultation between the companies and the USFWS on this matter is expected to result in the use of nonlethal means of protection in most cases. In any event, the number of bears lost as a result of such encounters is expected to be very low.

Under the Preferred Alternative, seals and polar bears could be affected by possible oil exploration offshore drilling from an ice island and subsequent oil development in or on the coast of Dease Inlet/Admiralty Bay and Elson Lagoon (Map 51, Map 57, Map 58, and Map 59). Development construction activities are assumed to occur over a 7-year period, with production to occur over the assumed 20-year life of the oil fields using 6 production rigs and as much as 230 mi. of pipelines (Table IV-05 and Table IV-29). Most of the exploration and development activities are assumed to occur onshore but some activity may occur in Dease Inlet-Admiralty Bay and Elson Lagoon, with pipelines routed across the NPR-A and connecting to TAPS (Map 108). Gas development is expected to follow similar onshore pipeline routes. These onshore activities would affect local tundra habitats and would not likely affect individual marine mammals or populations.

(b) Effects of Spills

1) Effects from a Large Spill

There is an estimated 0 to 33 percent chance of one or more spill occurring. For purposes of this analysis, the spill could be a 500- or 900-bbl spill under the Preferred Alternative (Table IV-19). If this spill were to occur near the Dease Inlet area, some of the oil could reach the marine environment. Within the marine environment some spotted seals (perhaps as many as a few hundred) could be exposed to the spill if it occurred during the open-water season. It could affect ringed seals if it occurred during melt-out in the spring. Assuming the spill occurred during the summer open-water period, several square kilometers of coast line could be contaminated in the Dease Inlet/Admiralty Bay area and the spill could sweep over 100 km^2 during open water or 100 km^2 to about 200 km^2 if it occurred during melt-out. Several hundred spotted seals that congregate in Dease Inlet/Admiralty Bay near the mouths of streams flowing into the inlet could be exposed to the spill. Small aggregations of ringed seals may also be present in the area. Such an event could result in the contamination and possible loss of some spotted seals (perhaps 10 to 50 seals out of a population of about a thousand animals could suffer lethal effects). The population is likely to replace this loss within one year. The number of ringed seals affected if the spill occurred during meltout could potentially be in the tens to perhaps one hundred seals. The ringed seal Beaufort Sea resident population of about 40,000 is likely to replace this potential loss within one year. The pipeline spill is not likely to affect many bearded seals, walruses, beluga and gray whales because these species tend to occur offshore of Dease Inlet/Admiralty Bay and the spill is expected to disperse before it reaches migration routes and offshore habitats where these species could be exposed to the spill. Few if any bearded seals, walruses, beluga and gray whales are likely to be exposed to the spill and suffer sublethal or lethal effects. These species populations would not be affected by this spill.

Little or no significant contamination of benthic food organisms and bottom-feeding habitats of walruses, bearded seals, and gray whales would be expected, from a pipeline spill because only a very small amount of oil would be expected to reach feeding areas. A small fraction of the spill (1 to 5%) is expected to be widely dispersed in the water column and to be weathered and degraded by bacteria (USDOI, MMS, 1997:Sec. IV.A.3, *Spilled Oil Fate and Behavior in Marine Waters*). The amount of benthic prey killed or contaminated by the spill is likely to be very small and represent an insignificant proportion of the prey and benthic habitat available to walruses, bearded

floating-fast ice zone at the mouth of Dease Inlet or in Elson Lagoon. Local displacement of some denning ringed seals could occur, but this activity is not expected to affect ringed seal distribution and abundance adjacent to the Planning Area.

The overland moves typically occur each winter; travel from Prudhoe Bay or Oliktok Point to Cape Simpson and the Barrow area; follow a route offshore over stable sea ice; and include 20 to 100 trains of 1 to 6 vehicles and attached sleds. These moves could be a disturbance to denning ringed seals if the routes cross floating-fast ice areas, and may temporarily displace seals within a short distance of the traffic route. Polar bears also may be temporarily disturbed within about 1 mi of this traffic.

Recreational camps may attract bears in some cases, and this could result in the shooting of bears that learn to associate humans with food sources. Such losses by themselves are expected to be minor or insignificant to the bear population but would contribute to cumulative adverse effects.

Very small fuel spills (probably < 1 bbl) are expected to occur in association with resource inventories and surveys, recreational activities, and overland moves. These spills are likely to involve aviation fuel and other light-fraction hydrocarbon fuels that would evaporate and disperse rapidly. Fuel spills are required to be cleaned up immediately, if possible. Such events are not expected to have any significant effects on marine mammals in the Planning Area.

The effects on marine mammals--seals, polar bears, and whales--of activities other than oil and gas exploration and development under the Preferred Alternative would be local and short term, with no significant adverse effects to the populations.

(2) Effects of Oil and Gas Activities

(a) Effects of Disturbances

Some potential noise and disturbance to marine mammals from aircraft traffic and seismic activities could occur in and along the coast--primarily in the Dease Inlet/Admiralty Bay area and Elson Lagoon--and these effects are expected to be local and short term (generally < 1 year or intermittent during construction periods).

The primary source of noise and disturbance would come from air traffic along the coast of the Planning Area, specifically from helicopters associated with the projected oil exploration and production activities. Aircraft traffic (several helicopter round trips/day during exploration and development) centered out of Deadhorse-Prudhoe Bay traveling to and from NPR-A exploration and production facilities, is assumed to be a potential source of disturbance to ringed or spotted seals hauled out on the ice or beaches, respectively, along the coast and polar bears using coastal habitats.

During the summer, some of the air traffic to and from exploration and production facilities could disturb ringed and spotted seals hauled out on the ice or along the coast, causing them to charge in panic into the water. Because of frequent low visibility due to fog, aircraft may not always be able to avoid disturbing hauled-out seals. In Dease Inlet/Admiralty Bay and Elson Lagoon the number of spotted and ringed seals affected would depend on the number of disturbance incidents. Aircraft disturbance of large groups of hauled-out spotted seals in the Planning Area (such as on Oarlock Island in Admiralty Bay) could result in injury or death to young spotted seal pups if they were trampled by other seals during the disturbance or were abandoned by their mothers. Although air-traffic disturbance would be very brief, the effect on individual seal pups could be severe. Aircraft disturbance of small groups of spotted and ringed seals hauled out along the coast is not likely to result in the death or injury

WAH and CAH caribou, grizzly bear, moose, wolverine, and wolf. Impacts to these populations and species would be expected to be higher because more exploration and development would occur in the southern part of the Planning Area, and a southern pipeline would be constructed.

(6) Conclusion--Multiple Sales

Multiple sales under the Preferred Alternative would be expected to increase disruption of TLH caribou movements within insect-relief areas and cause some disruption of CAH and WAH caribou. Impacts to grizzly bears, moose, wolves, and wolverines would be greater as more development would be located in higher density habitats for these species.

b. Marine Mammals

Under the Preferred Alternative, the northern coast of the Planning Area, including Dease Inlet-Admiralty Bay and Elson Lagoon, would be open to leasing. Leasing would be deferred for 10 years in the eastern portion of the Planning Area, including Peard Bay and the coastline to the east. The Kasegaluk Lagoon would be designated as a Special Area under the Preferred Alternative. Seven species of nonendangered marine mammals--ringed, spotted, and bearded seals, walruses, polar bears, beluga, and gray whales--commonly occur year round or seasonally in coastal habitats within or adjacent to the Planning Area. Under the Preferred Alternative, some individual members of these species--particularly spotted and ringed seals and polar bears--may be exposed to effects from oil and gas exploration and development activities as well as from other activities that could occur in Dease Inlet-Admiralty Bay and Elson Lagoon. Important spotted seal and beluga whale habitats--including Kasegaluk Lagoon and Peard Bay--would be deferred from oil and gas leasing for 10 years. No permanent or temporary facilities would be allowed within ½ mi of the bank of the Kuk River estuary, an important habitat of beluga whales (Map 18).

(1) Effects of Non-Oil and Gas Activities

The primary potential causes of disturbance of marine mammals would be helicopter traffic (1 to 2 round trips per day for 3 to 6 weeks per survey party), fixed-wing aircraft traffic (2/week/party), and humans on foot. Overland moves and seismic operations occur during the winter on stable sea ice or frozen tundra. Other activities take place in summer and early fall (June-September). These activities, if they occur along the coast of the Planning Area, could cause short-term (< 1 hour) displacements or harassment of hauled-out seals and polar bears.

It is assumed that geophysical surveys would use 60 persons and would collect 5 to 10 line-miles of 3-D seismic data/day and would be conducted entirely in winter (early December-mid-April) using ice roads. Under the Preferred Alternative, seismic surveys conducted near the coast could expose a few denning polar bears to seismic-activity noise and associated disturbances. This activity could result in the displacement of a few maternal polar bears and their cubs, leading to the abandonment of the den site and possible loss of a small number of cubs. Few polar bears would be expected to be affected, however, because of the low number of recorded maternal den sites in and adjacent to the Planning Area (Map 51). Seismic surveys would be prohibited near known polar bear den sites in the Planning Area.

Onshore seismic activity is not expected to have any effects on other marine mammals. However, possible seismic operations in Dease Inlet-Admiralty Bay and Elson Lagoon could affect ringed seals that den on the floating shorefast ice during the winter. Ringed seals den during the winter, however denning ringed seals could be expected to be exposed to the noise and activity associated with offshore seismic operations if it occurs in the

Overall, activities under the Preferred Alternative are not expected to significantly affect terrestrial mammal populations.

(5) Multiple Sales

If several lease sales were to occur under the Preferred Alternative, considerably more exploration activity would be expected to occur in the habitat of the TLH and WAH caribou, with 3 times as many exploration wells being drilled (Table IV-7). Twice as many oil fields would be developed (Table IV-6) and the number of staging areas and pipeline miles would increase. In addition to development predicted to occur under the first sale, an oil field or fields could be developed in the southern portion of the Planning Area within the summer range for WAH (Map 47).

For many years, the WAH has exhibited a consistent pattern of movement during the summer (ADF&G comments on Draft IAP/EIS). After calving in the Utukok Uplands, the herd moves west into the Lisburn Hills (west of the Planning Area). During the height of the insect season (early July), 80 to 90 percent of the herd forms into large aggregations in the western DeLong Mountains and western North Slope (south of the Planning Area). During late July through early August, they move rapidly back east toward Howard and Anaktuvuk Pass (south of the Planning Area) and then disperse north and west onto the North Slope and the Planning Area during late August and early September. Since most of the WAH animals are outside the Planning Area during most of the insect season, there would be minimal impacts on movement of insect-harassed WAH animals. Within the Planning Area, insect-harassed groups of WAH caribou may have to detour around oil fields. Impacts would be limited to short term disruption or displacement.

An elevated pipeline would likely be constructed from the oil field east to TAPS Pump Station 2. This would cross the route used by the CAH to migrate between their winter habitat in the Brooks Range and calving grounds along the Arctic Ocean (Map 47). Short-term impacts during construction would be the same as those discussed above for construction of a new pipeline to the Kuparuk area. No road would be associated with the new pipeline and the mere physical presence of the pipeline would probably have minimal effect on the behavior, movement, or distribution of caribou, except perhaps during periods of heavy snowfall or intensive human activity (e.g., during major pipeline repairs or spill cleanup). Human activities associated with transportation routes can affect the behavior and distribution of caribou. Frequent disturbance can have adverse effects on caribou energy levels. In the cumulative case, two additional manmade features would be introduced into the range of the CAH--a caribou population that has already been affected by development at Prudhoe Bay and Kuparuk--in the form of a gas pipeline from the southern part of the Planning Area to Prudhoe Bay and an elevated oil pipeline connecting to TAPS.

The increase in the number or length of roads and pipelines, and number of oil fields that would accompany development under multiple sales is expected to further impede movements of TLH caribou from insect-relief areas along the coast to inland foraging areas (Map 49 and Map 50). This would be minimized to the extent possible by locating and designing facilities to allow free movement of caribou. This effect is expected to persist over the productive life of the oil fields and may reduce productivity of the TLH.

Impacts to moose, wolverines, wolves, and bears would be similar to those discussed under the single sale scenario. However, if the oil field facilities were to be located in the southern part of the Planning Area, a greater number of animals could be exposed to oil exploration and development, as densities of these species are greater in the foothills and mountains than on the coastal plain. Moose and muskoxen could be temporarily disturbed during construction of a southern pipeline and second gas pipeline.

Spills under the multiple sale scenario would be expected to have about the same type and level of effects on terrestrial mammals and their habitats as under the single sale scenario but with a higher likelihood of impacts to

ROP E-4: Quality assurance/quality control would reduce the potential for pipeline spills or blowouts from manufacturing, maintenance or operation failures. This would reduce the potential for direct mortality of terrestrial mammals due to toxic exposure and the contamination of prey and forage. There would be fewer spills, resulting in less cleanup activity along pipelines and fewer disturbance impacts to terrestrial mammals. Positive results associated with this ROP would not be significant under the Preferred Alternative but would contribute to reducing impacts in the cumulative case.

ROP E-7: This ROP, requiring design of roads and pipelines to allow for free movement of caribou, would greatly reduce impacts of oil development on caribou and other large mammals. Average pipeline height of 7 ft, and separation of roads and pipelines by 500 ft would facilitate movement of TLH caribou from insect-relief habitat to inland foraging habitat. This ROP would reduce (but not eliminate) impacts of oil development on caribou movements. Since caribou are sensitive to humans on foot and moving vehicles, there would be some negative effects on their ability to freely move through the area regardless of how well the facilities were designed.

ROP E-12: This ROP, requiring an assessment of wildlife habitat before development of permanent facilities would facilitate site-specific mitigation of impacts to terrestrial mammals and should reduce the overall impact of development.

ROP F-1: This ROP would minimize disturbance of caribou by requiring minimum altitudes of 1,000 to 2,000 ft above ground level (AGL) for aircraft over occupied caribou winter range and caribou insect-relief areas, respectively, during critical times of the year.

ROP I-1: This ROP, requiring training of all personnel regarding stipulations, ROPs, and environmental concerns, would reduce impacts on terrestrial mammals by making workers more aware of the potential impacts of their activities on wildlife. Education of employees should reduce the potential for harassment and direct mortality of terrestrial mammals. This ROP would reduce the likelihood of DLP killing of bears.

ROP K-5: This ROP, requiring a 3-year study of caribou movements within the Caribou Study Area before construction, would greatly reduce (but not totally eliminate) impacts on TLH caribou. The presence of facilities and associated human activity would still result in disturbance impacts to caribou. Caribou distribution can vary from year to year depending upon many factors. What appears to be the best design and location based on a minimum of 3 years of data may not hold true over the life of the facility or may be altered as additional infrastructure is constructed in other areas.

(4) Conclusion--First Sale

Non-oil and gas activities, seismic work, exploration wells, and spills would have minor effects on terrestrial mammals. Projected levels of oil and gas development would result in increased disturbance of caribou and other terrestrial mammals. Increased habitat alteration would include the development of up to 4 oil fields, an elevated pipeline to Kuparuk, and a buried gas pipeline to Prudhoe Bay. Some TLH caribou would be expected to be disturbed and their movements delayed along the pipeline during periods of air traffic and construction. Near the oil fields, surface, air, and foot traffic would be expected to displace some terrestrial mammals. If extensive development were to occur in the TLH insect-relief area, movements of caribou from coastal insect-relief areas to foraging areas would be disrupted to some extent. This effect would be minimized by locating and designing oil and gas facilities to allow for free movement of caribou. Within the Caribou Study Area, a study of caribou movements would be undertaken before facility development to better reduce impacts of development on caribou movements. Extensive development in this area could result in the functional loss of some insect-relief habitat for TLH caribou.

likelihood of caribou, moose, muskoxen, wolves, or grizzly bears being exposed to toxic amounts of gas and condensates is very low and (should it occur) would probably only affect a few individuals. Smaller, less mobile species with small home ranges, such as squirrels, voles, and lemmings may be affected in larger numbers. However, there would be no population level impacts on any species.

(c) Summary

Among the terrestrial mammal populations that could be affected by management actions under the Preferred Alternative are the TLH, WAH, and CAH caribou. Caribou could be temporarily exposed to aircraft traffic and other human activities associated with resource inventories, seismic operations, exploratory drilling, and pipeline construction, but such exposure is not expected to have any effects at the population level. The TLH caribou movements within insect-relief areas may be disrupted by oil development activities with undetermined levels of effects on the productivity of the herd. The WAH caribou maybe exposed to oil development facilities in localized areas. The CAH caribou may be exposed to disturbance impacts from construction of off-site facilities such as a pipeline to existing infrastructure. Moose, muskoxen, grizzly bears, wolves, wolverines, foxes, and small mammals may be locally affected by activities associated with oil and gas exploration and development.

(3) Effectiveness of Stipulations and Required Operating Procedures

ROP A-1 through ROP A-7, regarding solid- and liquid-waste disposal, fuel handling, and spills, would reduce the potential effects of spills and human refuse on grizzly bears, arctic foxes, and other terrestrial mammals. ROP A-8 requiring a bear-interaction plan would reduce impacts to grizzly bears by reducing human/bear interactions. These ROP's would benefit bears by reducing both the number of bears killed in defense of life and property (DLP) and the number of bears becoming habituated to anthropogenic food sources.

ROP C-1, requiring avoidance of known grizzly bear dens, would potentially reduce impacts to denning grizzly bears from seismic operations. The success of this ROP would be relative to the effort made to locate bear dens before initiating work.

ROP C-2: This measure puts restrictions on the types of heavy equipment used and the seasons of allowable use and would be beneficial to terrestrial mammals by reducing the amount of habitat disturbed during overland moves and seismic work. Use of low-ground-pressure vehicles may also reduce the mortality of small mammals.

Stipulation D-1: This stipulation prohibiting exploratory drilling in active floodplains would reduce the potential for damage to the riparian habitats that are so important to many species of terrestrial mammals, including moose, bear and wolverine. Disturbance impacts to wolverines and moose would also be reduced.

ROP E-5: This ROP would require the lessee to minimize the development footprint and would be beneficial to terrestrial wildlife in that it would reduce the amount of habitat lost and decrease disruption of caribou movements. Conversely, it would also reduce the number of gravel habitats created that can be used to advantage by ground squirrels. Although caribou may also use gravel pads for insect-relief habitat, the negative effects of development outweigh any positive impacts. Overall, the effect of this ROP would be beneficial to most terrestrial wildlife.

Oil spills on wet tundra kill the moss layers and aboveground parts of vascular plants and sometimes kill all macroflora at the site (McKendrick and Mitchell, 1978). Damage to oil-sensitive mosses may persist for several years, if the site is not rehabilitated (McKendrick and Mitchell, 1978). The length of time a spill persists is dependant upon soil moisture, and concentration of the product spilled. McKendrick (2000) reported that complete vegetation recovery occurred within 20 years on a wet sedge meadow without any clean up. A dry habitat exposed to the same application supported less than 5 percent vegetative cover after 24 years. For the most part, onshore oil spills would be very local in their effects and would not significantly contaminate or alter caribou, moose, and muskoxen habitat. However, some local contamination of tundra vegetation is expected to occur near production wells and processing facilities. Spills that occur within or near streams and lakes may affect foraging habitat along these water bodies.

Grizzly bears depend on coastal streams, beaches, mudflats, and river mouths during the summer and fall for catching fish and finding carrion. If an oil spill were to contaminate beaches and tidal flats along the Beaufort Sea coast, some grizzly bears would be likely to ingest contaminated food, such as oiled birds, seals, or other carrion (USDOI, BLM, 1998). Such ingestion could result in the death of a few bears. An oiling experiment on captive polar bears indicated that if a bear's fur becomes oiled and the bear ingests a considerable amount of oil while grooming, kidney failure and other complications could lead to the bear's death (Oritsland et al., 1981). Brown bears on the Shelikof Strait coast of Katmai National Park (an area contacted by the *Exxon Valdez* oil spill) were observed with oil on their fur and were consuming oiled carcasses (Lewis and Sellers, 1991). A study of the exposure of Katmai National Park brown bears to the *Exxon Valdez* oil spill through analysis of fecal samples indicated that some bears had consumed oil or were exposed to oil; one young bear that died had high concentrations of aromatic hydrocarbons in its bile and might have died from oil ingestion (Lewis and Sellers, 1991). Anecdotal accounts of polar bears deliberately ingesting hydraulic and motor oil, and foreign objects from human garbage sites suggest that both bear species are vulnerable to ingesting oil directly, especially from oiled carrion and other contaminated food sources (Derocher and Stirling, 1991). Skin damage and temporary loss of hair can result from oiling of bears, with adverse effects on thermal insulation (Derocher and Stirling, 1991). Spills estimated to occur under the Preferred Alternative could result in the loss of small numbers of grizzly bears through ingestion of contaminated prey or carrion.

Small mammals and furbearers may be affected by spills from oiling or ingestion of contaminated forage or prey items. Small mammals such as lemmings and voles may be killed during spill response. These impacts would be localized around the spill area and would not have population level impacts.

If seawater were used for enhancement of oil production, a saltwater spill could occur within the NPR-A. According to McKendrick (2000), brine spills kill plants on contact and increase soil salinity to the point that many species of plant cannot survive. Unlike oil, salts are not biodegradable, and natural recovery occurs only after salts have leached from the soil. A spill would have adverse effects on salt-intolerant vegetation near the seawater pipeline, but the amount of tundra habitat affected would be small, no more than a few acres. Thus potential saltwater spills are not likely to affect forage availability for caribou, muskoxen, moose, or other terrestrial mammals in the Planning Area. In cattle, injestion of saltwater at > 10,000 ppm salt can cause sodium-ion toxicity and at lower levels may affect rumen activity (Edwards, 1985). In the case of a saltwater spill on tundra habitat the water would likely be absorbed into the vegetative mat or in wet habitats, diluted with fresh water. Response and rehabilitation activities would likely keep terrestrial wildlife out of the spill area for the short-term. Over the long-term, mortality of vegetation in the area affected by the spill would make the area undesirable for grazing by terrestrial mammals until the vegetation recovers.

In the event of a natural gas well blowout or pipeline rupture, there would be a short-term release of gas (1 day) that could extend downwind for about 1 km and would quickly dissipate once the blowout or leak was stopped. Terrestrial mammals in the immediate vicinity of the blowout could be killed. Natural gas and condensates that did not burn in the blowout would be hazardous to any terrestrial mammal exposed to high concentrations. Given the small area that would be exposed to the plume and the rapid dissipation of the gas, it is not likely that any animals other than individuals present in the immediate vicinity at the time of the blowout would be affected. The

habitat may increase local densities of ground squirrels. These effects are expected to be insignificant to populations on the Arctic Slope of Alaska.

(b) Effects of Spills

The extent of impacts to terrestrial mammals from spills would depend upon the type and amount of materials spilled, the location of the spill, and effectiveness of the response. The following effects would be more likely to result from a large spill. Most small spills would be contained on the gravel pad and thus have no impact on terrestrial mammals or their habitat. In the case of a spill, terrestrial mammals could become oiled, ingest contaminated vegetation or be disturbed/displaced by spill response activities. Potential impacts to terrestrial mammals would be similar to those discussed under Alternative B and somewhat lower than those discussed under Alternative A. Approximately 17 percent of the Planning Area would be deferred from leasing for 10 years; no impacts from spills would be expected during the deferral period. No population-level effects on terrestrial mammals are anticipated.

Adult caribou, moose, and muskoxen that become oiled are not likely to suffer from a loss of thermal insulation during the summer, although toxic hydrocarbons could be absorbed through the skin or inhaled. However, the oiling of young calves could significantly reduce thermal insulation, leading to their death (USDOI, BLM, 1998). Oiled caribou, moose, and muskoxen hair would be shed during the summer before the winter fur is grown. If caribou were oiled in the winter after shedding their summer coats, oiling would not be expected to affect thermal insulation, because the outer guard hairs of caribou are hollow. No documented caribou deaths have been attributed to the numerous spills associated with TAPS. Caribou, moose, and muskoxen that become oiled by contact with a spill in contaminated lakes, ponds, rivers, or coastal waters could die from toxic hydrocarbon inhalation and absorption through the skin. Exposure of horses and cattle utilizing grazing lands that support oil extraction have resulted in mortality and morbidity (Edwards 1985). Exposure may involve heavy metals, salt water, caustic chemicals, crude oil, and condensates. In cattle, this exposure may result in a wide variety of symptoms including effects on the central nervous system, cardio-pulminory abnormalities, gastrointestinal disorders, inhalation pneumonia, and sudden death (Edwards 1985). For large spills that are not successfully cleaned up, the potential for contamination would persist for a longer time and there would be a greater likelihood of animals being exposed to the oil. Cleanup success may vary depending upon the environment. Over time, any remaining oil would gradually degrade. Although oiling of animals would likely not remain a threat after clean-up efforts, some toxic products could remain for some time. Depending upon the spill environment, part of the oil could persist for 5 years (USDOI, BLM, 1998).

If a release from a pipeline, or a spill large enough to escape from a gravel pad were to occur, some tundra vegetation would become contaminated. Toxicity studies of crude-oil ingestion in cattle (Rowe, Dollahite, and Camp, 1973) indicate that anorexia (significant weight loss) and aspiration pneumonia leading to death are possible adverse effects. Caribou, moose, and muskoxen probably would not ingest oiled vegetation, because they tend to be selective grazers and are particular about the plants they consume (Kuropat and Bryant, 1980). For most spills, control and cleanup operations (ground traffic, air traffic, and personnel) at the spill site would frighten caribou, moose, and muskoxen away from the spill and prevent the possibility of these animals grazing on the oiled vegetation. In most cases, onshore oil spills are not expected to affect caribou, moose, and muskoxen through ingestion of oiled vegetation.

Spill response would result in disturbance impacts to some species of terrestrial mammals. The extent of the disturbance would depend upon a variety of factors including species affected, spill size and location, response actions, and season of year. Disturbance to moose and muskoxen is unlikely given their distribution within the Planning Area. Aircraft or overland vehicles responding to the spill may cause disturbance of terrestrial mammals such as caribou and grizzly bears. Disturbance response may last from a few minutes to a several hours. Larger and more mobile species would be temporarily displaced by human activity around the cleanup site. Displacement may last from a few days to a few weeks. Cow caribou with calves may be displaced up to 2.5 mi (4 km). These disturbance impacts are not expected to have population level effects on any terrestrial mammals.

North Slope. An average of 51 percent of the observations of radio-collared bears were in riparian corridors along major rivers and streams.

Construction of a natural gas pipeline would have minor impacts on bears. The pipeline would be constructed during the winter, when bears are generally hibernating. If construction were to occur within 600 ft of an occupied bear den, hibernating bears could be disturbed by noise and could abandon the den. Minimal habitat disturbance would occur at river crossings.

e) Wolves

Potential effects on wolves include short-term disturbance from air and surface traffic and human presence, and increased hunting and trapping pressure through improved access or increased human presence that may be associated with oil development. If caribou abundance were negatively affected by oil and gas development, wolf abundance could in turn be adversely affected. Wolves are generally not abundant in the Planning Area and the highest populations are located in the southern and eastern portions of the area. Oil and gas development in the high potential area would have minimal impact on wolves.

f) Wolverines

Potential effects on wolverines from oil and gas development could include disturbance from air and surface vehicle traffic, increased human presence, and habitat alteration. Wolverines may be sensitive to development activities and abandon habitat areas near oil development. Winter seismic activities in the Pik Dunes area south of Teshekpuk Lake caused the displacement of a wolverine from its den (Harry Brower, Jr., as cited in USDOI, BLM, 1997c). If caribou abundance were adversely affected by oil development, wolverines could be affected in return. Decline in distribution and abundance of wolverines in Canada was attributed to increased harvest and decline in caribou populations (Van Zyll de Jong, 1975). Alteration of riparian habitats through gravel excavation or gas pipeline construction could adversely affect wolverines, especially during the winter, when theses habitats provide cover and important hunting areas. Some wolverines may be displaced near (within a few miles) oil field facilities.

g) Foxes

Oil and gas development activities would affect the arctic fox by increasing the availability of food and shelter. Oil field facilities provide additional food sources for foxes at dumpster sites near the galley and dining halls and at dump sites (Eberhardt et al., 1982; Rodrigues, Pollard, and Skoog, 1994). Crawlspaces under housing, culverts, and pipes provide foxes with shelter for resting and, in some cases, artificial dens (Eberhardt et al., 1982; Burgess and Banyas, 1993). Localized oil development activities do not appear to have any dramatic, deleterious effect on arctic fox populations (Eberhardt et al., 1982). A study of den sites and fox productivity near Prudhoe Bay indicates that adult fox densities and pup production are higher in the oil fields than in surrounding undeveloped areas (Burgess et al., 1993). An increase in the fox population associated with oil development may adversely affect some fox-prey species (such as ground-nesting birds) in the development area and over a region larger than the oil field itself (Burgess et al., 1993). If development occurs in the arctic foothills or mountains similar impacts to red foxes could occur.

h) Other Mammals

Small rodents and their predators would be affected locally (direct mortality and loss of habitat of individuals or small groups of lemmings and voles) along pipelines, gravel pads, and other facilities. Arctic ground squirrels sometimes den in gravel fill in the oil fields (Shideler and Hechtel, 2000). The availability of suitable burrowing

caribou such as elevated pipelines and minimum altitudes AGL for aircraft would also reduce impacts to muskoxen. Immigration into specific areas could be slowed by development. Construction of oil and gas pipelines to Prudhoe Bay may result in temporary disturbance of mixed-sex groups of muskoxen in the Colville and Fish river areas. Repeated disturbance of the same group during the winter could negatively affect energy balance of individual animals and potentially contribute to winter mortality.

d) Grizzly Bears

Major sources of noise include construction of roads, pipelines and pump stations, gravel mining, and drilling operations. These activities may disturb grizzly bears occurring within a few miles of the noise sources. Industrial activities and human presence also pose potentially serious disturbances to denning bears. In one study, seismic activities within 1.15 mi (1.8 km) of a grizzly bear den caused changes in heart rate and movement of the female bear and cubs (Reynolds, Reynolds, and Follmann, 1986). The investigators suggest that seismic testing activities within about 600 ft of the den may cause abandonment of the den. A similar effect could occur from construction activities within 600 ft of dens. In a study of maternal denning of polar bears and their cubs (a comparable species), disturbances from capture, marking, and radio tracking did not affect litter sizes or the stature of cubs produced. This tolerance by bears and the fact that maternal investment in the denning effort increases through the winter indicate that spatial and temporal restrictions on development activities could prevent abandonment of the dens (Amstrup, 1993).

Human scent and other noises also may disturb the bears. When grizzly bears first encounter humans on foot, their initial response is to flee; responses to ground-based human activities are stronger than responses to aircraft, especially when encounters occur in open areas such as the Arctic Slope (McLellan and Shackleton, 1989). Both the increase in human presence and resulting encounters with grizzly bears associated with recreation and tourism are temporary in nature. However, the establishment of permanent settlements such as oil fields usually leads to human-bear encounters on a regular basis--and to conflict, particularly if bears learn to associate humans with food (Schallenberger, 1980; Harding and Nagy, 1980; Miller and Chihuly, 1987; McLellan, 1990). Grizzly bears initially avoid human settlements because of the noise and disturbance (Harding and Nagy, 1980), but if the area includes an important food source (such as a fish stream), some bears are likely to habituate to the noise and human presence, leading to an increase in encounters. These encounters often lead to the loss of bears (Archibald, Ellis, and Hamilton, 1987). Individual bears, especially females with cubs, vary in the degree of habituation-tolerance to human presence, and some would continue to avoid areas when humans are present (Olson and Gilbert, 1994). Although studies show that cub survival is higher in bears using anthropogenic food sources in the oil field region (Prudhoe and Kuparuk), this effect is countered by the fact that these bears have a lower than normal survival rate after becoming sub-adults (Shideler and Hechtel, 2000). The attraction of grizzly bears to garbage and/or food odors at oil- and gas-related facilities has led to encounters in which the need to protect workers results in the loss of bears (Schallenberger, 1980). Once bears become conditioned to the availability of human sources of food, measures to reduce this availability by improved garbage handling are not always effective (McCarthy and Seavoy, 1994).

Oil exploration and development under the Preferred Alternative are expected to attract some grizzly bears to oil field facilities and may result in the loss of some bears due to interactions with humans. The level of impacts to bears would be dependant upon the location of the oil fields. Bears are much less common in the coastal plain than in the foothills and mountains of the southern part of the Planning Area. Oil development in the area with the highest potential for oil reserves (the north) would initially have fewer impacts on bears than development in the middle to southern portion of the Planning Area. However, if bears are attracted to development, impacts may increase over time. Shideler and Hechtel (2000) estimated bear densities in the oil field region (Prudhoe and Kuparuk) to be 4 bears/1,000 km^2 more than twice the highest density estimate for the coastal plain. This higher density could not be attributed to anthropogenic food sources and the authors speculated that the oil field region was higher quality habitat than other parts of the coastal plain.

Gravel mining in riparian corridors along major rivers could result in disturbance and loss of 20 to 50 acres (per material site) of bear habitat. Shideler and Hechtel (2000) found that bears often used riparian habitats on the

using year-round ice pads; or reusing gravel from previous Husky drill sites. Gravel extraction (outside of the Planning Area), hauling of the gravel on ice roads (into the Planning Area), and deposition of gravel in the lease areas would result in local disturbance-displacement of small numbers of individual animals but would not affect the overall distribution and abundance of caribou. The loss of relatively small areas of tundra habitat to gravel pads, roads, and other alterations has not had significant effects on the CAH caribou and would have minimal impact on the TLH and WAH.

If a system to transport North Slope natural gas to southern markets were developed, a natural gas pipeline would be constructed from oil fields in the Planning Area to Prudhoe Bay. The pipeline would be buried and thus would not affect caribou movements. Wintering caribou could be temporarily disturbed or displaced during construction. A relatively small amount of habitat both within (45 to 90 acres) and outside (305 to 610 acres) of the Planning Area would be disturbed by trenching.

Compared to Alternative A, impacts to caribou would be reduced under this alternative by the establishment of the Caribou Study Area, deferral of leasing in approximately 17 percent of the Planning Area, coastal area setbacks, ROP's and stipulations.

b) Moose

Moose occur in low densities in the Planning Area during the summer and are concentrated in major drainages at the southern edge of the Planning Area in the winter (Map 55). Unless an oil field were to be developed in the southeastern portion of the Planning Area such as the headwaters of the Ikpikpuk or near the Colville River, development would be unlikely to impact moose. A number of studies show that the TAPS has had little effect on moose movements and habitat use near the pipeline (Sopuck and Vernam, 1984, 1986; Eide, Miller, and Chihuly, 1986). In one study, 94 percent of the moose successfully crossed the pipeline corridor, and moose distribution was independent of distance from the pipeline (Sopuck and Vernam, 1986). However, moose preferred to cross pipelines elevated above 5 ft (Sopuck and Vernam, 1984). Under the Preferred Alternative, a crude oil pipeline (elevated 7 ft) connecting with the TAPS is not expected to affect moose habitat use and movements regardless of the location of the field(s). Depending upon the location, construction of a pump station would result in the loss of up to 40 acres of moose habitat. Given the amount of habitat available in NPR-A, the impacts would be negligible. Moose could be temporarily disturbed or displaced during construction if the pump station were located in winter moose range.

If gravel is mined from riverbeds in the Planning Area, there is a potential for temporary displacement and disturbance of moose. From 20 to 50 acres of moose habitat could be destroyed or degraded by borrow pit operations. Construction of a natural gas pipeline would have minimal impact on moose. The pipeline would be constructed during the winter, north of winter moose habitat in the Planning Area. Outside the Planning Area, moose in the Colville River may be temporarily displaced or disturbed during pipeline construction.

c) Muskoxen

Potential effects of oil and gas development activities include displacement and disturbance of individual animals, direct habitat loss from gravel mining in river floodplains and at oil field facilities, and indirect habitat loss through reduced access caused by physical or behavioral barriers created by roads, pipelines, and other facilities (Clough et al., 1987, as cited by Winters and Shideler, 1990; Garner and Reynolds, 1986). Muskoxen may be more exposed to oil exploration and development than caribou, because they tend to remain year-round in the same habitat area (Jingfors, 1982); conversely, muskoxen may be more likely to habituate because of this year-round exposure. Muskoxen have been exposed to the TAPS and the Dalton Highway with the expansion of their range west from the ANWR and the Kavik River. Muskoxen are still uncommon in the Planning Area. Initial oil and gas development activities are unlikely to impact muskoxen. However, as populations continue to expend west into the Planning Area, they may move into areas of development. In this case, mitigation measures for

season.

Impacts to caribou during the insect season would be reduced under this alternative by the establishment of the Caribou Study Area, coastal area setbacks and associated ROP's and stipulations. Pipelines and roads shall be designed to allow free movement of caribou regardless of location within the Planning Area. Before construction of facilities in the Caribou Study Area (Map 91), the lessee would study caribou movements in the insect-relief area to help determine the best facility design and location. Permanent facilities would be located at least ¾ mi from the coastline to the extent practicable to minimize alteration of caribou movements.

Curatolo and Murphy (1986) evaluated the ability of caribou to cross roads and pipelines. They concluded that crossing success was reduced where pipelines were adjacent to heavily traveled roads (> 15 vehicles/hour). Isolated pipelines or roads had lesser effects on crossing success. Groups did eventually cross the roads and move through the oil field, however the energetic costs associated with such delays are unknown. For caribou in the Prudhoe Bay and Kuparuk oil fields and pipeline-road corridors, the greatest human-caused influence on behavior and movement is vehicle traffic (particularly high traffic levels, such as 40 to 60 vehicles/hour, or traffic levels of > 15 vehicles/hour) within the pipeline-road corridors (Murphy and Curatolo, 1984; Lawhead and Flint, 1993). Caribou may be hesitant to cross the Dalton Highway and other roads on the oil fields because of the traffic (Leonard Lampe, as cited in USDOI, BLM, 1997a). A decline in the frequency at which caribou cross pipeline corridors is attributed to high traffic levels on the adjacent road (Curatolo, 1984). Caribou generally hesitate before crossing under an elevated pipeline and may be delayed in crossing a pipeline and road for several minutes or hours during periods of heavy road traffic; however, successful crossings do occur. Caribou have returned to areas of previous disturbance after construction was complete in other development areas (Hill, 1984; Northcott, 1984 as cited in USDOI, 1998). ROP E-7 requiring elevation of pipelines and 500 ft separation between roads and pipelines would help minimize disruption of caribou movements.

A pipeline from the oil field(s) in the northern part of the Planning Area would connect to the TAPS through facilities at the Kuparuk fields (Map 108). The pipeline would be constructed during winter using ice roads and no permanent road would be built. During construction, air traffic could temporarily disturb some caribou within about 1.2 mi (2 km) of the pipeline. Disturbance effects on caribou are expected to be short term, interference with their movements would be temporary (a few minutes to less than a few days), and they eventually would cross the pipeline area. Also, disturbance reactions would diminish after construction is complete. The mere physical presence of a pipeline would probably have minimal effect on the behavior, movement, or distribution of caribou, particularly when designed to facilitate movement. During the winter, caribou movements can be blocked or interrupted along the elevated (5 ft) pipelines, when snow drifts under the pipeline (Issac Nukapigak, as cited in USDOI, BLM, 1997a). Elevation of the pipeline to 7 ft above ground level as required by the ROP would reduce the potential for drifting snow effects. Also, such an effect is expected to be temporary and local, with the caribou moving across the corridors at locations where the snow is shallower or has melted during the spring. Construction of additional pipelines through Northeast NPR-A to the Kuparuk area would add to the cumulative effect of development on TLH and CAH caribou. Construction of a pump station in NPR-A would result in the loss of up to 40 acres of tundra habitat and temporary displacement or disturbance of caribou during construction.

Development of an oil field or fields could result in impacts to wintering TLH (Map 54) and WAH caribou. Depending upon the location of the development, some TLH migration movements may be temporarily disrupted or diverted by air and surface traffic along pipelines and roads within the oil field. Wintering animals may be temporarily disturbed or avoid the development area. Repeated disturbance of the same animals during the winter could have negative impacts on individual animals' energy balance. A required minimum altitude AGL over identified caribou wintering ranges would reduce impacts to caribou from aircraft over flights. Most of the WAH animals winter south of the Brooks Range (Map 47) and would not be affected.

Development of oil fields would require up to 5 million yd^3 of gravel. Gravel is a scarce resource in NPR-A and if local sources of gravel are not available, alternative strategies may be used, including: barging construction materials to coastal staging areas for later transit over ice roads; processing bedrock for construction materials;

may be delayed in reaching the calving grounds because of delays in crossing roads or attempts to detour around roads or oil fields. Calving en route to calving grounds may result in reduced calf survival.

One issue arising from oil field development is the ability of caribou to move freely through the oil fields during insect seasons. Caribou under extreme insect harassment initially move rapidly to insect-relief habitat. For the TLH, this is often coastal areas from Peard Bay to Smith Bay (Map 49 and Map 50). After reaching these habitats, they often continue to move rapidly and may cover long distances. Caribou are generally less sensitive to disturbance when under extreme insect harassment. When insect harassment abates, caribou drift inland to better foraging areas. At this time, they are more sensitive to disturbance; and infrastructure and activities in oil fields or roads between oil fields could delay or deflect movements of caribou from coastal insect-relief areas to foraging habitat further inland. Impaired movements between insect-relief habitat and inland foraging areas could depress energy balance (Smith, 1996) and rates of weight gain. The probability of producing a calf is directly related to body weight and/or fat content of females during the previous autumn (Cameron et al., 2000). Since reproductive success of caribou is highly correlated with nutritional status (Cameron et al., 2002), there could be reproductive consequences from extensive disruption of caribou during the insect season.

Cameron et al. (1995) noted that reports of insect-harassed caribou aggregations along the Beaufort Sea Coast and completely traversing the Prudhoe Bay complex as reported in the 1970's had become rare. An analysis of the distribution of radio-collared female CAH caribou from 1980-1993 suggests that caribou use of the oil field region at Prudhoe Bay has declined considerably from that observed in the 1970's (Cameron et al., 2002). However, the Prudhoe Bay field was not designed to facilitate caribou movement. It is complex and has many older pipelines that are less than 1.5 m above ground. Movement of insect-harassed caribou through the Kuparuk Oil Field has been examined in several studies (Johnson and Lawhead, 1989; Lawhead, Johnson, and Byrne, 1994; Smith, Cameron, and Reed, 1994). In the Kuparuk Field where all pipelines are elevated a minimum of 1.5 m above ground, insect-harassed caribou were able to pass through the field on their way to and from insect-relief habitat, although they typically detoured around drill pads and were often delayed up to several hours at road crossings. Smith, Cameron, and Reed (1994) monitored caribou movement in relation to roads and increasing development in the Kuparuk Area from 1978-1990. They found that groups of insect-harassed caribou were deterred from crossing roads with higher levels of vehicular traffic. Over the 12 years of the study, a change in access to the oil field area by insect-harassed caribou occurred. During the early years of construction, large insect-harassed groups of caribou approached the road from the middle section. By the end of the study, most large groups were observed at the extremes of the road transect indicating that caribou might be avoiding the core areas of industrial activity. Designing oil fields to facilitate movement of caribou reduces but does not eliminate impacts.

Development in the TLH insect-relief habitat is a likely development scenario given the high potential for oil and gas in the area. In this case, production pads, pipelines, within-field roads, and other facilities (housing, airfield, processing plant) could be located within important TLH insect-relief habitat (Map 50 and Map 49). Movements of the TLH caribou from coastal insect-relief areas to foraging areas further inland during the insect season would be adversely affected by pipelines and roads with vehicle traffic located between the Ikpikpuk River and Dease Inlet. There may be increased energetic costs to caribou and possible decreased weight gain. Summer is the season when female caribou need sufficient forage to meet the demands of lactation and to gain sufficient weight to enable conception in the fall (Cameron et. al., 1993). Reproductive pauses may occur if necessary weight gain is not achieved during summer (Cameron, 1994). There could be reproductive consequences to the TLH if extensive disruption of caribou occurs during the insect season. Extensive development in this area could result in the loss of some insect-relief habitat for TLH caribou.

Gravel pads and roads are sometimes used as fly-relief habitat by caribou (Johnson and Lawhead, 1989; Pollard et al., 1996b). Oestrid flies are less common in shade than in sunlit areas (Pollard et al., 1996a) and caribou sometimes use the shade of elevated pipelines and buildings to escape from flies (Murphy and Lawhead, 2000). There may be a similar disruption of some WAH caribou if an oil field or fields were developed in the southern part of the Planning Area. Population level effects to the WAH are unlikely as the majority of the herd uses insect-relief habitat that is south and west of the Planning Area. About 10 percent of the herd could use the Planning Area during the insect season and thus be exposed to development structures during the peak insect

a) Caribou

Although much of the construction associated with oil and gas development would occur during winter, development would bring year-round facilities and activities to caribou range. Caribou may be disturbed by traffic, humans on foot, and low-flying aircraft (Calef, DeBock, and Lortie, 1976; Horejsi, 1981; Shideler, 1986; Tyler, 1991). The response of caribou to potential disturbance is highly variable from no reaction to violent escape reactions depending on their distance from human activity; speed of the approaching disturbance source; frequency of disturbance; sex, age, and physiological condition of the animals; group size; and season, terrain, and weather. Caribou cow and calf groups appear to be the most sensitive to traffic, especially in early summer during and immediately after calving, while bulls appear to be least sensitive.

Tolerance to aircraft, ground vehicle traffic, and other human activities has been reported in several studies of caribou and other hoofed-mammal populations in North America (Davis, Valkenburg, and Reynolds, 1980; Johnson and Todd, 1977). The variability and unpredictability of the arctic environment dictate that caribou have the ability to adapt their behavior (such as change the time and route of migration) to some environmental changes. Some groups of caribou that have been frequently exposed to disturbance apparently have become somewhat accustomed to human activities. Such habituation has been observed in the Prudhoe Bay area (Cronin et al., 1994). It appears that caribou can habituate to structures, noise and odors but habituate slowly or not at all to humans on foot or large moving objects such as vehicles (Murphy and Lawhead, 2000). Most of the caribou in the Planning Area are from the TLH and WAH herds, have had less exposure to human activities, and are likely to be less tolerant of disturbances than animals habituated to Prudhoe Bay.

Some displacement of the Central Arctic herd (CAH) from a portion of the calving range near the Prudhoe Bay and Milne Point facilities is well documented (Cameron, Whitten, and Smith, 1981, 1983; Cameron et al., 1992). In the Kuparuk-Milne Point area, the relative distribution of calving has shifted away from development facilities (Lawhead et al., 1997; Wolf, 2000). Cameron et al. (2002) evaluated changes in distribution of calving CAH caribou associated with the Kuparuk-Milne Point area. Before construction of a road system to Milne Point, caribou were found in a single, more or less continuous concentration, roughly centered where the road was later built. After construction of the road, a bimodal distribution--with separate concentrations of animals east and west of the road--was clearly apparent, indicating that calving caribou are avoiding the infrastructure area. Ground observations of caribou within the Kuparuk area from 1978-1990 indicated that caribou increasingly avoided zones of intense activity, especially during the calving period (Smith et al., 1994). Data analyzed by Cameron et al. (2002) suggest that having roads too closely spaced would depress calving activity within the oil field complex. Other studies (Roby, 1978; Cameron et al., 1981, 1983; Cameron et al., 1992; Pollard and Ballard, 1993) and literature reviews (Cronin et al.,1994, 1998) indicate some seasonal avoidance of habitats within 1.86 to 2.48 mi (3 to 4 km) of existing Prudhoe Bay area facilities by cows and calves during calving and early post-calving periods (May through June). An analysis of the distribution of radio-collared female CAH caribou from 1980-1993 suggests that caribou use of the oil field region at Prudhoe Bay has declined considerably from that observed in the 1970's (Cameron et al., 2002). Recent information on the body weight of CAH caribou calving in the oil fields compared to CAH caribou calving east of the Sagavanirktok River suggests that displacement-disturbance of cow caribou on the oil fields may be affecting caribou productivity (Cameron, 1994). Several data sets examined by Cameron et al. (2002) indicate reduced nutritional status and fecundity of female CAH caribou exposed to oil development west of the Sagavanirktok River compared to those in undeveloped areas to the east. Body-weight estimates, over-summer weight gain, the incidence of pregnancy in two successive years, and perinatal calf survival all tended to be lower for female caribou west of the Sagavanirktok River.

The TLH, WAH, and CAH core calving ranges lie outside the Planning Area. Development would not result in the loss of any core calving habitat. Thus, on-site development is expected to have no effect on caribou movements within the calving range, and no calving activity would be displaced unless access to calving grounds is disrupted. In some years, 5 to 10 percent of the WAH may winter on the North Slope. Depending upon the location of oil development infrastructure, movement of both WAH and TLH caribou from winter range to calving grounds could be disrupted by oil and gas development. The level of effect would depend upon the level of development. An above ground pipeline with no associated road would have little effect on movement between winter habitat and calving grounds. A road and associated traffic would have a greater impact. Pregnant caribou

Potential effects on wolverines could include disturbance from air and surface-vehicle traffic, and increased human presence. Wolverines are considered a shy and secretive species, and they may be sensitive to disturbance. Winter seismic activities in the Pik Dunes area south of Teshekpuk Lake are known to have caused the displacement of a wolverine from its den (Harry Brower, Jr., as cited in USDOI, BLM, 1997a).

Small rodents (such as lemmings and voles) may be locally affected through direct mortality and minor loss of habitat from overland traffic associated with seismic operations. Their predators (such as short-tailed weasels) may be indirectly affected in local areas due to a reduction in prey. These losses would be insignificant at the population level.

2) Exploratory drilling

Impacts from exploratory drilling on terrestrial mammals would be similar to Alternative B and somewhat less than that predicted in Alternative A. Impacts to terrestrial mammals would be similar to those caused by seismic activity, though lesser in spatial terms and greater in temporal terms. Habitat impacts would be minimal, as exploratory drilling would occur during the winter on frozen tundra, packed snow roads, and ice roads. Potential causes of disturbance to terrestrial mammals from exploratory drilling include surface vehicular traffic, humans on foot, and aircraft traffic. In most cases, these activities are expected to cause short-term (few minutes to 1 hour) displacements and/or disturbance of terrestrial mammals. Camps at drill sites may result in localized disturbance and/or displacement of terrestrial mammals for several weeks to months. Exploratory drilling operations and ice roads would traverse TLH and WAH caribou wintering areas. Any caribou in the immediate vicinity of the activity would be disturbed, possibly having a negative effect on their energy balance. Aircraft traffic disturbance impacts to wintering caribou would be reduced by requiring a minimum altitude of 1,000 ft over caribou winter range. Few wintering WAH animals would be affected because less than 10 percent of the herd typically winters in the Planning Area. Because these animals are mobile and the operation is temporary, it is not expected that there would be any long lasting effects on caribou from exploratory drilling.

Muskoxen and moose winter distribution is such that exploratory drilling activities would be unlikely to have any impacts on these species unless located in the eastern or southeastern portions of the Planning Area (Map 55). In that case, impacts would include short-term displacement or disturbance similar to that caused by seismic activities. Impacts to arctic foxes, grizzly bears and wolverines would be similar to impacts from seismic activities, but would be more frequent or longer in duration. There would be a higher potential for bears and foxes to be attracted or habituated as camps associated with drill sites would be in place for several months vs. a week or less. Small rodents (such as lemmings and voles) may be locally affected due to direct mortality and minor loss of habitat from snow compaction or ice road construction. These losses would not result in population level impacts.

3) Oil and Gas Development

Primary effects on terrestrial mammals would come from construction of facilities such as roads and pipelines; motor vehicle traffic within the oil field(s) and on connecting roads; foot traffic near facilities and camps; aircraft traffic; crude-oil and fuel spills contaminating tundra, stream, and coastal habitats; and habitat alteration associated with gravel mining and construction. The greatest potential for significant impacts to caribou is through disruption of the movement of TLH caribou from insect relief habitat to foraging areas, and delay or disruption of caribou cows migrating to the calving grounds. Impacts to terrestrial mammals would be somewhat less than that predicted in Alternative A because of a lower level of anticipated development, deferral of leasing on approximately 17 percent of the Planning Area, the establishment of the Caribou Study Area and Coastal Area, and stipulations and ROP's applied to these areas.

1) Seismic

Effects of seismic activities on terrestrial mammals would be similar to those predicted under Alternative B and somewhat less than those predicted under Alternative A. Two 2-D or 3-D seismic operations (70 to 110 people associated with each) would occur in each winter and could affect terrestrial mammals. Habitat impacts would be minor as seismic activities occur during the winter on frozen tundra, or ice. Potential causes of disturbance to terrestrial mammals from seismic activities include surface vehicular traffic and fixed-wing aircraft traffic. In most cases, these activities are expected to cause short-term (few minutes to 1 hour) displacements and/or disturbance of terrestrial mammals. With 3-D seismic exploration where survey lines are located only 500 to 2,000 ft apart, disturbance impacts to terrestrial mammals would increase. Localized displacement of terrestrial mammals could last for several days rather than minutes or hours. Effects on terrestrial mammals would be similar in type to those discussed under non-oil and gas activities, but greater in extent, frequency, and duration.

Seismic operations may temporarily disturb wintering Teshekpuk Lake herd (TLH) and Western Arctic herd (WAH) caribou. Avoidance of seismic lines and associated human activity could reduce their ability to avoid areas of deep snow. If multiple encounters occurred, the additional energy expenditure may result in increased winter weight loss. Aircraft traffic would be required to stay 1,000 ft above ground level (ROP F-1) over caribou wintering areas, reducing disturbance impacts to caribou and other terrestrial mammals. Unless seismic activity is intense, there should be few conflicts with wintering caribou. Only a small percentage of the WAH that winters north of the Brooks Range may be exposed to seismic activity. The TLH core wintering area (Map 54) is southwest of the high potential oil area, further reducing the potential for conflicts.

Studies of the effects of oil and gas exploration on muskoxen in Alaska and Canada have focused on disturbances associated with winter seismic operations. Some muskoxen reacted to seismic activities at distances up to 2.48 mi (4 km) from the operations; however, reactions were highly variable among individuals (Reynolds and LaPlant, 1985). Responses varied from no response to becoming alert, forming defense formations, or running away (Winters and Shideler, 1990). The movements of muskoxen away from the seismic operations did not exceed 3.1 mi (5 km) and had no apparent effect on muskoxen distribution (Reynolds and LaPlant, 1986). Muskoxen are not able to easily travel and dig through snow. In the winter, they search out sites with shallow snow, and greatly reduce movements and activity to conserve energy (USDOI, FWS, 1999). Muskoxen survive the winter by using stored body fat and reducing movement to compensate for low forage intake (Dau, 2001). Because of this strategy, muskoxen may be more susceptible to disturbances during the winter. Repeated disturbances of the same animals during winter could result in increased energetic costs that may affect mortality rates. Depending upon the location of the seismic exploration, impacts on muskoxen would be non-existent to minimal. Most of the Planning Area is currently unoccupied by muskoxen but, suitable habitat exists and populations outside of the Planning Area are gradually expanding their range. At most, seismic operations would be expected to encounter no more than an occasional lone bull within the Planning Area. No breeding groups would be affected except possibly from seismic crews accessing the Planning Area on overland routes from the Kuparuk area.

Exploration activities and human presence pose potentially serious disturbances to denning bears. In one study, seismic activities within 1.15 mi (1.8 km) of a grizzly bear den caused changes in heart rate and movement of the female bear and cubs (Reynolds et. al., 1986). The investigators suggest that seismic testing activities within about 600 ft of a den may cause abandonment of the den. Under this alternative, ROP C-1 prohibits cross-country use of heavy equipment and seismic activity within ½ mi of occupied grizzly bear dens. If den locations are known in the areas that seismic work occurs, impacts to hibernating bears would be reduced. If den locations were unknown, the stipulation would have little effect. Impacts to bears are expected to be relatively low since the area of highest potential for oil is the lowest density bear habitat.

Bears and foxes may also be attracted to camps. However, no adverse impacts are anticipated. Since seismic camps generally move at least once a week and proper handling of wastes is emphasized in the required operating procedures (ROP A-2), the potential for bears or foxes to be attracted to human food sources is low. In addition, most seismic activity would occur when bears are hibernating.

Effects of non-oil and gas activities on terrestrial mammals would be similar to those predicted under Alternative B and somewhat less than those predicted under Alternative A. Activities that may affect terrestrial mammals include aerial surveys (including those for wildlife) and ground activities such as resource inventories, paleontological excavations, research camps, recreational camps (hunting and river floating), and overland moves. Overland moves occur during the winter on frozen tundra, ice roads, or stable shorefast ice. The other activities occur from summer to early fall (June-September).

Short-term displacement and/or disturbance (few minutes to a few hours) of terrestrial wildlife may result from helicopter and fixed-wing traffic, and ground traffic associated with these activities. Caribou have been shown to exhibit panic or violent flight reactions to aircraft flying at elevations of 162 ft (60 m) and to exhibit strong escape responses (animals trotting or running from aircraft) to aircraft flying at 150 to 1,000 ft (45 to 300 m) (Calef, DeBock, and Lortie, 1976). These documented reactions were from aircraft that circled and repeatedly flew over caribou groups. While aircraft associated with aerial wildlife surveys may circle or fly over a group of caribou more than once, aircraft associated with support of survey/inventory camps would pass over caribou only once on any given flight to or from a camp. There may be additional disturbance impacts to TLH caribou under the Preferred Alternative due to ROP K-5 which requires a 3-year study of caribou movements within the Caribou Study Area before development (Map 91). Minor disturbance impacts to TLH caribou from studies would be offset by the improved mitigation of development impacts that would result from these studies.

Recreational and research camps may result in short-term displacement (24 hours to 6 weeks) or harassment of terrestrial mammals and minor disturbance to the vegetation and soil due to trampling (< 3/4 acre). Potential habitat disturbance from large camps would be reduced by using existing sites whenever possible. Camps may attract bears and foxes, and result in the shooting of bears that learn to associate humans with food sources. Such losses by themselves are expected to be minor or insignificant to the bear population but would contribute to cumulative adverse effects. Direct mortality and degradation of habitat of small rodents (such as lemmings and voles) may occur locally at excavations, camps, and on trails used for overland moves. These losses would not result in any population level impacts on small mammals or their predators on the Arctic Coastal Plain.

Very small fuel spills (< 1 bbl) could occur in association with resource inventory surveys, recreational activities, and overland moves. These spills are likely to involve aviation fuel and other light-fraction hydrocarbon fuels that would evaporate and disperse rapidly in the environment with only a local effect on vegetation. Such events are not expected to have any adverse effects on terrestrial mammals.

Current management practices, stipulations developed through the permitting process and ROP's would effectively mitigate impacts to terrestrial mammals from non-oil and gas activities.

Under the Preferred Alternative, the Planning Area would be designated as limited for recreational OHV use. Over the short term, these designations would have no practical effect on terrestrial mammals as virtually no recreational OHV use currently occurs. Over the long term, if recreational OHV use were to increase substantially, having designations in place could reduce impacts to terrestrial mammals from recreational OHV use. Impacts would consist primarily of disturbance impacts from increased human access into terrestrial mammal habitats, and increased harvest from trapping and hunting.

(2) Effects of Oil and Gas Activities

(a) Effects of Disturbances

in high-bird-concentration areas, as appears likely in the vicinity of Dease Inlet, greater numbers of individuals would be expected to be displaced and more species would be involved than with a single sale. Such effects could alter bird populations of these local areas substantially. For species with narrower habitat preferences, limited tolerance to disturbance factors, or small and/or declining populations (red-throated loon, yellow-billed loon, king eider, common eider, Sabine's gull, gyrfalcon, peregrine falcon, snowy owl), effects could extend to regional populations and involve long-term changes in distribution. Effects for these and other vulnerable species could be elevated to a moderate level if multiple developments were to be concentrated in a limited region.

The estimated number of onshore oil spills of 500 or 900 bbl for the first sale or multiple sales (Table IV-19) is expected to stay constant (0 for the $18/bbl no-development scenario, 1 for the $30/bbl development scenario).) Also, the number/volume of small crude oil and refined oil spills, projected at 112/277 under the first sale (average size 3/0.7 bbl or 126/29.4 gal.), is expected to remain constant if multiple sales occur (Table IV-20). These small, chronic spills generally are contained and cleaned up on pads and roads. Habitat contamination would be expected to increase locally at the spill sites and along any streams contaminated by these spills. Any habitat contamination that is not effectively cleaned up would likely persist for several years but is expected to result in negligible effects for most species and potentially minor effects for sensitive species. Fuel spills at potential staging areas at Cape Simpson, Barrow, or Peard Bay (Map 18 and Map 107) could result in moderate losses if occurring when substantial numbers of birds are present in or downstream of these sites. Recovery of cumulative lost productivity and recruitment may not be detectable above the natural fluctuations of the population and survey methods/data available.

f. Conclusion--Multiple Sales

Under the Preferred Alternative, displacement of birds from disturbance and habitat alteration or loss would be expected to increase substantially if development and production facilities were to be located in a limited region of higher resource potential (i.e., northern Planning Area). This could occur in several portions of the Planning Area if multiple sales are held and development occurs in areas where higher density of several species overlap. Such development potentially could alter local populations in these areas. For species that appear more vulnerable to habitat changes or disturbance (e.g., loons, eiders, raptors) effects could extend to regional populations and involve long-term changes in distribution. Although most effects that would be likely to occur throughout the Planning Area are expected to be short-term and negligible to minor, moderate effects could occur if concentrations of several particularly vulnerable species--declining or with small or sensitive populations--were involved. The likely increase in numbers of small crude oil and refined oil spills (over single sale projections) would be expected to elevate losses of birds somewhat during the period of development resulting from multiple sales. In any scenario of losses and subsequent recovery of cumulative lost productivity and recruitment may not be detectable above the natural population fluctuations given the survey methods/data available. However, effects of oil and gas developments resulting from lease sales following the first sale are expected to be additive to those of the first, and may range from a slight increase to a doubling or tripling of effect. This would depend on whether the later developments were concentrated or scattered through areas of low or high density and distributional overlap of species that vary in their vulnerability to development activities (i.e., low: increasing/stable population and/or less sensitive species, versus high: declining population and/or sensitive species). If subsequent developments are scattered, they may occur by chance in areas of low bird vulnerability and thus add little to the effects of earlier sales.

10. Mammals

a. Terrestrial Mammals

(1) Effects of Non-Oil and Gas Activities

available habitat of the type indicated, and/or a relatively small proportion of a given species' regional population.

d. Conclusion--First Sale

Under the Preferred Alternative, disturbance effects from transport operations, seismic exploration activities and gravel mining in winter and small camps, waste/fuel spill removal, river transport activity, and aerial surveys in summer are likely to be negligible for most local and regional bird populations. Elevated activity and air traffic in the vicinity of large summer camps could result in minor impacts on local populations. Regional populations are expected to experience negligible effects from such activity, except those of species that are uncommon, decreasing, or recently declined (loons, eiders), where a minor effect may occur. Routine helicopter traffic to oil and gas development sites in summer, especially over higher density areas, is likely to result in minor impacts. Gravel mining, pads, airstrips, short pad-connecting roads, and pipelines, although eliminating small areas of breeding habitat and displacing small numbers of nesting birds, are likely to result in negligible population effects. Raptors nesting along major rivers are expected to experience negligible effects from potentially disturbing activities.

Effects from crude oil spills when confined to terrestrial and freshwater aquatic habitats--where mortality of waterfowl, shorebirds, raptors, and passerines would likely be relatively low--could range from negligible for most species to minor for rare species or those with declining populations. Minor to moderate effects would be likely for stable/increasing and declining species populations, respectively. If a spill were to enter a river delta or nearshore Beaufort marine habitats occupied by substantial numbers of loons, sea ducks, black guillemots, or Ross' gulls. Effects (including disturbance) on any species utilizing Kasegaluk Lagoon and the western Planning Area--but particularly those with substantial numbers of post-breeding individuals concentrating in the lagoon (brant, king eider, common eider)--potentially could be lower and/or deferred under the Preferred Alternative than under Alternative A as a result of oil and gas activities being prohibited in the proposed Kasegaluk Lagoon Special Area and deferred for 10 years in the proposed Deferral Area. Also, several ROP's and one stipulation specifically applicable to birds are included in the Preferred Alternative.

Quantitative effects might be difficult to separate from natural variation in population numbers. Stipulations and ROP's would decrease disturbance from most factors for most species and help prevent fuel and oil pollution and degradation of important bird habitats. Several of these measures specifically applicable to birds apply only to the Preferred Alternative.

e. Multiple Sales

If multiple sales were to occur under the Preferred Alternative, construction activity could last 15 to 30 years, (deferred 10 years in the proposed Deferral Area), tapering off as existing infrastructure is used for each succeeding development. Under a multiple-sale scenario, depending on the price of oil, the combined number of exploration and delineation wells drilled could increase substantially (21 to 72 for multiple sales versus 7 to 30 for the first sale, Tables IV-07 and IV-05); the number of fields developed could increase from 4 for a single sale to as many as 8 for multiple sales (Tables IV-04 and IV-06), and production pads would be likely to increase from 0 to 6 for a single sale to 0 to 12 for multiple sales (Tables IV-05 and IV-07). Oil pipeline mileage could increase from 70 mi to 340 mi (Table IV-29).

Effects from disturbance factors and habitat alteration or loss for each development would likely be short-term and negligible to minor over most of the Planning Area (see discussion for the first sale). Habitat buried or excavated in the vicinity of development and production facilities or at gravel mine sites essentially would be lost to species present before development. Surface, air, and foot traffic could increase substantially in some areas if oilfield facilities associated with multiple sales were grouped in high resource interest areas. If these were located

ROP E-10, by requiring that exterior lights be directed inward and downward, may reduce collisions of birds with oil and gas facilities during low light conditions.

ROP E-12, by requiring development of an ecological land classification map for use in siting facilities, could help conserve important habitat types.

ROP F-1, by requiring that aircraft maintain an altitude of at least 1,500 ft AGL when within ½ mi of raptor nesting sites April 15-August 15 or gyrfalcon nest sites March 15-August 15, 2,000 ft AGL over the Caribou Study Area June 15-July31, and 2,000 ft AGL over the Caribou Coastal Insect Relief Areas June 15-July 31, and minimizing the number of takeoffs and landings at all airstrips, could mitigate aircraft disturbance of birds.

ROP I-1, by providing all personnel with information concerning applicable required operating procedures and stipulations, and importance of not disturbing biological resources, habitats, and bird colonies, could help reduce disturbance of birds.

Stipulation K-1, by prohibiting permanent oil and gas facilities within setback zones of ½ to 1 mi of listed waterways, could mitigate disturbance of raptors nesting along listed waterways and other birds occupying adjacent corridors, as well as avoiding destruction of habitats.

Stipulation K-2, by prohibiting permanent oil and gas facilities within ¼ mi of deep water lakes with depth greater than 4 m, could minimize the loss of habitats occupied by fish prey of loons, mergansers, and terns, which could adversely affect the breeding success of these water bird species.

Stipulation K-3, by prohibiting oil and gas exploration activity May 15-October 15, requiring adequate year round spill response capability, including during periods of broken ice, or alternate methods to prevent oil spills, requiring that facilities minimize impacts to seasonally concentrated birds, and requiring that daily activities are conducted to minimize impacts to seasonally concentrated birds, could protect bird habitats and avoid disturbance of seasonally concentrated birds.

ROP K-4, by requiring pre-construction aerial surveys of proposed development sites and surrounding ½ mi area, prohibiting development or curtailing activities within ½ mi of brant colonies and brood-rearing areas, could minimize habitat loss or disturbance of nesting and brood-rearing brant.

ROP K-7, by prohibiting significant alteration of high quality raptor foraging habitat within 15 mi of raptor nest sites, particularly in waterbody, wetland, and riparian habitats, could reduce impacts on important habitats of raptors and other birds occupying surrounding areas in the Colville River Special Area.

Stipulation K-8, by prohibiting permanent oil and gas facilities within the boundary of the Special Area, could protect birds using Kasegaluk Lagoon.

These stipulations and required operating procedures would minimize disturbance of most bird species from most factors; minimize adverse alteration of habitats; and could help prevent spilled fuel or other toxic materials from reaching waterbodies where waterbirds, prey of fish-eating birds, or surrounding nesting and brood-rearing habitats could become contaminated. The measures do not specifically establish minimum aircraft altitudes for routine flights over areas of high bird density. Also, the lack of a specific stipulation for summer use of ground vehicles in high bird density areas, except in the vicinity of raptor nest sites, could result in lowered nest success in local areas. In most cases, the stipulations and ROP's are likely to affect only a relatively small proportion of

Section VI

Consultation and Coordination

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VI. CONSULTATION AND COORDINATION

Preview of this Section

This section summarizes the scoping process conducted for the preparation of the draft IAP/EIS. It also summarizes the public review and comment process on the draft IAP/EIS. Summaries of the development of BLM's Preferred Alternative and Government-to-Government consultation are provided. The individual BLM and MMS preparers with their areas of expertise and/or responsibility are also listed.

A. FORMAL SCOPING

Formal scoping began when BLM published a Notice of Intent (Notice) to prepare the Northwest NPR-A IAP/EIS in the Federal Register on November 15, 2001. Publication of the Notice initiated a 45-day public scoping period. The scoping process provides the public the opportunity to submit comments and relevant information for the IAP/EIS and to inform agencies on issues relating to the future land use, planning, and management of the Northwest NPR-A Planning Area. The Notice also included a call for nominations from the oil industry for lands within the Planning Area to be considered for oil and gas leasing.

During the formal scoping period, BLM met with a range of interested parties. This included representatives of environmental groups; the oil industry; North Slope village and corporate leaders; and leaders of the NSB, State of Alaska, and other Federal land-management and resource- protection agencies. Public meetings were held in Point Lay, Anaktuvuk Pass, Wainwright, Atqasuk, Barrow, Nuiqsut, Anchorage, and Fairbanks throughout December 2001 and January 2002. Eight scoping meetings were originally scheduled. These facilitated meetings were electronically recorded and subsequently transcribed into a written record. An interpreter was present at the meetings in the North Slope communities. One hundred thirty-two individuals signed in at the eight public meetings. An additional meeting was arranged on short notice (with no public notice) to accommodate members of the Point Lay Tribal Council who were unable to return from Barrow in time for the public meeting in Point Lay. Four individuals attended that meeting. Meeting attendance totaled 136 citizens while 21 written comments were received during the scoping period. The formal public scoping period was extended until February 15, 2002.

B. AGENCIES AND ORGANIZATIONS CONTACTED

The following agencies and organizations were contacted during the planning process.

Federal Agencies

1. National Marine Fisheries Service (NOAA Fisheries)
2. Environmental Protection Agency
3. Fish and Wildlife Service
4. Minerals Management Service

State of Alaska Agencies

1. Department of Fish and Game
2. Department of Natural Resources
3. Division of Governmental Coordination

Municipal Governments

1. North Slope Borough
2. City of Anaktuvuk Pass
3. City of Atqasuk
4. City of Barrow
5. City of Nuiqsut
6. City of Wainwright

Following is a partial list of organizations and officials who were notified that the draft IAP/EIS was available for review and comment (for a complete mailing list, contact: Bureau of Land Management, Office of External Affairs (912), 222 W. 7th Ave., Anchorage, AK 99513)

- Arctic Slope Regional Corporation
- Alaska Center for the Environment
- Alaska Miners Association
- Alaska Oil and Gas Association
- Alaska Outdoor Council
- Alaska Wildlife Alliance
- Alyeska Pipeline Service Company
- Anadarko Petroleum Corporation
- ARCO Alaska
- BP Exploration (Alaska) Inc.
- Chevron USA
- Ducks Unlimited Inc.

- Exxon
- National Audubon Society
- Northern Alaska Environmental Center
- ConocoPhillips Alaska Inc.
- Sierra Club
- The Nature Conservancy
- Union Oil Company
- Union Texas Petroleum Company
- Elected Officials
- Governor of Alaska Frank Murkowski
- U.S. Senator Ted Stevens
- U.S. Senator Lisa Murkowski
- U.S. Representative Don Young
- Alaska State Senators
- Alaska State Representatives

C. PUBLIC REVIEW AND COMMENT ON THE DRAFT IAP/EIS

The Notice of Availability of the Northwest NPR-A Draft IAP/EIS was published in the *Federal Register* on January 17, 2003. Comments on the draft IAP/EIS were received via letters, e-mail, fax, website, and formal public meetings. Public meetings were held in Fairbanks (February 12, 2003), Anchorage (February 13, 2003); Point Lay (February 18, 2003), Wainwright (February 20, 2003), Anaktuvuk Pass (February 19, 2003), Atqasuk (February 24, 2003), Barrow (February 27, 2003); Nuiqsut (March 3, 2003), and Washington D.C. (March 13, 2003). The comment period closed April 2, 2003. A summary of the comments received and specific comments and responses are presented in Section VII of this final IAP/EIS. Selected letters are reproduced in Appendix 15.

D. DEVELOPMENT OF THE PREFERRED ALTERNATIVE

The draft IAP/EIS was released for public review and comment in January 2003. After completion of the public meetings and closing of the public comment period, the core planning team, resource staff, and management met to develop the Agency's Preferred Alternative. The starting point was a look at the proposals submitted by Alaska Audubon and others referred to as the "Wildlife Habitat Alternative" (see Comment Letter 213 in Section VII and Appendix 15). The resource information submitted by Audubon was consistent with BLM/MMS information and with that submitted by others, including the U.S. Fish and Wildlife Service (FWS), the State of Alaska, and the North Slope Borough (NSB). Recommendations by Audubon for new special areas and corresponding restrictions were evaluated in light of the oil and gas resource information. While BLM felt some of Audubon's recommendations were too restrictive, especially in the high prospective area for oil and gas resources in the northeast portion of the Planning Area, BLM also acknowledged that it must look carefully at protections for brant, spectacled and Steller's eiders, yellow-billed loon, Peregrine falcon, caribou, and the coastal bays and lagoons in developing the Preferred Alternative and that protections must in some cases be fairly prescriptive and quantitatively defined (e.g., ½-mile setbacks on rivers). The BLM consulted with the FWS on some of Audubon's specific recommendations, as well as about additional options for protection of specific resource as suggested by Audubon.

As discussions proceeded and additional information and input was received, the Preferred Alternative evolved. The State of Alaska, the Alaska Oil and Gas Association (AOGA), ConocoPhillips, the NSB, the EPA, the Alaska Center for the Environment et al., the American Society of Mammalogists, and the FWS all made extensive

comments specific to individual stipulations and ROP's. These comments were compiled to facilitate a review of each stipulation and ROP. Other more general comments on stipulations and ROP's from these and other entities, such as those submitted by Kuukpik, were widely distributed to the analysis team for consideration. Concurrently, management considered public comment related more generally to management philosophies and new alternatives.

As a result of many meetings to consider comments and other new information, management direction on the Preferred Alternative was set forth. In light of this direction and in consideration of comments on specific stipulations and ROP's, BLM developed the land allocations, stipulations, and ROP's for the Preferred Alternative. The stipulations and ROP's were further discussed with representatives of the NSB and the State of Alaska. Subsequent to those meetings, BLM sought additional information from the State of Alaska, the NSB, and FWS, and developed the final stipulations and ROP's that are now part of the Preferred Alternative.

E. GOVERNMENT-TO-GOVERNMENT

Federally recognized Tribes have a special, unique legal and political relationship with the Government of the United States as defined by the U.S. Constitution, treaties, statutes, court decisions, and executive orders. These definitive authorities also serve as the basis for the Federal Government's obligation to acknowledge the status of federally recognized Tribes in Alaska.

The BLM consults with federally recognized tribes consistent with the Presidential Executive Memorandum dated April 29, 1994, on Government-to-Government Relations with Native American Tribal Governments; Executive Order 13175 dated November 6, 2000, on Consultation and Coordination with Indian Tribal Governments; and the January 18, 2001, Department of the Interior-Alaska Policy on Government-to-Government Relations with Alaska Native Tribes. The BLM formally consults with federally recognized Tribes in Alaska before taking action or undertaking activities that will have a substantial, direct effect on federally recognized Tribes, their assets, rights, services, or programs. To this end, government-to-government meetings and consultation with the following federally recognized traditional governments occurred during the planning process for the Northwest NPR-A:

- Native Village of Anaktuvuk Pass;
- Native Village of Atqasuk;
- Native Village of Barrow;
- Native Village of Nuiqsut;
- Native Village of Point Lay;
- Native Village of Wainwright; and
- Iñupiat Community of the Arctic Slope.

Below is a list of specific BLM government-to-government meetings with Federally recognized tribes and state and local governments.Topics of discussion and location of meetings, if available, are provided in parentheses.

- Dec. 6, 2001 NSB Wildlife Management Committee (Barrow)
- Dec. 9, 2001 NSB Mayor (Mayor's office)
- Feb. 8, 2002 Native Village of Point Lay Tribal Council (NSB Assembly Chambers, Barrow)
- Feb. 20, 2002 North Slope Regional Subsistence Advisory Council (Inupiat Heritage Center)
- Feb. 21, 2002 Iñupiat Community of the Arctic Slope President

- Feb. 21, 2002 NSB Planning Department Director and staff (Barrow)
- March 14, 2002 Subsistence Advisory Panel (Subsistence Workshop, Barrow)
- March 18, 2002 NSB Planning Department GIS staff (Cabin and Camp GIS Inventory)
- March 18, 2002 Native Village of Barrow Tribal Council (informational meeting on developing the Northwest NPR-A Plan, Barrow)
- March 18, 2002 NSB Wildlife Management Department (cabins, coordination, studies, NSB Title 19 Special Habitat District, Subsistence Management Zones)
- March 18, 2002 Ukpeagvik Inupiat Corporation (split estate lands, cabin management)
- April 25, 2002 North Slope Borough Planning and Zoning Commission (Barrow)
- April 26, 2002 Alaska BLM Regional Advisory Council (Fairbanks)
- May 9, 2002 Barrow Planning and Zoning Commission (Special Area designation, Barrow)
- May 9, 2002 Iñupiat Community of the Arctic Slope President (consultation process to be used for oil and gas activities)
- Nov. 25, 2002 Native Village of Barrow Tribal Council (informational meeting on Puviaq project and Northwest NPR-A planning process)
- Dec. 15, 2002 Subsistence Advisory Panel (Barrow)
- Jan. 24, 2003 Native Village of Barrow Tribal Chairman, Executive Officer, and staff (consultation procedures and Northwest NPR-A plan)
- Jan. 24, 2003 Arctic Slope Regional Corporation Chairman
- Jan. 24, 2003 NSB Mayor (Barrow)
- Feb. 18, 2003 Northwest NPR-A 810 Subsistence Hearing and public meeting on draft IAP/EIS (Point Lay)
- Feb. 18, 2003 Point Lay Tribal Chairman
- Feb. 29, 2003 Northwest NPR-A 810 Subsistence Hearing and public meeting on draft IAP/EIS (Anaktuvuk Pass)
- Feb. 20, 2003 Northwest NPR-A 810 Subsistence Hearing and public meeting on draft IAP/EIS (Wainwright)
- Feb. 24, 2003 Northwest-NPR-A 810 Subsistence Hearing and public meeting on draft IAP/EIS (Atqasuk)
- Feb. 25, 2003 Subsistence Advisory Panel (attendees included representatives from Iñupiat Community of the Arctic Slope, Native Village of Barrow, City of Barrow, NSB, Alaska Department of Fish and Game, and oil industry, Barrow).
- Feb. 27, 2003 Northwest-NPR-A 810 Subsistence Hearing and public meeting on draft IAP/EIS (Barrow)
- March 3, 2003 Northwest-NPR-A 810 Subsistence Hearing and public meeting on draft IAP/EIS (Nuiqsut)
- March 7, 2003 Barrow Community (meeting organized by Native Village of Barrow, ICAS, City of Barrow and North Slope Borough, Barrow)
- March 13, 2003 Public meeting on draft IAP/EIS (Washington D.C.)
- March 18, 2003 Native Village of Nuiqsut President, City of Nuiqsut Mayor, and Kuukpik Corporation President (Nuiqsut)
- March 26, 2003 Western Arctic Caribou Herd Working Group (Nome)
- April 8, 2003 NSB Mayor and staff (Anchorage)
- April 8, 2003 Alaska Department of Environmental Conservation (Northwest NPR-A lease stipulations)
- June 26, 2003 NSB Planning Director (draft Preferred Alternative, Barrow)

Throughout the entire planning process, comments and issues brought forward through formal Government-to-Government consultation with Native Tribal Governments consistently focused on a few familiar topics. These issues included concerns about: (1) protection of subsistence resources; (2) effects of special designations, such as wilderness and Special Areas, on subsistence activities; (3) measures to prevent pollution and/or clean-up of spills; (4) anticipated levels of oil and gas and related activities (including seismic exploration) as a result of leasing new areas; (5) development of roads to villages; (6) status of NPR-A Energy Impact Funds; (7) use of traditional knowledge in making decisions; (8) impact of oil and gas-related activities on native allotments and subsistence cabins; and (9) local employment opportunities. During consultation meetings to

discuss the BLM's Preferred Alternative, the tribal councils of Atqasuk and Nuiqsut raised additional questions about restrictions on access to subsistence resources. Specifically, tribal leaders had concerns about possible limitations on access to traditional subsistence areas because of tighter security near oil and gas infrastructure such as pipelines and production facilities. They were worried that as infrastructure expands westward into NPR-A, local residents would be prevented from hunting and fishing near these facilities.

During consultation, tribal leaders made a few specific recommendations. These recommendations included prescribing higher minimum heights for pipelines, requiring operators to lower drilling rig towers during periods of caribou migrations to prevent deflecting caribou away from hunting areas, and requesting studies to determine appropriate water withdrawal limits for ice road construction.

All comments and recommendations were received verbally during meetings with individual tribal councils. No written comments were received.

F. LIST OF PREPARERS FOR FINAL IAP/EIS

The portions of Sections III, IV, and V that were written by the following specialists are indicated in parentheses. AFO=Anchorage Field Office, ASO=Alaska State Office, NFO=Northern Field Office.

- Akerelrea, Carol (BLM-ASO) Technical Writer
- Anker, Elinore M. (MMS) Technical Publications Writer-Editor (Bibliography)
- Banet, Art (BLM-ASO) Geologist (Coal Resources)
- Belenski, Carol (BLM-ASO) Visual Information Specialist
- Brumbaugh, Rob (BLM-ASO) Physical Specialist (Physiography)
- Burwell, Mike (MMS) Socioeconomic Specialist (Subsistence and Sociocultural Systems)
- Childs, Jeff (MMS) Fish and Wildlife Biologist (Marine Fish)
- Childs, Susan (BLM-ASO) Marine Biologist (Wetlands)/EIS Coordinator
- Cole, Jeanie (BLM-NFO) Wildlife Biologist (Terrestrial Mammals)
- Craig, Jim (MMS) Geologist (Petroleum Geology, Oil and Gas Assessment and Oil and Gas Exploration and Development Activities)
- Cranswick, Deborah (MMS) Environmental Scientist/EIS Coordinator
- Delaney, Roger (BLM-NFO) Natural Resource Specialist (Recreation and Wilderness Resources)
- Goodwin, Randy (BLM-NFO) Outdoor Recreation Planner (Off Highway Vehicles - Recreation)
- Hammond, Tim (BLM-NFO) GIS Specialist
- Hansen, Don (MMS) Wildlife Biologist (Marine Mammals)
- Holder, Tim (MMS) Economist (Economy)
- Hubbard, Joel (MMS) Wildlife Biologist (Birds and Endangered Species)
- Karlen, Bob (BLM-NFO) Fisheries Biologist (Non-marine Fish, Essential Fish Habitat)
- Kelly, Lon (BLM-NFO) Outdoor Recreation Planner (Wild and Scenic Rivers)
- King, Fred (MMS) Supervisory Environmental Scientist
- Kleven, Mike (BLM-NFO) Northern Field Office Environmental Planning Coordinator
- Kosnik, Kristine (BLM-NFO) GIS Specialist
- Kostohrys, Jon (BLM-NFO) Hydrologist (Water Resources)
- Kunz, Mike (BLM-NFO) Archaeologist (Cultural Resources and Paleontological Resources)
- Maclean, Beth (BLM-AFO) Geologist (Hardrock Mineral Resources)
- McCaa, Craig (BLM-NFO) Public Affairs Specialist
- McClain, Holli (BLM-NFO) Outdoor Recreation Planner (Visual Resources)

- McIntosh, Stacie (BLM-NFO) Anthropologist (ANILCA 810 Analysis)
- Meares, Don (BLM-NFO) Natural Resource Specialist (Physiography, Sand and Gravel, Oil and Gas Exploration-Environmental Status)
- Menge, Ida (MMS) GIS Technician
- Nordmann, Jerry (BLM-NFO) Natural Resource Specialist (Lands/Realty)
- Parker, Mazelle O. (MMS) EIS Specialist
- Servoss, Shawn (BLM-NFO) GIS Specialist
- Sherwood, Kirk (MMS) Geologist (Petroleum Geology and Oil and Gas Assessment)
- Sires, Beverly (MMS) Minerals Leasing Specialist (Coastal Zone Management)
- Smith, Caryn (MMS) Oceanographer (Climate and Meteorology and Oil Spills)
- Svejnoha, Wayne (BLM-ASO) Hazardous Materials (Hazmat) Specialist (Hazardous Materials)
- Theisen, Skip (BLM-NFO) Fire Management Specialist (Fire)
- Tremont, John (MMS) Geographer (Transportation and Major Projects Considered in the Cumulative Case)
- Wilson, Curt (BLM-ASO) Planner/Environmental Coordinator, NPR-A Team Leader
- Worley, Mike (BLM-NFO) Realty Specialist (Lands/Realty)
- Yokel, Dave (BLM-NFO) Wildlife Biologist (Terrestrial Mammals and Vegetation)

Section VII

Comments and Responses

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Section VII. Public Comments on the Draft IAP/EIS

Preview of this Section

This section provides a statistical summary of the comments received on the draft IAP/EIS. A list of the agencies, organizations and individuals who submitted substantive comments for which BLM has prepared specific responses is also provided. Finally, both general and specific comments and BLM's responses to those comments are presented.

A. Summary of Comments on the Draft IAP/EIS

Approximately 97,000 individual comment media on the draft IPA/EIS were received during the public comment period January 15 through April 2, 2003. Comments on the draft IAP/EIS were received via letter, e-mail, fax, website, and formal public meetings; many were received from various states of the United States, Canada, Mexico, and Europe. Approximately 87,000 comments arrived via e-mail or via internet in response to solicitations from advocacy groups. An additional 8,000 comments were sent via facsimile transmission. Many of the comments prompted by campaigns organized by environmental organizations were identical statements. Comments were also made directly on the document on at BLM's Draft IAP/EIS website. Nine public meetings/subsistence hearings were held during February 2003. More than 150 people made statements. The meetings were held at Anaktuvuk Pass, Anchorage, Atqasuk, Barrow, Fairbanks, Nuiqsut, Wainwright, and Point Lay, Alaska, and Washington, D.C.

Comment letters were entered into a database that randomly assigned tracking numbers. Individual tracking numbers were assigned to only one representative letter for identical or nearly identical form letter.

All comment letters and hearing transcripts were reviewed by a team of BLM and MMS specialists and comments requiring specific responses were identified. A comment received a specific response if it 1) is substantive and related to inadequacies or inaccuracies in the analysis or methodologies used; and/or 2) identifies new impacts or recommends reasonable new alternatives or mitigation measures; and/or 3) involves substantive disagreements on interpretation of significance (BLM NEPA handbook). Specific comments and reponses are provided in Section VII.D. The comments and responses are presented by topics that were frequently mentioned in the comment letters overall. The IAP/EIS has been revised when appropriate to address many of the comments. Additional information, either requested or provided by public input, has been incorporated in the IAP/EIS.

The 97,000+ comment letters received have not been reproduced in this document. The written and oral testimony

reproduced in this document are representative of the substantive and general comments received. Representative comment letters are reproduced in Appendix 15 in the CD-ROM and website versions of the Final IAP/EIS. The comment letters are part of the administrative record and can be inspected upon request.

B. Commenting Agencies, Organizations, and Individuals

Substantive comments were received from the agencies, organizations, and individuals listed below. The number following the name of the organization or individual(s) below is a discrete identification number that was used in the response to comments process. The specific comments and responses are presented in Section VII.D. Reproductions of representative letters, including each letter with a comment requiring a specific response, are provided in Appendix 15, which is not included in the printed version of the Final IAP/EIS but can be viewed on the CD-ROM and website.

Federal Agencies

- U. S. Department of Commerce, National Oceanic and Atmospheric Administration
  - National Marine Fisheries Service (NOAA Fisheries; formerly NMFS) (209)
  - NOAA Climate Monitoring and Diagnostics Laboratory (183)
- U. S. Environmental Protection Agency (261)
- U. S. Fish and Wildlife Service (260)
- U. S. Geological Survey (164)

State and Local Governments and Tribal Organizations

- Governor Frank Murkowski and the State of Alaska (251)
- Representative Norman Rokeberg, Alaska State Legislature (80066)
- The North Slope Borough (80065)
- City of Barrow (80015)
- City of Nuiqsut (80026)
- City of Wainwright (80012)
- Inupiat Community of the Arctic Slope (254)
- Native Village of Barrow
- Municipality of Anchorage, Office of the Mayor (80061)

Alaska Native Claims Settlement Acts Corporations

- Arctic Slope Regional Corporation (186)
- Kuukpik Corporation (254)
- Olgoonik Corporation (169)
- Wainwright Tribal Council (80012)

Oil and Gas Industry and Related Groups

- Alaska Oil and Gas Association (247)
- Anchorage Sand & Gravel Co., Inc. (80088)
- Anadarko Petroleum Corporation (256)
- ConocoPhillips Alaska, Inc (255)
- NANA Development Corporation (80025)
- Resource Development Council (267)
- WesternGeco (215)
- Fairbanks Economic Development Corporation (265)
- Greater Seattle Chamber of Commerce (80010)
- Tacoma-Pierce County Chamber, Tacoma WA (168)

Conservation Groups and Related Groups

- Alaska Coalition- Sierra Club Alaska Chapter, Alaska Center for the Environment (80016)
- National Audubon Society, Alaska (213)
- Wilderness Society, et al. (253)
- American Society of Mammalogists (249)
- Alaska Beluga Whale Committee (271)
- Anchorage Audubon Society (174)
- North Country Ecological Studies (80003)
- Santa Clara Valley Audubon Society (80011)
- Western Arctic Caribou Herd Working Group (WACH) (80004)
- Polar Bears Futures (80008)
- Sierra Club (80014)
- Natural Resources Defense Council (147)

Other Written Comments

- Alaska Miners Association, Inc. (268)
- David van den Berg (189)
- Michael Masters (180)
- Teena Helmericks (172)
- Rosemary Ahtuangaruak (167)
- Paul Hugo (187)
- Jodi Peterson (80005)
- Valerie Sovalik (166)
- Kellie Ward (80023)
- Terry Woods (80021)
- Joseph Akpik (258)
- Gregory Chase (80044)
- Robert Franz (80009)
- Walter Gove (245)
- Christine Henderson (252)
- Patricia Phillips (170)
- David Pray (80002)
- John Stroud (246)
- Jessica Sprajcar (46)

- Issac Conlen (80090)

Public Meeting Testimony Documents and Individual Comments

All of the following individuals spoke at the public meetings. The comments that received a written response have been assigned a discrete comment identification number located beside the name of the individual.

Anaktuvuk Pass ,Alaska (Document Identification Number 80072)

- Gilbert Lincoln, Citizen (80072-979)
- Raymond Paneak, Citizen (80072-980)
- Mark Morry, Citizen (80072-982)
- Laura Ticket, Citizen (80072-983)

Anchorage ,Alaska (Document Identification Number 80073)

- Tom Maloney, VECO
- John Schoen, Senior Scientist, for Audubon Alaska (80073-957,958,959,960,990,991,992,993,1004)
- Diana Rhodes, Alaska Coalition/Alaska Native Conservation Group
- Sara Callahan Chappell, Regional Representative, for Sierra Club (80073-1005)
- Tad Owens, Executive Director, for the Resource Development Council for Alaska (80073-1006,1007,1008)
- Rick Mott, Vice President, Exploration and Land for ConocoPhillips Alaska, Inc.
- Diane Kerr, Manager, Alaska and Canada Frontier Exploration, Anadarko Petroleum Corp.
- Maynard Tarp, President, Haw Construction Consultants
- Lynn Johnson, President, Dowland-Bach Corporation
- Dennis Stacey, Citizen
- Mary Waters, Wilderness Society, Audubon Alaska
- Larry Houle, General Manager, Alaska Support Industry Alliance (The Alliance)
- Cindy Middlestadt, For Mark Huber, Vice President, Doyon Universal Services, Joint-Venture
- Pamela Miller, Arctic Connections
- Karen Jettmar, Wilderness Adventure Travel Company
- Keith Silver, President, Prudhoe Bay Community Council
- Tony Alvarado, Wells Fargo Bank, Vice President , Commercial Banking Division
- Debra Williams, Executive Director, Alaska Conservation Foundation
- Bill Wielechowski, Vice President, Alaska AFL-CIO
- Bob Dittrick, Citizen
- Eric Myer, Citizen
- Bill Mohrwinkel, Wilderness Guide in the Arctic
- Michael Totemoff, Citizen
- Victoria Martin , Citizen
- Rosemary Ahtuanagaruak, Alaska Native, Nuiqsut, Alaska
- Stan Porhola, Graduate Student at UAA
- Rebecca Kyle, Substitute Teacher
- Kate Taylor, Citizen
- David van den Berg, Wilderness Guide
- Bob Randall, Citizen

Atqasuk, Alaska (Document Identification Number 80074)

- Larry Aiken, Inupiat Community of the Arctic Slope (80074-896)
- Joseph Akpik, Tribal Member of Inupiat Community of the Arctic Slope (80074-883,884,885,887,888,889,890,891,892,893)
- Hazel Hopson, Atqasuk Corporation
- Bernadine Itta, Citizen (80074-895)
- James Aiken Sr., Citizen (80074-894)

Barrow, Alaska (Document Identification Number 80075)

- Kris Anderson, VECO Alaska
- Geoff Carroll, Citizen(80075-408,412,414,511)
- Alfred Brower, Citizen
- Marie Carroll, Citizen (80075-470,471,473,474)
- Richard Garrard, ConocoPhillips in Alaska
- Arnold Brower, Sr., Citizen
- Arnold Brower, Hearing Officer
- Theresa Imm, Arctic Slope Regional Corporation
- Dorothy Edwardsen, Citizen (80075-477,478)
- Diana Rhodes, Alaska Coalition (80075-479,480,481)
- Robert Suydam, Wildlife Biologist (80075-482)
- Vera Williams, Citizen (80075-483,485,486,487,488)
- James Patkotak, Inupiat Community Arctic Slope (80075-489)
- Russell Schnell, NOAA (80075-490)
- Thomas Nusunginya, Citizen
- George Ahmaogak, Mayor, North Slope Borough (80075-491,492)
- Craig George, North Slope Borough
- Maggie Ahmaogak, Alaska Eskimo Whaling Commission (80075-493)
- Nathaniel Olemaun, Jr., Inupiat Community Arctic Slope (80075-494)
- Charles T. N. Brower, North Slope Borough
- Noah Itta, Citizen
- Jenny Ahkivgak, Citizen
- Theresa Judkins, Alaska Eskimo Whaling Commission
- Charlie Okakok, Citizen (80075-495)
- Tom Brower, Citizen (80075-496,497)
- Percy Nusunginya, Native Village of Barrow, Inupiat Traditional Government (80075-448, 499)
- Edith Edwardsen Vorderstrase, Mayor of Barrow (80075-501)
- Gordon Brower, North Slope Borough (80075-502,503)
- Doreen Lampee, Citizen
- Johnny Brower, Citizen (80075-505)
- Diana Gish, Citizen
- Taqulik Hepa, North Slope Borough (80075-506, 507,508)
- Todd O'Hara, Citizen
- Roland Brower, Citizen (80075-509)
- Dorothy Webermazonna, Citizen (80075-510)

Fairbanks ,Alaska (Document Identification Number 80076)

- Deb Moore, Northern Alaska Environmental Center (80076-897)
- Steve Thompson, Mayor of Fairbanks
- John Whitehead, ConocoPhillips Alaska, Inc.
- Margaret Russell, Seekins Ford Lincoln Mercury
- David van den Berg, Wilderness Guide (80076-898)
- Jim Laiti, Plumbers and Pipefitters, Local 375
- John Miller, Citizen (80076-899,900)
- Don Lowery, Operating Engineers, Local 302
- Dave Klein, Retired Professor (80076-901,902,904,907)
- Charles Parkvan, Laborer's Union
- Pat Kerber, Citizen
- R. L. Odsather, Citizen (80076-905,906)
- Don Ross, Citizen
- Tim Sharp, Laborer's Union Local 942
- Chris Johansen, Citizen
- Kathy Miller, Citizen
- Kara Moriarty, Greater Fairbanks Chamber of Commerce
- John Zuleger, Laborer's Union
- Sam Meadows, Laborer's Local 942
- Laura Henry, Arctic Audubon
- Richard Gaul, Laborer's Union
- Jim Drew, Retired Professor
- Norm Phillips, Doyon Limited
- Frank Kein, Citizen
- Bob Hagberg, Local 942 Laborer's

Nuiqsut ,Alaska (Document Indentification Number 80077)

- Michael Wheatall, ConocoPhillips Alaska, Inc. (80077-924)
- Rosemary Ahtuanagaruak, Citizen (80077-925,926,927)
- Isaac Kaigelak, Citizen (80077-928,930,931,947)
- Bernice Kaigelak, Citizen (80077-933,934,935,936,937,938,939)
- Eli Nakapigak, Citizen (80077-940,942)
- Sarah Kunaknana, Citizen (80077-943,944
- James Tallak, Citizen (80077-945,946

Point Lay , Alaska

- Willard Neakok, Point Lay Vice Mayor

Wainwright, Alaska

- Homer Bodfish, Native tribal member (80079-985)
- Bob Shears, Petroleum Engineer (80079-986)
- Frederick George Ahmaogak, Citizen (80079-987)
- June Childress, Native Village of Wainwright (80079-988)
- Enoch Oktollik, Citizen (80079-989)
- Marjorie Angashuk, Volunteer Firefighter
- George Anaggassag, Citizen

Washington D.C. (Document Identification Number 80081)

- Larry Williams, Citizen
- Pamela A. Miller, Owner, Arctic Connections, Anchorage, Alaska (80081-531,532,535,537)
- Cindy Shogan, Executive Director, Alaska Wilderness League (80081-539,540,541)
- Patricio Silva, Energy Attorney, Practicing in Washington, D.C. (80081-542)
- Marcia Argust, Legislative Representative/Campaign for America's Wilderness (80081-543,544,545)
- Lydia Kay Savalik, Alaska Native, Nuiqsut, Alaska
- Rosemary Ahtuangaruak, Alaska Native, Nuiqsut, Alaska
- Joseph Luijten, Citizen
- Charles Clusen, Alaska Director, National Resources Defense Council (80081-546,547,549)
- Marquerite Carr, Citizen
- Randall Moorman, Legislative Research Associate for Earth Justice (80081-550)
- Tony Cobb, Executive Director, Conserve America
- Jim Steitz, Citizen
- Bradley Kinder, Citizen
- Joanna Winchester, Student, Kenyon College, Gambier, Ohio, CRS Student Coalition
- Andrew Hunt, Student St. Johns College, Annapolis, MD
- Daniel Lavery, Sierra Club of Alaska (80081-551,552)
- Geoff Suttle, Citizen
- Bart Semcer, Citizen
- Justin Tatham, Representing the U.S. Public Interest Research Group (80081-553,554)

C. General Comments and Responses

The comments below were expressed in many ways in many of the comment letters received. Although these comments are not specifically on the content of the Draft IAP/EIS or the Plan under consideration, BLM believes that responding to these concerns on broader issues is appropriate.

Comment: The public did not have adequate opportunity to provide input.

Response: The NEPA process provides specifically for two public input opportunities--scoping and public meetings on the draft IAP/EIS. The 45-day scoping period of the Northwest NPR-A IAP/EIS was formally initiated with publication of the Notice of Intent to Prepare an Integrated Activity Plan/Environmental Impact Statement and Call for Information and Comments in the November 14, 2001, *Federal Register*. Scoping is specifically intended to give stakeholders and the public an opportunity to have input on the issues, alternatives,

and mitigation measures of the IAP/EIS.

The public review and comment period on the draft IAP/EIS provides stakeholders and the public another opportunity to comment on the issues, alternatives, and mitigation measures as well as on the information and analyses in the IAP/EIS. If scoping comments were not understood or were not considered in the draft IAP/EIS, the public comment period is an opportunity to clarify or repeat a concern. The comment period on the draft Northwest NPR-A IAP/EIS was initially 60 days and was then extended an additional two weeks. Comments on the draft document were accepted through a variety of means--mail, fax, e-mail, website, and public meetings. The comments could be as lengthy and detailed as needed to fully convey concerns. Multiple comment letters can be submitted during the comment to provide additional detail as it occurs to the commenter.

In response to public requests for more time to comment on the draft IAP/EIS, the close of the public review and comment period on the draft IAP/EIS was extended from March 18, 2003, to April 2, 2003.

Comment: I hope you will take my comments seriously.

Response: The BLM received almost 100,000 letters, postcards, e-mails, faxes, and web-based comments on the draft IAP/EIS. Every comment submission was reviewed by BLM or MMS staff.

Comments on the content of the IAP/EIS were identified and responded to. A response to a comment may be revision or addition to the text of the IAP/EIS, or a direct answer to the comment, or both. Section VII explains the criteria and process by which we identified, evaluated, and responded to substantive comments.

Opinions regarding oil and gas leasing in the National Petroleum Reserve-Alaska--whether for, against, or ambivalent--are considered by BLM management and decisionmakers in preparing the Record of Decision. Opinions are not analyzed in the IAP/EIS because they don't generate changes in the technical content. They are forwarded for management consideration and are part of the permanent record for this planning process.

Many, many of the comments received are form letters. Comments that appeared in form letters or were expressed multiple times in multiple ways have been addressed in a response to a specific comment or have been summarized and responded to as a general comment.

Comment: Environmental Impact Statements are supposed to contain all possible and probable alternatives to the proposed action. The alternatives put forth in your draft environmental impact statement offer little in the way of balancing oil and gas development with protecting the area's wildlife, wilderness, or its residents' subsistence lifestyle.

Response: Under NEPA, we must "rigorously explore and objectively evaluate all reasonable alternatives" not all "possible and probable alternatives" to the proposed action. A reasonable alternative must meet the proposal objectives. As noted in Section I.A of the IAP/EIS, the proposal's objective "encourages oil and gas leasing in NPR-A while requiring protection of important surface resources and uses. "The IAP/EIS examines an array of alternative packages created by varying the area within NPR-A that could be offered for oil and gas leasing and the conditions that would be applicable to that leasing, including provisions to protect wildlife, wilderness, and subsistence lifestyle. The four alternatives in the draft document (No Action, A, B, and C) and the Preferred Alternative developed for the final document adequately cover the range of reasonable alternatives.

Comment: The recent findings of the scientific community that oil and gas development have had very negative impacts on the arctic terrain, contrary to the industry's assertions, makes critical a careful evaluation of any

further arctic development.

Response: The recent report by the National Research Council, which examined previously published research, while expressing concerns over past and potential effects of oil and gas development, did not conclude that "oil and gas development have had very negative impacts on the arctic terrain. "Indeed, more than decades of experience of the oil and gas industry have yielded technology and other strategies that minimize effects to the terrain. We have used much of the research reviewed by the NRC in our analysis of potential cumulative effects. The IAP/EIS has made the rigorous and objective evaluation of the reasonable alternatives required by NEPA.

Comment: There are no provisions for renewable energy development. We should turn our focus to fuel economy and conservation&then to alternative energy, and finally to further oil exploration and development. Draining the Arctic will just postpone the inevitable a little longer. It's time to get serious about alternative fuels and fuel efficiency. The administration argues that we need more independence from foreign oil. How is this proposal going to lessen our demand for oil? How can this relatively small amount of land provide us with the necessary petroleum to reduce our overseas imports? It would seem clear & that we cannot expect even a dramatic increase in our domestic production to do much to satisfy our [U.S.] consumption, given we consume 25 percent of the world's oil production.

Response: As noted in Section I.A of the IAP/EIS, the objective "encourages oil and gas leasing in NPR-A while requiring protection of important surface resources and uses. "As such, alternative energy programs would not be included in the range of reasonable alternatives.

In any event, the energy needs of the United States will be met by a combination of imports from foreign sources, domestic oil and gas exploration, development and production, conservation, and other energy sources such as wind, solar, geothermal, and nuclear. Each source makes a contribution to satisfying the need and each has ecological, technological, and economic advantages and disadvantages. For example, a recent Department of the Interior report eliminated Alaska from examination of the potential for public lands in the State to be used for wind power generation because the lack of an electricity distribution grid within the state limited the effectiveness of the technology. In the period envisioned by the proposed action, fossil fuels will continue to be the single largest component of the domestic energy stream.

Comment: My question on the issue is what is going to be the economic advantage to the exploitation of this area? What would the citizens of the U.S. get in return for opening the NPR-A to oil and gas leasing?

Response: The economy of the area is discussed in Section III of the IAP/EIS. The IAP/EIS examines an array of alternative packages created by varying the area within NPR-A that could be offered for oil and gas leasing and the conditions that would be applicable to that leasing and the potential effects to the economy under each alternative are discussed in Section IV. The production of oil and gas resources within NPR-A could make a valuable contribution to the domestic production portion of the stream by offsetting declines in production from Prudhoe Bay, using the existing TAPS pipeline and tanker transportation and distribution system.

If a decision is made to open all or part of the Northwest NPR-A to oil and gas leasing, companies will competitively bid for leases. The money received from successful bids, annual rentals on the leased acreages, and royalties on produced oil and gas would be divided between the Federal Government and the State of Alaska. Federal statute provides that 50 percent of the receipts from sales, rentals, and royalties on NPR-A leases are to be paid to the State of Alaska semiannually. The federal law provides that, in allocating these funds, the State give "priority to use by subdivisions of the State most directly or severely impacted by development of oil and gas" in the Reserve.

The 1999 Lease Sale in the Northeast NPR-A resulted in $38.6 million in first year bonus bids and $1.7 million in first year rentals for the Federal Government. The Federal Government estimates future annual rentals due to the Federal Government from the 1999 Northeast NPR-A Lease sale to be $2 million. The 2002 Lease Sale in the Northeast NPR-A resulted in $31.9 million in first-year bonus bids for the Federal Government.

Comment: I oppose opening the Arctic National Wildlife Refuge to oil and gas drilling.

Response: Many comments received on the draft IAP/EIS expressed concern about ANWR--the Arctic National Wildlife Refuge. This IAP/EIS is for the National Petroleum Reserve-Alaska (NRP-A). Although both the NPR-A and ANWR are located on the North Slope of Alaska, they are different--and not adjacent--areas. The area designated as a National Petroleum Reserve is the western part of the Arctic Coastal Plain and the Arctic Foothills Provinces. The ANWR is 100 miles to the east, adjacent to Canada. The NPR-A and ANWR are managed by different federal agencies. Please see Map 1 of the IAP/EIS.

D. Specific Comments and Responses

The specific comments and responses below include both substantive comments and representative comments on more general topics related to the Northwest NPR-A Plan. The representative comments provide the reader with a range of topics and issues that reflect the core of what was expressed in the 97,000+ letters received. The full texts of the substantive and representative comment letters are reproduced in Appendix 15 . Appendix 15 is provided in CD-ROM and website versions of the Final IAP/EIS.

Each letter is identified by a unique number, and each comment from a particular letter is also coded with a unique identification number. Every individual response following a comment is coded with a combination of these unique identification numbers so the reader will know what letter and specific comment from the letter is being responded to.

1. TOPIC : PREFERRED ALTERNATIVE

Comment From: Resource Development Council (Comment Letter No. 267)

RDC strongly opposes the withdrawal of land in the planning area for habitat preservation. Special habitat preservation areas tend to go beyond their intended purpose and unnecessarily inhibit reasonable uses of the land. RDC believes environmental concerns regarding development in sensitive habitat areas should and can be adequately addressed during the permitting process through balanced and reasonable permit stipulations. However, we do not support stipulations that would prohibit surface facilities and other limitations before exploration has taken place. Such measures would be premature and unnecessarily limiting. **(Comment No. 267-1034)**

Response To: Comment 267-1034

The BLM has taken your comments and concerns into considertion in developing the Preferred Alternative. We believe the PA is a well balanced alternative that will facilitate the development of the available oil and gas resources as well as provide protection for the natural wildlife resources found in the Northwest NPR-A.

2. TOPIC : STIPULATIONS - GENERAL

Comment From: City and Native Village of Nuiqsut (Comment Letter No. 80026)

Hazardous Materials Documentation: Additionally, we would like to see a requirement for hazardous materials documentation regarding routing and removal throughout the NPR-A area. **(Comment No. 80026-1015)**

Response To: Comment 80026-1015

Please see responses to comments 249-520, 80075-505, and 80082-542 (Site Clearance and Requirements for Restoration). See also the General Lease Stipulations and Required Operating Procedures for the Preferred Alternative, specifically Required Operating Procedures A-3, A-4, A-5, A-6, A-7, E-4 and Stipulation G-1.

3. TOPIC : WILD AND SCENIC RIVERS

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

We commend BLM for taking an initial look at potential wild, scenic and recreational rivers in the Northwest Planning Area DEIS as directed by the Wild and Scenic Rivers Act of 1968. To implement the intent of the Act BLM must proceed to formally review and address the eligibility and suitability of each of the 22 rivers identified in the DEIS as having "outstanding remarkable values". During the study process full consideration should be given to the "wild" category as well as the 'scenic' category. By only considering 'scenic' designations the DEIS fails to meet the requirements of the Act. **(Comment No. 253-27)**

Response To: Comment 253-27

The Record of Decision for the IAP/EIS will make suitable determinations for all the rivers identified as eligible. The planning team considered the possibility of preliminary classification as "wild" during scoping, but settled on "scenic" after reviewing the information available for each river, including the information presented at public meetings. The initial classification of all identified eligible rivers as "scenic" was based on existing patterns of motorized subsistence use, and the presence of camps and cabins along most of the eligible streams. The team still finds "scenic" as the most appropriate preliminary classification. This would, of course, not preclude Congress from designating one of these streams for management as a wild river area.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Under Alternative C, the DOI/BLM proposes to designate 22 rivers as 'Wild' or 'Scenic' pursuant to the Wild and Scenic Rivers Act. These streams include: Alataktok, Alaktak, Avak, Avalik, Chipp, Inaru, Ivisaruk, Kaolak, Ketik, Kigalik, Kuk, Kungok, Meade, Nakotlek, Ongorakvik, Oumalik, Titaluk, Topagoruk, Tunalik, Usuktuk, and Maybe Creek and the Colville River. EPA would also recommend Ikpikpuk River to be included to this list due to its importance for raptor nesting habitat. EPA strongly supports DOI/BLM's decision to designate these streams as 'Scenic' or 'Wild' as part of any Preferred Alternative that is selected for the NW NPR-A IAP/EIS. The final IAP/EIS should document input from the local communities and any private land owners who were consulted prior to designating these rivers. **(Comment No. 261-91)**

Response To: Comment 261-91

Section III.C.10.c of the IAP/EIS explains why the Ikpikpuk River is not reviewed for eligibility and suitability for Wild and Scenic River designation. Additionally, BLM did document input from the local communities and any private land owners who were consulted prior to designating these rivers. Please see Section III-Response of Entities Affected by River Designation Status - in the Final IAP/EIS.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

To implement the intent of the Act BLM must now proceed to formally review and address the eligibility and suitability of each of the 22 rivers identified in Table III-38 of the DEIS as having "outstanding remarkable values". During the study process full consideration should be given to the "wild" category as well as the 'scenic' category since many river sections are 'free of impoundments and generally inaccessible except by trail, with watersheds and shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America" Title 16 Chapter 1273 (b) (1). The National Petroleum Reserve-Alaska contains some of the most primitive county left in the United States'much of it along its rivers. While these river studies are underway no activities should be permitted that degrade any of the river values for these 22 rivers. The BLM should, as part of its planning process, incorporate management provisions that will protect the outstanding qualities of any segments suitable for designation as a Wild and Scenic River. If BLM stops short of suitability determinations and only conducts eligibility inventories, eligible streams and rivers must likewise be protected. The DEIS must evaluate the adverse impact of roads, pipelines, seismic work and gravel extraction to the future designation of these rivers. **(Comment No. 253-347)**

Response To: Comment 253-347

The Northwest NPR-A IAP/EIS will complete the river study process by making suitability determinations for all the rivers in the Planning Area. During the planning process we will use our existing authority to minimize negative impacts to rivers in the area. The analysis in the draft IAP/EIS does not identify any particular threats to the outstandingly remarkable values of the eligible rivers over the planning timeline. If the record of decision for the IAP/EIS finds any rivers suitable for addition to the National Wild and Scenic Rivers System, then BLM will use our existing authority, to the extent possible to protect that suitability while Congress considers possible designations. Please also see the response to comment 253-27 (Wild and Scenic Rivers).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Due to their importance, key rivers should be protected by a stipulation creating buffer zones extending from each bank in which no permanent oil and gas infrastructure may exist. The size of these No Permanent Improvement zones should be similar to those used in the Northeast NPR-A for rivers of equivalent resource value. In principle, we can agree to limited exceptions for necessary roads or pipelines transecting the river buffer zones so long as these are kept to one per river unless more than one is environmentally preferable. There is no reason not to provide this significant baseline protection to the rivers corridors that we and the wildlife rely upon for our survival and movement. **(Comment No. 254-623)**

Response To: Comment 254-623

The suggestions in this comment are largely adopted in the Preferred Alternative through Stipulation K-1. The stipulation establishes areas along certain named rivers where there will be no permanent oil and gas facilities. Of

the 19 rivers listed in Kuukpik's comment, 12 are named in Stipulation K-1. The remaining seven rivers are in the Preferred Alternative Deferral Area.

Comment From: The Sierra Club (Comment Letter No. 80014)

In addition, BLMs investigation of potential wild, scenic and recreational river designations within the planning area must proceed to formally review each of the 22 rivers identified as having "outstanding remarkable values" and give full consideration to the "wild" category of designation. **(Comment No. 80014-863)**

Response To: Comment 80014-863

Please see the responses to comments 253-27 and 253-347 (both in Wild and Scenic Rivers).

Comment From: Walter Gove (Comment Letter No. 245)

I strongly recommend that you maximize the degree to which the Ikpikpuk River is untouched by exploration. There appears to be no reference to this river in the EIS, which is hard to understand, given the importance of this river. **(Comment No. 245-865)**

Response To: Comment 245-865

The Ipikpuk River is discussed in Section III.C.10.c of the IAP/EIS.

4. TOPIC : MANAGEMENT

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Moreover, the energy policy directs the Secretary of the Interior to 'consider environmentally responsible oil and gas development based on sound science and the best available technology' (DEIS p. I-2). If BLM intends to fulfill this mandate, then a revised DEIS is necessary to incorporate the new science from both Audubon Alaska and the National Research Council before an adequate NEPA analysis can proceed. Further, the stipulations in this DEIS fail to require the industry to use the proclaimed best available technology and therefore are also inadequate to fulfill this mandate. **(Comment No. 253-38)**

Response To: Comment 253-38

We have considered the reports from the Audubon Society and the National Research Council in development of the Preferred Alternative presented in this document. Several ROP's have been developed since the draft IAP/EIS was published to ensure appropriate levels of research prior to construction of possible development-related sites. Some of the original Stipulations and ROP's have also been rewritten to make more clear BLM's goals of protecting wildlife species and their habitats and the standards to achieve these goals. The cumulative effects analysis has been revised with consideration of the NRC report

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

In addition to failing to include all reasonable choices available to meet BLM's stated goal of multiple-use management, the four alternatives also fail to meet the substantive standards established by the NPRPA and FLPMA. If, in fact, it does authorize this leasing program, the NPRPA also requires that any 'activities . . . shall include or provide for such conditions, restrictions, and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface Resources.' 42 U.S.C § 6508(1). Moreover, exploration in special areas must be conducted 'in a manner which will assure the maximum protection of [the] surface values.' Id. § 6504(b). The alternatives and stipulations provided in the DEIS do not meet those standards. **(Comment No. 253-66)**

Response To: Comment 253-66

We believe that the draft alternatives do meet the substantive standards established by the NPRPA and FLPMA, and that the activities proposed in each alternative also include appropriate measures to protect surface resources that are present. Each alternative described in chapter II of the draft and in the Preferred Alternative in this document includes a set of Stipulations and Required Operating Procedures in the form of setbacks, seasonal and other restrictions, and other measures to accomplish this. The Preferred Alternative in this document includes a setback of one mile from the Colville River in the Colville River Special Area to provide additional protection for raptors. While there are no special measures applicable solely to the Teshekpuk Lake Special Area, the Preferred Alternative protects caribou, brant, subsistence uses and other resources within this area by including stipulations and ROP's that apply to these resources both within the Special Area and in areas adjacent to the Special Area. These measures are more effective than if they stopped at the boundary of the Special Area.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Similarly, under FLPMA, BLM is obligated to manage the NPR-A 'under principles of multiple use and sustained yield' 43 U.S.C. § 1732; see also id. §1701(7), (8). Management for multiple use means that the agency is required to manage 'public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people' and to achieve 'harmonious and coordinated management,' considering 'the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.' 43 U.S.C. § 1702(c). Further, BLM must emphasize the long-term management potential of public lands to satisfy the needs of both current and future generations, see id. § 1703(h), and must 'take any action necessary to prevent unnecessary or undue degradation of the lands,' id. § 1732(b). The alternatives and stipulations considered do not meet those standards because they provide inadequate protection for surface resources and do not establish a coherent management scheme for the Planning Area. **(Comment No. 253-67)**

Response To: Comment 253-67

The alternatives and accompanying protective measures contained in the draft and the Preferred Alternative herein do meet the standards of FLPMA and do consist of appropriate actions to prevent unnecessary or undue degradation of public lands. In developing all alternatives BLM has taken its responsibility for long-term management and the principles of multiple-use and sustained yield seriously. This commitment is reflected in the substantive requirements of the protective stipulations and required operating procedures that accompany each alternative.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

NEPA and its implementing regulations require that an EIS be a 'detailed' statement. 'See 42 U.S.C. 4332'. 'What is required is information sufficient to permit a reasoned choice of alternatives so far as environmental aspects are concerned.' Natural Resources Defense Council v. Morton, 458 F.2d 827, 836 (D.C. Cir. 1972). Settled case law holds that 'detailed' means 'site-specific.' 'Site-specific analysis is essential to meaningful environmental analysis.' State of California v. Bergland, 483 F. Supp 465, 483 (E.D. Ca. 1980), aff'd and rev'd in part sub nom. State of California v. Block, 690 F.2d 753 (9th Cir. 1982). An EIS cannot be the basis for federal action if it fails to consider the individualized, 'on the ground' effects on local environments. . . .[and] does not provide the detailed analysis of local geographic conditions necessary for the decision-maker to determine what course of action is appropriate under the circumstances. Natural Resources Defense Council v. Morton, 388 F. Supp. 829, 833, 838-9 (D.D.C. 1974) (emphasis added), aff'd without opinion 527 F.2d 1386 (D.C. Cir.), cert. denied 427 U.S. 913 (1976); see also Natural Resources Defense Council v Hodel, 819 F.2d 927, 928 (9th Cir. 1987) (Morton is 'the leading case in this area' holding that NEPA requires 'assessment of the environmental effects . . . in specific areas.'); 40 C.F.R. § 1502.14 (EIS must 'sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decisionmaker and the public.'). The DEIS for the Northwest Planning Area is not site-specific. Indeed, BLM cannot reasonably claim that in just a few hundred pages, it could adequately analyze on a sitespecific basis the impacts that might occur from oil and gas leasing on 8.8 million acres of the Reserve. A generic discussion of resources and potential impacts like that contained in the DEIS simply cannot suffice as the required site-specific analysis. Under different circumstances the broad-scale approach that BLM has taken in the DEIS might possibly be acceptable in a programmatic EIS, if the programmatic EIS does not purport to become the basis for authorization of discrete activities, such as oil and gas leasing, in particular areas of the Reserve. This DEIS, however, does not claim to be a programmatic EIS, but forms the basis for a leasing program. Based on this NEPA process, BLM will issue leases that authorize oil and gas exploration and development. Accordingly, the choice among alternatives will have direct, on-the-ground impacts that must be considered on a site-specific basis. The DEIS will establish the lease stipulations and ROPs that are intended to protect surface resources when exploration and development occur. Decisions such as these will impact the environmental resources directly and, therefore, must be considered on a site-specific basis. Accordingly, if BLM intends that it be the basis for authorizing oil and gas leasing in particular areas of the Reserve, it must be scaled so that it is site-specific. An adequate site-specific analysis cannot take place until BLM provides a detailed and reasonable projection of potential development. As discussed in the next section, the DEIS fails to describe realistic development scenarios that can form a basis for an adequate site-specific analysis. In the later sections on specific resources, areas where site-specific impacts need to be analyzed further are identified. Until this analysis is done, the IAP/EIS may serve as programmatic planning document, but cannot be used as a basis for entering into oil and gas leases. **(Comment No. 253-69)**

Response To: Comment 253-69

The IAP/EIS complies with NEPA's requirements regarding site-specificity. As required by NEPA, the IAP/EIS summarizes and synthesizes site-specific information regarding the environment of the Planning Area, including its physical, biological, cultural, and socio-economic resources. Scientific information is presented concerning the differing soil types and their locations, vegetation, groundwater and surface water resources, air quality, fish, bird, and mammal species that inhabit the Planning Area and where they are found in concentrations, marine mammals, and threatened and endangered species. Human settlements, socio-economic systems, uses of the land, transportation corridors and the importance of subsistence in the region are also described and mapped. The IAP/EIS summarizes the known information on historic, paleontological and cultural resources of the Planning Area, and identifies the varied scenic, recreational, wild and scenic river, and wilderness resources. Additional information that has been received as a result of the public comments on the draft IAP/EIS has been incorporated in the final IAP/EIS, where appropriate. The IAP/EIS and accompanying maps provide a clear picture of the locations in the Planning Area where different resources and species are concentrated at different times during the year and when they are in particularly sensitive life stages. For example, the IAP/EIS provides detailed discussion of the areas important for caribou calving, insect relief, and wintering areas; polar bear denning sites; prime molting, nesting, and brood-rearing areas for birds; marine mammal haul outs; and so on. This information, gathered in Section III of the IAP/EIS and the accompanying appendices, summarizes the existing scientific surveys and studies which have been conducted on each species or resource and provides adequate site-specific information to form the basis for the detailed analysis of direct, indirect, and cumulative environmental impacts in Section IV of the IAP/EIS. Section IV refers to and utilizes the resource information from Section III to predict various levels of impacts from projected activities in different locations in the Planning Area under each

alternative. This information will inform BLM in its decision making regarding where in the Planning Area to allow oil and gas leasing and other management activities, and under what conditions. In addition to the information gathered in this IAP/EIS, NEPA reviews will occur at each subsequent stage of any oil and gas activities proposed to be authorized by BLM following leasing. These subsequent environmental reviews will be conducted before approval of any on-the-ground oil and gas exploration or development plans, and they will be tiered to this IAP/EIS. Any new information regarding resources or impacts anticipated from particular development proposals will be gathered and presented in a new NEPA document at each permitting stage, thus ensuring that BLM's decisions continue to be well informed as activities proceed. This document uses the same kind of scenarios that were used in the Northeast NPR-A EIS/IAP and that are commonly used in planning documents in many places by various agencies. These scenarios are developed by combining what is known about the oil and gas potential of the area and current industry technology. Environmental analysts then use the scenarios to estimate the effects of development on natural and cultural resources in the planning area, which is a common practice in planning documents.

Comment From: State of Alaska (Comment Letter No. 251)

The State of Alaska recommends that the area be available for oil and gas leasing but only under the condition that no permanent surface facilities be allowed in the Lagoon and surrounding onshore areas. The State recommends that the specific boundaries of this "no surface occupancy" area be defined more specifically by the Bureau of Land Management (BLM) in consultation with appropriate federal, state and local regulatory and resource agencies and incorporated in the Final IAP/EIS. **(Comment No. 251-135)**

Response To: Comment 251-135

Under the Preferred Alternative, oil and gas leasing will be deferred for 10 years in the Kasegaluk Lagoon to Peard Bay area. Prior to the lease offerings, appropriate protections, including a No-Surface-Occupancy stipulation, will be imposed. Additionally, the Preferred Alternative recommends that the Kasegaluk Lagoon and adjacent lands be designated a special area.

Comment From: State of Alaska (Comment Letter No. 251)

The BLM proposal to include ROPs as conditions of applicable individual permits presents two problems: 1) except where specific protection is mandated by state or federal law, few protective measures for critical industry operations (e.g., waste and hazardous material handling, transportation, facility design) are committed at this time under the IAP/EIS process; and 2) the public and state authorities will have very diminished weight in review and decisions (if any review is planned) on individual permits issued by BLM. **(Comment No. 251-136)**

Response To: Comment 251-136

Required Operating Procedures (ROP's) incorporated in the Preferred Alternative and adopted as such by the Record of Decision would be a commitment by BLM to require an applicant to meet the identified standards and requirements. That these requirements will not be attached to a lease as stipulations does not minimize their importance. The ROP's must be incorporated as a design feature or management practice as a part of any proposal submitted to BLM to operate on public lands within the Planning Area. As part of the proposal, an ROP need not be stipulated. While the list of ROP's is in fact fairly comprehensive it is understood that it is not and can not be all inclusive. The BLM will continue to develop additional project-specific mitigation through the application and NEPA process, which allows for state and public review.

Comment From: State of Alaska (Comment Letter No. 251)

Development project planning and design often reaches the point where major changes are not possible or economically feasible when presented to agencies at the permitting stage. If the additional stipulations (or many of them) are included as conditions of the lease, industry will have most of the requirements that their development plan must address at the time the leases are presented for sale. This will provide industry with a greater degree of certainty in preparing for development, ensure a greater degree of protection for resources, and provide for more efficient use of corporate and agency time and resources. Unless the requirement is a restatement of federal or state law or there is some other clear justification, we recommend that a number of required operating procedures be converted to stipulations and added to the lease (see Technical Comments). **(Comment No. 251-137)**

Response To: Comment 251-137

Required Operating Procedures (ROP's) adopted by BLM will be identified in the Record of Decision. With that decision, ROP's become requirements that industry will have to address in their development plans and permit proposals.

5. TOPIC : PURPOSE OF NPR-A

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

BLM states the purpose of the DEIS very broadly -- 'to determine the appropriate multiple-use management' of the Northwest -- and calls the document an 'Integrated Activity Plan/Environmental Impact Statement.' (DEIS pp. I-1-2.) This purpose is much broader than simply determining the appropriate parameters of an oil and gas leasing program. Instead that statement of purpose indicates that BLM intends to use the DEIS to develop a comprehensive management plan for the Planning Area. Consistent with this broad purpose, BLM states that it will determine not only whether lands that should be offered for oil and gas leasing and the measures that should be implemented to protect surface resources if leasing occurs, but also 'what non-oil and gas land allocations should be considered for this portion of the NPR-A.' (Id. p. I-2.) The analysis conducted in the DEIS, however, is not consistent with this broadly stated purpose. Rather, BLM has placed an unduly heavy emphasis on oil and gas development in its proposed management of the Northwest Planning Area. That emphasis is evident in the alternatives selected by the agency and in the cursory manner in which impacts of oil and gas leasing are evaluated. Contrary to BLM's stated goal, emphasizing oil and gas development will preclude effective management of the area and sacrifice surface resources. Such an emphasis on oil and gas leasing is not warranted at this time, and BLM has not demonstrated a need for an aggressive leasing program. The DEIS cites the President's energy policy, the Naval Petroleum Reserves Production Act (NPRPA), 42 U.S.C. § 6501, et seq., the Federal Land Policy and Management Act (FLPMA), 43 U.S.C. § 1701, et seq., as the primary sources of authority for leasing and as demonstrations of need for the DEIS. None of those statutes or proposals, however, provide adequate justification for the emphasis on extensive exploration and development contemplated by the BLM at this time. BLM has not identified a need for such drastic action taken before sufficient scientific information is available to predict more accurately the impact exploration and development may have on the Reserve environment. Instead, the DEIS should take a more balanced approach to multiple-use management of the Reserve. **(Comment No. 253-35)**

Response To: Comment 253-35

This document address the issues of wilderness, wild and scenic rivers, special areas, visual resource management, and travel management besides making decisions about where oil and gas leasing will be allowed and what Stipulations and ROP's will be used to protect surface resources. The reasons for considering a leasing

program at this time are adequately presented in Chapter 1. Please see our response to 253-40 ((Legal).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

BLM states that it is undertaking the National Environmental Policy Act (NEPA) process 'to fulfill the mandates of the President's energy policy.' (DEIS p. I-2.) In determining the purposes and goals of this action, however, BLM is required to heed the views of Congress. See Citizens against Burlington, Inc, v. Busey, 938 F.2d 190, 196 (D.C. Cir. 1991); City of New York v. Department of Transp., 715 F.2d 732, 743-45 (2d Cir. 1983). Congress has not ratified the President's energy policy, and it may not do so. Moreover, BLM should not base decisions on a policy that was determined during closed door meetings with oil industry officials and no public process pursuant to NEPA. Accordingly, the energy policy does not provide a legitimate basis for a decision to lease or demonstrate a need for such action at this time. Nor should it skew the agency's decision making away from multiple-use management and toward oil and gas leasing. **(Comment No. 253-36)**

Response To: Comment 253-36

Congress authorized developing this Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) in the 2003 budget. Congress is aware of the fact that the BLM traditionally identifies lands available for oil and gas leasing in its land use plans and is also aware that the Northeast NPR-A IAP/EIS authorized leasing. Had Congress objected to oil and gas leasing, it would not have authorized the expenditure of funds for a process that might lead to such an action.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS, however, never makes clear which provisions of FLPMA are applied or how that statute establishes a need to manage the Reserve. **(Comment No. 253-45)**

Response To: Comment 253-45

Section 102 of FLPMA requires that BLM manage all of its lands from a multiple-use perspective. Oil and gas leasing is a legitimate use of BLM-managed lands and a specific use designated for the National Petroleum Reserve-Alaska. The IAP/EIS would be inadequate if it failed to identify areas to be made available for leasing and to establish the rules for that leasing.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The counterpart provision to multiple use is sustained yield (43 U.S.C. § 1702(h)). It requires BLM to emphasize the long-term management potential of our public lands to satisfy the needs of both current and future generations. Needs are satisfied only to the extent that they do not permanently impair the productivity of the land or quality of the environment. **(Comment No. 253-46)**

Response To: Comment 253-46

The IAP/EIS contains assessments of the effects of oil and gas activities on various natural and cultural resources. The conclusions of these assessments are summarized in Appendix 2. There is nothing in any of the summaries that indicates there will be any more than minimal short-term or long-term effects on most resources. The

exception is that development in the caribou insect-relief areas near Dease Inlet could have more serious impacts, but BLM has developed Stipulations and ROP's to minimize the likelihood of the occurrence of these effects.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

Let me add to my testimony with this, I believe, without a doubt, that the Secretary of the Interior breached duty of protection by issuing permits for land held in aboriginal position by Inupiats of the North Slope. The NPR-A was withdrawn without the notification and consultation of our tribal government that owned the land. I will also add by quoting a few cases from the U.S. Courts. A. The Johnson v. McIntosh case of 1823, the rules of discovery, gives title to discoverer and therefore, the Inupiat were living and using this land now known as NPR-A before the United States and Navy were ever here. B. The Cherokee Nation v. Georgia case of 1831. It was proved that Indian Nations are not foreign nations but are considered domestic dependent nations. Domestic within borders of the U.S. dependent on U.S. for protection from states. The U.S. government was to protect us from the states and not give what we own to the state government using ANCSA. We are considered nations with inherent sovereignty existing before U.S. Constitution. I would also like to add that the U.S. Constitution grants power to Congress to regulate commerce with Indian tribes, and two, laws made under the Constitution are the supreme law of the land. Federal power over Indian affairs. Plenary, plenary power is complete not absolute. It can preempt state power but can't violate the U.S. Constitution. I believe that our aboriginal title is protected by treaties with the United States but the absence of any treaty does not diminish the Federal duty to protect against trespass. And because of this, ANCSA did not abolish the preexisting tribal governments. We know that Section .810 of ANILCA requires the Federal government to assess the effect of any Federal activity in Alaska on Native subsistence and the passage of ANILCA did not compel suggestion that Congress intended to exercise commerce clause powers over all submerged lands and navigable Alaska waters. **(Comment No. 80075-478)**

Response To: Comment 80075-478

The BLM has met all of its government-to-government consultation obligations by meeting with the tribal organizations of the North Slope. Documentation of these meetings can be requested from the Northern Field Office in Fairbanks. The subsistence analysis required by section 810 of ANILCA is located in Appendix 5. Please see comment response 253-328 (ANILCA).

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

Like many of you we were disappointed about the Mineral Management Service's decision to open the Beaufort Sea and, like the Beaufort Sea, it is the Bush's administration stated intent and order to BLM to heavily develop the NPR-A. **(Comment No. 80075-479)**

Response To: Comment 80075-479

In accordance with the President's energy policy, BLM is considering making additional lands within the National Petroleum Reserve-Alaska available for oil and gas leasing.

Comment From: Gregory Chase (Comment Letter No. 80044)

I don't believe the reserve should be undrillable. It makes sense to use it in a time of great national need (if that ever occurs) but not before. Assuming this point is agreed, then why develop the land and ready it for drilling so far in advance of said time' Sure, establish the public precedent that the land is drillable. That will keep our heads

clear and enhance our negotiating position internationally. Actually doing anything physically, though, would only increase the temptation to declare a "time of need" at a premature date and do harm to the wilderness. **(Comment No. 80044-769)**

Response To: Comment 80044-769

Please see the response to comment 253-20 (Birds).

Comment From: Kellie Ward (Comment Letter No. 80023)

The proposal mentions a governmental projection that by 2020 two-thirds of the countrys oil will be imported from other countries given the amount of available oil. Drilling for oil and gas in the National Petroleum Reserve will provide a very temporary solution. Petroleum (as well as natural gas) is a non-renewable resource, which is becoming more and more scarce. I would encourage you to utilize this money and energy into researching more renewable alternatives to petroleum, which might provide a better solution to oil dependency and take our country in the direction of sustainability. **(Comment No. 80023-837)**

Response To: Comment 80023-837

The BLM is a land management agency with the authority to lease appropriate public lands for oil and gas leasing. We do not fund research into alternative sources of energy or energy conservation. Other agencies are responsible for energy research.

Comment From: Alaska Miners Association, Inc. (Comment Letter No. 268)

The NWPA should also be opened to mineral entry under the general mining laws and leasing laws. This area is known to contain vast coal deposits and is also prospective for discovery of metal deposits. The plan should be changed to recommend opening of the area to leasing of coal and leasable minerals under the applicable laws. Our nation needs these metal and energy resources and the current closure should be removed so exploration for metal and coal deposits can begin. **(Comment No. 268-843)**

Response To: Comment 268-843

Opening the National Petroleum Reserve- Alaska to mining operations was an alterative that was considered and subsequently eliminated from further analysis in this IAP/EIS. A brief discussion of the history and decision regarding this issue is provided in Section II.G.4.

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

To my further comments include the Draft Executive Summary which indicates the alternative presented in the Integrated Plan EIS are consistent with the purposes of the NPR-A governing statues. And I'd like to get that governing statute, which statutes are we looking at' Okay. Offering a different balance between serving the total, what the President has said the total energy needs for the nation. The goal of the NPR-A, this is coming from the (In Inupiaq) and protecting surface resources from unnecessary and undue degradation as required by the Federal Land Policy and Management Act. **(Comment No. 80074-888)**

Response To: Comment 80074-888

The primary laws that direct BLM management of NPR-A are discussed in Section 1 of this document.

Comment From: Isaac Conlen (Comment Letter No. 80090)

I expect that this public land will be leased to development companies at market rates. I do not believe it is in the public interest to subsidize the exploration and development of publicly owned property as has occured in the past. **(Comment No. 80090-1040)**

Response To: Comment 80090-1040

If the decision documented by the Record of Decision at the end of this NEPA process is to make areas within the Northwest NPR-A Planning Area available for oil and gas leasing, then tracts will be delineated and offered for competitive bidding. Monies derived from Federal oil and gas leasing come from bonus bids at the time of leasing, rentals for the term of the lease, and royalties paid on oil and gas produced from the lease. The high bids received at a lease sale are evaluated by a team of geologists, geophysicists, and minerals economists to ensure the public receives fair market value based on the agency's estimate of resources that may occur under the lease. The Federal Government does not subsidize oil and gas exploration and development. A "subsidy" is monetary assistance granted by a government to a person or private commercial enterprise. The Federal Government has offered incentives to balance high operational costs or high risk in certain areas. Royalty relief (lowering or temporarily suspending royalty rates on production) is an example of an incentive that has been applied to certain oil and gas operations both onshore and on the outer continental shelf. Without appropriate incentives in some areas, some leases might never be explored or developed, or some production operations might become uneconomic, triggering plugging and abandonment without maximizing the extraction of the oil and gas resources. No incentives are proposed in this IAP/EIS.

Comment From: Jodi Peterson (Comment Letter No. 80005)

Since 1923, NPRA has been stipulated for development only in times of pressing national need. By any definition, that time is now. America could save 20 billion barrels of oil (ten times as much as the reserve is estimated to contain in economically recoverable oil) just by making a modest improvement in fuel-economy standards. **(Comment No. 80005-969)**

Response To: Comment 80005-969

See the responses to 253-20 (Birds).

6. TOPIC : PLANNING

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS fails to balance short and long-term costs and benefits. BLM must consider potential uses of the public lands and disclose how resource uses result in losses of lands for wilderness, wildlife habitat, and watershed

protection. **(Comment No. 253-47)**

Response To: Comment 253-47

The assessments include short- and long-term effects on wilderness, wildlife habitat and watershed protection. The IAP/EIS discusses the relationship between the local short-term uses and maintenance and enhancement of long-term productivity (Section IV.H) as required by NEPA.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The stated purpose of the DEIS is broad -- 'to determine the appropriate multiple-use management' of the Northwest Planning Area. The alternatives analyzed by BLM, however, do not fulfill such a broad mandate. Indeed, none of the alternatives in any way reflect comprehensive 'management.' Rather, each of the alternatives in which leasing is permitted simply identifies the areas that will be leased, the protections that may be put in place to minimize the harm caused by drilling, and potential designations for protected areas. Such provisions are insufficient to constitute 'multiple-use management.' Those activities might constitute facets of comprehensive management, but they are insufficient standing alone to represent a management scheme for the Planning Area. Further, the 'no-action alternative' requires absolutely no management. Instead, it requires that the agency take absolutely no action in the area except permitting seismic exploration. Accordingly, because none of the choices presented will allow it to achieve 'multiple- use management' of the Northwest NPR-A, BLM has failed to consider all reasonable or feasible alternatives. **(Comment No. 253-59)**

Response To: Comment 253-59

The BLM believes that each of the alternatives presented in the draft and the Preferred Alternative presented in Section 5 of this document do meet our mandate of providing management plans. The reader is invited to review the contents of table II-01 in this document for a summary of the management decisions that are being made in each of the alternatives. Note that we are making decisions on potential Wilderness Study Areas, Special Areas, Wild and Scenic Rivers, VRM designations, travel management, subsistence and authorized uses and lands available for oil and gas leasing. The BLM has also developed Required Operating Procedures that apply to all activities that may occur within the planning area; not just oil and gas. We think this breadth of coverage is reasonable in a multiple use management plan. There is no requirement that we consider "all feasible alternatives". Rather, we must consider a reasonable range of alternatives. We believe that the range of alternatives presented does this. Again, please see table II-02 for a summary of the alternatives that documents this conclusion.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

BLM has failed to provide for any area-wide planning despite stating that such management is its primary goal. The need for such comprehensive management has been highlighted by the recent study performed by the National Research Council. The NRC Report specifically calls for 'two kinds of comprehensive planning' in the North Arctic. It states the need for 'a comprehensive slope-wide land-use plan to guide industrial development and assist in planning for the eventual departure of industry from the region' and 'a coordinated and comprehensive research plan.' (NRC Report at 242.) BLM has the opportunity to begin this sort of comprehensive management in this EIS. Unfortunately, the agency instead has constructed alternatives that allow only for leasing and some protection from development, rather than management. **(Comment No. 253-61)**

Response To: Comment 253-61

The BLM can only plan for public lands under BLM management. Please see the response to comment 261-87 (Planning) for a discussion of what BLM is doing to achieve consistency between the plans for the NPR-A Planning Areas. Please see Section II.F.8 in the Final IAP/EIS for a description of how BLM and others will be addressing slope-wide research issues.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

While EPA recognizes the benefit of working with subunits for planning purposes, EPA recommends that there be consistency among all of the three Integrated Activity Plans to ensure the protection of valuable subsistence, environmental, fish and wildlife, historic and scenic values of the Reserve, as required by NPRPA as well as aiding lessees to comply with uniform standards where appropriate. To reach that goal, we recommend that DOI/BLM develop guidelines and criteria for the entire NPR-A which would be carried forward in all three planning areas. These guidelines and criteria would provide overarching direction for the NPR-A in (1) developing stipulations and operating procedures, management measures and practices, (2) establishing appropriately protective buffer areas, (3) prohibiting certain development activities in environmentally sensitive areas, (4) monitoring the effectiveness of stipulations through a Research and Monitoring Team, (5) conducting necessary research and studies, and (6) protecting important subsistence and cultural resources through a Subsistence Advisory Panel. The final IAP/EIS and Record of Decision should reflect the development and implementation of such guidelines. **(Comment No. 261-87)**

Response To: Comment 261-87

The BLM is working to ensure consistency of planning across NPR-A and will begin developing an amendment to the Northeast IAP/EIS during Fall 2003. One of the goals of that amendment will be to address and maintain consistency issues between the Northeast and Northwest NPR-A Planning Areas. The BLM intends to initiate a plan for the southern part of NPR-A in 2004 and will make that plan as consistent as possible with the previous plans. Over time, using the amendment process, we expect to continue to address issues of consistency as they arise.

Comment From: Audubon Alaska (Comment Letter No. 213)

A major concern within NPRA deals with incremental piece-meal development, which at some threshold level may have very significant impacts on fish, wildlife, recreational, and subsistence resources. Currently, there is no field-tested data to demonstrate that NPRA will not evolve into a far greater infrastructure of interconnected roads, pipelines, and drill pads which could have significant impacts on NPRA's wildlife, subsistence, and wilderness resources. **(Comment No. 213-356)**

Response To: Comment 213-356

See chapter IV, section F for an assessment of the cumulative effects of this proposal. The conclusions that are contained there and elsewhere in the chapter and those in the Northeast IAP/EIS are supported by the best currently available scientific information and do little to support your concerns. If, in the future, our assessments are incorrect, we can take management actions to address problems as they arise.

Comment From: Western Arctic Caribou Herd Working Group (Comment Letter No. 80004)

The Working Group has similar concerns about expansion of oil and gas infrastructure to the west where it

overlaps the WAH summer range. A major concern within NPR-A is incremental piecemeal development, which at some level may have significant impacts on caribou. There are no field-tested data to demonstrate that NPR-A will not evolve into a far greater infrastructure of interconnected roads, pipelines, and drill pads that could have significant impacts on NPR-A's caribou herds, both the WAH and TLH. **(Comment No. 80004-529)**

Response To: Comment 80004-529

Please see response to comment 261-87 (Planning) for a discussion of how we are trying to ensure the consistency of our plans within NPR-A.

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

The BLM has not spent sufficient time or devoted sufficient resources to studying the values of the NPRA as well as the potential effects of drilling, nor has it allowed the public sufficient time to study the environmental impact statement. **(Comment No. 80082-540)**

Response To: Comment 80082-540

The BLM agrees that there is always more to be learned about the natural resources of the National Petroleum Reserve-Alaska and the North Slope. We also believe there is adequate data, collected over at least several decades, to make responsible management decisions. It is important to recognize that prior to the authorization of any potentially ground-disturbing activity, BLM reviews the proposal and conducts additional site-specific analysis. From this review and analysis, additional mitigation would be developed if needed. The availability of the Draft IAP/EIS was announced by BLM on January 15, 2003. The EPA's Notice of Availability was published in the Federal Register on January 17, 2003. In response to public requests, the close of the public review and comment period was extended from March 18, 2003, to April 2, 2003. This 75-day period is longer than the 45-day minimum required by NEPA regulation and should be sufficient for interested parties to review and comment on the draft EIS.

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

It is the legal obligation of BLM to ensure that this planning process is as comprehensive and as inclusive as possible. **(Comment No. 80082-545)**

Response To: Comment 80082-545

We have taken your comments into consideration in developing the Preferred Alternative. Also please see comment response 261-87 (Planning).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

How leasing and development occurs in Northwest NPR-A is critical to Kuukpik, to KSOP, to us as individuals and to the Kuukpikmiut. We and our shareholders and members and our families use the eastern portions of the Northwest NPR-A Planning Area for subsistence. In addition, negative impacts on caribou near Wainwright or Point Lay impact us when those caribou, one of our chief food sources, migrate or should migrate into our traditional subsistence range. As Nuiqsut's population grows, the amount of subsistence resources needed by the

community increases. Similarly, to the extent that we have been, are being and will be squeezed out of portions of our traditional subsistence range by oil and gas development (first around Prudhoe Bay, then around Kuparuk, now around Alpine and fairly soon around the various Alpine satellites), our growing demand subsistence resources and the shrinking supply of such resources in our traditional range will force us to range further west into the Northwest NPR-A Planning Area than we have historically done. The state of the land and subsistence resources in the Northwest NPR-A is thus of critical importance to us. **(Comment No. 254-605)**

Response To: Comment 254-605

This information was considered in developing the Preferred Alternative.

Comment From: Tom Cade (Comment Letter No. 171)

If Interior considered as necessary the impressive amount of environmental analysis and planning that was carried out for the Northeast Planning Area, why not for the Northwest Area' Indeed, why has it not been done for the entire Petroleum Reserve, as many of us have urged for years' **(Comment No. 171-839)**

Response To: Comment 171-839

Please see the comment response to 261-87 (Planning) for a discussion of how we are trying to ensure the consistency of our plans within NPR-A.

Comment From: Tom Cade (Comment Letter No. 171)

I continue to be astounded by the fact that the Nation still has no comprehensive, overarching management strategy for the Petroleum Reserve and adjacent BLM-administered lands. The current DIA/EIS continues the shortsighted, piecemeal approach to management of the Reserve that started with the planning process for the Northeast Area of NPR-A. BLM and Interior need to start thinking holistically about the Reserve and to face up to the statutory responsibilities that make you the stewards for the people of all the resources of NPR-A'not just of the oil and mineral resources, which are of limited value and nonrenewable, but also of all the surface values and renewable resources, which have infinite value if properly cared for. **(Comment No. 171-840)**

Response To: Comment 171-840

Please see the comment response to 261-87 (Planning) for a discussion of how we are trying to ensure the consistency of our plans within NPR-A.

Comment From: Michael North (Comment Letter No. 80003)

Second, I would hope that the decision to expand oilfield production is not made in a political vaccuum, with the National Environmental Policy Act process just a hurdle to justify decisions already made. **(Comment No. 80003-847)**

Response To: Comment 80003-847

The National Environmental Policy Act requires that agencies involve the public in their decision-making processes so that decisions can't be made without consultation with the affected publics. The BLM has used the required scoping process and the public's opportunity to make comments on the draft to ensure that we get a broad array of comments from all of our affected publics. We have received valuable input from several federal agencies, the State of Alaska, the North Slope Borough, the communities of the North Slope, industry, environmental organizations and the general public.

Comment From: Michael North (Comment Letter No. 80003)

If the Arctic National Wildlife Refuge is opened up for development, does production in the National Petroleum Reserve - Alaska also need to be increased (to each of the possible scenarios)' And, 2) If production in the National Petroleum Reserve - Alaska is increased, does the Arctic National Wildlife Refuge need to be opened up for development. From a national energy perspective, these two areas of potential oil production cannot be considered separately. **(Comment No. 80003-849)**

Response To: Comment 80003-849

We can only plan for public lands that we control. See the responses to 213-202 (Special Designation Areas) and 213-217 (Special Designation Areas) for a discussion of what we are doing to achieve consistency between our plans.

Comment From: Public Meeting on DEIS - Fairbanks, Alaska (Comment Letter No. 80076)

And my criticism tonight is that the public is not being given the choice or the information needed to make this choice wisely. **(Comment No. 80076-899)**

Response To: Comment 80076-899

There is no requirement that the public make the choice of what to do with NPR-A. Please see the response to comment 80003-847 (Planning) for a description of how BLM seeks information about public concerns during the planning process. These concerns are considered when BLM develops the Preferred Alternative for how the area will be managed.

Comment From: Public Meeting on DEIS - Fairbanks, Alaska (Comment Letter No. 80076)

Also in the interest of full and meaningful participation by the American public, I encourage BLM to hold meetings around the nation and to take the time and expense to encourage input. **(Comment No. 80076-900)**

Response To: Comment 80076-900

The BLM held meetings seeking public comments in all affected North Slope villages, Anchorage, Fairbanks, and Washington DC.

Comment From: Public Meeting on DEIS - Fairbanks, Alaska (Comment Letter No. 80076)

It's not clear to me how surface values were assessed. I mean, when you're talking about wildlife values and wildlife habitats, that's one thing. But I don't think there was adequate -- adequately addressed the uses of the area primarily fish and wildlife related, and that includes subsistence use, primarily hunting from a wildlife standpoint but also commercial use such as guided hunting, trapping and eco-tourism and other forms of tourism. Sport and recreational hunting has been important, not just for non-Natives but for Natives as well, in addition to subsistence use of the area. So I think these areas haven't been addressed adequately. The potential as well as past use and current use. **(Comment No. 80076-901)**

Response To: Comment 80076-901

See Section III for detailed discussions of the resources of the area and Section IV for discussions of the affects of various management alternatives on the resources present in the area.

7. TOPIC : STIPULATIONS, REQUIRED OPERATING PROCEDURES, AND MITIGATIONS

Comment From: State of Alaska (Comment Letter No. 251)

In addition, the analyses of the potential mitigating effects of some of the proposed stipulations (e.g., B-1, E-1) need to clearly point out the varying degree of protection these measures will have based on the language used to craft the mitigation measure. Some of the stipulations for Alternatives A and B use terms such as 'may be required,' 'may authorize,' or 'up to' to denote the applicability of the measure. In these cases, the protection offered by these measures may therefore range from none or little to substantial. The analyses should identify the entire range of protection of the mitigation measure to allow the reader to more accurately assess the degree of impact of the activity to the resource. We have chosen not to comment on every single instance in the document where incomplete analysis of impacts occurs because the stipulations provide for varying degrees of resource protection. **(Comment No. 251-139)**

Response To: Comment 251-139

The stipulations referred to are found in Stipulation E-1 for Alternative B. Under that stipulation appears a list of geographic features and areas, resources that may be present and at risk from oil and gas activities, and an upper limit for setbacks that may be needed to protect the identified resources. An absolute setback was not established to allow greater flexibility to mitigate impacts when more site and project specific information became available. This approach recognizes that while we know certain resources are present and more concentrated in certain areas relative to elsewhere in the Planning Area, they are still relatively scattered. At any given location the resource may or may not be present. Furthermore, the nature of impacts differs with the facility and the associated activity. For example, the impacts from a road are not the same as from a pipeline and the impacts from a buried pipeline are not the same as from an aboveground pipeline. Therefore, lacking information necessary to develop appropriate mitigation, we attempted to provide the lessee with some idea of the range of restrictions that might be imposed on development, while building in some flexibility that would allow us to adapt our mitigation to the specific proposal through project-specific analysis. By this it should not be assumed that this flexibility and reliance on project-specific analysis would result in no (or inadequate) protection to a resource at risk. This erroneously assumes that BLM would abrogate its regulatory responsibility to take such action as deemed necessary to mitigate or avoid unnecessary surface damage and to minimize ecological disturbance throughout the NPR-A consistent with the requirements of the National Petroleum Production Act and the Federal Land Policy Management Act (43 CFR 2361.1). Please see the response to comment 253-38 (Management) for an explanation of the development of Stipulations and ROP's for the Preferred Alternative.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The stipulations for mitigating impacts from oil and gas development are harmfully insufficient to protect surface resources and value. The DEIS fails to evaluate adequate mitigation measures and fails to provide scientific rationale for weakening stipulations from the Northeast NPR-A Record of Decision. The promulgation of the stipulations and required operating procedures were based on the premise that the stipulations must not adversely affect the viability of potentially commercial oil discoveries, thereby creating a blanket provision for modification that renders the stipulations virtually meaningless. **(Comment No. 253-28)**

Response To: Comment 253-28

Please see the responses to comments 261-52 (Stipulations, Required Operating Procedures and Mitigations), 261-31 (Criteria for Range of Alternatives), 249-524 (Stipulations, Required Operating Procedures and Mitigations), and 251-136 (Management).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

General Comments EPA is particularly concerned with the stipulations and Required Operating Procedures (ROPs) associated with Alternatives A and B because they appear to be less protective than practices that are currently used for protecting natural, biological, and subsistence resources on the North Slope. While we acknowledge the apparent desire to provide additional flexibility in defining needed resource protections with Alternatives A and B, the draft IAP/EIS does not demonstrate that the stipulations and ROPs for those alternatives would be sufficient to ensure that resources would be protected. In some instances, the stipulations and ROPs are written with very prescriptive requirements (such as those proposed for Alternative C) while others are written in very broad, flexible terms (such as those proposed for Alternatives A and B). It is particularly important to have well defined and effective stipulations and ROPs in areas where high natural resource areas coincide with areas of high oil and gas potential, such as the area surrounding Elson Lagoon, Dease Inlet, and Admiralty Bay. **(Comment No. 261-52)**

Response To: Comment 261-52

The BLM does not believe that the mitigations we have developed are "less protective" or noticeably weaker than those in the Northeast NPR-A Record of Decision. We do recognize that we have tried a different approach and that in doing so the "stipulation package" looks very different, and that the number of lease stipulations is reduced. However, we do not believe that this results in less protection to surface resources. There are several reasons stipulations were removed or modified in the Northwest NPR-A IAP/EIS relative to the Northeast NPR-A Plan. Some of the stipulations were eliminated because they addressed specific issues or resources not present in the Northwest NPR-A Planning Area. Others were eliminated because the requirement already exists in law or regulation making the stipulation redundant. Some were removed because they were the responsibility of another Federal Agency or the State of Alaska and thus not enforceable by BLM. Many became required operating procedures (ROP's) because they would apply to all permitted activities, not just activities on oil and gas leases or those proposed by a lessee. Lastly, some stipulations that originated in Northeast Plan were modified and combined in the Northwest IAP/EIS because they related to the same type of activity and shared a common objective. Please see the response to comment 251-139 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

As presently written, we do not believe that Alternatives A and B provide well defined and protective stipulations or ROPs, particularly for areas with environmentally sensitive or high natural and subsistence resource values. We also note that the stipulations and ROPs for Alternative C, while affording greater protection than those for Alternatives A and B, represent less than one half of the stipulations that are presently being used to protect resources in the NE NPR-A planning area. The stipulations and ROPs represent the mitigation strategy to be applied to activities within the planning area and all alternatives should include measures that adequately protect environmental, biological, and subsistence resources with their implementation, as required by the implementing regulations for NEPA [see 40 CFR 1500.2(e) and (f)] and NPRPA. Consequently, we recommend that all action alternatives evaluated in the final IAP/EIS include stipulations and ROPs that provide adequate protection for important environmental and subsistence resources. In particular, the final IAP/EIS should include additional stipulations specific to protecting wetlands, fisheries resources, deep water lakes and water withdrawal areas, and gravel borrow source sites, which are mentioned in greater detail below. **(Comment No. 261-53)**

Response To: Comment 261-53

We have taken your comments into consideration in developing the Preferred Alternative; see General Lease Stipulations and Required Operating Procedures for the Preferred Alternative. Please also see the response to comment 261-52 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Should DOI/BLM choose to apply a different set of stipulations than those being used in NE NPR-A (as is presently proposed), the final IAP/EIS should provide a discussion of the reasons for the differences. This discussion should include an assessment of how the use of fewer and/or less protective stipulations and ROPs (relative to those used for NE NPR-A) would ensure that impacts to valuable natural resources would be avoided or minimized, as specified in the NEPA implementing regulations (see 40 CFR 1500.2) and protected as required by NPRPA. **(Comment No. 261-58)**

Response To: Comment 261-58

Please see the response to comment 261-52 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

EPA is concerned that there is a significant difference between the stipulations attached to the Preferred Alternative for the Northeast planning area of NPR-A (NE NPR-A) and those proposed for the alternatives for the Northwest planning area and would like clarification on this issue. While both EISs state that the stipulations and ROPs 'are based on existing policies and laws and knowledge of the resources in the Planning Area and current industry practices,' the draft IAP/EIS does not provide information that reveals changes to policies, laws, knowledge of resources or industry practices that have taken place since the Record of Decision for NE NPR-A was issued. As a consequence, we are unable to determine why the proposed stipulations for Alternatives A, B, and C are different from those currently in-place for leasing and post- leasing activities in NE NPR-A. **(Comment No. 261-56)**

Response To: Comment 261-56

Please see the response to comment 261-52 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

EPA believes that it is critically important that the final IAP/EIS validate the effectiveness of mitigation measures proposed as stipulations and ROPs. Since the stipulations and ROPs proposed in the draft IAP/EIS appear to be based on those currently being used in the NE NPR-A planning area, the final IAP/EIS should report on the implementation and effectiveness of those measures currently being used in NE NPR-A. We recommend that the final IAP/EIS include a discussion of the implementation (have the stipulations been implemented as required') and effectiveness of those measures in protecting natural resources (do they provide adequate/anticipated protections'). This information will disclose to the public and the decision maker understanding of and the likely outcomes associated with the use of stipulations that are based on those already in use. **(Comment No. 261-79)**

Response To: Comment 261-79

Effectiveness of the stipulations finalized by Northeast NPR-A Planning Area Record of Decision (ROD) has been addressed by the Research and Monitoring Team (RMT), which was established through the Northeast Planning process. The RMT has been superceded by the developing North Slope Science Strategy and the North Slope Management Oversight Group, groups who will assess mitgation effectiveness and follow up with appropriate plan maintenance or amendments. The Stipulations and ROP's in the Northwest NPR-A Planning Area IAP/EIS are intended to mitigate potential impacts to environmental resources in the Northwest Planning Area. Implementation of the measures would be achieved through the ROD. Measures adopted in the ROD are enforceable requirements.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

While Appendix 12 suggests that it contains an evaluation of the effectiveness of the proposed stipulations and ROPs, we were not able to determine the effectiveness of the stipulations and ROPs in either an absolute or relative sense. Appendix 12 does provide a good side-by-side comparison of which measures are expected to provide more (or less) resource protection. The appendix does not, however, present information that allows the public and decision maker to understand the likelihood of achieving the expected protections if the stipulations and ROPs were implemented. We believe that would be revealed with an assessment of the stipulations currently being used in the NE NPR-A planning area. **(Comment No. 261-80)**

Response To: Comment 261-80

Please see the response to comment 261-79 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

We find the explanation of the differences between the proposed stipulations and ROPs to be confusing and difficult to understand. Consequently, we recommend that the draft IAP/EIS be revised to clarify the differences between stipulations and ROPs and explain why they need to be differentiated from each other. **(Comment No. 261-83)**

Response To: Comment 261-83

Appropriate text in the IAP/EIS has been revised. Please also see the response to comment 251-136 (Management).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

To assure consistency, EPA recommends that the final set of stipulations and ROPs presented in the final IAP/EIS and adopted in the Record of Decision consistently use the word 'shall' to clearly indicate that the elements of each stipulation must be met. The draft IAP/EIS uses 'shall' interchangeably throughout the stipulations and ROPs. **(Comment No. 261-84)**

Response To: Comment 261-84

We have used the word "shall" where appropriate.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

While numerous stipulations contain quantitative values (e.g., buffer widths/setback distances, water depths) or dates that directly affect how and when stipulations would be implemented, we were unable to locate the complete data set in the draft IAP/EIS that supports these values and dates or a discussion of the use and effectiveness of these measures in ensuring the protection of applicable resources. We recommend that the final IAP/EIS include this information. **(Comment No. 261-85)**

Response To: Comment 261-85

Many quantitative values (e.g., no permanent facility setbacks/distances and water depths) and periods of time identified in the stipulations were developed by the Teshekpuk Lake Area Caribou/Waterfowl Impacts Analysis Workshop held in Fairbanks, Alaska in 1997. Other values and dates, not related to geese and caribou, were derived from extensive consultation with technical fish, wildlife, water, lands, subsistence, and environmental protection experts during development of the draft IAP/EIS. Scientific literature used to develop values and dates are provided in the bibliography at the end of the IAP/EIS. Values and dates are based on the best available scientific information and expertise with the objective of protecting surface resources. In some instances, quantitative values and dates represent a consensus position derived from consultation with policy and technical experts. Authors have relied upon all sources of information available in evaluating impacts.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Stipulation A-1 - 'Procedures applicable to fuel handling (associated with transportation vehicles) may consist of Best Management Practices if approved by the AO.' We recommend that the Best Management Practices applicable to this activity be included in the final IAP/EIS, consistent with the direction of the NEPA implementing regulations to include appropriate mitigation measures in the final IAP/EIS [see 40 CFR 1502.14(f)]. ROP-1 - 'A current list of approved precautions, specific to type of permitted used, can be obtained by the AO.' We recommend that these precautions be included in the final IAP/EIS, consistent with the direction of the NEPA implementing regulations to include appropriate mitigation measures in the final IAP/EIS [see 40 CFR 1502.14(f)]. ROP-4 - We recommend that the second sentence of element c. be revised to read as follows: 'The AO may permit alternate disposal methods if the lessee demonstrates that subsurface disposal is not feasible or prudent and that the alternate method will not result in adverse environmental effects.' Stipulation C-1 - We recommend that element b. be replaced with Stipulation 24 i. and j. from the Preferred Alternative for the NE NPR-A planning which will ensure consistent protection of the tundra from overland moves and seismic work.

ROP C-1 - We recommend that element f. for Alternatives A and B be replaced with element a. for Alternative C to ensure consistent protection of raptors and gyrfalcon from overland moves and seismic work. Stipulation E-1 - We recommend that Stipulation E-1 for Alternative C be applied to all alternatives, replacing Stipulation E-1 defined for Alternative B and applied to Alternative A (which does not presently have a stipulation defining setbacks from specified water bodies). This will ensure that high- value resource areas will be receive consistent protection throughout the planning area. This approach would also protect resources in a manner that is similar to the approach being taken the NE NPR-A planning area. Stipulation E-2 - We recommend that Stipulation E-2 for Alternative C be applied to all alternatives. As presently proposed, neither Alternative A or B have a stipulation or ROP defining required practices that will ensure that environmental effects from permanent roads are minimized. EPA believes that such a stipulation should be attached to any alternative to ensure that all reasonable means have been taken to avoid or minimize any adverse environmental effects, per the NEPA implementing regulations [40 CFR 1500.2(f)]. ROPs E-4 and E-5 - We recommend that these ROPs be replaced with Stipulations 34, 35, 36, and 37 used for the NE NPR-A planning area. The use of these stipulations will ensure consistent protection of caribou and subsistence users access using accepted industry practices. ROP E-7 - We recommend that this ROP (applicable to Alternatives A and B) be replaced with Stipulation 40 used for the NE NPR-A planning area to ensure that requirements for developing and reclaiming gravel mine sites are established. ROP-7 only addresses gravel mine reclamation. ROP F-1 - We recommend that ROP F-1 for Alternative C be applied to all alternatives to ensure that impacts from air traffic are reduced using standard, accepted practices to minimize effects to wildlife and birds. ROP I-1 - We recommend that this ROP be expanded to ensure that the orientation program includes notification of personnel of the stipulations and ROPs applicable to lease and post- lease activities, an explanation of why they exist and what they are intended to achieve, and the employees obligations to conduct activities in accordance with the stipulations and ROPs. Stipulation J-1 - We recommend that Stipulation J-1 for Alternative C be applied to all alternatives to ensure that impacts from air traffic are reduced using standard, accepted practices to minimize effects to raptors within the Colville River Special Area. Stipulation J-2 - We recommend that Stipulation J-2 for Alternative C be applied to all alternatives. As presently proposed, neither Alternative A or B have a stipulation or ROP defining required practices that will ensure that impacts to grizzly bear dens will be minimized. EPA believes that such a stipulation should be attached to any alternative to ensure that all means have been taken to avoid or minimize any adverse environmental effects, per the NEPA implementing regulations [40 CFR 1500.2(f)]. **(Comment No. 261-86)**

Response To: Comment 261-86

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

We do not believe that the currently proposed stipulations and ROPs are likely to provide adequate protection of valuable subsistence resources and subsistence hunting activities. EPA recommends that the final IAP/EIS evaluate an alternative that includes mitigation measures (stipulations and ROPs) that protect subsistence resources and subsistence hunting activities, while allowing for the lease sales in areas of high oil and gas potential in the planning area. **(Comment No. 261-109)**

Response To: Comment 261-109

We have taken your comments into consideration in developing the Preferred Alternative; specifically see Section H "Subsistence Consultation for Permitted Activities" K-1 and K-3 of the General Lease Stipulations and Required Operating Procedures in the Preferred Alternative.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

In the draft IAP/EIS, the cumulative effects analysis of noise and other disturbances indicates that avoidance behavior due to the estimated number of helicopter and vessel round trips per month alone would impact marine and terrestrial animals (valuable subsistence resources) the majority of each day and affect subsistence harvesting activities of the Inupiats. The final IAP/EIS should include stipulations and/or ROPs that restrict noise and traffic disturbances (e.g., seismic activity, vessel and helicopter use, etc.) for facilities developed near or on the ocean shore during the spring and fall whale migrations. We recommend the development of such stipulations/ROPs in consultation with the subsistence whalers. **(Comment No. 261-115)**

Response To: Comment 261-115

We have taken your comments into consideration in developing the Preferred Alternative. See specifically Section H "Subsistence Consultation for Permitted Activities" and K-3, 6, and 8 of the General Lease Stipulations and Required Operating Procedures in the Preferred Alternative.

Comment From: State of Alaska (Comment Letter No. 251)

The format of the alternatives presented in the Draft IAP/EIS, with both increasingly restrictive land classifications and increasingly restrictive stipulations and ROP's makes it difficult to comment on the appropriateness of the alternatives, and to recommend a preferred alternative from the choices provided. Specifically, the most restrictive stipulations and required operating procedures generally have been attached to Alternative C, with less restrictive conditions attached to the other alternatives. This situation makes it difficult to accurately assess the impacts to resources of each alternative given differing levels of impact mitigation associated with each alternative. A better approach would be to have levels of impact mitigation equal for all alternatives so that the true effects of a development scenario to the resources can be assessed. We recommend each stipulation or required operating procedure be developed and applied to all of the proposed alternatives. **(Comment No. 251-138)**

Response To: Comment 251-138

Appendix 12 of the Draft IAP/EIS addresses the effectiveness of the most restrictive stipulations and ROP's, from Alternative C, in the context of the least restrictive oil and gas leasing decisions (and more likely development) of Alternatives A and B. In addition, the effectiveness of the Stipulations and ROP's is evaluated under each resource analysis for each alternative.

Comment From: State of Alaska (Comment Letter No. 251)

The stipulations, currently designed for oil and gas development activities, should be expanded to address potential community roads from Barrow to Atqasuk and Wainwright that could serve a mainline/trunk road function for both exploration and production operations, including connection to a pipeline route for products east through the Northeast (NE) NPR-A to production facilities. Stipulations must be sufficiently flexible to accommodate the linear nature of these facilities. The State recommends that a stipulation specific to community roads be added that allows such roads if they are designed, constructed, and operated to minimize impacts to surface resources. **(Comment No. 251-143)**

Response To: Comment 251-143

The construction of a community road across NPR-A would require a Right-of-Way (ROW) grant from the BLM.

Prior to issuance of a ROW, an environmental analysis in accordance with the National Environmental Policy Act would be required. Appropriate stipulations would be developed at that time. The ROP's developed as part of this IAP/EIS would be considered in the proposal.

Comment From: State of Alaska (Comment Letter No. 251)

Section II, Stipulations and Required Operating Procedures, Definitions, Page II-16. The definition of 'Body of Water or Waterbody' states 'a lake, river, stream, creek, or pond that holds water throughout the summer and supports a minimum of aquatic life.' This definition should be expanded to include ephemeral streams that may only contain water for part of the summer season. These streams are very important rearing and spawning habitat for some species of fish such as Arctic grayling. **(Comment No. 251-149)**

Response To: Comment 251-149

The text has been amended to read "for much of the summer." Most ephemeral streams on the North Slope do not dry up when they cease to flow after breakup, but usually contain isolated pools (often called beaded streams) that would still be protected.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Alternative A, Environmental Justice, Effectiveness of Stipulations and Required Operating Procedures, Page IV-225. This section notes Stipulation E-1 will assist in protecting subsistence resources by way of facility setbacks. However, Stipulation E-1 does not apply to Alternative A. **(Comment No. 251-172)**

Response To: Comment 251-172

The text has been changed to eliminate the discussion of Stipulation E-1.

Comment From: Audubon Alaska (Comment Letter No. 213)

The northeastern portion of the proposed Dease Inlet-Meade River Special Area should be given additional protection in a no- lease zone to conserve its high-density waterbird nesting habitat, caribou insect-relief habitat, and polar bear denning habitat (Fig. 2). The marine waters of both Dease Inlet and Elson Lagoon should be designated as no-surface activity zones within the special area to protect these important and sensitive habitats. Elsewhere in the special area, we recommend special stipulations to protect habitats for threatened spectacled eiders and yellow-billed loons. **(Comment No. 213-214)**

Response To: Comment 213-214

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the response to comment 213-232 (Alternatives General).

Comment From: Audubon Alaska (Comment Letter No. 213)

Additional Waterbird Stipulations : Two high-density waterbird nesting areas occur south of the recommended Dease Inlet-Meade River Special Area (Fig. 1). One area, south of Atqasuk, is an important spectacled eider nesting area. The other area, west of Ikpikpuk River, is an important yellow-billed loon nesting area. Both of these areas are identified in Figure 2 and should receive special stipulations to prevent impacts to waterbird nesting habitat. We recommend that specific stipulations for waterbird nesting areas be developed in consultation with appropriate experts at the U.S. Fish and Wildlife Service. **(Comment No. 213-227)**

Response To: Comment 213-227

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the response to comment 213-232 (Alternatives General). Nesting area densities of spectacled eiders south of Atqasuk and yellow-billed loons west of the Ikpikpuk River noted by Audubon range from medium to medium-high, rather than high, on maps generated from aerial survey data by the USFWS. As indicated in the response to Comment 213-225 (Special Designation Areas), several stipulations and ROP's in the IAP/EIS (most notably E-11) would provide protection for these nesting species. The necessity for additional protection would depend in part upon the types of activities that would occur in this area; additional specific stipulations for waterbird nesting areas, as suggested by Audubon, are one approach. This will be considered at subsequent approval stages if necessary.

Comment From: Audubon Alaska (Comment Letter No. 213)

Kasegaluk Lagoon is an important staging and feeding area for as many as 63,000 brant. Habitat change, disturbance, development, and potential for oil and other toxic spills in these areas must be avoided. **(Comment No. 213-234)**

Response To: Comment 213-234

We have taken your comments into consideration in developing the Preferred Alternative.

Comment From: Audubon Alaska (Comment Letter No. 213)

Construction of permanent facilities, including roads and pipelines, should be prohibited within 5,000 ft (1,500 m) of nesting cliffs. Aircraft should avoid low- level flights within 1,000 ft (305 m) from cliffs, and camping or prolonged human presence near nesting sites should be prohibited or tightly managed to avoid impacts. **(Comment No. 213-239)**

Response To: Comment 213-239

If significant oil and gas resources were to be found within certain river corridors, Stipulation K-1 would require that additional design features or mitigation measures be observed, including setbacks of up to ½ mile (most rivers) or 1 mile (Ikpikpuk and Colville rivers). Required Operating Procedure F-1, requiring that aircraft operations minimize impacts on birds--or even more conservatively (Alternative C), that aircraft maintain 1,500 ft AGL within ½ mile of identified raptor nesting sites--could decrease disturbance of raptors. ROP I-1, requiring oilfield personnel to attend an orientation program could increase awareness concerning what types of activities are likely to have adverse impacts on wildlife, including raptors.

Comment From: Audubon Alaska (Comment Letter No. 213)

It also does not address the potential of rolling back habitat protection for calving grounds within the Northeast Plan. **(Comment No. 213-304)**

Response To: Comment 213-304

Future changes to habitat protections around Teshekpuk Lake are not discussed in the cumulative impact analysis because such changes are speculative at this time and beyond the scope of this document. Any proposed changes would be addressed in a separate NEPA document and any decisions on changes would be made subsequent to that NEPA process.

Comment From: State of Alaska (Comment Letter No. 251)

The following are stipulations and required operating procedures that the State believes: 1) need to be modified to adequately protect land, water, fish, wildlife, subsistence, and cultural resources; 2) require modifications to maintain protection of resources without unnecessarily restricting development activities; or 3) make the proposed stipulations consistent with best management practices and policies developed and implemented by technical staff from industry and the State's resource agencies over many years of oil and gas development on state land. Stipulation A: Waste Prevention, Handling and Disposal and Spills Stipulation A-2, Page II-17. This stipulation discusses fuel storage requirements within the planning area. For Alternatives A and B, setbacks are 100 ft. from non fish-bearing water bodies and 500 ft. from fish-bearing water bodies. For Alternative C, the setback is 500 ft. from all waterbodies. We recommend the stipulation language used in Alternatives A and B, with 100 ft. setbacks from non fish-bearing waterbodies and 500 ft.from fish-bearing waterbodies, be used for all alternatives. Stipulation A-3, Page II-18. This stipulation prohibits refueling of equipment within 500 ft. of any fish-bearing waterbody and 100 ft. from a non fish-bearing waterbody for Alternatives A and B. Under Alternative C, the distance is 500 ft. from any waterbody. We recommend the stipulation language used in Alternatives A and B, with 100 ft. setbacks from non fish-bearing waterbodies and 500 ft. from fish-bearing waterbodies, be used for all alternatives. Required Operating Procedures A-1 through A-8, Pages II-18 and II-19. These mitigation measures pertaining to waste prevention, handling, disposal, and spills all should be changed to stipulations to the lease as they pertain to major issues that lessees need to be concerned with prior to submitting bids for leases. Required Operating Procedure A-3. Page II-18. Annular injection or disposal (AD) is specifically mentioned. AD is one of two underground waste disposal methods available State of Alaska NW NPR-A Comments from the Alaska Oil and Gas Conservation Commission (AOGCC). AD has regulatory limits including limited volume (35,000 bbls) and limited duration (90 days in a calendar year) than deeper Class II disposal. Depending on the local geology, AD may be the only option for large volumes of waste as is the case at Alpine. Required Operating Procedure A-4. Page II-18. It is highly unlikely that terrestrial discharge of produced water would be allowed. Produced water may be used for enhanced recovery operations or disposed of in a Class I or Class II well. Produced water may not be disposed of by AD. Stipulation B: Ice Roads and Water Use Stipulation B-1, Page II-20. This stipulation discusses winter water withdrawal within the planning area. For Alternatives A and B, the stipulation states the AO may authorize winter water withdrawal from lakes, creeks, or rivers. This provision needs to be modified to reflect the Alaska Department of Natural Resources' (ADNR) exclusive regulatory authority to approve water withdrawls from surface and subsurface waterbodies in Alaska, including waterbodies in the NPR-A. This authority is based on the common law doctrine of Public Trust which is embedded in the Alaska Constitution, Article VIII Section 3, entitled Common Use. The doctrine provides that fish, wildlife and waters within the State must be managed by the state as a public trust for the benefit of the people as a whole. Alaska Statute (A.S.) 46.15 specifically delegates the authority to adjudicate water rights and temporary authorizations for the use of surface and subsurface waters to the ADNR. In addition, the State has not authorized winter water withdrawal from rivers on the North Slope for approximately 25 years, and without new information we have no intention of changing this policy. As written, we believe this variant fails to adequately protect fish resources in North Slope waters. Therefore, we recommend that this component of Stipulation B-1 for alternatives A and B be deleted. Reference to winter water withdrawal from rivers also should be removed from other appropriate sections of the document. The Stipulation B-1 developed for Alternative C which prohibits winter water withdrawal from rivers and streams should be adopted for all proposed alternatives. In addition, the

stipulation should be modified to state that 1) water withdrawal should be limited in fishbearing lakes to 15% of the under- ice volume for those lakes with depths below 7 ft. and 2) for those lakes with depths between 5 and 7 ft. deep that contain only ninespine stickleback and Alaska blackfish (species capable of tolerating waters with low dissolved oxygen concentrations) water withdrawal of up to 30% of the under-ice volume may be authorized. Present water withdrawal limitations in the NE NPR-A are 15% for sensitive species, and on state land, 30% of the under ice water volume for resistant species. With completion of further fish studies, the numbers may warrant further adjustments by permitting agencies under the exception provision. These proposed changes in the water withdrawal limitation will provide agencies an opportunity to adjust the number based on future acquisition of more complete or detailed information. Stipulation B-1 also implies that a water monitoring plan will be conducted on a year-to-year basis for any and all lakes accessed. If this were the case, it would represent a significant cost and logistical quagmire to the industry. For major operations, lakes utilized in one project could number in the fifties or greater. Use of the suggested wording below would allow sufficient studies to be undertaken that monitor drawdown and water changes before, during and after pumping on a representative number of lakes authorized and from an equal number of control lakes, which would not be utilized. Furthermore, it would not be prudent or necessary to impose a monitoring plan on an operator who is requesting a one-time two-week authorization of a modest water withdrawal from one lake. The portion of Stipulation B-1 related to removal of ice aggregate should be modified to allow U.S. Fish and Wildlife Service (USFWS), ADFG and ADNR to review the request for use of ice chips on a waterbody-specific basis, depending on is size, water volume, depth, fish population and species diversification. Scenarios could range from no ice chip harvesting, to restricting the amount of ice taken (e.g., 15 % of the under-ice water volume), to no limitation. Ice aggregate from fish-bearing lakes may be allowed where the ice is naturally grounded, with the condition that the amount removed be included in the 15% withdrawal limit. The Stipulation should also provide for fle xibility to allow ice aggregate removal from rivers where the ice has naturally grounded. These modifications will provide flexibility to the NW NPR-A water withdrawal stipulation and ensure that impacts on fish resources are minimized. In summary, Stipulation B-1 for all alternatives should be modified to read: Water withdrawal from rivers and streams during winter is prohibited unless and until new information is brought forward indicating that additional review is warranted. Water withdrawal from fish-bearing lakes is limited to 1) 15% of the under-ice volume for those lakes with depths below 7 ft. and 2) water withdrawal up to 30% of the under- ice volume for those lakes with depths between 5 and 7 ft. deep that contain only ninespine stickleback and Alaska blackfish. After consultation with the appropriate federal, state, and North Slope Borough (NSB) regulatory and resource agencies, ADNR may authorize withdrawals from any lake if the proponent demonstrates that no fish exist in the lake. A water monitoring plan may be required to assess drawdown and water quality changes before, during and after pumping any fish-bearing lakes. Removal of ice aggregate from lakes and shallow rivers may be allowed on a waterbody-specific basis, depending on its size, water volume, depth,fish population and species diversification, and where the ice is naturally grounded, after consultation and approval from appropriate agencies (USFWS, ADFG and ADNR). Any water intake structures in fish-bearing waters shall be designed, operated, and maintained to prevent fish entrapment, entrainment, or injury, unless specifically exempted by the ADFG. Stipulation B-2, Page II-20. This stipulation regarding prohibition of compaction of snow cover or snow removal from ice over fish-bearing waterbodies except at approved ice road crossings and lake water pumping stations should be applied to all alternatives and not just Alternative C. Stipulation C: Overland Moves and Seismic Work ADNR has been responsible for tundra travel permitting and enforcement on state land on the North Slope since the first oil wells were drilled in 1969 **(Comment No. 251-325)**

Response To: Comment 251-325

The State of Alaska, the Alaska Oil and Gas Association, ConocoPhillips Alaska, Inc., the North Slope Borough, the Environmental Protection Agency, the Alaska Center for the Environment et al., the American Society of Mammalogists, and the U.S. Fish and Wildlife Service all made extensive comments specific to individual Stipulations and ROP's. These comments were compiled in a report by the core planning team to facilitate a review of each Stipulation and ROP. Other more general comments on stipulations and ROP's from these and other entities, such as those submitted by Kuukpik, were compiled in another report or widely distributed to the team for consideration. Concurrently, management was considering public comment related more generally to management philosophies and new alternatives. As a result of those management meetings, basic direction related to the Preferred Alternative was set forth (please also see the response to 213-232 (Alternatives General). In light of this direction and comments specific to the Stipulations and ROP's, BLM modified and selected a Stipulation/ROP "package". The Stipulation/ROP "package" was further discussed with representatives of the

North Slope Borough and the State of Alaska. Based on those meetings, BLM sought additional information from the State of Alaska, North Slope Borough, and USFWS, and developed the Stipulations and ROP's that are now part of the Preferred Alternative.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The NRPRA requires that oil and gas leasing activities in the Reserve 'shall include or provide for such conditions, restrictions, and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources.' 42 U.S.C § 6508(1); see also 43 U.S.C. §§ 1701, 1702, 1732. As in the NEPA documents it prepared for the Northeast Planning Area, BLM attempts to comply with that requirement in large part by creating a series of conditions and restrictions that should, or might, be included on leases that are issued for oil and gas exploration. In comments submitted with regard to the Northeast NPR-A DEIS, however, we outlined significant shortcomings of the lease stipulations proposed to protect surface resources in that planning area. (See Northeast FEIS, at V-342-44.) BLM has not remedied many of those deficiencies in the Northeast, and we reiterate those comments here in reference to both the Northeast and Northwest Planning Areas. Moreover, instead of striving to protect resources adequately in the Northwest Planning Area, BLM has proposed significantly weaker and even more discretionary stipulations and Required Operating Procedures (ROPs) in this DEIS. Those protections are sufficiently weak and discretionary as to constitute a complete abdication of BLM's responsibility under the NPRPA and a complete failure to provide protection for environmental and socio-cultural resources. Rather than weakening the already deficient protections used in the Northeast Planning Area, BLM should have provided for additional protections in the Northwest. Moreover, at the very least, BLM should have provided some rationale for its choice to weaken the already deficient stipulations used in the Northeast Planning Area, and addressed the potential impacts of the weakened protections. BLM's failure to do so renders the public and the agency incapable of making an informed decision about the sufficiency of the protections. Primarily, we are concerned that the stipulations and ROPs provided in the DEIS for mitigating impacts from oil and gas exploration and development are harmfully insufficient to protect surface resources in the Northwest Planning Area. The DEIS removes entirely a significant number of lease stipulations put in place in the Northeast, dramatically weakens others, and changes still other mandatory protections into discretionary ROPs. The specific stipulations that are removed, weakened, or changed into discretionary ROPs are listed in the following section. The decision to remove or weaken those protections violates BLM's duty under the NPRPA and FLPMA to protect the surface resources in the NPR-A. 62 The decision to turn restrictions that were stipulations in the Northeast ROD into what the agency has misleadingly termed Required Operating Procedures in this DEIS warrants further comment. Stipulations, under both this DEIS and the Northeast ROD are included as conditions on leases and subsequent activities. By contrast, ROPs are intended to ensure additional mitigation and may be included as stipulations or added as conditions on subsequent permits for oil and gas activities. (DEIS at II-9.) Failing to include these requirements as lease stipulations will mean that their application will be left to the discretion of the local agency official and, therefore, may be subject to far more political pressure. Moreover, it is not clear that these ROPs will be included at all. The potential requirements that applicants would be required to address in their applications how they would implement the ROPs or [w]here applicable, applicants would be required to submit mitigation plans expla ining how they would comply with a particular ROP are meaningless because no standards are provided whereby those applications would be judged, and the DEIS does not explain how those plans would be reviewed. Those changes are dramatic, and we believe that the protections should be required as lease stipulations by default, subject to alteration in some cases, if certain criteria are met. Further, BLM has provided these dramatically weakened protections without adequate explanation for the level of protection selected or an appropriate analysis of the potential ramifications. Indeed, no specific scientific or economic basis was provided for the selection of mitigation measures provided as lease stipulations or ROPs in this DEIS or for the difference stipulation and ROPs provided for each alternative. First, BLM has not provided any justification for its decision to deviate from the protections required in the Northeast ROD. At a minimum, BLM should explain the weakened standards by comparing them to the entire suite of stipulations that were attached to leases by the Northeast ROD (tailored as necessary to the geographic features and sensitive habitats in the NW Area). To do so, BLM should review the effectiveness of the stipulations from the Northeast ROD before determining which, if any, requirements should be changed. The review should include a report of the frequency and associated reasons for modifying and waiving stipulations in the Northeast Planning Area. Moreover, the DEIS should contain scientific evidence that the stipulations will be adequate in mitigating impacts to an acceptable level. Similar stipulations on industrial development within oil fields have had a checkered history in preventing

habitat loss and degradation elsewhere across the North Slope. Additionally, some rationale should be provided for downgrading some protections from stipulations to ROP's. BLM has not justified the decision to weaken the protections based on any economic evidence. At most, the DEIS provides a vague description of the costs of implementation in the section on overall assumptions (DEIS at IV-31-32). The DEIS simply assumes that 'lessees would incur some costs (delays, project modifications, additional studies, lower oil/gas recovery) to implement the protective and restrictive measures.' For Alternative A, it states that 'a qualitative analysis of the costs of implementing the protective measures indicates that development of up to 30 percent of potential future production could be precluded as a result of requiring these protective measures,' (DEIS at IV-32), yet no source document was provided for this assertion, nor were the reasons why there 63 would be additional costs. A similar lack of documentation was given for Alternative B. Instead it is assumed that 'all of the protection measures, regulatory restrictions, and area closures would reduce the exploration opportunities and decrease the likelihood that commercial production would occur.' (DEIS at IV-31.) That assumption is both unsupported and unwarranted. For Alternative C, the DEIS simply asserts that 'protective and restrictive measures for the areas that would remain open for leasing are likely to have adverse effects on oil and gas exploration and development activities,' (DEIS at IV-32), but no reason is given as to why the measures would cost more. Further, by assuming that no development would occur under Alternative C, even though 47% of the area is leased, it may dramatically understate the effects on wildlife habitats and subsistence in particular locations in the event that oil development did take place there. If there are studies showing the costs of various measures, they should be provided. Regardless, in determining the costs of the particular protections, the DEIS should consider both the assumptions used to determine the amount of economically recoverable oil and the assessment of potential locations and quantities of technically recoverable oil, as well as the locations of sensitive resources and the specific measures to be applied. Such overlays and analyses have not been done for this DEIS. Here, the BLM simply states that it is too expensive to include requirements for a wide range of measures that are listed in Alternative C, in direct contradiction to the Secretary of the Interior's statements to the U.S. House Resources Committee on February 11, 2003, about the use of ice roads, directional drilling, etc. Further, the DEIS does not address adequately the impacts of the weakened protections. The stipulations and ROPs will provide on-the-ground protections for surface resources over the entire Northwest Planning Area. BLM, therefore, must conduct a site-specific analysis in order to predict **(Comment No. 253-350)**

Response To: Comment 253-350

Please see the responses to comments 251-136 (Management), 249-524 (Stipulations, Required Operating Procedures and Mitigations), and 261-52 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: Audubon Alaska (Comment Letter No. 213)

Until definitive effects can be documented, denning sites should be avoided in future exploration activities. **(Comment No. 213-352)**

Response To: Comment 213-352

We have taken your comments into consideration in developing the Preferred Alternative (PA). Please see Required Operating Procedure C-1 of the PA which specifically sets limits around grizzly bear dens. Also see the responses to comments 213-232 (Alternatives General) and 251-325 (Stipulations, Required Operating Procedures and Mitigations). Other than subsistence whale-harvest sites such as in the Point Barrow area, the locations where marine mammal carcasses occur and are scavenged vary greatly from season to season and from year to year. It is not practical to protect these constantly changing locations. If a particular location of a carcass were to be in the path of an oil spill, the carcass could be removed to prevent exposure of scavengers to the spill. The potential effects of seismic noise on denning polar bears have been investigated (Amstrup, 1993). Methodologies are being developed to remotely locate occupied dens and avoid disturbance of the bears. Seismic operations would be prohibited within one mile of known (occupied) polar bear dens.

Comment From: Audubon Alaska (Comment Letter No. 213)

Activities should not occur during June-July when belugas are present. **(Comment No. 213-353)**

Response To: Comment 213-353

We have taken your comments into consideration in developing the Preferred Alternative (PA). Please see specifically Stipulation K-8, Kasegaluk Lagoon Special Area, in the PA. Also, see the responses to comments 213-232 (Alternatives General) and 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Northwest Stipulation C-1. a. Ground operations are to begin only after frost and snow cover have reached sufficient depths to meet the tundra protection objectives of minimizing compaction of soils and the breakage, abrasion, compaction, or displacement of vegetation. Ground operations shall cease when the spring melt of snow begins, approximately May 5 in the foothills area where elevations exceed 300 ft and approximately May 15 in the northern coastal areas. The exact dates will be determined by the AO. The Northwest DEIS stipulation is far weaker than Northeast stipulation 24i. It deletes the required frost depth of 12' and minimum snow depth of 6'. The DEIS provides no scientific basis for eliminating a long-term practice regarding frost minimums, and does not provide a standard for what would be acceptable level of disturbance to vegetation or soils (BLM does not require avoidance of damage). Studies of snow depth during seismic operations in the Arctic National Wildlife Refuge showed that 'measurable, low level disturbance occurs at depths of as much as 18 inches in tussock tundra, and 28 in. in sedge-shrub tundra (Felix and Reynolds 1989b). Moderate disturbance occurs at snow depths to 10 in. in tussock tundra and 14 in. in most sedge-shrub tundra' (NRC 2003 p. 134). If anything deeper minimum snow depths sho uld be considered, and the different topographic relief and geographic features taken into account. The NRC found that ice roads, pads and vehicle trails from seismic and overland moves change the structure of the snow-pack, and can disturb the vegetation and soils in areas where the snow-pack is thin. **(Comment No. 253-368)**

Response To: Comment 253-368

Please see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Why are there not mandatory lease stipulations for caribou mitigation' In some cases, the 5 foot elevation of the Northeast Plan stipulation #37, is not thought to be sufficient by local people. **(Comment No. 253-369)**

Response To: Comment 253-369

Please see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

This ROP is very vague and fails to set concrete performance standards that would protect fish habitat. Given the very controversial nature of causeways, it is recommended that stipulations remain in place in order to adequately protect fish habitat. According to the National Research Council, better information is still needed regarding causeway impacts. Oil development could harm grayling, arctic cisco, broad whitefish, and other species due to interference with migration patterns or over-wintering habitat caused by causeways, water withdrawals, and other effects (p.211). **(Comment No. 253-370)**

Response To: Comment 253-370

Please see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The new ROP fails to address potential impacts to floodplain or riverine habitats from gravel mines. Both the Northeast stipulation and the Northwest ROP fail to address potential impacts to migratory bird habitats that may be lost due to excavation of gravel mines. **(Comment No. 253-371)**

Response To: Comment 253-371

Please see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Northwest ROP F-1. All aircraft use shall be conducted in a manner that will minimize impacts to wildlife and birds. This extremely vague ROP replaces the specific stips. 52, 53, 54, and 57 but does not explain how helicopter and plane flights will avoid disturbing wildlife such as nesting Steller's eiders, nesting Spectacled eiders, and other key sensitive areas. **(Comment No. 253-372)**

Response To: Comment 253-372

Please see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-512, Scenario for a Possible Permanent Road Connecting Northwest NPR-A to Outside of the Planning Area. The State recommends that this section be revised to incorporate: 1) the development of community roads between Barrow- Atqasuk-Wainwright that may also be used for oilfield development mainline of trunk road functions. This potential is well within the stated 15 to 20-year period used for modeling in the Draft IAP/EIS. 2) economic modeling for road access connecting to transportation systems outside the NPR-A consistent with possible public funding for a mainline or truck road development into NPR-A. As noted earlier, the economic model used in the Draft IAP/EIS that assumes roads are unlikely in the planning area because they are uneconomic to the private sector is flawed and should be reevaluated given that the State may choose to finance roads in whole or part. **(Comment No. 251-407)**

Response To: Comment 251-407

Inter-community roads within the Northwest NPR-A Planning Area are mentioned in the cumulative scenario and are considered speculative at this time. The BLM acknowledges that such studies for such roads are in progress with State DOT oversight. The final route selection, material requirements, and environmental impacts will undergo thorough NEPA review before ROW permits are approved. The section referred to in the comment is on the "Scenario for a Possible Permanent Road Connecting Northwest NPR-A to Outside of the Planning Area." The Barrow-Atqasuk-Wainwright road would be wholly within the Planning Area. The economic modeling for this IAP/EIS addressed activities under consideration in the Alternatives and the past, present, and reasonably foreseeable cumulative activities. As stated above, inter-community roads within the Northwest NPR-A Planning Area are considered speculative at this time.

Comment From: State of Alaska (Comment Letter No. 251)

Appendix 13, Page 13-1 through 5, Standardized Stipulations Applied to Mitigate the Impacts of Non-oil and Gas Authorizations. This section should be reviewed to ensure that the stipulations adequately address and do not preclude potential road/transmission line projects. D. Alaska Department of Natural Resources Section II.C, Alternatives, Page II-9. Recent exploration successes, combined with the results of a recent evaluation of the petroleum potential of the NPR-A by the U.S. Geological Survey, indicate that the Barrow arch, Arctic Platform, and foothills belt offer the greatest potential for economically significant hydrocarbon accumulations. The greatest potential for large fields with recoverable oil reserves in excess of 100 million barrels lie in Jurassic and Lower Cretaceous age sandstones deposited on the Barrow arch, a south-southeast-trending subsurface ridge. Oil in these potential reservoirs will most likely be high quality crude with low sulfur content and high gravity (28° to 39° API). Shallower secondary reservoir objectives in younger Cretaceous age sandstones on the Barrow arch represent significant additional potential and will serve to reduce exploration risks when drilling to older (and deeper) targets. The Arctic platform and foothills belt are less prospective relative to the Barrow arch, but still possess significant potential for economically viable oil and gas fields. Alternative A will allow the greatest access to the Barrow arch and Arctic platform, and permit the most efficient exploration for these plays. Alternative B removes significant areas on the Barrow arch from oil and gas activities, but retains enough acreage to be practical from an exploration perspective. Alternative C effectively removes the most prospective areas from potential oil and gas activity **(Comment No. 251-410)**

Response To: Comment 251-410

The project-specific mitigation measures listed in Appendix 13 would not preclude road or transmission line projects. Relevant stipulations listed in Appendix 13 would be applied to any authorized project. This would not preclude the need for additional project-specific analysis to consider impacts resulting from any future potential road/transmission line. Through that analysis necessary additional mitigation would be developed as appropriate.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

The most alarming exploration [sic] that I found was that all of the subsistence stipulations from the Northeast Plan were replaced by one stipulation and one ROP in all alternatives, A, B and C. This stipulation and ROP basically say that the industry will consult with local representatives and come to an agreement on how operations will take place. If they can't agree, then the administrative officer will make the final decision on which activities will occur. I am very much opposed to leaving a decision like this in the hands of one man. I'm sure that Bob Schneider would treat people very fairly but we have no idea who will follow Bob in the job. **(Comment No. 80075-414)**

Response To: Comment 80075-414

We have taken your comments into consideration in developing the Preferred Alternative, please see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

There are no specific stipulations on high subsistence use areas to help guide the industry before they spend millions of dollars. Especially when everyone knows that the high oil and gas potential sites lay right under our subsistence use areas or important habitat for wildlife. It is harder to come back and say no after millions of dollars are invested on any project. **(Comment No. 80075-470)**

Response To: Comment 80075-470

We have taken your comments into consideration in developing the Preferred Alternative; several required operating procedures and lease stipulations specifically address subsistence use issues. Please see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures. See Stipulations K-1, K-3, K-6, and K-8.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

We call on BLM to not roll back stipulations that safeguard the Arctic environment. **(Comment No. 80075-480)**

Response To: Comment 80075-480

The BLM does not believe that the stipulations for the Northwest NPR-A Planning Area provide less safeguards for the arctic environment than do the stipulations adopted in the Northeast Plan. Please also see the responses to 249-524 (Stipulations, Required Operating Procedures and Mitigations) and 251-136 (Management).

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

And so one of my questions is how will BLM mitigate the impacts to people and to subsistence and, in fact, can these impacts be mitigated at all' **(Comment No. 80075-482)**

Response To: Comment 80075-482

The BLM cannot eliminate all impacts to the residents of the North Slope and to subsistence resources and activities. The BLM does believe that the stipulations, ROP's, and other features of the Preferred Alternative, in combination with project-specific permitting and NEPA processes, would result in greatly mitigating the impacts.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

On the pipeline, I'd like to state that the caribou crossings need to be made bigger so that the Natives that are going to and from their cabins will have better access crossing to and from their cabin sites. **(Comment No.**

80075-485)

Response To: Comment 80075-485

We have taken your comments into consideration in developing the Preferred Alternative. Please see specifically Required Operating Procedure E-7, Part B.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

And some sort of reflectors for the Natives that travel out during winter seasons, we have no sun rays for a period of time during winter and this brings out a concern for safety for the hunters that are going to and from their cabins. And one thing that I'm just foreseeing is accidents that would be happening and it would affect the North Slope Borough Search and Rescue on missions. And I just wanted to make that statement that reflectors should be thought about on these pipelines for the oil industries to think about. Another is access to and from, going through all these pipelines, are you going to be considering some type of, I don't know -- I know when you go through Prudhoe Bay right now there's a security system and you need some kind of access to go through. What are you going to be considering for this type of access for all the Natives going to and from their subsistence sites' I know I'm not going to be bringing an ID and I don't think I'll need any security clearance to go anywhere where I need to go to my cabin. So I just wanted to bring that out, that access to and from our cabins is something that is free for us to use and that you will have to be considering because you will be going through our subsistence sites. **(Comment No. 80075-486)**

Response To: Comment 80075-486

We have taken your comments into consideration in developing the Preferred Alternative; several stipulations and required operating procedures address subsistence issues. Please see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures. Also see Stipulation K-1, K-3, K-6, and K-8.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

On the oil seeps, I made a little notation that was shown on one of your pictures a few minutes ago. Will there be stipulations to clean our environment as a benefit for our environment because you would be in the vicinity of our area already' What an opportunity for the oil seeps, you can use to test your booms to clean the environment. What an idea while in the area or as you are searching and starting your production for oil, something to think about for BLM and the oil industry. Something that's already out there that needs to be cleaned. And I know that Alaska Clean Seas has all these booms and whatever they have. I think what a time for you guys to think about using all that to see if they are viable to use to clean the environment. And as you seen on those oil seeps, there is some areas that can be cleaned and what an opportunity for them to use it.
(Comment No. 80075-488)

Response To: Comment 80075-488

We understand the commenter is referring to naturally occurring oil seeps. It is unlikely that BLM could stop such occurrences; therefore, any cleanup efforts would be unproductive. BLM has no plan to clean up naturally occurring oil seeps.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

Now, what I'm advocating in the oil drilling scenario, we have something called a clean air sector. It means the air from here to 130 degrees -- at the 130 degrees line and out to 45 is some of the best locally uncontaminated air in the world. And when you do oil wells, one oil well out here will screw up this record that's 30 years long. And if the oil drilling lasted for some period of time we would lose all of that data and we have no other place to go. There's just -- this is such a unique situation and a lot of time and money was spent. So when you start thinking about these leases, please, try to keep out of Elson Lagoon and this area it's such a small amount of area. And I know you're not going to go out here on the ice because you couldn't drill out there. **(Comment No. 80075-490)**

Response To: Comment 80075-490

Special restrictions for oil and gas development would be required along the coast and in Elson Lagoon. Appropriate mitigation is best developed through site/project-specific analysis when activities are actually proposed. National Marine Fisheries Service (NOAA Fisheries, formerly NMFS) will be added to the list of agencies we request to comment on applications for permits for oil and gas activities within 50 km of Barrow.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

It is critical that throughout the package of mitigating measures attached to any planning area lease the burden is consistently placed on the developer/operator to establish that unreasonable adverse impacts will not occur. **(Comment No. 80075-491)**

Response To: Comment 80075-491

The BLM has a regulatory responsibility to take such measures as deemed necessary to mitigate or avoid unnecessary surface damage and to minimize ecological disturbance throughout the Reserve. As part of that responsibility, BLM has identified stipulations and ROP's that an operator has the responsibility to adhere to or to provide sufficient information to demonstrate why such requirements are not technically feasible, are economically prohibitive, or that related management objectives can be met or exceeded in an alternative manner. Ultimately, the responsibility to prevent unreasonable impacts is shared by all who operate in the Reserve and by all who oversee those operations. Under the Preferred Alternative there are Stipulations and ROP's that have been developed that include numerous requirements to consult with the North Slope Borough, Native Tribal Governments, local communities, and other entities. For example, in the case of stipulations for Dease Inlet, Admiralty Bay, Elson Lagoon and associated Barrier Islands, consultation is required with the Alaska Eskimo Whaling Commission to prevent conflicts with whaling activities of North Slope communities. Seismic operations have additional requirements to contact individual cabin users in writing to minimize impacts with subsistence activities. Procedures to facilitate government-to-government consultation have also been established.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

If you don't have things written precisely in an EIS to have minimum standards of how you're going to build, to do it correctly in an area where it's more heavily populated. An example is we've tried for many years to promote pilot projects such as alternative oil production such as buried pipelines, in the road shoulder pipelines, but nothing ever materializes because it's not written that they have to do that, it's not in their EIS, but I think it's to the point where we need to be concise. We need to be very careful how these EIS' get finalized, those wordings have to be in there to protect us. **(Comment No. 80075-502)**

Response To: Comment 80075-502

The BLM has tried to build appropriate standards into the stipulations and ROP's. At the same time, BLM has tried to maintain a measure of flexibility to provide for project and site variability. While allowing this flexibility, it remains BLM's responsibility to make sure appropriate standards are met.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

The last thing I wanted to mention was the importance of a variety of different subsistence use areas. One of them is the Dease Inlet, Elson Lagoon and Admiralty Bay. This area could be considered an Inupiat Highway. When you think of it, for bear hunters, during the summer this is basically their only access to certain hunting camps or to where the animals are. So this area needs to be, you know, really thought out carefully. I would say no surface occupancy, if they could do directional drilling in Admiralty Bay, Dease Inlet and Elson Lagoon, that's what I would recommend, because that route is important to many people who use their boats to go to the variety of different rivers and camp sites or where the animals are. Other important areas that I think also need to be thought out carefully is Peard Bay, another high use area, Koug River near Wainwright, Ikpikpuk River, Chip River, the Inaru, Tukukapak, Kokruagarok, Meade River and Kasegaluk Lagoon, as many other areas that, you know, I might have not mentioned all of them, but these areas are very important to many different people and we need to have that community meeting. Okay. **(Comment No. 80075-508)**

Response To: Comment 80075-508

BLM acknowledges the importance of Kasegaluk Lagoon, Elson Lagoon, Dease Inlet, Admiralty Bay, and the rivers identified (in this comment) as subsistence use areas. In BLM's Preferred Alternative Peard Bay and Kasegaluk Lagoon have been deferred from leasing for a period of 10 years. Special restrictions and setbacks apply to Admiralty Bay, Dease Inlet and Elson Lagoon. Important subsistence use rivers have been identified and setbacks of various distances have been established. See specifically Stipulations K-1, 2, 3, 6, and 8.

Comment From: American Society of Mammologists (Comment Letter No. 249)

the Stipulations in this draft EIS fail to require the oil and gas industry to use the proclaimed best available technologies. Therefore, they fail to meet the mandate of the President's energy policy, which directs the Secretary of the Interior to 'consider environmentally responsible oil and gas development based on sound science and the best available technology.' **(Comment No. 249-521)**

Response To: Comment 249-521

The President's energy policy directs the Secretary of the Interior to "consider additional environmentally responsible oil and gas development, based on sound science and best available technology, through further lease sales in the Petroleum Reserve-Alaska." The BLM is pursuing this directive by considering further lease sales in the NPR-A and in doing so is establishing management objectives and operational standards and requirements that will require the use of the best available technology.

Comment From: American Society of Mammologists (Comment Letter No. 249)

We feel that the stipulations given for mitigating impacts from oil and gas development are grossly inadequate to

protect the ecological integrity of the NW NPR-A. The draft EIS generally fails to evaluate adequate mitigation measures for wildlife species. Further, it perplexing that the Stipulations in the present draft EIS are noticeably weaker than those listed in the NE NPR-A Record of Decision. **(Comment No. 249-524)**

Response To: Comment 249-524

The BLM does not believe that the mitigations we have developed are "grossly inadequate" or that they are noticeably weaker than in the Northeast NPR-A Record of Decision (ROD). We do recognize that we have tried a different approach and that in doing so the "stipulation package" looks very different and that the number of lease stipulations is reduced. However, we do not believe that this results in less protection to surface resources. There are several reasons stipulations were removed or modified in the Northwest IAP/EIS relative to the Northeast IAP/EIS. Some of the stipulations were eliminated because they addressed specific issues or resources not present in the Northwest NPR-A Planning Area. Others were eliminated because the requirement already exists in law or regulation making the stipulation redundant. Some were removed because they were the responsibility of another agency or the State of Alaska and thus not enforceable by BLM. Many became Required Operating Procedures (ROP's) because it was felt they should be a requirement of all permitted activities, not just activities on oil and gas leases or proposed by a lessee. Lastly, some stipulations that originated in Northeast NPR-A Plan were modified and combined in the Northwest NPR-A IAP/EIS because they related to the same type of activity and shared a common objective.

Comment From: American Society of Mammologists (Comment Letter No. 249)

Modify Stipulation J-1 for Alternative C so that no permanent facilities would be constructed in the Colville River Special Area, identified in the 1983 NPR-A EIS. The Colville River drainage area, which includes the Arctic Foothills Province and Colville River Special Area, contains important habitat for moose and wolves (Carroll 2000a, b). Previous surveys, habitat characteristics, and food source opportunities (such as scavenging wolf kills; Magoun 1987, Carroll 1995) suggest this is important wolverine habitat. This is also among the best suitable habitat for muskoxen in the entire Planning Area, expanding south and west from reintroductions east of the NPR-A (Reynolds 1998, Carroll 2002). (2) Modify Stipulation E-2 to prohibit construction of permanent roads connecting production sites between separate oil fields, so that caribou and riparian habitats are afforded better protection. Studies have shown that a portion of the Central Arctic caribou herd has been displaced from their traditional calving areas in the Prudhoe Bay and Kuparuk oil fields (Cameron et al. 1992, Nellemann and Cameron 1998, Wolfe 2000). The Western Arctic caribou herd has its traditional calving areas in the southwestern portion of the NW NPR-A and significant summer and transitional use occurs here as well. This herd is substantially larger than the Central Arctic herd and human dependence on subsistence hunting is greater. However, oil and gas development exacerbate the adverse effects of insect harassment on caribou'loss of additional habitat, when accompanied by weather conditions that favor insect harassment, is likely to depress nutrient status (hence summer weight gain) for lactating female caribou. Depending upon the degree of nutritional stress, this could result in increased mortality of young caribou. NPR-A Planning Team, from A.S.M. 5As seen in other areas of the North Slope, even a slight displacement (a few miles) of caribou can suffice to halt growth in the herd. (3) Ensure application of Stipulation C-1 on overland moves, listed under the No Action Alternative to Alternative C to prevent disturbance of denning polar bears. Human activity along the coast and near shore has influenced the suitability of some areas for use by denning female polar bears; disturbances during denning could result in population declines (Orians et al. 2003). (4) Modify Stipulation J-2 to prohibit petroleum exploration and production activities within 4 km of an occupied grizzly bear den (identified by the ADF&G). Net effect of cumulative effects on grizzly bears of oil and gas development-related killing of bears, hunting, habitat alterations, disturbances, and climate warming are not known, but all of these factors have a negative impact on grizzly bears (Orians et al. 2003). (5) Many of the Stipulations contain wording that would allow other types of mitigation of effects from a particular activity. We feel that mitigation efforts are largely unsuccessful in arctic ecosystems and therefore are not acceptable as allowances for violating a Stipulation or other condition. (6) All Alternatives should state that the BLM requires all oil/gas lessees to participate in and fund any and all needed habitat restoration once exploration and development activities have ceased. (7) The BLM should initiate action now to designate permanent protection for at least five special areas within the NW NPR-A Planning Area, including the Colville River, Teshekpuk Lake, Kasegaluk Lagoon, Peard Bay, and Meade

River/Dease Inlet. These areas are of particular ecological importance due to their unique wildlife species and wilderness values'no oil or gas exploration or development should be contemplated in these areas. **(Comment No. 249-526)**

Response To: Comment 249-526

Please see the response to comment 251-325(Stipulations, Required Operating Procedures and Mitigations).

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

First I will say this is an oil industry plan. Alternatives A and B, 100 percent leased, 96 percent leased. Alternative C is sort of the red herring. Even it is a dramatic departure from even what the BLM did that I felt was woefully inadequate in their first lease sell in the Northeast corner of the NPRA. They have rolled back the stipulation phenomenally from 79 stipulations to for Alternative A, 10 for Alternative B, and 20 for Alternative C, and even then, they are not strict, as they were in the first plan. **(Comment No. 80082-531)**

Response To: Comment 80082-531

Please see the responses to comments 249-524 (Stipulations, Required Operating Procedures and Mitigations)and 80074-888 (Purpose of NPR-A).

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

That's a lot of conflict, and certainly we don't know all the impacts to the wildlife so far, but this new lease plan for the Northwest NPRA is extremely aggressive. It will not have -- the only red flag I see in this plan is that it is industry getting what it wants, and it's using it as a way to undo what woefully insufficient mitigation measures there were in the first plan for the Northeast NPRA. **(Comment No. 80082-537)**

Response To: Comment 80082-537

The alternatives and accompanying protective measures contained in the draft and the Preferred Alternative herein meet the standards of FLPMA and consist of appropriate actions to prevent unnecessary or undue degradation of public lands. The BLM does not believe that the mitigations we have developed are insufficient or that they are noticeably weaker than in the Northeast NPR-A Record of Decision (ROD). Please also see the response to comment 249-524 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

As Rosemary so eloquently laid out, we really need to consider the socioeconomic impacts, subsistence, you need to do wilderness reviews not just for some of the area but for all the area, and you must study all the wild and scenic rivers, not just a few. **(Comment No. 80082-546)**

Response To: Comment 80082-546

See Section IV. for an analysis of subsistence impacts and chapter III for a discussion of wilderness. See response to comment 253-344 (Legal) and Section III. for a discussion of the process.

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

And finally, I will just say that we are also very disappointed at the consideration of abandoning the kinds of stipulations that were done in the Northeast areas, which we thought were really barely minimal, and urge you strongly, for any area that is ultimately made available for leasing, that you have the strongest stipulations. **(Comment No. 80082-549)**

Response To: Comment 80082-549

Please see the responses to comments 249-524 (Stipulations, Required Operating Procedures and Mitigations) and 80074-888 (Purpose of NPRA).

Comment From: Arctic Slope Regional Corporation (Comment Letter No. 186)

Second, oil and gas development must respect our people, land, environment, fish and wildlife resources, and our Iñupiat traditional way of life. **(Comment No. 186-556)**

Response To: Comment 186-556

The BLM has taken your comments into consideration in developing the Preferred Alternative. Please see Section H Subsistence Consultation for Permitted Activities of the General Lease Stipulations and Required Operating Procedures

Comment From: Arctic Slope Regional Corporation (Comment Letter No. 186)

Similarly, granting development stipulations such as 'no surface facilities' and other limitations before exploration has even taken place seems premature and unnecessarily limiting. Once exploration has been completed and any resources identified, then reasonable decisions can be made about development via the consultative process. **(Comment No. 186-563)**

Response To: Comment 186-563

Restrictions that prohibit surface facilities such as development pads may prevent a lessee from reaching otherwise recoverable oil and gas reserves. Such a restriction takes from the value of the lease and must be a stipulated in the lease contract.

Comment From: Arctic Slope Regional Corporation (Comment Letter No. 186)

In addition, seismic camps and drill rigs now are prohibited from leaving any trash or materials on the ground when their operations have been completed. Their operations are closely monitored by the North Slope Borough and other permitting agencies. The IAP/EIS for the Planning Area should mandate the best practices that industry

has developed over time and which have shown themselves to be sufficient in protecting the environment while it should also leave open inclusion of utilization of new technology and practices that are sure to be developed in the future. **(Comment No. 186-564)**

Response To: Comment 186-564

The BLM believes that many of the ROPs identified in the Preferred Alternative are best practices that have been established by BLM, the State of Alaska, and industry. The BLM also believes that appropriate Stipulations and ROPs have been structured to allow consideration of new technology and practices.

Comment From: The North Slope Borough (Comment Letter No. 80065)

We will support full leasing, which will allow exploration across the entire area, only if we can be assured that measures restricting permanent facilities in the limited critically sensitive areas we identify will remain in place and be enforced. Our residents must have a clear understanding of what areas may ultimately see exploration and development, and what areas will remain free of permanent facilities. Industry too should have certainty with respect to what areas will be open to exploration and development, and under what conditions, and what areas will remain closed to permanent facilities. **(Comment No. 80065-572)**

Response To: Comment 80065-572

We have considered your comments in developing the Preferred Alternative.

Comment From: The North Slope Borough (Comment Letter No. 80065)

We find the Required Operating Procedure (ROP) concept as it is presented in the Draft troubling. The relationship between stipulations and ROPs is unclear. It is unclear how the stipulations and ROPs would be applied in the first and subsequent Northwest Planning Area lease sales. It is unclear how they would be applied with any uniformity to development and production operations and facilities. Neither the Borough, nor the BLM can now tell our residents, or potential lessees for that matter, the lease conditions that will be placed on industrial operations occurring in the Northwest Planning Area. Certain measures prescribe area buffers with an upper limit, but no lower limit. Certain measures use discretionary language, rather than specifying what must be done. The general lack of clarity in how, or even if, measures will be applied, and the specific lack of clarity in certain stipulations and ROPs are unacceptable. **(Comment No. 80065-580)**

Response To: Comment 80065-580

Please see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The North Slope Borough (Comment Letter No. 80065)

The Borough recommends that the concept of ROPs be eliminated in favor of more straightforward stipulations. We offer the following comments on specific proposed measures presented in the Draft IAP/EIS: **(Comment No. 80065-581)**

Response To: Comment 80065-581

Please see response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The North Slope Borough (Comment Letter No. 80065)

Stipulation A-2, Page II-17. This stipulation specifies fuel storage requirements within the planning area. For Alternatives A and B, setbacks are 100 feet from non-fish-bearing water bodies and 500 feet from fish- bearing water bodies. For Alternative C, the setback is 500 ft from all waterbodies. We recommend the stipulation language used in Alternatives A and B, with setbacks of 100 feet from non-fish-bearing waterbodies and 500 feet from fish-bearing waterbodies, be used for all alternatives, with the term 'small equipment' clarified. **(Comment No. 80065-582)**

Response To: Comment 80065-582

Please see response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

One of our most fundamental objections to the Draft EIS/IAP is the wholesale elimination from the stipulations and conditions to be placed on lessees in the Northwest NPRA of the vast majority of Stipulations and Conditions for the protection of subsistence that were made part of leases under the Record of Decision for the Northeast NPR-A IAP/EIS. Of the 79 Stipulations and Conditions placed in Northeast NPR-A leases for protection of Subsistence, 43 are eliminated from all Alternatives in the Draft Northwest NPR-A EIS/IAP and 19 are modified or weakened to varying degrees in all or some of the proposed Alternatives for the Northwest NPR-A. **(Comment No. 254-607)**

Response To: Comment 254-607

The BLM has considered your comments in developing the Preferred Alternative. Please see the response to comment 249-524 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The Service believes that Stipulations and Required Operating Procedures developed for the different Alternatives in the DEIS may not be precise enough to avoid potential impacts associated with development within the CRSA. We recommend the following for your consideration: Setbacks of at least 2 miles from the northern bluff of the river for permanent facilities and roads should be required because of the unusual concentration of nesting raptors on portions of the Colville River and the uncertainty regarding how these birds would react to disturbance within this corridor. The larger buffer also would enhance the protection of adjacent habitats used as foraging areas by raptors. **(Comment No. 260-609)**

Response To: Comment 260-609

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the

response to comment to 251-325.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The CRSA is especially vulnerable to the impacts associated with increased access to the area, because it would be an attractive destination for a variety of users and nesting raptors are susceptible to disturbance. While the DEIS assumes a development scenario without permanent road connections (roadless) to the Kuparuk Oil Field, the document recognizes the possibility of a road link to the Dalton Highway across State lands and the Colville River. In order to protect the habitats and wildlife resources within the CRSA and to minimize impacts associated with development, we recommend a roadless development scenario be identified as an element of the agency preferred alternative. Aircraft restrictions of at least 1,500 feet AGL within one-half mile of cliffs identified as raptor nesting areas from March 15 - August 5. The Service recommends the entire CRSA be designated as the Colville River Bird Conservation Area, recognizing the area as supporting the most diverse land bird community in the Alaskan Arctic. **(Comment No. 260-610)**

Response To: Comment 260-610

We have taken your comments into consideration in developing the Preferred Alternative. Please see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

BLM has taken the position that placing stipulations and conditions in the Record of Decision and as contractual terms in leases is unnecessary and is less flexible than proceeding on a case-by-case basis. Let's consider the advantages of placing such terms and conditions as contractual terms in lease. First, in no way can the lessee ever claim that it was unaware of (and was prejudiced as a result of) a requirement or a limitation on its development rights if that requirement or limitation is stated in its lease. Such a lessee cannot claim hardship because its bid on the lease must have reflected known constraints on development that the lessee was on notice would be placed in the lease. Second, while by and large the federal government is immune to suits or to claims of a taking of property rights based on restrictions imposed on development by the government in its regulatory capacity, that is not a universal rule nor one which a smart lawyer wouldn't have a good shot at getting around, given the right set of facts. Third, any party is in a stronger legal position if the lessee must seek an exception to a contractual term than if no such term exists. That is going to be as true if BLM is in court defending a position as it would be if the property owner were a private party. Fourth, as a basic tenet of human psychology, an applicant for relief from a rule or a contractual term is less likely to obtain a waiver than that same applicant seeking a permit to construct in the absence of such a rule or contractual term. BLM is made up of people, just like any other organization, and rules of human behavior apply to organizations because the decisions of those organizations are made by people. Fifth, isn't the role of a regulator to provide guidance' What guidance is provided by telling a lessee that "We'll see when you want to build. Maybe there'll be some restrictions and maybe there won't." What advantage is there to a lessee to having an unknown set of development requirements lurking out there waiting' Any commercial finds of oil and gas have to be found before they can be developed. Development of any finds in the Northwest NPR-A is 8 to 10 years away, at least. If the administration in office then has a more environmentally restrictive approach, the lessee has probably lost out on any perceived advantage which might be gained by the loosey-goosey nature of having nothing in writing. Sixth, it seems highly doubtful that those increased uncertainties encourage development, when the oil industry in Alaska is forever preaching the need for stability and known quantities to help oil companies make long-term commitments and investments. Given this level of uncertainty, an oil company would pay less for a lease with unknown development restrictions than with known ones. Seventh, if the case-by-case approach to subsistence protections is applied to a development application 8 or 10 years from now, much if not all of the institutional knowledge built up at BLM and other agencies as to the specifics of various studies, risks and environmental sensitivities as a result of the work done on this EIS will be gone, through retirement or transfer of the personnel involved or through simple loss of memory of decadeold information. It is axiomatic that much of the knowledge gained in

such work is never written down, and the conclusory nature of the analysis in many parts of the Draft EIS/IAP simply demonstrates that fact. Such conclusory analysis will be of little benefit to someone ten years from now who is trying to understand the need for protection of a particular site or population. This is a corollary of the rule mentioned above that an exception to a rule or contractual term is harder to get than gaining the identical end when there is no rule or contractual term. Eighth, with all the best will in the world, an official 10 years from now is either going to have to recreate a huge amount of work and knowledge or will simply wing it and most probably not afford adequate attention. Wouldn't it be better to take advantage of all of the work and knowledge that has been gained to distill some tentative ground rules which would be subject to waivers or exceptions upon adequate evidence, rather than to leave it all to chance or re-discovery' We couldn't say of our scientific predecessors that we stand on the shoulders of giants if they'd done their analysis but never bothered to write down more than that it was okay to proceed. The equivalent of that will happen here if no rules are drawn from this EIS/IAP and protections are left to an ad hoc approach at during a series of applications in the future. Ninth, there's certainly no administrative efficiency or convenience involved here, no savings to the federal governmnet from proceeding in this fashion. Tenth, area-wide stipulations provide the predictability of a baseline to both the oil industry and the North Slope residents. This baseline lets everyone know what the rules are. If the BLM relies primarily on site specific analysis, no one knows the rules ahead of time and greater tension and mistrust will exist between the oil industry and the Native communities. The benefit of big-picture planning will also be lost as focus is drawn to specific projects and away from impacts across an entire planning area. Eleventh, an emphasis on site specific analysis also places a heavy burden on the NPRA communities and residents to monitor every aspect of proposed future development. We sometimes feel all "meetinged out" given the number of public meetings scheduled in Nuiqsut over the last couple of years and the size of documents (such as this EIS) that we have to review. It would be nice to reach some conclusions and put some rules into place. Budgets in the NPRA communities are limited, so few organizations have the time or the staff to review and analyze proposed developments in sufficient detail to determine on a site-specific basis what interests will be impacted by proposed development. Given all these advantages of having a firm rule or contractual term, how can an ad hoc or case-by-case approach be squared with the Congressional mandate of 16 U.S.C.3112(1) that BLM is to ' cause the least adverse impact possible on rural residents who depend upon subsistence uses of the resources of such lands" (emphasis added). Clearly it' s "possible" to simply make the stipulations and conditions a matter of contract with the lessee, as was done in the Northeast NPR-A. It' s equally clear that such an approach is likely to reduce harmful impacts on subsistence uses. It will be similarly clear when comments from the Native community on the Draft EIS/IAP are analyzed that the Native community would prefer stipulations and conditions inserted in the lease to the ad hoc approach proposed by BLM. Obviously not everything that' s humanly "possible" to protect subsistence needs to be done. If that were so, there would be no development. BLM is to strike a balance, but it must be a balance within a range of reasonableness. At some point, a court would find that the balance struck by BLM on a particular term exceeded the authority granted to BLM given the stated Congressional policies. We think that the wholesale dumping of subsistence related protections that were found appropriate in the Northeast NPR-A Record of Decision is such a case. Similar cases are to be treated similarly, and we think the Northwest NPR-A is largely similar to and should be treated like the Northeast NPR-A was.
(Comment No. 254-611)

Response To: Comment 254-611

Stipulations and conditions are an integral part of BLM's alternatives. While we have tried to rethink what we consider is best addressed as a lease stipulation and what is more effectively addressed as a required operating procedure (ROP), we do recognize that both need to be documented in the Record of Decision. Subsequently, lease stipulations will be included as contractual terms of the lease, and ROP's will be requirements that need to be addressed as part of (or prior to) any permit proposal. The ROP's will apply to all applicants, whether a lessee or not. At the same time, BLM does wish to build into these stipulations and ROP's a degree of flexibility to allow new information, new technology, and new uses of existing technology to be considered. BLM seeks to avoid a situation where exceptions are required as a result of better information or newer technology. We have attempted to address this situation in the Preferred Alternative by stating the objective for each stipulation and ROP and, where appropriate, by establishing standards and requirements that allow a degree of flexibility. These flexible or performance based standards and requirements can be tailored or modified on a case by case basis to meet the objective without being unnecessarily restrictive. The ROP's for the Brant Survey and Caribou Study areas are two examples.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

We strongly believe that those Northeast NPR-A Stipulations and Conditions strike a sound, reasoned balance and should generally be applied in the Northwest NPR-A, as well. **(Comment No. 254-615)**

Response To: Comment 254-615

The BLM believes the Stipulations and ROP's in the Northwest NPR-A Preferred Alternative represent a sound and reasoned approach. Please also see the response to comment 249-524 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Cabins and camp sites also require the protection of a development buffer stipulation. Typically these cabins and campsites have been used for generations and occupy a specific site because the fishing is superior to other locations or because caribou frequent the area. In either case, an industrial facility in close proximity can destroy the very reason for the cabin or camp site' s existance, essentially destroying its value. Permanent oil and gas improvements should not be allowed within a mile of these cabins and campsites. Such a stipulation could be subject to exception after consultation with the nearest North Slope community and written consent from the family or families who regularly occupy the cabin or camp site. Because exploratory activities such as drilling and seismic surveys make changes, at least temporarily, to the tundra and exploratory drilling leaves behind a well head, such activities should not be allowed in the immediate vicinity (1/4 of a mile) of cabins or camp sites either. This stipulation, too, could be subject to the same exception procedure. **(Comment No. 254-624)**

Response To: Comment 254-624

The BLM has considered your comments in developing the Preferred Alternative; please see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures for the Preferred Alternative.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Other areas of high valued habitat also deserve the protection of a development buffer. Lakes deeper than 7 feet and waterbird nesting and brooding habitat are of significant concern and should be protected by a ½ mile, No Permanent Improvement buffer zone. Grizzly bear dens are also of concern and should be protected by a ½ mile "No Surface Activity" buffer zone. **(Comment No. 254-625)**

Response To: Comment 254-625

The BLM has considered your comments in developing the Preferred Alternative. See specifically Required Operating Procedures B-2, C-1, E-11 and Stipulation K-2 in Section II.C.6 of the Final IAP/EIS. Also, please see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

When road-supported facilities are environmentally preferable to roadless facilities, we want the BLM to require that a lessee who proposes to build a pipeline running parallel to a road to show that this is environmentally preferable over burying the pipeline in the road or to separate the road and the pipeline by at least 500 feet. **(Comment No. 254-627)**

Response To: Comment 254-627

The BLM has considered your comments in developing the Preferred Alternative. See specifically, Required Operating Procedure E-7 in Section II.C.6 of the Final IAP/EIS. Also see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Where aboveground pipelines are environmentally preferable to burying pipelines inside roads or the tundra, a stipulation should require that such pipelines be raised a minimum of 8 feet above the tundra. **(Comment No. 254-628)**

Response To: Comment 254-628

The BLM has considered your comments in developing the Preferred Alternative. See specifically, Required Operating Procedure E-7 in Section II.C.6 of the Final IAP/EIS. Also see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

It is also important to keep the roads and pipelines in the Northwest NPR-A Planning Area and outside this Planning Area to a minimum. Less infrastructure should equate to less impact. **(Comment No. 254-629)**

Response To: Comment 254-629

The BLM has considered your comments in developing the Preferred Alternative. See specifically Required Operating Procedure E-7 in Section II.C.6 of the Final IAP/EIS. Also see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Stipulations on where facilities and infrastructure may be located and how facilities and infrastructure may be built and used need to be augmented with stipulations preserving our movement and subsistence activities in and around oil and gas infrastructure and ensuring that the communities are kept apprised of oil industry activities. The Draft EIS/IAP recognizes this and concludes that 'without some mechanism to ensure subsistence hunters ongoing access to and through development areas and a protocol for defining 'no fire' zones around development sites, the overall ability to reach subsistence-harvest areas by local subsistence hunters would potentially be restricted. Such mechanisms are necessary in order to cause the "least adverse impact possible" on rural residents who rely on subsistence. Yet, the BLM has not proposed such mechanisms in the Draft EIS/IAP. **(Comment No. 254-634)**

Response To: Comment 254-634

The BLM has considered your comments in developing the Preferred Alternative; see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The DEIS identifies the oil and gas potential for the area south of Peard Bay as low. The Service recommends the area be recognized as a Special Area for its high wildlife value. We further recommend Stipulations that would require setbacks of at least one-half mile for permanent structures and roads from known nesting colonies and brood-rearing areas. The estuaries and coastline of Peard Bay would also require a one-half mile setback for permanent development, with no permanent structures in the nearshore waters. **(Comment No. 260-636)**

Response To: Comment 260-636

The BLM is aware of the area's resource values and has taken them and your comments into consideration in developing the Preferred Alternative. Please also see the responses to comments 213-202 (Special Designation Areas) and 213-232 (Alternatives General).

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The Service recommends that the wetlands associated with Dease Inlet and Meade River be identified as a Special Area because of its unique habitats and high nesting densities of waterbirds. At a minimum, Stipulations and ROPs equivalent to what is proposed in Alternative C would be appropriate for this area. **(Comment No. 260-640)**

Response To: Comment 260-640

The BLM is aware of the area's resource values and has taken them and your comments into consideration in developing the Preferred Alternative. Please also see the responses to comments 213-202 (Special Designation Areas) and 213-232 (Alternatives General).

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

Currently the proposed Northwest Planning Area dramatically rolls back lease stipulations addressing environment mitigation measures compared with Secretary Babbitt's plan for Northeast NPR-A. Indeed, the Northwest Plan has slashed the requirements. BLM proposes anywhere from 20 to nine lease stipulations in the Northwest Area compared with 79 in the '98 Final Decision for the Northeast NPR-A. Some examples of the rollbacks that are in the draft include no prohibition during exploration of permanent gravel roads, pads and airports, no prohibition on winter water withdrawals from rivers and streams, no requirement for annual spill drills, and no specific caribou mitigation measures. That's only a sampling of the stipulations that were left out in this Draft Plan. Sierra Club opposes these rollbacks of environmental safeguards and we urge the BLM to include the full compliment of mitigation measures in the final decision. **(Comment No. 80073-1005)**

Response To: Comment 80073-1005

Please see the response to 249-524 (Stipulations, Required Operating Procedures and Mitigations) regarding Northwest and Northeast Lease mitigations.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

In addition, under both Alternatives, Kasegaluk Lagoon would be unavailable for oil and gas lease sales. The Service endorses the designation and the no-lease Stipulation because of the area's importance for migratory birds. Kasegaluk Lagoon and its associated wetlands are areas of high bird concentration and diversity, providing critically important habitats for specific species of waterfowl and shorebirds (Johnson et al. 1993). The lagoon also is seasonally important for molting and fall-staging waterfowl, particularly brant. The villages of Point Lay and Wainwright also use the area extensively for subsistence activities. **(Comment No. 260-642)**

Response To: Comment 260-642

The BLM is aware of the area's resource values and has taken them and your comments into consideration in developing the Preferred Alternative. Please also see responses to comments 213-217 (Special Designation Areas) and 213-232 (Alternatives General).

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

In order to protect these areas and minimize disturbance to nesting and brood-rearing spectacled and Steller's eiders, the Service recommends Stipulations and ROPs be developed to protect these critical areas. Based on our experience and observations, we believe that to avoid significant impacts to high density nesting and brood-rearing areas they should be protected with minimum one-half mile setbacks for permanent structures. The estuaries and coastlines of Peard Bay and Dease Inlet should be buffered as well with one-half mile setbacks for permanent facilities. **(Comment No. 260-647)**

Response To: Comment 260-647

We have taken your comments into consideration in developing the Preferred Alternative. See specifically Required Operation Procedure E-11 and Stipulations K-3 and K-6. Also, please see the responses to comments 251-325 (Stipulations, Required Operating Procedures and Mitigations) and 213-232 (Alternatives General).

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The Service has questions relative to the Stipulations and ROPs associated with the various DEIS Alternatives. We believe that the DEIS could be improved by more clearly defining the Stipulations and ROPs, by identifying the application criteria to be used for determining where and when they will be applied, and finally specifying the circumstances when exceptions to the stipulations and ROPs will be authorized. If these additions were made, the Service believes that the apparent contradictions in the DEIS regarding how the Stipulations and ROPs would be applied to additional lease-sales and subsequent permit in the Northwest Planning Area would be resolved. In certain cases, we have specific concerns regarding the language of some Stipulations such as those that identify measures indicating a maximum distance (e.g., a buffer zone) without specifying any minimum setback distance. We believe that any Stipulation or ROP should be defined in terms of minimum requirements. It is our position that the oil and gas industry and other users need to know, prior to leasing, the minimum extent of buffers and

other protective measures they will be expected to employ. Without a clear explanation of how the Stipulations and ROPs are defined and applied to exploration and development activities, it is difficult to assess the Alternatives and determine their impacts on the resources of the Northwest Planning Area. **(Comment No. 260-648)**

Response To: Comment 260-648

A better explanation of Stipulations and Required Operating Procedures has been added in the text. Please also see the responses to comments 251-136 (Management), 251-137 (Management), and 251-139 (Stipulations, Required Operating Procedures and Mitigation and 249-524 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Our experience leads to one conclusion, the consultation stipulation needs to be strengthened, not weakened. This becomes even more critical in the Northwest NPR-A Planning Area, where there are more communities and more people potentially affected. BLM is, in effect, sponsoring these oil industry activities and needs to take a more pro-active role in ensuring that consultation occurs. Before approving any activities in the NPR-A, the BLM should ask itself - has consultation occurred with all communities that may be affected. If the answer is no, the activities should not be allowed to go forward.56 Finally, any consultation process should require lessees to give the BLM notice of any concerns expressed by subsistence users during operations. This way, BLM will be kept informed of any problems arising in the field and BLM can monitor whether oil and gas operations in the NPR-A are consistent with Congress's protection of our subsistence activities. **(Comment No. 254-653)**

Response To: Comment 254-653

Please see the response to comment 254-652 (Monitoring for Compliance).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

We think that a requirement for active BLM involvement in the consultation process is implicit in the Northeastern NPRA planning area stipulations. If this implicit requirement is not clear enough or if BLM proposes not to apply those stipulations in the Northwest NPR-A or to change or delete the relevant stipulations, Congress has clearly given the BLM the task of assuring that our subsistence way of life is not adversely impacted, which is the whole point of consultation. See, e.g, 16 U.S.C. 3112. **(Comment No. 254-654)**

Response To: Comment 254-654

Please see the response to comment 254-652 (Monitoring for Compliance).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

While we believe that industry will continue to use ice based exploration in the Northwestern NPRA we would like to see a stipulation prohibiting the placement of new gravel to support exploration activities. We are not opposed to the use or improvement of already existing gravel pads as summer staging areas for winter exploration. **(Comment No. 254-655)**

Response To: Comment 254-655

Please see Stipulation D-2 in the Preferred Alternative.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

We strongly recommend that the Subsistence Representative program or something like it be adopted as a Stipulation to be incorporated in all leases. The Subsistence Representative would come from the community in whose subsistence range the activity was located. **(Comment No. 254-656)**

Response To: Comment 254-656

The BLM has considered your comments in developing the Preferred Alternative; see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures. Also, please see response to comment 254-652 (Monitoring for Compliance).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

It is critical to make sure that winter tundra travel does not begin before the tundra is sufficiently frozen and covered with snow. At the same time, BLM should be sensitive to differences among types of equipment which result in different levels of impact. Some equipment may be capable of starting tundra travel before others. In addition, BLM should be open to solid proof of the acceptability of alternate approaches to determining when tundra travel is safe for particular types of equipment, as well as to technological changes and improvements to equipment itself. **(Comment No. 254-658)**

Response To: Comment 254-658

The BLM has considered your comments in developing the Preferred Alternative; please see Required Operating Procedure C-2, as well as the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Operators and their contractors should be encouraged to use state-of-the-art equipment. Similarly, they should be actively discouraged from using metal-tracked vehicles such as bulldozers or from using older more damaging operational techniques, such as turning tracked vehicles by locking one track. Equipment in the seismic industry has upgraded substantially in recent years with lighter and rubber-tracked vehicles. We want to see old practices such as use of metal-tracked bulldozers ended. The two prior winter seismic seasons (2000-01 and 2001-02) saw a series of incidents of major tundra damage, all or almost all of which involved bulldozers and poor operating practices. **(Comment No. 254-659)**

Response To: Comment 254-659

The BLM has considered your comments in developing the Preferred Alternative; please see Required Operating Procedure C-2, as well as the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Sound management of the NPRA requires annual spill-response refresher training for local responders and annual spill-response field-deployment drills. **(Comment No. 254-665)**

Response To: Comment 254-665

The Oil and Gas industry is required to present an Oil Spill Response Plan (OSRP) at the time of application for permit to develop. The OSR training should be a component of the OSRP, or the training would become the subject of a (requirement) mitigation of the permit.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

In fact, to protect against possible contamination of water, the BLM should adopt stipulations in the Northwestern NPRA requiring that all fuel be stored at least 500 feet from any waterbody with the exception of small caches. The refueling of equipment (except motor boats, and float or ski planes) within 500 feet of the highest watermark of any waterbody should also be prohibited. **(Comment No. 254-666)**

Response To: Comment 254-666

The BLM has considered your comments in developing the Preferred Alternative; please see Required Operating Procedures A-5 and E-2, as well as the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Stipulations requiring lessees to continue to look for ways to reduce waste generated at facilities and to find new ways to prevent spills before they happen give industry an incentive to continue advancing, and should be adopted in the Northwestern NPRA management plan. **(Comment No. 254-667)**

Response To: Comment 254-667

The BLM has considered your comments in developing the Preferred Alternative; please also see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: Olgoonik Corporation (Comment Letter No. 169)

That the cabins be protected whether they are in native allotments or as squatters on BLM lands. That there is accessibility to and from the cabin as well as the surrounding area of the campsites. **(Comment No. 169-696)**

Response To: Comment 169-696

The BLM has made no distinction between authorized or unauthorized cabins and campsites in its consultation requirements; see section H "Subsistence Consultation for Permitted Activities" in the "Lease Stipulations and Required Operating Procedures."

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Additionally, we suggest changes to the following Stipulations and ROPs for Alternative B: ROP C-1f (page II-21): This ROP states that motorized traffic will be minimized within 1 mile of any raptor nest and may be prohibited within one-half mile of any raptor nest. The Service suggests that the ROP be revised to prohibit vehicular traffic within one-half mile of raptor nests sites from March 15 to August 15. Stipulation D-1 (page II-22): This Stipulation is the same for Alternative A and B. The Stipulation apparently restricts exploratory drilling in shallow lakes, streams, lake beds, and the active flood-plain unless the applicant can demonstrate that impacts to fish, wildlife, vegetation, and hydrology would be minimal. As written, this Stipulation does not offer specific protection to aquatic resources, as there is no definition of what minimal implies. In addition, the selection of water bodies is ambiguous and illdefined. Criteria need to be defined for the terms shallow lake, lake bed, and stream. It is unclear whether deep lakes and rivers are afforded any protection under this Stipulation. We suggest that the Stipulation be re-written to clearly define the resources involved and offer explicit protection, similar to the same Stipulation for Alternative C. Stipulation D-2 (page II-22): There is no Stipulation D-2 for Alternative B as there is for Alternative C. This Stipulation would prohibit permanent roads and airstrips to be constructed for oil and gas exploration in the planning area. The standard on adjacent State and Federal land prohibits permanent roads for exploration activities. Even if climate warming continues in the Arctic, further reducing the window for winter tundra travel, other options exist for exploratory activities (e.g., the Anadarko Arctic platform and changes in access technology). The Service believes Stipulation D-2 should be a part of any development Alternative. Stipulation E-1 (a - v) (pages II-22-26): This Stipulation identifies specific areas within the planning area which contain subsistence, wildlife habitat, and cultural/paleontological resources that may be protected if and when development occurs. The Stipulation offers little protection from exploration activities and provides no guarantee that protection would be forthcoming prior to development. The Stipulation gives maximum distances (e.g., up to one-half mile) that could be provided rather than minimum distances. Meaningful protective measures need to be presented as minimums for the benefit of lessees and subsistence users; both understandably interested in the minimum effort that will be required for resource protection. The Service recommends that minimum distances be applied (similar to Alternative C) and that exceptions be assessed and potentially granted on a case-by-case basis prior to development. Meaningful set-backs are particularly important for the raptor nesting areas of the Colville and Ikpikpuk rivers and for coastal bays and lagoons. ROP E-5 (page II-27): This ROP is the same for Alternatives A and B and states that pipelines and roads shall be designed to facilitate caribou and subsistence-user passage. As written, this ROP is too vague and does not establish a minimum pipe height or pipe-road separation. The Service believes that this ROP should be replaced, at a minimum, with the ROP for Alternative C, which establishes a 5 foot minimum pipe height and 500 foot pipe-road separation. These standards have been crafted and based on a significant body of research, largely accomplished in the adjacent Kuparuk Oilfield. We see no reason for changing these standards on Federal land, except for the possibility of increasing the pipe height to 7 feet based on recent concerns expressed by Nuiqsut residents. These concerns include the potential for pipeline clearance to be diminished by snow drifts during the winter and spring seasons. In fact, the Teshekpuk Lake Caribou Herd frequently spends a significant portion of the winter in the NPR-A. ROP E-6 (page II- 28): This ROP is the same for Alternatives A and B and states that permanent facilities within 500 feet of shallow lakes, streams, lake beds, estuaries, and active floodplains shall only be approved if minimal impacts to fish, wildlife, vegetation, and the hydrologic condition can be demonstrated by the applicant. As is, this ROP is similar to D-1 and provides little explicit guidance for protecting aquatic resources. The wording of this ROP requires further definition, or the ROP should simply be replaced by Stipulation E-3 found in Alternative C. ROP E-8 (page II-28): This ROP should be replaced with Stipulation E-5 found in Alternative C. The placement of docks and causeways should be restricted in deltas and estuaries and would be regardless under Stipulation E-1v for Alternative B. We believe that the addition of a required monitoring program to determine water quality and fish passage, as required by Stipulation E-5, should be attached to any dock or causeway construction within the planning area. ROP F-1

(page II-29): This ROP is the same for Alternatives A and B and states that aircraft operation shall be conducted in a manner that will minimize impacts to wildlife and birds. The ROP does not establish minimum heights or timing windows and therefore is not enforceable. The Service believes that this ROP should be replaced with ROP F-1 and Stipulations F-1 and F-2 as found under Alternative C. Stipulation J-1 (page II-31): This Stipulation is the same for Alternatives A and B. As written, it does not establish minimum distances from raptor nests for development and is therefore unenforceable. The Service believes that replacing the Stipulation with Stipulation J-1 as it exists under Alternative C, would establish minimum distances for developments from raptor nests within the Colville River Special Area. **(Comment No. 260-697)**

Response To: Comment 260-697

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: Olgoonik Corporation (Comment Letter No. 169)

That leasing should not be done prior to finalizing the Vietnam Veterans selections for native allotments and that the current pending allotments and corporate land be finalized. **(Comment No. 169-700)**

Response To: Comment 169-700

The deadline for applications for Vietnam Veterans applications for Native allotments has already passed. Applicants were allowed to select lands within the NPR-A; however, most applications have not been adjudicated. The locations of all approved allotments and pending allotment applications are shown on master title plats and other BLM-maintained records. Completion of Native corporation land selections is underway. One alternative in the EIS proposes withholding leasing until Native land selections are finalized. BLM will make a final decision on this issue in the ROD.

Comment From: Olgoonik Corporation (Comment Letter No. 169)

That all community travels routes accesses are protected whether they are winter or summer routes. **(Comment No. 169-702)**

Response To: Comment 169-702

The Alaska National Interest Lands Conservation Act states that the Secretary (of the Interior) shall ensure rural residents engaged in subsistence activities reasonable access to subsistence resources on the public lands. The BLM has interpreted this to include customary and traditional travel between local communities.

Comment From: Olgoonik Corporation (Comment Letter No. 169)

That the minimum pipeline height be 7 feet and that there is dull finish to them. **(Comment No. 169-703)**

Response To: Comment 169-703

We have taken your comments into consideration in developing the Preferred Alternative.

Comment From: Olgoonik Corporation (Comment Letter No. 169)

That there be no permanent facilities (BLM; 'No surface occupancy' (NSO) designation) in heavy insect relief areas near Peered Bay, Pingosukruk to Pt. Belcher area. (see attached map with identified areas for specified setback) **(Comment No. 169-704)**

Response To: Comment 169-704

We have taken your comments into consideration in developing the Preferred Alternative.

Comment From: Olgoonik Corporation (Comment Letter No. 169)

The consensus was that there be a 3 mile setback on the Kuk River drainage, a heavily used subsistence area as well as associated drainage's as well as the Kokolik River to about 50 miles upriver. (see attached map with identified areas for specified setback) **(Comment No. 169-705)**

Response To: Comment 169-705

Under the Preferred Alternative, oil and gas leasing will be deferred in that area for 10 years. Prior to the deferred lease offerings, appropriate protections, including no-surface-occupancy stipulations, will be considered using new information and analysis.

Comment From: Olgoonik Corporation (Comment Letter No. 169)

No surface occupancy around the Kasegaluk lagoon extending from Wainwright to the NPRA border. This is a very high-use subsistance area for the village during the summer where caribou, seals, waterfowl, fish and beluga. **(Comment No. 169-706)**

Response To: Comment 169-706

Under the Preferred Alternative, oil and gas leasing will be deferred in that area for 10 years. Prior to the deferred lease offerings, appropriate protections, including no-surface-occupancy stipulations, will be considered using new information and analysis.

Comment From: Olgoonik Corporation (Comment Letter No. 169)

That there be no restrictions for local people in surface facilities. In the event that a subsister is in need of help whether their means of transportation is broken down and/or they have an accident. **(Comment No. 169-707)**

Response To: Comment 169-707

The BLM would be happy to assist the Olgoonik Corporation in negotiating an agreement with potential lessees concerning the protocols for helping subsistence hunters in need of assistance due to accidents or mechanical breakdowns. The issue of hunting access near surface oil facilities was raised during discussions for the NPR-A Northeast EIS/IAP and still needs clarification. We have taken your comments into consideration in developing the Preferred Alternative, see section H "Subsistence Consultation for Permitted Activities" in the "Lease Stipulations and Required Operating Procedures." Please also see the response to comment 254-612 (Subsistence).

Comment From: Olgoonik Corporation (Comment Letter No. 169)

All fish bearing lakes have the ½ set back. **(Comment No. 169-709)**

Response To: Comment 169-709

We have taken your comments into consideration in developing the Preferred Alternative

Comment From: Olgoonik Corporation (Comment Letter No. 169)

All petroleum companies should contact the affected communities regularly. **(Comment No. 169-710)**

Response To: Comment 169-710

We have taken your comments into consideration in developing the Preferred Alternative; see section H "Subsistence Consultation for Permitted Activities" in the "Lease Stipulations and Required Operating Procedures."

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Nothing in the scientific data suggests that these alternatives and the prescriptive restrictions contained in the stipulations in an 'excluded' area will provide any greater benefit than the operational restrictions proposed in a protective stipulation that still allows access to the area. Within the broad areas identified by these alternatives as potential set asides, there are always many unused areas and low use habitat that could be developed in an environmentally sound manner. CPAI has scientific data from studies designed in consultation with state and federal agencies tha t demonstrate we can operate in sensitive areas without adversely impacting the wildlife using the habitat. Moreover, some of the DEIS proposed stipulations were not designed to address "small footprint" fields like Alpine or those being proposed in the Alpine Satellite Development EIS currently underway. **(Comment No. 255-744)**

Response To: Comment 255-744

The Preferred Alternative (PA) does not have any areas that would be unavailable for leasing; however, the PA does provide protective measures by deferring oil and gas leasing for 10 years in the Kasegaluk Lagoon to Peard Bay area. Prior to the lease offerings, appropriate protections, including a no-surface-occupancy stipulation, will be imposed. Additionally, the Preferred Alternative recommends that the Kasegaluk Lagoon and adjacent lands be

designated a special area. Development of the Stipulations and ROP's was done with consideration of "small footprint" fields like Alpine.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

The territorial exclusion also prohibits future exploration and development when newer technology will be available. **(Comment No. 255-746)**

Response To: Comment 255-746

All areas in the Northwest NPR-A Planning Area would be made available for leasing under the Preferred Alternative.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

The stipulation should recognize and allow storage and operations at areas closer than the stated distances that are properly designed to account for specific hydrologic conditions. **(Comment No. 255-753)**

Response To: Comment 255-753

Fuel storage stipulations in the Preferred Alternative have been revised to be in agreement with Alaska Department of Natural Resources (ADNR) and Alaska Department of Fish and Game (ADF&G) regulations.

Comment From: City and Native Village of Nuiqsut (Comment Letter No. 80026)

NPR-A Northeast Stipulations: All stipulations contained in the Northeast NPR-A IAP/EIS should also be incorporated into the Northwest IAP/EIS as a matter of continuity and environmental protection. Additionally, our City and Tribal governments need to be involved in the design of subsistence stipulations. BLM should utilize the local Subsistence Oversight Panel to make determinations, however the whole community should be involved in consultations and the utilization of traditional/local knowledge needs to be a priority. **(Comment No. 80026-1017)**

Response To: Comment 80026-1017

Please see responses to comments 213-208 (Research and Monitoring Team), 254-614 (Possible Northeast Amendment), 80077-946 (Government to Government). See also the General Lease Stipulations and Required Operating Procedures for the Preferred Alternative, specifically Required Operating Procedures H-1 and H-2.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Stipulation B-1 is silent on the use of ice chips from lakes less than 7 feet deep. We request this stipulation be clarified to allow the use of ice chips from naturally grounded sections of all lakes regardless of water depth. **(Comment No. 255-770)**

Response To: Comment 255-770

The stipulations for ice chip removal (Section II.C.5) have been revised for the Preferred Alternative to be in agreement with ADNR and ADF&G regulations.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

During this winter season, ground operations (winter tundra travel) are allowed only when frost and snow cover are sufficient such that the tundra meets protective objectives. Although ROP C-1 clarifies this somewhat, it is not exactly clear what vehicles would be allowed on the tundra once winter season ground operations are allowed under Stipulation C-1. However, ROP C-1 would restrict use to low-ground-pressure vehicles, such as rolligons and a limited use of tractors equipped with wide tracks or 'shoes'. It would not allow other standard equipment that is typically used on ice roads and ice pads. **(Comment No. 255-772)**

Response To: Comment 255-772

The Preferred Alternative discusses in detail the protective provisions developed for ground operations during the winter. See specifically Section II.C.6.c, Stipulation C-2. Also, please see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Both ROP C-1 and Stipulation C-1 should be clarified to make sure the intent was to allow for the use of this equipment on ice roads and pads. **(Comment No. 255-773)**

Response To: Comment 255-773

We have taken your comment into consideration in developing the Preferred Alternative. Please see the responses to comments 251-325 (Stipulations, Required Operating Procedures and Mitigations),and 255-770 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Stipulation C-1 and ROP C-1 also apply only during the winter season. As such, it is unclear what stipulations, if any, address tundra travel outside the winter season. **(Comment No. 255-775)**

Response To: Comment 255-775

Recreational as well as commercial tundra travel outside the winter season is not allowed.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

From our conversations with BLM, we have been told that the intent of the DEIS is not to disallow summer tundra travel OHV use in a manner consistent with that of the State of Alaska. CPAI requests that a specific stipulation be included if necessary to clarify such use. **(Comment No. 255-777)**

Response To: Comment 255-777

The Preferred Alternative does not allow non-recreational summer tundra travel except as may be authorized on a case-by-case basis by the Authorized Officer. Recreational use of OHV's is limited to winter use of snow machines and other low ground-pressure vehicles and no summer recreational use of motorized vehicles. Subsistence use of all-terrain vehicles (ATV's) is not restricted except that summer use of airboats would be limited to streams, lakes and estuaries that are seasonably accessible by motorboats. Airboat use would be prohibited in seasonally flooded tundra and shallow waters with wetland vegetation adjacent to streams, lakes and estuaries.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

ROP C-1.c ' as discussed in our comments on Stipulation C-1, once winter tundra travel is opened, use should not be restricted to only low- ground pressure vehicles. **(Comment No. 255-779)**

Response To: Comment 255-779

Please see response to comment 255-772 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: WesternGeco (Comment Letter No. 215)

In regard to Stipulation A-3, the floodplain in the NPR-A is quite large and not well mapped. WesternGeco already bases refueling stations at distances greater than 500 feet from water bodies. This year however, the BLM recommended that we set back a distance of 200'. To comply with the floodplain criterion, we would need to obtain floodplain maps from the BLM. In some areas the floodplain may be so extensive as to exclude seismic operations. In this case, WesternGeco would like to have the option to apply for an exemption from the AO. **(Comment No. 215-780)**

Response To: Comment 215-780

We have taken your comments into consideration in developing the Preferred Alternative. The option to request an exception is available to any applicant.

Comment From: WesternGeco (Comment Letter No. 215)

"the applicant shall make every reasonable effort, including such mechanisms as a conflict avoidance agreement and mitigating, to ensure'.' The majority of seismic operations occur during the winter months and not during the annual subsistence harvest. Conflict avoidance agreements and mitigation measures are generally applicable during specific time periods corresponding to the traditional seasonal harvest. Stipulation H-1 should be applied only a time period extending from May 15 to October 1. **(Comment No. 215-781)**

Response To: Comment 215-781

Subsistence activities are not limited to the period between May 15 and October 1. Accordingly, consultation requirements are not seasonal.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

ROP C-1.d ' the second sentence should delete the reference 'for use by rolligons'. Ice roads and hardened snow trails can be used by many vehicles, not just rolligons. **(Comment No. 255-782)**

Response To: Comment 255-782

Please see response to comment 255-772 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

ROP C-1.e ' this stipulation is not clear as currently written. It states that the use of bulldozers is prohibited but then allows the clearing of snow for some activities such as seismic lines. The ROP implies that the use of bulldozers is approved for snow removal to the extent that the tundra mat is not disturbed. It needs to be clarified that bulldozers can be used for snow removal as long as the tundra mat is not disturbed. **(Comment No. 255-784)**

Response To: Comment 255-784

Please see response to comment 255-772 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

ROP C-1.f ' applicability needs to be clarified. The entire ROP C-1 is designated for the winter season. However, ROP C-1.f includes dates that extend out to August 15, 2003, well beyond the winter season. **(Comment No. 255-787)**

Response To: Comment 255-787

Please see response to comment 255-772 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

As a result, CPAI believes this stipulation should be an ROP to be taken into account when looking at a specific project and the potential impacts resulting from that project. **(Comment No. 255-789)**

Response To: Comment 255-789

We have taken your comment into consideration in developing the Preferred Alternative. Please see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: City and Native Village of Nuiqsut (Comment Letter No. 80026)

River, Stream and Lake Set-Backs: Stipulation E-1 provides for various setback widths for named rivers, streams and lakes. Most of the setbacks are ½ mile in width, except for the 2-mile setback on the northern bluff or bank of the Colville River. The Preferred Alternative selected for Northeast NPR-A development should include setback widths of no less than 3 mile(s) for all rivers, stream and lakes. Wider setbacks are imperative in protecting our subsistence resources. **(Comment No. 80026-1019)**

Response To: Comment 80026-1019

We have taken your comments into consideration in developing the Preferred Alternative. Please see the General Lease Stipulations and Required Operating Procedures for the Preferred Alternative, specifically Required Operating Procedure B-1 and Stipulations E-2, E-3, and K-1.

Comment From: Tom Cade (Comment Letter No. 171)

I am concerned that there may be impending decisions within BLM, or in the Department of the Interior, to relax considerably the well-conceived stipulations and required operating procedures that were approved in Interior's Record of Decision for the Northeast Planning Area in 1998. As I indicated in my letter to you in September of 1998, the preferred alternative and associated stipulations adopted at that time struck 'a reasonable'if not visionary'balance between the interests of conservation and development.' There should be no retreat from those high standards. The proposed strategy to defer detailed environmental studies of potential impacts to the time when permits for actual work are being processed instead of doing them prior to the leasing process, as was the case for the Northeast Planning Area, may be convenient for the industry and BLM, or for some high level political agenda, but it certainly does not augur well for the most effective conservation of surface values and renewable natural resources that would be impacted by development. **(Comment No. 171-838)**

Response To: Comment 171-838

Please see the responses to comments 251-136 (Management) and 249-524 (Stipulations, Required Operating Procedures, and Mitigations).

Comment From: Michael North (Comment Letter No. 80003)

Third, I would hope that the federal government would implement appropriate levels of mitigation, following the U.S. Fish and Wildlife Service's step-down mitigation policy of avoidance, minimization, rectification, reduction, compensation. I shall comment on these one at a time. Avoidance: 1) Oilfield support facilities and lease areas must be located such that aircraft overflights do not cross over the core molting areas of the Teshekpuk Lake Special Area. 2)The core yellow-billed loon breeding areas on the Meade, Chipp and Ikpikpuk Rivers must be removed from any consideration of leasing. Minimization: 1)Smaller lease areas should be approved rather than larger lease areas, and the leased areas should form compact aggregations rather than be spread throughout the NPR-A. This approach would hold in reserve some areas where wildlife populations would not be disturbed, areas that would be analogous to refuges or to "sources" in "source-sink" theory. Rectification: 1) the federal

government should set an absolute cap on the amount of area that can be covered by gravel for roads, drill pads, pipelines, etc. at any one time, and any new future leases would thus have to be tied in with removal of gravel from abandoned facilities. This approach would link all of the North Slope oilfields into a consolidated national planning effort, as gravel pads and roads in the Prudhoe Bay area would become obsolete sooner than new facilities in the NPR-A. Reduction: 1) As gravel pads and roads become obsolete, they need to be removed irrespective of any cap on the amount of area allowed to be developed on the North Slope. Compensation: 1)When there was a concerted effort and considerable likelihood in 1991 that Arctic NWR was going to be opened up for development, there was a rider known as the Jones Amendment that would have established the Teshekpuk-Utokok Uplands NWR in the NPR-A as compensatory mitigation. **(Comment No. 80003-850)**

Response To: Comment 80003-850

We have taken your comments into consideration in developing the Preferred Alternative. We have also responded to several issues mentioned in this paragraph of your comment. • Avoidance. The location of support facilities is not the only sole means of avoidance. Standard flight paths may be established by the lease holder to comply with avoidance concerns in those areas of the Special Area that require avoidance treatment. It is important to note that exploration of the 1940's through 1980's had no such restrictions and the breeding grounds still exist. • Avoidance. It is not necessary to delete areas from leasing to avoid areas of concern and protect resources. Resources of concern can be protected by measures required in lease stipulations, requirements attached to permits, and through Notices to Lessees that requiring such measures to be incorporated into lessees' plans. • Minimization. Maximum lease tract size is governed by law, for NPR-A it is set at 60,000 acres. The BLM policy sets the tract size limit generally at 1 township, 20,000 acres. These sizes are based on economic concerns in that a lease tract must be a size that makes ownership and opportunity of discovery worthwhile in an area of high cost and high risk. The odds of finding small fields decreases as the tract size becomes smaller and administrative costs increase. The offering of leases does not necessarily equate to development, only the possibility of exploration. Intense development is likely to occur on a very small number of leases. In a realistic development scenario, one would see a range of development from intense (production facility) to an abandoned exploration well to no activity at all across all leases offered. The BLM is directed by legislation to offer leases. There is no legal authority for the creation of "refuges" within the reserve. Although oil and gas reservoirs occur along geologic trends, it is only possible to determine areas of potential accumulations until drilling and testing proves whether or not hydrocarbons are present. • Rectification Once a field is discovered and delineated, both environmental and economic considerations dictate a minimum of facilities to attain maximum ultimate recovery of the hydrocarbons. • Reduction. The removal of gravel and other re-use options will be consider at the site specific level. A planning effort like as the author proposes would only work after the oil and gas field locations and quantities are known. • Compensation. Wilderness review in NPR-A is an area of uncertain law. Until recently BLM took the phrase from the Interior Appropriations Act of December 1980, "...the provisions of section 202 and section 603 of the Federal Lands Policy and Management Act of 1976 (90 Stat. 2743) shall not be applicable to the Reserve..." to mean that BLM had no authority to evaluate and recommend areas with wilderness characteristics in the NPR-A. Section 603 is the BLM's implementation of the Wilderness Act. Recent interpretations appear muddled at this time. • Compensation. Federal law requires that the State in allocating its 50 percent share of sales, rentals, and bonus royalties from any leasing in the NPR-A, give "priority to use by subdivisions of the State most directly or severely impacted by development of oil and gas" in the Reserve (P.L. 96-514). Under the law (AS 37.05.530), funds the State receives from leasing on the NPR-A are placed in the NPR-A Special Revenue Fund. These impact funds are distributed to communities through a grant program (19 AAC 50) administered by the Department of Community and Regional Affairs.

Comment From: Alaska Coalition (Comment Letter No. 80016)

Where oil leasing and development proceed, strong environmental safeguards are essential to protect the land, air, water, and wildlife resources of this unique arctic environment. **(Comment No. 80016-855)**

Response To: Comment 80016-855

The BLM agrees that it is important that the Plan include measures to protect the land, air, water, and wildlife resources. These measures must be balanced with meeting the purpose and need for land management in the National Petroleum Reserve-Alaska, as described in Chapter 1 of the IAP/EIS. The configuration of the area offered for lease and the stipulations and required operating procedures present a range of protection to the decisionmaker.

Comment From: The Sierra Club (Comment Letter No. 80014)

While Sierra Club does not oppose oil development within the Reserve, we believe that the many special places and unique wildlife resources within the Reserve are at serious risk from piecemeal development and shortsighted planning. It is imperative that BLM work to set aside the biologically essential components of the Reserve before additional leasing in the area proceeds. Sierra Club seeks effective protection for the nationally and internationally recognized wildlife habitats, wild rivers, cultural resources and wilderness found in the Reserve. The most biologically rich and recognized wildlife and wilderness values of the region are not permanently protected. A balanced approach to the management of these natural resources is needed to protect the most sensitive areas and cultures. The existing alternative proposed in the DEIS do not provide a realistic balance between oil development and habitat protection. None of the management alternatives provide adequate and appropriate protection for the unique cultural, natural, fish and wildlife, scenic and historical values as expressly required by Congress in the National Petroleum Reserve Production Act of 1976. **(Comment No. 80014-858)**

Response To: Comment 80014-858

The BLM believes the draft IAP/EIS provided a range of alternatives that included strong protections for the important cultural, natural, biological, scenic, historic and subsistence resources found in NPR-A. Despite the fact that many did not see among the alternatives one that they could embrace, we believe the appropriate building blocks were provided. Further, we believe that the range was appropriate for purposes of analysis and to provide a strong stimulus for public comment. A critical aspect of our planning process is the opportunity provided the public to comment. The BLM chose to take full advantage of public input and wait until after the comment period to develop a Preferred Alternative, an alternative we feel provides for balanced and environmentally responsible management of NPR-A.

Comment From: The Sierra Club (Comment Letter No. 80014)

Where oil development is allowed to proceed, the strictest environmental safeguards should be in place to protect the wildlife and subsistence values of the Reserve. The proposed plan presented in the DEIS dramatically rolls back lease stipulations addressing environmental mitigation measures, compared with the plan for the NE NPR-A. Indeed, the NW Plan slashes the requirements. BLM proposes from 9 to 20 lease stipulations in the NW Area, compared with 79 in the 1998 final decision for the NE NPRA. This is an unacceptable rollback that will have significant consequences for the long-term impact of oil development in the Arctic. **(Comment No. 80014-861)**

Response To: Comment 80014-861

Please see the responses to comments 249-524 (Stipulations, Required Operating Procedures and Mitigations)and 251-135 (Management).

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

But first of all, I can see a lot of these that were deleted, completely dropped from Alternative A and B. It even covers leasees shall conduct annual environmental compliance. That hasn't ever been struck out. And so this has been a very disturbing piece of paper that I did not want to read but we -- water withdrawals from rivers and streams during winter is prohibited, that's got to be struck out, too. They can pump all the water they want, build everything, open it wide open. So those are some of the things that I'd like to make it for the record. Even the locations of the winter ice roads shall be offset from one year to minimize vegetative impacts, meaning using the same route, we can use the other route and this is what it means. You know, they got to strike that out, too. And seismic work is prohibited. This is under Babbitt, seismic work is prohibited within a thousand to 1,200 feet of any known cabin. (In Inupiaq)They even struck out stipulation 24, to prevent surface disturbance to tundra and other vegetation, track vehicles will not execute (Oil and gas drilling explorations.) (In Inupiaq) So these are some of the things that I wanted to briefly present to the public here. Also Ikpikpuk River, half a mile setback from the banks of Ikpikpuk River (In Inpiaq), which has been struck out and that's in Alternative A and B, Ikpikpuk River. Teshekpuk Lake, half a mile setback from the bank. HEARING OFFICER BROWER: Joe, could I ask you..... MR. AKPIK: Yes. HEARING OFFICER BROWER: .....if we delete the half mile setback is there another setback that you prefer or was that just objecting to that one that is..... MR. AKPIK: Yes, I am presenting my objection, that I have gone and that are going to be stipulated in Northwest, okay. Fish Creek, three mile set back from each bank. (In Inupiaq) I've lived there in Nuiqsut for overthree, four, five years and I fished there when I was growing up with Uncle George and Auntie Nanny. And Fish Creek has been one of the vital spots when I used to fish there. So these are some of the things that are very disturbing. Fish Creek is one of the most pristine areas that I've seen. We have to travel there. Judy Creek is another one there, too. That is one of the prettiest rivers I ever seen and they are going to be deleted. Colville River, one mile setback from the western bluff. (In Inupiaq) They're going to alleviate that one mile setback from the western bluff. (In Inupiaq) So these are some of the things that are very likely deletions that looking into A and B. Okay. HEARING OFFICER BROWER: These are Northeast quarter plans -- stipulations..... MR. AKPIK: Right. HEARING OFFICER BROWER: .....that were deleted that you're objecting to right now' MR. AKPIK: Right, completely -- no -- yeah, these were completely dropped from Alternative A and B. It's about how many pages here, about eight pages of deletions that are really -- that we really need in order for an area to be looked at. HEARING OFFICER BROWER: Now, this, in applying to the Northwestern quarter..... MR. AKPIK: Right. HEARING OFFICER BROWER: .....you want those kind of things reinstituted rather than deleted for the..... MR. AKPIK: Northwest. HEARING OFFICER BROWER: .....Northwest quarter' MR. AKPIK: Exactly. Thank you, Mr. Brower. Yes, there was a lot of deletions from Northeast Alternatives -- a lot of deletions in reference to Northwest. **(Comment No. 80074-883)**

Response To: Comment 80074-883

We have taken your comments into consideration in developing the Preferred Alternative. Please see comments 251-136 (Management) and 249-524 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: Wainwright Tribal Council (Comment Letter No. 80012)

The community members feel that they should have a 3-mile setback on the Kuk River drainage, this is a heavily used subsistence area. This should also include the Utukok and Kokolik Rivers since some of our hunters use that area for fishing and hunting. The community members will have stipulations to preserve and protect our natural resources should there be development in the future. We respect our land, natural resources and we will expect the oil companies to do the same. There should be local people hired to work in the oil companies. Local people should be hired to monitor activities of the oil companies, this would help ensure the protection of the land and natural resources that we depend on. **(Comment No. 80012-1030)**

Response To: Comment 80012-1030

We have taken your comments into consideration in developing setbacks for the Preferred Alternative. Please see

the General Lease Stipulations and Required Operating Procedures for the Preferred Alternative, specifically Required Operating Procedure B-1 and Stipulations E-2, E-3, and K-1. For a discussion of employment and local hire, please see responses to comments 169-712 (Economy), 80065-577 (Economy), 80075-489 (Government to Government), and 80077-924 (Government-to-Government).

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

Exercising required operating procedure, which are ROPs which will fall under the Bureau of Land Management Department. (In Inpiaq) There will be no special areas, neither buffer zone around our unique pristine hunting and fishing grounds. And to include watersheds, which provides us fish and waterfowl. (In Inpiaq) The watersheds are very important to be addressed, which we enjoy and utilize to gather our subsistence during the very short summer period after a long harsh cold winter which is 24 hour darkness. (In Inpiaq) **(Comment No. 80074-890)**

Response To: Comment 80074-890

We have taken your comments into consideration in developing the Preferred Alternative; specifically, setbacks along important subsistence use rivers and an expanded consultation process are part of the Preferred Alternative.

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

My recommendation toward Northwest Development, if the A and B alternatives are approved, we should utilize shallow, small jack-knife rigs to be laid down during the summer period to alleviate the tower and drilling rigs. **(Comment No. 80074-891)**

Response To: Comment 80074-891

Under the Preferred Alternative use of such equipment is not prohibited.

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

Another thing, when they do make the pipeline, do it like they do it at Nuiqsut, the road is not close to the pipeline, it's a little further, then that way the caribou won't be afraid to cross the road and the pipeline. HEARING OFFICER BROWER: That was Bernadine, recommends the pipeline be not as close to the -- if there's an existing road to be somewhat up away from the road system so that snow pile or things that may happen will not unduly complicate the passing caribou underneath the pipeline because in association with the road. MS. ITTA: It won't obstruct their migratory path. **(Comment No. 80074-895)**

Response To: Comment 80074-895

We have taken your comments into consideration in developing the Preferred Alternative.

Comment From: Public Meeting on DEIS - Fairbanks, Alaska (Comment Letter No. 80076)

I'm leery about oil field development in relationship to potential loss of hunting opportunities, especially since September 11th. In the interest of security of any kind of exploration and development hunting is not really compatible in today's world. I think that needs to be addressed in the report. **(Comment No. 80076-907)**

Response To: Comment 80076-907

Security is always an issue within an oil field, undoubtedly more so since September 11th. However, the traditional lifestyle of the residents of the North Slope is equally important. This is one reason BLM feels that the Subsistence Consultation requirements (reference section H of the "General Lease Stipulations and Required Operating Procedures") are a critical part of the EIS.

Comment From: NOAA (Comment Letter No. 209)

Page II-29 Air Traffic ROP F-1 To minimize the impact of aerial surveys and aircraft flights on marine mammals, we recommend that Required Operating Procedure (ROP) F-1 to also include this statement: 'All aircraft shall maintain an altitude of at least 1,500 ft AGL when operating along the coast and beyond (seaward of) 500 ft of the coastline, except during take off and landing.' **(Comment No. 209-908)**

Response To: Comment 209-908

The BLM can restrict some air traffic as part of a BLM authorized activity; however, we do not have the authority to implement nor enforce blanket restrictions on air traffic activities.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

Our subsistence uses of the lands occur during the heightened activities during the development because of the subsistence seasons, the monitoring activities occur during our heightened uses of the areas. We need to have buffers put in that allow us to utilize the area of our needed subsistence resources. **(Comment No. 80077-925)**

Response To: Comment 80077-925

We have taken your comments into consideration in developing the Preferred Alternative, please see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures and Stipulations K-1, K-3, K-6, and K-8.

Comment From: David van den Berg (Comment Letter No. 189)

I urge the BLM to do all it can to protect the recreational, scenic and aural qualities of the Colville River: please do what you can to maintain the wilderness character of the Colville. There are many things you can do to protect the public's interest in this area, which has been amply demonstrated over time (including but not limited to): the fact of its establishment as a Special Area in 1977, the 1980s-era NEPA processes, 1998 NE NPR-A EIS process, the 1998 RAC resolution calling for watershed level planning for the Colville, surveys collected at Umiat, commercial permits issued to recreational outfits, public comment in the aborted Colville River IAP, and public comment in the present EIS process **(Comment No. 189-1036)**

Response To: Comment 189-1036

We have developed a stipulation that creates a one-mile setback for development from the Colville because of its important values. In addition the protections provided by many of the other area-wide stipulations and ROPs apply to the Colville. Also see the response to 80076-898 (Special Designation Areas).

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

And then I'm pretty sure that Barrow and Atqasuk and all those had their statements and stuff, but I think if they keep the buffer zone and BLM is the one that say -- have the say so of the buffer zones and stuff on the rivers and to keep, as far as, you know, instead of trying to get closer to the rivers and stuff like that because they have directional drilling that will be going underneath or past the buffer zones and they might disturb the ecosystem of the fish and insects and whatever that nests in these rivers. **(Comment No. 80077-931)**

Response To: Comment 80077-931

We have considered your comments in developing the Preferred Alternative; please see the "General Lease Stipulations and Required Operating Procedures" and Stipulation K-1.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

Although she supports Bernice and Eli's comments on the no action, that careful planning around our culture and subsistence hunting areas, in that planning area should tend to the subsistence and cultural concerns of the Nuiqsut and Arctic Slope communities. There should be stipulations that are already set in, cast in stone if they're going to continue. But these things should be planned so that none of our renewable resources will be altered, that come in seasons. **(Comment No. 80077-944)**

Response To: Comment 80077-944

We have considered your comments in developing the Preferred Alternative and have incorporated many measures into the Preferred Alternative to protect subsistence resources and activities. See Section H and K of the "General Lease Stipulations and Required Operating Procedures" in the Preferred Alternative.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

So I'd like to see that, more regulations come from like water and air quality safety for the animals and the people, of like studying half of it and then see what kind of impacts and hazardous stuff that they can find out. Because to me it's never a good long- term study of what they're doing and stuff like that but I'd like to see half of it done. Because like they say, we ain't got no way of stopping it but we, the people, are going to be the endangered species here if they plan to do all of it and then not knowing the outcome of what's going to happen to our village and our health in this village. **(Comment No. 80077-947)**

Response To: Comment 80077-947

See responses to comments 80077-925 (Stipulations, Required Operating Procedures and Mitigations), 80077-930

(Studies), and 80077-946 (Government-to-Government).

Comment From: David van den Berg (Comment Letter No. 189)

There are so many things you can do to protect the Colville's character, starting with: 1. Do not make available for lease the Colville River Special Area within the NW Planning Area. Though I offer this sincerely, and mean it quite literally, I expect that the agency has already made up it's mind to make it available. Still, it's what I'd like to see happen. 2. In which event, I make a fallback plea that you not offer for leasing the CRSA. 3. As if I don't mean either of the last two entreaties, I urge you to neither make available for leasing nor offer for leasing the Colville watershed. 4. As if I did not mean that, please do not allow any surface occupancy within the CRSA for exploration or development phases. 5. Anticipating that the BLM is already committed to a course that may not allow significant change, I make a penultimate, and decreasingly efficacious request that no surface occupancy be permitted during the exploratory or development phases within the Colville watershed. 6. And finally, a last request that you assign a VRM Class 1 to the whole of the CRSA and reevaluate its SQRU scores. 7. And, oh, one more: please make the Colville a Wild and Scenic River. **(Comment No. 189-1038)**

Response To: Comment 189-1038

The law states that exploration within areas designated by the Secretary as special areas containing significant subsistence, recreational, fish and wildlife, or historical or scenic value, shall be conducted in a manner which will assure the maximum protection of such surface values to the extent consistent with the requirements of the Production Act for the for the exploration of the reserve. The Colville River Special area was designated because it contained significant regional habitats for raptors. The Preferred Alternative provides special measures to protect raptor habitat, see Area Specific Lease Stipulations and ROPs. The Preferred Alternative also designates the lands along the Colville River as a Visual Resource Management class 1.

Comment From: David van den Berg (Comment Letter No. 189)

1a. Not making the CRSA available for leasing suggests that the agency understands at some level that oil drilling conflicts with wilderness qualities; that the Colville deserves protection; that deferring leasing confers a semantic and symbolic presumption in favor of the area's protection: if you don't now open the door to oil and gas drilling, it can't come in yet. Yet! You'll have precluded no options. 2a. The CRSA within NW is only 441,000 acres, approximately 5 percent of the planning area. Not offering it for leasing this time around will not 'blind' bidders to the overall hydrocarbon potential of the NW Planning Area. Will it' Not offering it will not unduly lighten BLM's coffers. Will it' Why not defer leasing here' 3a. The Colville watershed within NW is only 274,548 acres, approximately 3.1 percent of the planning area. Not offering it for leasing this time around will not 'blind' bidders to the overall hydrocarbon potential of the NW Planning Area. Will it' Not offering it will not unduly lighten BLM's coffers. Will it' Why not defer leasing here' 4a. The rhetorical drift from BLM has been to equate the Colville's purpose merely with raptor habitat conservation and recovery. If this is true, it should stop. The CRSA was established also to protect scenic and recreational values, among others. Stipulations for protecting the recreational and scenic qualities of the Colville in NE were weak; in the NW, your stips to protect these values won't do the job. For exploration (winter), your stips may work. But beyond that phase, a one mile or even a two mile buffer for infrastructure is just a futile formality. It's also an insult to those of us who use the river. So it's worth being honest now with the oil companies that you won't countenance surface occupancy along the Colville within a much greater buffer. At almost any point along the Colville between the Awuna confluence and the NE boundary, a drill tower, a bunk house, or a coil of pipe a mile or two from the river merely ensures that it's in plain view from the river. 5a. How about enacting stipulations that prohibit surface occupancy within the Colville River watershed' Since this takes in the 275,000 acres closest to the river, it is the most sensible boundary to draw to protect the Colville's wild character. If you preclude surface occupancy in the watershed, then all occupancy would by definition be on the 'other side of the hill,' visually and aurally isolated from the river. 6a. What more evidence do you need to raise the Colville's VRM and SQRU scores' It's an amazing, peerless wilderness. Beauty is subjective, of course, and I'm telling you that I and others feel it is beautiful, especially that stretch from the

Awuna to the Ninuluk Bluff area. 7a. You've dodged the Wild and Scenic issue by blaming it on Native hostility to the idea. And then to the fact that BLM does not control both shores of the Colville. Well, there are other rivers designated as Wild and Scenic where land ownership is more complicated: The Fortymile River, where the state owns the uplands and the riverbed. The Gulkana River, where the state and Natives own the uplands and the state owns the riverbed. Why not start now to make the Colville within the NW Plan a Wild and Scenic River' **(Comment No. 189-1039)**

Response To: Comment 189-1039

The Preferred Alternative prohibits permanent facilities within one mile of the bluff along that portion of the Colville River within the Planning Area; please see the Area Specific Lease Stipulations and ROPs' for the Preferred Alternative. Please see the response to comment 189-1038 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

The Northeastern portion of this area, that's the cross-hatch on the right side of Dease Inlet, should be given additional protection in a no lease zone to conserve its sensitive wildlife habitat values. The marine waters of both Dease Inlet and Elson Lagoon should be designated as no surface activity zones to protect these important and sensitive habitats. Elsewhere in the special area we recommend developing special stipulations to protect habitat for threatened spectacled eider and yellow-billed loons. And those are the little cross-hatch red areas. These areas would not preclude leasing. **(Comment No. 80073-959)**

Response To: Comment 80073-959

Please see comment responses 213-202 (Special Designation Areas), 213-225 (Special Designation Areas, and 213-232 (Alternatives General).

Comment From: Paul Hugo (Comment Letter No. 187)

All activities should be done before and after spring and fall caribou migration. **(Comment No. 187-966)**

Response To: Comment 187-966

Several measures to minimize impact on caribou movement are included in the Preferred Alternative. However, these measures are focused on the Teshekpuk Lake Caribou Herd, not the Western Arctic Herd (WAH). Impacts to the WAH from oil and gas activities in the Planning Area are not specifically addressed because the winter range, calving area, primary migratory area, and most of the summer range of the WAH are outside of the Planning Area.

Comment From: Jessica Sprajcar (Comment Letter No. 46)

Water ecosystems tend to be more fragile than land-based ones. Therefore it is imperative that oil drilling does not occur near the wetlands, bogs, streams, etc. of the NPR-A. Off-shore oil drilling should also be avoided if possible. Studies have shown that the man-made structures of off-shore rigs cause imbalances in the marine flora and fauna, creating explosions of jelly-fish populations that harm other creatures. **(Comment No. 46-971)**

Response To: Comment 46-971

We have taken your comments into consideration in developing the Preferred Alternative. Please see the General Lease Stipulations and Required Operating Procedures of the Preferred Alternative.

Comment From: Jessica Sprajcar (Comment Letter No. 46)

Secondly, care should be taken to create a continguous area of protected land, not small fragmented spots throughout the reserve. Habitat fragmentation is one of the biggest killers of indigenous populations of animals, as they run out of sustenance, or are separated from other breeding populations and become inbreeding colonies. Roads and pipelines should not run through the middle of any key habitat in the area, as this could lead to disasterous results. **(Comment No. 46-972)**

Response To: Comment 46-972

Please see the response to comment 253-59 (Planning).

Comment From: Gordon Brower (Comment Letter No. 48)

BLM must provide some parameters to steer development. **(Comment No. 48-974)**

Response To: Comment 48-974

Because the locations of economically viable oil and gas reservoirs cannot be known until drilling and well testing are completed, it is not possible for a regional infrastructure plan to be designed at this stage.

Comment From: Gordon Brower (Comment Letter No. 50)

Using of equipment on tundra must be limited and prohibited in any marshy area. **(Comment No. 50-977)**

Response To: Comment 50-977

Please see the General Lease Stipulation and Required Operating Procedures Section II.C . 6, for a discussion on Tundra Travel.

Comment From: Hearing -Anaktuvuk Pass (Comment Letter No. 80072)

HEARING OFFICER BROWER: So the concern is that the caribou -- Teshekpuk Herd should not be hindered from moving south to Anaktuvuk Pass area because that does occur, some caribou from the Teshekpuk Herd do migrate to -- so there needs to be some protection, some assurance that that will not be barred or hindered. **(Comment No. 80072-983)**

Response To: Comment 80072-983

Several measures have been included in the Preferred Alternative to minimize impact on movement of the TLH caribou. These include restrictions on aircraft use, elevating pipelines a minimum of 7' above ground level, requiring separation of roads and pipelines, designing oil fields to minimize impacts on caribou movement, and a three-year study of TLH caribou movements within the Caribou Study Area (Map 91) before construction of permanent facilities. In addition, a six-year study of caribou demography, distribution and movement in relation to oil field infrastructure will be conducted by ADF&G with support by BLM and other agencies. See Required Operating Procedures F-1, E-7, and K-5 under "General Lease Stipulations and Required Operating Procedures".

8. TOPIC : SPECIAL DESIGNATION AREAS

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

To be consistent with past management decisions regarding SMZs, EPA recommends designation of (1) Kasegaluk Lagoon, (2) Peard Bay and Kugrua Bay, and (3) Elson Lagoon, Dease Inlet, and Admiralty Bay as Special Areas for the NW NPR-A due to their importance as critical waterbird and wildlife habitat, subsistence resources, and socio-cultural significance. This would be consistent with recommendations provided by the U.S. Fish and Wildlife Service. (1) Kasegaluk Lagoon - As proposed in the draft IAP/EIS, Alternatives B and C would create a new Special Area for Kasegaluk Lagoon. Given this would be consistent with past management decisions and existing statutory directions for the NPR-A, EPA recommends that DOI/BLM proceed forward with this designation, including gathering input from local communities for any Preferred Alternative that is selected for the NW NPR-A IAP. (2) Peard Bay and Kugrua Bay - This complex of islands and shoal protected deep water bays provide important nesting ha bitat for spectacled eider, a species listed as 'threatened.' There are a number of polar bear denning areas (Map 51). Designation of Peard Bay and Kugrua Bay would be consistent with past management decisions and existing statutory directions for the NPR-A. A Preferred Alternative for the NW NPR-A should include Peard Bay and Kugrua Bay as a Special Area. (3) Elson Lagoon, Dease Inlet, and Admiralty Bay - This ecological area comprises of lagoons, inlets, and bays, which is essential for wildlife and waterfowl habitat. East of Dease Inlet is a caribou insect relief area (Map 91). Threatened Spectacled Eiders nest in this area as well as pacific loons (Map 38) tundra swans (Map 39), white fronted geese (Map 40), northern pintails (Map 41), long tailed ducks (Map 42), king eiders (Map 43). Brants use this area for brood rearing. This is an important area for Yellow-billed loons nesting habitat (Map 90). Dease Inlet provides spotted seal coastal haul out and concentration areas (Map 59). There are a number of onshore dens for polar bears (Map 51). The important habitat values described in the draft IAP/EIS for this area warrant DOI/BLM to designate Elson Lagoon, Dease Inlet, and Admiralty Bay as a Special Area. This would be consistent with DOI/BLM management decisions and existing statutory directions for the NPR-A. EPA would support designation of Elson Lagoon, Dease Inlet, and Admiralty Bay as a Special Area. **(Comment No. 261-88)**

Response To: Comment 261-88

See comment response 213-202 and 213-217 (Special Designation Areas) for discussions of why BLM chose to identify only the Kasegaluk Lagoon as a new Special Area.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

We recommend that the final IAP/EIS include separate maps for (1) Kasegaluk Lagoon, (2) Peard Bay and Kugrua Bay, and (3) Elson Lagoon, Dease Inlet, and Admiralty Bay, which includes this resource information.

(Comment No. 261-89)

Response To: Comment 261-89

Information for subsistence, recreational, fish and wildlife, and historical and scenic resources in the Kasegaluk Lagoon area, Peard Bay and Kugrua Bay area, and the Elson Lagoon, Dease Inlet, and Admiralty Bay area is provided in text, tables, and maps. The BLM believes that the maps included in this IAP/EIS are appropriate in scale and level of detail for this IAP/EIS and provide the necessary information to support the program decision.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

The draft IAP/EIS analyzes many of the issues that surfaced at the scoping meetings and states that these concerns influenced the alternatives presented. EPA sees some correlation between the issues raised in the scoping meetings and the stipulations and required operating procedures (ROPs), but not in the overall alternatives presented. The designation of Special Areas (SA), Wilderness Study designations or Wild and Scenic Rivers (WSR) status for Alternatives B and C appear to restrict subsistence harvest activities as they would be viewed by affected EJ communities to discourage traditional travel and subsistence hunting practices (page IV-306 of the draft IAP/EIS). An alternative that protects subsistence resources and does not restrict subsistence activities would be ideal for subsistence harvesters. None of the alternatives offer this option. We believe the final IAP/EIS should include such an alternative. **(Comment No. 261-104)**

Response To: Comment 261-104

The stipulations are an integral part of the alternatives and we believe that the stipulations, in combination with the land and resource allocations presented in the Preferred Alternative, No Action Alternative, and Alternatives A, B, and C, do respond to the issues raised during scoping and represent a reasonable range of alternatives for consideration. Further, BLM believes that the No Action Alternative is an option that protects subsistence resources and does not restrict subsistence activities.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Kasegaluk Lagoon The final IAP/EIS should include a full scale map of this biologically important area which includes, but is not limited to, all the environmental resource information, such as marine mammal habitat; bird nesting sites; subsistence resource harvest areas; etc. **(Comment No. 261-131)**

Response To: Comment 261-131

Please see the response to comment 261-89 (Special Designation Areas).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Peard Bay and Kugrua Bay The final IAP/EIS should include a full scale map of this biologically important area which includes, but is not limited to, all the environmental resources information, such as waterfowl habitat and nesting areas for spectacled eider; polar bear denning areas; etc. **(Comment No. 261-132)**

Response To: Comment 261-132

Please see the response to comment 261-89 (Special Designation Areas).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Elson Lagoon, Dease Inlet, and Admiralty Bay The final IAP/EIS should include a full scale map of this biologically important area which includes, but is not limited to, all the environmental resources information, such as caribou insect relief areas; waterfowl habitat and nesting areas for spectacled eider, yellow billed loons and red-throated loons; polar bear denning areas; spotted seal haul out areas; etc. **(Comment No. 261-133)**

Response To: Comment 261-133

Please see the response to comment 261-89 (Special Designation Areas).

Comment From: Audubon Alaska (Comment Letter No. 213)

Summary of Key Recommendations and Concerns 1. Special Areas: Audubon strongly recommends designating four new special areas within the Northwest Planning Area of the National Petroleum Reserve-Alaska. Areas recommended for new special area status include: Dease Inlet-Meade River, Peard Bay, Kasegaluk Lagoon, and South Ikpikpuk River. In addition, we recommend a no lease zone in the Colville River Special Area that occurs within the planning area. Audubon's wildlife habitat alternative provides significantly more industry access to areas of high oil and gas resource potential than BLM's Alternative C. We request that Audubon's Wildlife Habitat Alternative be considered as a formal alternative in the FEIS. **(Comment No. 213-202)**

Response To: Comment 213-202

The Preferred Alternative identifies the Kasegaluk Lagoon for Special Area status. In other areas where you have recommended special protections, we have not chosen to create special areas. The purpose of special areas is to provide protection for the resources within the area. There are other means to provide protection to the resources of these areas. The BLM believes protection would be provided through the comprehensive set of Stipulations and ROP's. We have established setbacks and other restrictions that would provide adequate protection for species present and their habitats in and around rivers and lakes and along the shorelines of bays, inlets, and lagoons. Some of the setback distances have been increased in the Preferred Alternative in response to concerns expressed by your organization and other members of the public. In the Preferred Alternative, we have also added several ROP's that would require studies of threatened and other important species and their habitats prior to making final decisions about construction of permanent facilities. Rather than establish a no lease zone on the Colville River, we have developed a stipulation that will preclude surface occupancy for development within one mile of the river. We think that these restrictions and others included in the Stipulations and ROP's for the Preferred Alternative would provide adequate protection to the resources that are present in the areas you have suggested receive Special Area status. The BLM has considered your recommendations in the development of the Preferred Alternative. The Audubon's proposed Wildlife Alternative addresses some (but not all) species of birds in some parts of the Planning Area, however, this is not a comprehensive alternative that addresses all of the issues the plan must deal with. Alternatives that we consider in our plans must address all of the issues that are of concern. Please see the response to comment 213-232(Alternatives General).

Comment From: Audubon Alaska (Comment Letter No. 213)

Protected Areas: Although the North Slope is undergoing significant change, there are no permanently protected conservation units, except the very small, eastern tip of the Arctic Refuge. The lack of protected areas reduces our opportunity to establish ecological baselines from which we can evaluate long-term impacts from expanding industrial infrastructure and separate these from other environmental effects like climate change. The DEIS does not address this issue. We recommend adopting Audubon's habitat conservation alternative as the start of a comprehensive protected areas strategy. **(Comment No. 213-207)**

Response To: Comment 213-207

The Preferred Alternative will defer for 10 years development in the 18 percent of the Planning Area in the far west and will include a no-surface-occupancy restriction on Kasegaluk Lagoon. These actions should allow the development of the ecological baselines you advocate.

Comment From: Audubon Alaska (Comment Letter No. 213)

The area also includes numerous deep-water lakes. The productive wetlands complex of Dease Inlet-Meade River should be designated by BLM as a new special area (Fig. 2). **(Comment No. 213-211)**

Response To: Comment 213-211

Please see response 213-202 (Special Designation Areas).

Comment From: Audubon Alaska (Comment Letter No. 213)

This area's high wildlife values justify its designation as a special area. Audubon recommends a no- lease zone and permanent protection for Peard Bay (Fig. 2), which has low potential for oil development. **(Comment No. 213-215)**

Response To: Comment 213-215

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the response to comment 213-232 (Alternatives General). The area south of Peard Bay recommended for special protection by Audubon does include several high-density nesting areas for the spectacled eider, as well as for Pacific loon, white-fronted goose, long-tailed duck, scaup, and shorebird species. Abundant high-density areas for these latter species exist elsewhere in NPR-A, and several areas of high and medium-high spectacled eider density also occur, as shown on relevant maps in the IAP/EIS. The IAP/EIS recognizes that some polar bear den locations occur in the Peard Bay area (See Map 51). The necessity for additional protection would depend in part upon the types of activities that would occur in this area. Designating the area as a no-lease area, as suggested by Audubon, is just one possible approach. BLM took a different approach which emphasized the use of setbacks and other protective stipulations. Protective mitigation measures are also appropriately developed during the site-specific environmental review at the permitting stage for specific proposed activities. Under the Preferred Alternative presented in the final IAP/EIS, oil and gas leasing would be deferred for 10 years in the Peard Bay Area to provide an additional opportunity to develop baseline information and study the affected spaces.

Comment From: Audubon Alaska (Comment Letter No. 213)

Kasegaluk Lagoon is also an important subsistence area for the communities of Point Lay and Wainright. Audubon recommends special area designation for the northern portion of Kasegaluk Lagoon. Because of the lagoon's unique habitat values for birds and marine mammals, the entire special area should be zoned as a no-lease area within the Northwest Planning Area (Fig. 2). Kasegaluk Lagoon should be given permanent protection. **(Comment No. 213-217)**

Response To: Comment 213-217

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the response to comment 213-232 (Alternatives General). As the comment notes, Kasegaluk Lagoon is well known as an important staging area for brant in late August-early September prior to their annual fall migration to southern overwintering areas. The Teshekpuk Lake Special Area, however, is the major brant molting area in arctic Alaska. The necessity for additional protection of the Kasegaluk Lagoon area would depend in part upon the types of activities that would occur. Designating the area as a no-lease area, as suggested by Audubon, is just one possible approach. BLM took a different approach which emphasized the use of setbacks and other protective stipulations. Protective mitigation measures are also appropriately developed during the site-specific environmental review at the permitting stage for specific proposed activities. Under the Preferred Alternative presented in the final IAP/EIS, oil and gas leasing would be deferred for 10 years in Kasegaluk Lagoon. The EIS recognizes that polar bears concentrate along the Alaskan coast including Kasegaluk Lagoon (See Map 51 and Section III.B . 5.b(5)). The EIS recognizes the importance of Kasegaluk Lagoon for beluga whales (See Section III.5.b(5)) and to spotted seals (See Section III.B . 5.b(3)). The text on spotted seals in Section III.5.b(3) has been expanded in response to this comment.

Comment From: Audubon Alaska (Comment Letter No. 213)

This interior coastal plain, which borders the Northeast Planning Area, should be designated as a special area to protect anadromous fish habitat and nesting peregrine falcons. In fact, the entire Ikpikpuk River system should be combined into this special area. Audubon recommends a nolease zone for this special area (Fig. 2). The Ikpikpuk River, flowing north to the TLSA, should be protected with a 2-mi no-surface activity zone along the west side of the river. If necessary, a designated crossing area could be identified along that river corridor. **(Comment No. 213-220)**

Response To: Comment 213-220

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the response to comment 213-232 (Alternatives General). Currently, the Ikpikpuk River is highlighted as a wildlife habitat area of significant concern [(Stipulation K-1 of the Preferred Alternative (PA)] where up-to-1-mile setbacks may be required for facilities and activities. When significant resources occur in designated wildlife habitats, additional design features or mitigation determined through site-specific NEPA analysis would be required to minimize impacts. These protective measures would provide significant protection for peregrine falcons along this river, the upper portion of which has one of the most numerous concentrations of peregrine nest sites. Audubon recommendations of special area designation, 2-mile setbacks, and no-lease zone designation provide alternative approaches for protecting wildlife in this area. Stipulation K-1 of the PA would require additional design features or mitigation, including up-to-1-mile setbacks, for this river if significant resources occur there.

Comment From: Audubon Alaska (Comment Letter No. 213)

The entire special area within the Northwest Planning Area should be protected as a no-lease zone (Fig. 2). This

portion of the Colville River should be given permanent protection. **(Comment No. 213-222)**

Response To: Comment 213-222

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the response to comment 213-232 (Alternatives General). Several stipulations and required operating procedures (ROP's) contained in the IAP/EIS address potential disturbance or pollution problems for other species that could offer protection for raptors and/or songbirds in the Colville River corridor. These include: a) Stipulation K-1, providing up-to-½-mi setbacks for activities along the Colville River could benefit nesting raptors and songbirds in the river's riparian corridor by decreasing disturbance in these areas; b) ROP F-1, requiring that aircraft operations minimize impacts on birds could decrease disturbance of nesting raptors along the Colville River and songbirds occupying the riparian corridor; and c) Stipulation K-7, location of any required permanent facilities in the Colville River Special Area as far from raptor nests as is feasible would minimize disturbance of raptors, and songbirds occupying riparian habitats along the river.

Comment From: Audubon Alaska (Comment Letter No. 213)

Conservation stipulations should be developed and applied in this portion of the TLSA to protect waterbird and caribou populations. **(Comment No. 213-225)**

Response To: Comment 213-225

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the response to comment 232-213 (Alternatives General). Several Stipulations and Required Operating Procedures (ROP) contained in the IAP/EIS address potential disturbance or pollution problems for other species that also could offer protection for yellow-billed loons. These include: a) ROP E-2, prohibiting the storage of fuel and other petroleum products and liquid chemicals within 500 ft of fish-bearing waterbodies and requiring precautionary measures, would decrease the potential for pollution of the larger/deeper lakes and rivers containing fish, thereby decreasing the potential for lethal fouling of loon plumage and mortality of fish, their primary prey; b) ROP A-5, prohibiting equipment refueling within 500 ft of fish-bearing waterbodies would decrease the potential for lethal fouling of loon plumage and mortality of their fish prey; c) Stipulations K-1,2,3,4,8, and E-11, providing up-to-½-mi setbacks for activities around inlets, bays, lagoons, fish-bearing lakes, numerous rivers, and waterfowl nesting and brood-rearing areas could result in some benefit for loons by decreasing disturbance in these areas; d) ROP E-2, prohibiting permanent oil and gas facilities within 500 ft of lakes could reduce the potential for disturbance and contamination impact on loons; e) ROP F-1, requiring that aircraft operations minimize impacts on birds could decrease disturbance of loons; and g) ROP I-1, requiring oilfield personnel to attend an orientation program could increase awareness concerning what types of activities are likely to have adverse impacts on loons.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

We commend BLM for recognizing the important wildlife, subsistence, cultural and wilderness values of Kasegaluk Lagoon. However BLM arbitrarily dismisses designation of additional Special Area because the remaining area of the Northwest Planning Area are 'not exceptional for subsistence, fish, wildlife, historic, or scenic resources ' (DEIS p.II-41). Agency science referenced in this DEIS and Audubon's December 2002 report, Alaska's Western Arctic: A Summary and Synthesis of Resources contradict this claim. We strongly recommend designating the following new Special Areas within the Northwest Planning Area of the National Petroleum Reserve-Alaska by prohibiting leasing, the placement of roads, pipelines and other support infrastructure within the boundaries of these areas. We request that Audubon's wildlife habitat conservation recommendations be considered as the foundation for new alternatives in the revised DEIS and FEIS. **(Comment No. 253-340)**

Response To: Comment 253-340

Please see responses to comments 213-202 (Special Designation Areas) and 213-232 (Alternatives General).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

We are disappointed BLM did not move the boundary of the Northwest Planning Area to exclude the entire Colville River watershed. It is unacceptable for BLM to piecemeal the planning for the Colville River in four separate planning efforts. The record is clear, both the public and the Resource Advisory Council have consistently expressed interest in stringent protections for the Colville River. **(Comment No. 253-341)**

Response To: Comment 253-341

Please see the response to comment 213-222 (Special Designation Areas).

Comment From: Arctic Slope Regional Corporation (Comment Letter No. 186)

3. ASRC opposes large swaths of land in the Planning Area being 'set-aside' for animal habitat preservation in the Planning Area. Although well-intended, preservation areas often grow beyond their intended purpose and unnecessarily inhibit reasonable land use practices. Current federal, state and local permitting methods are sufficient to protect the environment and the interests of the North Slope residents; and **(Comment No. 186-560)**

Response To: Comment 186-560

Please see the response to comment 213-202 (Special Designation Areas).

Comment From: The North Slope Borough (Comment Letter No. 80065)

Alternatives B and C of the Draft IAP/EIS include the recommendation that Kasegaluk Lagoon be considered for Special Area designation. We support that recommendation, and suggest that Peard Bay and Dease Inlet-Meade River also be considered as Special Areas within the Northwest Planning Area. We recognize that Special Area designation does not in itself prohibit oil and gas leasing, exploration, or development, but does attach a level of scrutiny and protection independent of this planning effort. Designation would allow for management of these areas designed specifically to protect their unique values and uses, and would not permit later piecemeal degradation of protections under the pressure of multiple future development proposals. We recommend that designation of these areas include permanent facility setbacks and seasonal operating restrictions. **(Comment No. 80065-575)**

Response To: Comment 80065-575

We have considered your comments in developing the Preferred Alternative.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The Service supports the designation of Kasegaluk Lagoon as a Special Area and recommends that two additional areas, Dease Inlet-Meade River and Peard Bay be considered as Special Areas within the Northwest Planning Area because of their importance to migratory birds and other trust resources. The acreage of these five Special Areas, if designated, would total approximately 3,583,000 acres or about 40 percent of the Northwest Planning Area. We recommend that Stipulations and ROPs, such as development set-backs and timing windows, be developed which would protect the high-value habitats and fish and wildlife within these areas while allowing oil and gas exploration and development to proceed. **(Comment No. 260-599)**

Response To: Comment 260-599

See responses to comments 213-202 (Special Designation Areas) and 213-217 (Special Designation Areas).

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

These segments of the TLSA contain high-density waterfowl nesting areas, especially for yellowbilled loons (King and Brackney 1997, Larned et al. 2003, Mallek et al. 2002), and habitat for the Teshekpuk Lake caribou herd (Prichard et al. 2001). The Service believes that the protections allotted to the TLSA in the Northeast Planning Area Final EIS should be extended to those portions which lie within the Northwest Planning Area. At a minimum, Stipulations should be crafted restricting development within high-density waterbird nesting areas. Additionally, measures should be taken to ensure ease of passage through the area by caribou because of their importance for subsistence use. **(Comment No. 260-602)**

Response To: Comment 260-602

See responses to comments 213-202 and 213-225 (Special Designation Areas).

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Protecting the habitats within the CRSA, therefore, may not only be important for maintaining local populations of raptors, but for maintaining healthy populations over a broad area. Because of the importance of this area, the Service encourages BLM to develop a comprehensive management plan for the CRSA. **(Comment No. 260-604)**

Response To: Comment 260-604

BLM does intend to develop a Colville River Plan as early as 2006. See response to comment 213-222 (Special Designation Areas).

Comment From: Olgoonik Corporation (Comment Letter No. 169)

No wilderness areas are designated in the proposed NW NPR-This is a reaction to the experience that Anaktuvuk Pass now experiences. Although we've been told by BLM at the 2/20/03 hearing that we are protected under the ANILCA law. We questioned that fact why Anaktuvuk Pass this is not the case for them. **(Comment No. 169-693)**

Response To: Comment 169-693

While subsistence activities within the Wilderness Areas are protected under ANILCA, Section 1110(a), the Preferred Alternative does not recommend any areas for Wilderness designation.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

The creation of new wilderness areas proposed in Alternative C has not been fully analyzed and should be removed from consideration. **(Comment No. 255-748)**

Response To: Comment 255-748

No wilderness areas are proposed in the Preferred Alternative. Please see response to comment 255-737 (Criteria for Range of Alternatives).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

The creation of new wilderness areas will preclude land use for all types of activities, including non-oil and gas activities, that have not been adequately addressed by this DEIS. **(Comment No. 255-750)**

Response To: Comment 255-750

No wilderness areas are proposed in the Preferred Alternative. Please see response to comment 255-737 (Criteria for Range of Alternatives.).

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV. D. 9. b. The statement 'The Planning area would be open to oil and gas leasing and exploration in the Kasegaluk Lagoon proposed Special Area under Alternative B' should be changed to 'The Planning area would not be open to oil and gas leasing and exploration in the Kasegaluk Lagoon proposed Special Area under Alternative B.' **(Comment No. 260-755)**

Response To: Comment 260-755

The text has been corrected.

Comment From: The Sierra Club (Comment Letter No. 80014)

While Sierra Club does not oppose oil development within the Reserve, we believe that the many special places and unique wildlife resources within the Reserve are at serious risk from piecemeal development and shortsighted planning. It is imperative that BLM work to set aside the biologically essential components of the Reserve before additional leasing in the area proceeds. Sierra Club seeks effective protection for the nationally and

internationally recognized wildlife habitats, wild rivers, cultural resources and wilderness found in the Reserve. The most biologically rich and recognized wildlife and wilderness values of the region are not permanently protected. A balanced approach to the management of these natural resources is needed to protect the most sensitive areas and cultures. The existing alternative proposed in the DEIS do not provide a realistic balance between oil development and habitat protection. None of the management alternatives provide adequate and appropriate protection for the unique cultural, natural, fish and wildlife, scenic and historical values as expressly required by Congress in the National Petroleum Reserve Production Act of 1976. **(Comment No. 80014-859)**

Response To: Comment 80014-859

See our response to 213-202 (Special Designation Areas).

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

Let me translate that real quick. James Aiken, Sr., an objection to the wilderness designation of the potential impacts and likelihood of impacts associated with Anaktuvuk Pass, Gates of the Arctic, they had a hardship in their subsistence way of life up there and maybe cumbersome for the new generation as they face their subsistence way of life into the future because you're not going to tell us -- somebody is not going to tell us the same thing you're telling us tonight about the -- some greenie, some environmental is going to take a position and your position telling them come and say, this is wilderness you can't be subsistence hunting here. Those are the impacts that they see in the classification and they would rather not see - James would not -- would rather see that classification of lands included into these areas. (In Native) **(Comment No. 80074-894)**

Response To: Comment 80074-894

Only Alternative C in the draft contained possible areas for wilderness designation. There are no wilderness units proposed for the Preferred Alternative.

Comment From: Public Meeting on DEIS - Fairbanks, Alaska (Comment Letter No. 80076)

When I've asked about why nothing has been done to protect the Colville area, I've just heard that there's industry interest to the west of Umiat. Well, where is this industry interest' If you look at this panhandle that sticks under the old northeast corner of -- or I'm sorry, the Northeast Planning Area, there's this panhandle, there's a lot of terrain under there and, you know, where is industry interested' Where have they expressed an interest' Can't there be a win/win for conservation and for those folks who want to go find and develop oil' I'd like to recommend six things the agency could do to help the Colville out here. They could defer leasing of the Colville special area until we get to the South Plan. They could defer leasing of the Colville watershed until we get to the South Plan. They could withhold from leasing the Colville River special area this time around in Northwest. They could withhold from leasing the Colville watershed this time around in Northwest. They could have a visual resource management Class I and a five mile setback for all of the alternatives, not just Alternative C. **(Comment No. 80076-898)**

Response To: Comment 80076-898

For the Colville River, we have chosen to provide protection to the resources present by establishing a one-mile setback for development along the river while allowing leasing to occur nearer to the river. The Preferred Alternative will also create a visual resource category of Class I for the river, which is consistent with your recommendation. We believe that these steps provide reasonable protections for resources of the river. Precluding

development within a mile should allow recreational use of the river without the intrusion of development facilities.

Comment From: NOAA (Comment Letter No. 209)

Based on NOAA's NESDIS operational requirements, the following measures, at a minimum, are required to avoid significant adverse effects on existing and future NOAA NESDIS activities in the Barrow area, and should be included as mandatory mitigation measures in the Final IAP/EIS and in the conditions of any Bureau of Land Management (BLM) leases of land for oil or gas exploration or BLM approval of oil or gas exploration or development within 50 kilometer (km) of Barrow: 1. The BLM should coordinate with NOAA NESDIS before leasing land for or permitting oil exploration or drilling activities within 50 km of Barrow. NOAA NESDIS will work with the BLM and the applicant to review proposed actions and clear those that will not adversely affect NOAA NESDIS activities as well as work with the BLM and the applicant to incorporate practical measures that will prevent potentially adverse physical effects. 2. The BLM and oil drilling companies should coordinate with NOAA when seeking to lease or develop lands within 50 km of Barrow to ensure that any structures are kept outside the satellite data beam clearance requirements. 3. The BLM and oil drilling companies should coordinate with NOAA when performing seismic surveys on lands within 50 km of Barrow to avoid interference with the satellite data transmissions or scientific measurements. This can be accomplished by conducting seismic operations only during nonsensitive periods and performing seismic work so that vibration levels at NOAA NESDIS facilities do not exceed quantified threshold levels. 4. The BLM and Federal Aviation Administration (FAA) should coordinate with NOAA NESDIS to ensure that TACAN/DME frequency assignments to ground beacons avoid channels 14Y, 15Y, 36Y, 37Y, 56Y, and 57Y. 5. The BLM should require that cellular telephones and other communications systems used by oil lessees and their contractors avoid operating in the 847.5 to 849 megahertz (MHz) frequency band. 6. The BLM should require that SMRs (or similar service radio systems) used by oil lessees and their contractors in the Barrow area avoid operating in the 851 to 855 MHz frequency band. 7. The BLM and oil lessees and their contractors should coordinate with NOAA to prevent adverse use of welders and plasma cutters (which emit large amounts of electromagnetic radiation) within 50 km of Barrow. **(Comment No. 209-918)**

Response To: Comment 209-918

You will be added to the list of agencies we request to comment on applications for permits for oil and gas activities within 50 km of Barrow.

Comment From: Alaska Oil and Gas Association (Comment Letter No. 248)

Fifth, the creation of new wilderness area proposed in Alternative C has not been fully analyzed and should be removed from consideration. As stated throughout these comments, AOGA is opposed to territorial exclusions when there is substantial evidence that oil and gas development can occur in sensitive areas through the use of new technologies and site specific mitigation. **(Comment No. 248-923)**

Response To: Comment 248-923

The Preferred Alternative does not recommend any areas for Wilderness designation.

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

Let me clearly state that Audubon is not opposed to oil and gas development in NPR-A. However, the Northwest

Planning Area of NPR-A encompasses important fish and wildlife habitat, subsistence and wilderness values. To protect these values, Audubon has identified the biological hot spots that should receive special protection. **(Comment No. 80073-957)**

Response To: Comment 80073-957

Please see comment response 213-202 (Special Designation Areas).

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

The Dease Inlet-Mead River area provides important wetland habitat for waterfowl, loons and shorebirds including high densities of rare yellow-billed loons, brant, and the threatened spectacled eider. Dease Inlet is used by polar bears for onshore denning and caribou use the area east of Dease Inlet for insect relief habitat. This productive wetland should be designated by BLM as a new special area. **(Comment No. 80073-958)**

Response To: Comment 80073-958

Please see comment response 213-202 (Special Designation Areas).

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

Peard Bay, which is the dark blue area in the middle, and adjacent wetlands encompass about 950,000 acres and provides high density shorebird and waterfowl habitat, including high density nesting areas for the threatened spectacled eider. Peard Bay is also a denning area for polar bear. Audubon recommends this as a no lease special area. **(Comment No. 80073-960)**

Response To: Comment 80073-960

Please see comment response 213-202 (Special Designation Areas).

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

The northern portion of Kasegaluk Lagoon on the far left in purple encompasses an area of about 260,000 acres. This area provides important marine mammal habitat particularly for beluga whale and spotted seals. Grizzly and polar bear also use this area. Kasegaluk Lagoon has the richest bird diversity of any coastal lagoon system in Arctic Alaska. The lagoon is particularly important to Pacific black brant for molting and fall staging. Audubon recommends special area designation with a no lease zone for Kasegaluk Lagoon. **(Comment No. 80073-990)**

Response To: Comment 80073-990

Please see comment response 213-202 (Special Designation Areas).

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

The southern Ikpikpuk River, which is on the border between the Northwest and Northwest Plain, south of the yellow, encompasses 53,000 acres and it has high density nesting of peregrine falcons. This interior coastal plain should be designated as a special area with no leasing to protect nesting peregrine falcons and anadromous fish habitats. **(Comment No. 80073-991)**

Response To: Comment 80073-991

Please see comment response 213-202 (Special Designation Areas).

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

The Colville River in the very south is one of the most important raptor nesting areas in Alaska and in the world. The central portion of the Colville River special area should be protected as a no lease zone. In BLM's Alternative C, less than two percent of high oil and gas resource potential is available for leasing. In comparison about 65 percent of high oil and gas potential would be available for leasing under Audubon Wildlife Habitat Alternative. **(Comment No. 80073-992)**

Response To: Comment 80073-992

Please see comment response 213-202 (Special Designation Areas).

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

In summary, Audubon strongly recommends designating four new special areas within the Northwest Plain Area. We believe the Wildlife Habitat Alternative combined with best management practices throughout the area will help minimize future impacts from industrial development on valuable fish and wildlife resources. **(Comment No. 80073-993)**

Response To: Comment 80073-993

Please see comment response 213-202 (Special Designation Areas).

9. TOPIC : MONITORING FOR COMPLIANCE

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Furthermore, the final IAP/EIS should include a monitoring strategy providing sufficient information to demonstrate the effectiveness of the stipulations and ROPs in protecting the resources they are intended to protect. **(Comment No. 261-55)**

Response To: Comment 261-55

See responses to comments 254-620 (Monitoring for Compliance) and 80077-946 (Government-to-Government).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Stipulations mean nothing if they are not voluntarily followed or actively enforced. Unfortunately our experience has been that mitigation measures have not always been followed as illustrated in the Nuiqsut Community's March 6, 2002 EA Letter.23 Nor have we seen state or federal inspections or active enforcement of stipulations and mitigation measures. The North Slope Borough has only a few inspectors who are in charge of the entire North Slope Borough. These inspectors are already overly busy with the Borough's own requirements. We cannot rely on these few inspectors to assure compliance with the BLM's requirements. In the face of broken stipulations and ignored mitigation measures and no active enforcement, we take only limited comfort in the baseline protections we receive from areawide stipulations in Northeast NPR-A, but we would be foolish to proceed without the brightline protections of stipulations at all.. **(Comment No. 254-620)**

Response To: Comment 254-620

The BLM has authority to monitor and inspect all permitted activities and require full compliance with lease terms, conditions of permits, and applicable regulations. BLM is also given authority to issue written or oral orders to govern specific operations to, among other things, ensure that the natural environment, life, and property are protected. Failure to comply can result in monetary assessments, civil and criminal penalties, lease cancellation and forfeiture under the bond. If poor operating practices cause, or could cause "immediate, substantial, and adverse impacts" to the environment, the BLM has the authority to require immediate action. In the event the operator does not comply with the written order, the BLM has the authority to enter upon the land, at the sole risk and expense of the operator, and perform such work as is judged necessary to protect the environment, life, or property. The available enforcement provisions, including assessments and civil penalties, have proven effective in achieving compliance on Public Lands. Our inspection and enforcement authority is the subject of 43 CFR Subpart 3161.2 and 43 CFR Subpart 3163.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

As to the second root cause, failure to comply with consulting requirements, just this winter we experienced what appears to have been the complete and utter failure of an company conducting seismic surveys just to the west of Nuiqsut to consult with anyone in the Village about proposed seismic work, even though the permit issued to the company specifically required consultation.55 No accidents occurred, but they easily could have with the community unaware that seismic cable was strung across the tundra so close to the village, with the sun below the horizon all day at that time of year and especially given the extensive snowmachining activity that occurs so close to the village. The company relied on out-of-date maps which did not reflect the latest interim conveyances (several years ago) to Kuukpik by BLM. As a result, the company also trespassed on Kuukpik land. If the consultation had occurred, they would have almost certainly learned of the current land status, and the problem would not have arisen. This type of practise is not acceptable and the BLM and the oil industry need to take notice that required and sufficient consultation is lacking. We also think that consultation with the impacted communities requires more than mentioning activities during a public meeting. For example the over summering of a drill rig at Puviaq was mentioned during a public meeting in Nuiqsut, but we received no additional information on this well or the plan to over summer the drill rig on the tundra. The Puviaq location is within our traditional subsistence range. Even if it were not, what happens outside our traditional range impacts the caribou which migrate into our traditional range and is thus of considerable concern to us. In addition, the substantial rolligon traffic needed to support Puviaq came through the heart of our subsistence range during the winter. We had to request a copy of the Puviaq well and over summering permit applications from CPAI, and that happened only after we became aware of what was going on through the Internet. This is not a scenario that should be

replayed in the future. Common courtesy and good relations between the agencies and the community both demand better consultation, which needs to be written into a clear stipulation so that, with personnel turnover, both agency and oil industry personnel remain clearly aware of the need for such consultation. **(Comment No. 254-652)**

Response To: Comment 254-652

The BLM is in agreement that the consultation stipulation included in the NW Plan should be stronger and more detailed than Stipulation 61 of the NE Plan. Section H of the General Lease Stipulations and Required Operating Procedures (ROP's) that accompany the Preferred Alternative for the NW NPR-A Final Integrated Activity Plan does this (please see Response to Kuukpik 254-651 (Subsistence Advisory Panel)). Please note that this ROP states "consultation does not include public meetings that are primarily for the purpose of information distribution, unless it is explained at the beginning of the meeting that there is an open dialogue, and that comments, concerns or other information are being actively solicited." The BLM is concerned about the failure of a nearby seismic operation to adequately consult with the community of Nuiqsut. This allegation will be investigated, and appropriate actions will be taken to ensure that permit stipulations are adhered to. With regard to requiring lessees to give notice to the BLM of concerns raised during the consultation process, this activity is actually the responsibility of the BLM. ROP H-1(b) requires the permit applicant to submit documentation of their consultation efforts, as well as their plan of operations, to the BLM in a timely manner so the BLM can use this information during the government-to-government consultation process. The process as outlined in the Northwest Plan Stipulations would require the industry to consult with local communities before creating their plan of operations to get preliminary concerns that they would take into consideration when writing their plan. Then, this document will be given to the BLM to be used during government-to-government consultation. It is during this government-to-government consultation that the BLM can be informed of any concerns that were expressed but not addressed by the permit applicant or any other additional complaints/concerns/issues that have since come up. The BLM will be able to make an informed decision before signing the permit, or may stipulate additional, project-specific mitigation measures.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

BLM also needs to ensure that there are serious consequences for poor operating practises, not just a slap on the wrist. Minor fines for serious damage to the land or subsistence resources cannot be seen by contractors as simply a cost of doing business. We believe that that is largely the case, at present. At this point, the biggest restraint on such practises is the fear of embarrassing the operator with harm that is serious enough to become known. Fines for breaching permit or lease terms need to enter the equation more than they do at present. **(Comment No. 254-661)**

Response To: Comment 254-661

Please see response to comment 254-620 (Monitoring for Compliance).

10. TOPIC : CRITERIA FOR RANGE OF ALTERNATIVES

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The alternatives proposed in the DEIS are neither balanced nor realistic. None of the alternatives provide adequate and appropriate protection for the unique cultural, natural, fish and wildlife, scenic and historical values as expressly required by Congress in the National Petroleum Reserve Production Act of 1976. Alternative

A opens the entire Northwest Planning Area to oil and gas leasing. Alternative B opens 96 percent of the area, hardly a middle ground proposal. Alternative C, presumably the conservation alternative, fails to protect all the key areas, but nonetheless is unlikely to be selected because it opens less than 2 percent of the high oil and gas potential areas to development, and the agency predicts that oil development would be financially infeasible under this alternative. **(Comment No. 253-21)**

Response To: Comment 253-21

Please see the responses to comments 80014-858 (Stipulations, Required Operating Procedures and Mitigations) and 261-31 (Criteria for Range of Alternatives).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Upon careful consideration of the issues we've outlined above, we have concluded a revised DEIS outlining and analyzing a reasonable range of alternatives for management of the Northwest Planning Area needs to be completed, and an opportunity for public comment on these new management alternatives must be provided. We believe a management alternative should be selected that provides adequate protection to the ecological, wildlife, subsistence, cultural and wilderness resource of the Northwest Planning Area. A more balanced, science based approach to energy development and environmental protection should be considered. **(Comment No. 253-30)**

Response To: Comment 253-30

Please see the response to comment 80014-864 (Criteria for Range of Alternatives).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

The alternatives being evaluated in the draft IAP/EIS do not appear to be consistent with the existing statutory directions for the National Petroleum Reserve-Alaska. The DOI/BLM does not anticipate any oil and gas development to occur under Alternative C since it would allow leasing of less than 2% of the areas of high oil and gas potential. The net result is the No Action Alternative and Alternative C would not meet the national energy needs and would fail to fulfill the existing legislative mandates to provide opportunities for oil and gas development of the Reserve. On the other hand, Alternatives A and B would provide 100% of the areas for oil and gas leasing in the high potential areas but fail to protect the significant subsistence, environment, fish and wildlife, and historic or scenic values of the Northwest planning area. We believe that it is necessary for this and future generations to maintain a balance between oil and gas leasing of the high potential areas and protection of significant subsistence, environmental, fish and wildlife, and historic or scenic values consistent with existing statutory directions for the NPR-A. NEPA [40 CFR 1502.14(a)] requires that the lead agency take a balanced approach to rigorously explore and objectively evaluate all reasonable alternatives consistent with the existing statutory directions for the NPR-A, per the NEPA implementing regulations [40 CFR 1502.14(a)]. This approach will ensure that the final IAP will meet the direction of the NPRPA to facilitate oil and gas leasing while protecting significant subsistence, environmental, fish and wildlife, and historic or scenic values. **(Comment No. 261-37)**

Response To: Comment 261-37

The BLM believes the Draft IAP/EIS presents a full range of reasonable alternatives and that the alternatives comply with the Naval Petroleum Reserves Production Act. Please also see the response to comment 261-31 (Criteria for Range of Alternatives).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Based upon our review, it appears that the alternatives in the draft IAP/EIS represent essentially 'all-or- nothing' options for the planning area. Alternatives A and B would allow oil and gas activities in all (Alternative A) or most (Alternative B) of the planning area while requiring lessees to comply with stipulations and Required Operating Procedures (ROPs) that are poorly defined (if required at all) and/or are less protective than practices that are currently used for protecting natural and biological resources on the North Slope. Thus, these alternatives represent options that would maximize the likelihood for oil and gas exploration and development activities (and their effects) while providing minimal or indeterminate protections for environmental, subsistence, and cultural resources. **(Comment No. 261-41)**

Response To: Comment 261-41

Please see the responses to comments 261-31 (Criteria for Range of Alternatives) and 251-136 (Management).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Furthermore, EPA recommends that the final IAP/EIS identify criteria and/or standards employed by DOI/BLM to develop reasonable alternatives consistent with the NPRPA and other statutory directions for the NPR-A. **(Comment No. 261-44)**

Response To: Comment 261-44

The BLM believes that Section I of the document provides this information.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

We recommend the final IAP/EIS reflect the development and evaluation of an alternative (or alternatives) designed to strike a balance between oil and gas exploration and development activities and the protection of valuable natural and cultural resources, consistent with the direction of NPRPA and the NEPA regulations. Developing a balanced alternative should provide for reasonable opportunities to lease in areas with high oil and gas potential and also provide necessary protections for environmental, biological and cultural resources. This is particularly important since the areas in the planning area with high oil and gas potential coincide with areas of high natural resource values. A more balanced alternative could include some, or all, of the following attributes: Availability of some high oil and gas potential areas for leasing (greater than 2% and less than 100% of the high potential areas). Some areas of high natural resource value are not available for leasing (less area than proposed in Alternative C but more than proposed in Alternative B). Clearly defined and protective stipulations and ROPs (such as those employed in the Northeast NPR-A planning area). Establish protections for the sensitive areas of Elson Lagoon, Dease Inlet, and Admiralty Bay; Peard Bay and Kugrua Bay; and Kasegaluk Lagoon (designations as special areas or development of area-specific stipulations). **(Comment No. 261-43)**

Response To: Comment 261-43

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

The final IAP/EIS should establish and identify the available minimum amount of public lands necessary to carry out a successful leasing program at normal price levels ($18 per barrel or $30 per barrel, etc.) while still excluding or restricting oil and gas leasing and surface activities in the areas most critical for subsistence and cultural uses, environmental resources, fish and wildlife habitat, and historic or scenic values. Other criteria and standards that should be considered include, but should not be limited to, the following: (1) economics of operations in remote areas; (2) distances and costs from existing infrastructure; (3) accessibility to oil and gas reserves; (4) future variations in oil prices that must be anticipated; (5) restrictions imposed on surface activities and facilities which increase environmental and subsistence protections, but also increases the costs to industry; (6) environmental sensitivity of the area; (7) subsistence resources; etc. The same standards and criteria should apply to how the Preferred Alternative is selected. These standards and criteria must be included in the final IAP/EIS to document DOI/BLM's process in the development of the range of alternatives and selection of the Preferred Alternative. **(Comment No. 261-49)**

Response To: Comment 261-49

Please see the response to comment 261-33 (Basic Assumptions).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Further, the four alternatives do not reflect consideration of all feasible options but, rather, represent opposite ends of the leasing spectrum with no middle ground. Alternative A opens the entire area to leasing, Alternative B opens 96% of the area, and the 'No Action' Alternative opens none of the Planning Area. Alternative C is supposedly the middle ground between 96% and 0% because it opens 'only' 47% of the area to leasing. Alternative C is not a true middle ground, however, because the agency has constructed it in such a way that it contains all of the most restrictive environmental protections and prevents exploration or drilling on more than 98% of the most promising oil and gas lands. That alternative considers the ramifications of recommending designation of all three potential wilderness areas together with all 22 potential Wild and Scenic River designations. Alternative C also applies more stringent stipulations than are applied under Alternatives A or B. That choice is particularly egregious considering that BLM predicts that no oil or gas development would be feasible under this alternative. If anywhere, these protections should be applied to scenarios in which development might occur. Ultimately, BLM predicts that no oil or gas development will be feasible financially if Alternative C is implemented. Thus, the inclusion of Alternative C does not create a 'range.' BLM gives no consideration to any alternatives in which some of the wilderness areas are recommended, only some of the rivers are designated, or the more stringent stipulations are applied to a development scenario. Indeed, by including all of those protections and the more stringent stipulations in Alternative C, and none in any of the other alternatives, the agency ensured that it can reject environmental restrictions on the grounds that they render oil and gas development infeasible. Thus, the agency has not fulfilled its duty to consider reasonable alternatives lying between full-scale leasing and no-action. **(Comment No. 253-62)**

Response To: Comment 253-62

According to the National Environmental Protection Act (NEPA) the BLM must "rigorously explore and objectively evaluate all reasonable alternatives." A reasonable alternative must meet the proposal objectives. As noted in Section I.A of the EIS, the proposal's objective "encourages oil and gas leasing in NPR-A while requiring protection of important surface resources and uses." The IAP/ EIS examines a range of alternative packages created by varying the area within NPR-A that could be offered for oil and gas leasing and the conditions that would be applicable to that leasing. The three alternatives (A, B, and C) adequately cover the

range of reasonable alternatives. Please see the responses to comments 80014-585 (Stipulations,Required Operating Procedures and Mitigations) and 261-31 (Criteria for Range of Alternatives) .

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Further, the agency has not provided any option allowing for management or protection in the absence of leasing. The 'No-Action' alternative forbids leasing, but it does not require the agency to take any further management actions in the Planning Area. Management of the area, in the absence of leasing, and should have been considered by the agency. Further, the 'No Action' alternative would result in fewer protections than exist currently. In addition, the 'No-Action' alternative does not stop seismic exploration in the area. Thus, the negative impacts associated with that exploration would continue under this alternative. **(Comment No. 253-64)**

Response To: Comment 253-64

All the alternatives including the No Action Alternative, which by definition is current management, include management protection even in the absence of leasing. Under the No Action Alternative, where oil and gas leases would not be offered and therefore has no lease stipulations, BLM has broad management authority. Under 43 CFR 2361.1(a), BLM has authority to take such action, including monitoring, as deemed necessary to mitigate or avoid unnecessary surface damage and to minimize ecological disturbance throughout the NPR-A consistent with the requirements of the Act for the exploration of the NPR-A. Because Alternatives A through C would offer oil and gas leases, lease stipulations were developed; however these stipulations do not diminish in any way BLM's existing authority to protect resources, as noted, or manage other permitted activities as provided under 43 CFR 2361.2. One option under the No Action Alternative would prohibit seismic exploration. To propose an action alternative that does not allow any exploration in the petroleum reserve is contrary to the objectives of this planning action and is inconsistent with requirements of NPRPA for petroleum exploration of the NPR-A.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

BLM may attempt to remedy these deficiencies by combining facets from the four alternatives suggested in the DEIS to create a Preferred Alternative. (DEIS p. II-9.) Such an approach, however, would foreclose meaningful public involvement and comment on the BLM's selected course of action. The final alternative may be very different from any in the DEIS and, thereby, require substantial revisions of the impact analyses and descriptions. Moreover, as explained above, the alternatives considered in the DEIS are so disparate in impact and construction that the agency will be incapable of appropriately considering the impacts of a new, preferred alternative. Accordingly, we believe a revised DEIS that describes BLM's proposed action and preferred alternative is needed, with opportunity for public review and comment on the revised DEIS provided, before a final EIS and Record of Decision is issued. **(Comment No. 253-65)**

Response To: Comment 253-65

The BLM disagrees that allowing the Preferred Alternative to be developed by combining facets of the four alternatives presented in the draft IAP/EIS forecloses meaningful public involvement or that a Preferred Alternative that combines facets of these alternatives will necessarily be so disparate in impact and construction as to result in the agency being incapable of appropriately considering the impacts. In fact, the Preferred Alternative is well within the range of impacts anticipated under the Draft alternatives, public input was extensive and meaningful and important components of the Preferred Alternative are clearly recognizable as having been facets of Alternatives A through C.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

To remedy these deficiencies, BLM should undertake a revised DEIS in which it identifies and evaluates several new alternatives. These new alternatives should consider additional protections for wildlife, address subsistence issues, and consider recommending several areas for wilderness and wild and scenic river designation. As explained below, see section III F., 'Protected Areas,' there are several additional areas in the Planning Area that warrant additional protections and could form the basis for more comprehensive management alternatives. At a minimum, BLM should consider the 'biological hotspots' identified in Audubon's December 2002 report as the basis for wildlife protections in the new alternatives. The agency, however, also should consider wider-ranging habitat protections, and it should consider them in conjunction with protections for subsistence users. Further, the new alternatives should consider recommending other areas in the Planning Area for designation as wilderness and should consider various combinations of wilderness and wild and scenic river designations. In that way, BLM would provide alternatives that could lead to appropriate multiple-use management of the Planning Area. **(Comment No. 253-68)**

Response To: Comment 253-68

Please see the responses to 80014-864 (Criteria for Range of Alternatives)and 213-232 (Alternatives General).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The Secretary not only has the authority to present recommendations to Congress for wilderness and wildlife refuge designations within the Reserve, but under the authorities of the National Petroleum Reserves Production Act, the Alaska National Interest Lands Conservation Act, the Federal Land Policy and Management Act, and The Wilderness Act, the Secretary can take administrative action to permanently protect these area. We would like to see the planning team address the role of BLM's National Landscape Conservation System in the Reserve. **(Comment No. 253-339)**

Response To: Comment 253-339

The National Landscape Conservation System was established to recognize certain exceptional areas managed by BLM. The NLCS is comprised of BLM-managed National Monuments, National Conservation Areas, National Wilderness Areas, National Scenic Trails, National Historic Trails, National Wild and Scenic Rivers, and Wilderness Study Areas. Of these special areas, the Secretary has authority to establish only National Wild and Scenic Rivers and Wilderness Study Areas The Secretary's authority under Section 2(a)(ii) of the Wild and Scenic Rivers Act to create new Wild and Scenic Rivers is quite limited: such designations are based on requests from state governments. 2(a)(ii) Secretarial designation actions are beyond the scope of a BLM integrated activity plan such as this one. The Secretary can also establish Wilderness Study Areas in areas having wilderness characteristics worthy of consideration by Congress for Wilderness designation. One of the purposes of this plan is to determine if there are any areas in the planning unit that should be recommended as Wilderness. If Congress were to establish a National Conservation Area, National Wilderness Area, National Scenic Trail, National Historic Trail, or National Wild and Scenic River in the planning unit, then the designated area would become part of the NLCS.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Upon review of the Draft Integrated Activity Plan/Environment Impact Statement for the Northwest National Petroleum Reserve-Alaska, we conclude that a revised DEIS outlining and analyzing a reasonable range of alternatives for management of the Northwest Planning Area needs to be completed, and an opportunity for public comment on the selected management alternative must be provided. **(Comment No. 253-377)**

Response To: Comment 253-377

Please see the response to 213-232 (Alternatives General).

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

Finally, we call on BLM to write a supplemental Draft-EIS to incorporate and consider the impacts of this balanced and sensible middle ground alternative. **(Comment No. 80075-481)**

Response To: Comment 80075-481

Please see the response to comment 80014-864 (Criteria for Range of Alternatives).

Comment From: American Society of Mammologists (Comment Letter No. 249)

Although the ASM recognizes the extensive efforts made by the BLM in compiling this voluminous (>1,000 pages) draft EIS, we feel that this document falls significantly short of what we believe to be acceptable for a draft EIS as mandated under NEPA. This draft EIS presents a rather lopsided development plan that would endanger the unique areas of the NW NPR-A and undermine responsible environmental safeguards. The Alternatives offered are not balanced, not realistic, nor do they conform to the requirements for 'adequate and appropriate protection for the unique cultural, natural, fish and wildlife, scenic and historical values' of the NPR laid out in the National Petroleum Reserve Production Act of 1976. The Alternatives given emphasize the literal assets of the area ('National Petroleum Reserve'), ignoring most or all of its other valuable natural aspects. We strongly believe that at least one management alternative should be identified that provides adequate protection to the ecological, wildlife, subsistence, cultural, and wilderness resources of the NW NPR-A; as currently written, this draft EIS fails to provide one. This is not to say that energy development cannot be considered in the NW NPR-A at some point, but this is only possible with a balance between energy development and environmental protection. Besides this over-arching issue, there were many other significant problems in the draft EIS that we identified, including the following: **(Comment No. 249-515)**

Response To: Comment 249-515

Please see the responses to 80014-858 (Stipulations, Required Operating Procedures and Mitigations) and 261-31 Criteria for Range of Alternatives) .

Comment From: American Society of Mammologists (Comment Letter No. 249)

the draft EIS simply does not make the case that leasing for oil and gas development in the NW NPR-A is even necessary at this time. Your draft EIS states that you (BLM) are following the NEPA process to fulfill the mandates of the President's energy policy, to meet your obligations under certain federal laws, and to meet the country's energy needs. None of these reasons come close to adequately demonstrating a need at this time for such a large-scale leasing program proposed by your agency, especially in light of the scientific and economic uncertainties associated with the impacts of the decision to lease these lands for this purpose. The President's energy policy, which, by the way, has not been approved by Congress, does not provide a legitimate basis for a decision to lease or demonstrate a need for such action at this time. (**(Comment No. 249-516)**

Response To: Comment 249-516

The NPRPA, 42 U.S.C. § 6508, provides the necessary legal authority for BLM to conduct oil and gas lease sales in the NPR-A. The President's energy policy directs the Secretary of the Interior to "consider additional environmentally responsible oil and gas development, based on sound science and best available technology, through further lease sales in the Petroleum Reserve-Alaska." Please also see the responses to comments 253-40 (Criteria for Range of Alternatives).

Comment From: John Stroud (Comment Letter No. 246)

Doesn't NEPA state that the Alternatives should be a range of possibilities' Bob Schneider showed the AK Resource Advisory Council a range of alternatives that did appear to be a range. After the Washington office review the mid-range alternative (some oil and gas, some conservation, etc) was removed, this only polarized the issues between resource extraction and resource conservation and protection. The Audubon submitted what was essentially the "mid" range back into the range of alternatives. The BLM should consider the Audubon report a citizen's alternative and treat it as such. If you do not, you should respond to my comment with reasons of why you did not. Their report "filled" back in the Washington Offices request to remove the good information that was originally there. **(Comment No. 246-559)**

Response To: Comment 246-559

Please see the responses to comment 80014-858 (Stipulations, Required Operating Procedures and Mitigations) and 213-232 (Alternatives General).

Comment From: The North Slope Borough (Comment Letter No. 80065)

Because our interests and concerns are complex, our development of a position with respect to a workable leasing alternative has not been a simple process of selecting one of those options presented in the Draft IAP/EIS. Instead, after consultation with our affected communities, we have identified our own leasing and mitigation structure, which we hope adequately captures the will of the broader North Slope community. It is our hope that this preferred management alternative accurately characterizes the affected biological and human environments of the region, effectively addresses the reasonably foreseeable impacts that oil and gas operations may have on the resources, uses, and values we recognize as requiring protection, and clearly describes and justifies the identified measures warranted to provide that protection. As the stakeholders most directly facing the impacts of the management decisions the Secretary and the BLM will make concerning the Northwest NPR-A Planning Area, we hope and expect that the Department of the Interior will consider the alternative we propose with appropriate weight and deference. **(Comment No. 80065-570)**

Response To: Comment 80065-570

We have considered your comments in developing the Preferred Alternative.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

From our perspective Alternatives A and B are simply unacceptable, yet those seem to be the Alternatives favored

by BLM. If the Preferred Alternative is likely to ressemble Alternatives A or B, the only one of the profered Alternatives that we could support is the No Action Alternative, in the hope of revisiting these issues at some future date with a more acceptable outcome. We hope to see the deficiencies corrected so that environmentally responsible development can occur in a timely way. **(Comment No. 254-606)**

Response To: Comment 254-606

The BLM believes the Preferred Alternative represents a comprehensive, balanced, and environmentally responsible option.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The Service recommends that the Alternatives in the DEIS, need more definition of the conditions that distinguish them. Except for a surface protection designation for Kasegaluk Lagoon, Alternatives A and B, do not differ significantly in development strategy. The Service recommends that Alternative B be revised to propose greater protection for habitats that are significant to federal trust species while still allowing for development. We offer the following revisions of Alternative B for your consideration: 1) Special Area designation for the Peard Bay and Dease Inlet-Meade River areas in addition to the Colville River, Teshekpuk Lake and Kasegaluk Lagoon designations; 2) Stipulations requiring surface development set-backs of at least one-half mile from lagoons, estuaries, rivers and designated high-density nesting areas (except for a recommended 2 mile set-back for the Colville River); 3) a surface protection designation for coastal waters within Special Areas; and 4) a surface protection strategy for Kasegaluk Lagoon and its surrounding wetlands. This revised Alternative would afford greater protection for specific areas while allowing for development to proceed in an orderly and predictable fashion. In addition, the Service recommends Stipulations and ROPs be more explicit throughout the document. We also recommend that 'no-lease' areas identified under Alternative C be explicitly defined in the text and Stipulations. Further comments on each existing Alternative are provided in the Specific Comments section of this document. **(Comment No. 260-649)**

Response To: Comment 260-649

The alternatives presented and evaluated in the draft IAP/EIS have not changed. The BLM has developed an additional alternative – the Preferred Alternative – for the final IAP/EIS. We have taken your comments into consideration in developing the Preferred Alternative. Please also see the responses to comments 251-325 (Stipulations, Required Operating Procedures and Mitigations) and 213-232 (Alternatives General).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

EPA found the range of alternatives that were evaluated in detail to be lacking an alternative that represents a compromise between an 'all or nothing' option for the planning area. Consequently, we recommend the development and evaluation of an alternative (or alternatives) which strikes a balance between oil and gas exploration and development activities and the protection of valuable natural and cultural resources, consistent with the direction of Naval Petroleum Reserves Production Act and the implementing regulations for NEPA (see 40 CFR 1500.2 and 1502.14). **(Comment No. 261-31)**

Response To: Comment 261-31

The BLM believes that Alternative B is a compromise between Alternatives A and C. Furthermore, the characterization of Alternatives A and C as "all or nothing" is incorrect. Under no alternative is BLM denying its

responsibility to mitigate or avoid unnecessary surface damage. Under Alternative A, we tried to eliminate the redundancy of developing lease stipulations that are already requirements of the State or other Federal agency and to eliminate stipulations that could not legally be enforced by BLM. Under Alternative A, we also placed greater reliance on developing mitigation at the operational or permitting stage when site and project specific information would be available. It was felt this would provide a more effective and efficient way to develop mitigations; this should not be misinterpreted to be an alternative that proposed development at any environmental cost. Furthermore, under Alternative C almost half of the Planning Area, approximately 4.1 million acres, would be available for lease. Admittedly, given existing information, the area of highest potential for oil and gas development is unavailable, but information is insufficient to be able to conclude that a significant find is not possible elsewhere. Industry continues to explore.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

The final IAP/EIS should clearly identify the criteria and/or standards employed by DOI/BLM to develop reasonable alternatives consistent with the existing statutory directions for NPR-A. **(Comment No. 261-32)**

Response To: Comment 261-32

The BLM believes that Section I of the IAP/EIS provides this information.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The DEIS states that while this Alternative would likely have the largest impacts, most of the impacts would be minor because development would impact a relatively small amount of acreage in the planning area (Section II D, page II-33). While the Service agrees that Alternative A would have the greatest impacts, we do not agree that the impacts would likely be minor. Alternative A would have the greatest impacts because it ignores the biological significance of specific areas. Distribution of many wildlife populations is clumped rather than evenly distributed, and therefore especially prone to impacts associated with site-specific development. The DEIS also states (Section IV C) that, under Alternative A, the most serious effect of oil and gas development on wildlife would include potential long-term change in behavior including traditional use of habitats. We agree that such effects could have serious ramifications for impacted species. **(Comment No. 260-692)**

Response To: Comment 260-692

Impact conclusions are based on the scenarios, presented in Section IV.A that project limited exploration and development activities within the very large Planning Area. The analyses recognize the uneven and clumped distribution of most wildlife populations. The uneven and clumped nature of the distribution of these wildlife populations enhances the effectiveness of certain types of project-specific mitigation measures that would be applied at the permitting stage. These measures would include moving a facility, delaying operations, or specifying some design criteria. The even and clumped distribution of wildlife populations was considered in developing the Preferred Alternative.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Alternative B would open 96 percent of the Northwest Planning Area to development. Under Alternative B, Kasegaluk Lagoon is identified as a Special Area that would exclude oil and gas leasing. In addition, the coastal areas and lagoons of the Kuk River and Peard Bay, and coastal waters east of Barrow including Elson Lagoon, Dease Inlet, and Admiralty Bay appear to be protected from surface disturbance. The DEIS states that impacts in

areas open for development would be minimized by the various Stipulations and ROPs outlined in the DEIS. We agree that some of the impacts could be minimized through the imposition of Stipulations and ROPs, however, as written the lack of specificity in the DEIS for Alternative B does not guarantee protection. In fact, the coastal areas mentioned above could be developed under Alternative B if the Stipulations and ROPs are not revised. It is also unclear if the maximum setbacks (one-half mile) were used when determining the amount of area (96 percent), which would be open for oil and gas development. As proposed earlier, the Service recommends that Alternative B be revised to propose greater protection for habitats that are significant to federal trust species while still allowing for development. **(Comment No. 260-694)**

Response To: Comment 260-694

"Setbacks" in this IAP/EIS are areas where permanent development facilities would be prohibited but which would be made available for lease. The oil and gas resources beneath a setback area (if not too large) might be recoverable through extended reach drilling (there would be both technological and economic constraints). The 96-percent figure includes resources in the development setback areas. Please also see the responses to comments 251-139 (Criteria for Range of Alternatives) and 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

EPA believes that the draft Integrated Activity Plan/Environmental Impact Statement (IAP/EIS) does not provide the public and the decision maker with the full range of reasonable options available for managing oil and gas exploration and development activities in the Northwest National Petroleum Reserve-Alaska (NW NPR-A) planning area. The implementing regulations for the National Environmental Policy Act (NEPA) instruct the lead agency to rigorously explore and objectively evaluate all reasonable alternatives and to present the expected effects in a manner that sharply defines the issues and provides a clear basis for choice (see 40 CFR 1502.14). In addition, the alternatives should comply with the Congressional mandate of the Naval Petroleum Reserves Production Act (NPRPA) for NPR-A to conduct 'an expeditious program of competitive leasing of oil and gas and at the same time to protect the significant subsistence, environmental, fish and wildlife, and historic or scenic values consistent with the requirements of this Act for the exploration of the reserve.' **(Comment No. 261-34)**

Response To: Comment 261-34

The BLM believes the Draft IAP/EIS presents a full range of reasonable alternatives and that the alternatives comply with Naval Petroleum Reserves Production Act. Please also see the response to comment 261-31 (Criteria for Range of Alternatives).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Areas that are available for leasing but do not allow permanent facilities are of concern to CPAI. Certain of the Alternatives advocate for no surface occupancy stipulations over large portions of the Northern area along the Barrow Arch. Much of this acreage is in the area of greatest interest to us and could not be produced, eve n with today's advanced extended reach drilling techniques, if these proposed stipulations are implemented. The result is that much of this area simply could not be developed if these no permanent facility designations remain. We would be hard pressed to bid on leases that could not be developed. We believe that we will be able to develop the resource in an environmentally sound manner after the appropriate studies, consultation, engineering and mitigation have been considered. Restrictions that disallow permanent facilities could eliminate this as an option. **(Comment No. 255-737)**

Response To: Comment 255-737

The BLM necessarily develops a wide range of draft alternatives for analysis and comment. Within this range of alternatives, the Preferred Alternative was developed. In crafting the Preferred Alternative, we have taken your comments into consideration. Please see the responses to comments 251-325 (Stipulations, Required Operating Procedures and Mitigations)and 213-232 (Alternatives General)

Comment From: Alaska Coalition (Comment Letter No. 80016)

Since 1976, when Congress transferred the management of the NPR-A (Western Arctic) from the the Navy to the Department of the Interior, it was understood that Congress did so in recognition of the Western Arctic's many nationally significant values, including oil and gas, fish and wildlife, subsistence, and wilderness. They were looking for balance. The alternatives put forth in your draft Environmental Impact Statement offer little in the way of balance. The alternatives also contain weak exploration and development stipulations to protect the environment. Most of the industry regulations approved in other lease sales have been rolled back or watered down in this plan. **(Comment No. 80016-854)**

Response To: Comment 80016-854

Please see the responses to 249-524 (Stipulations, Required Operating Procedures and Mitigations) 251-136 (Management), 80014-858 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: The Sierra Club (Comment Letter No. 80014)

To remedy the deficiencies in the DEIS, BLM should undertake a revised DEIS in which it identifies and evaluates several new alternatives. These new alternatives should consider additional protections for wildlife, address subsistence issues, and consider recommending several areas for wilderness and wild and scenic river designation. At a minimum, BLM should consider the "biological hotspots" identified in Audubons December 2002 report as the basis for wildlife protections in the new alternatives. The agency, however, also should consider wider-ranging habitat protections, and it should consider them in conjunction with protections for subsistence users. Further, the new alternatives should consider recommending other areas in the Planning Area for designation as wilderness and should consider various combinations of wilderness and wild and scenic river designations. In that way, BLM would provide alternatives that could lead to appropriate multiple-use management of the Planning Area. **(Comment No. 80014-864)**

Response To: Comment 80014-864

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the response to comment 251-325 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

The Alternatives A and B would open all hundred percent to 96 percent of the Northwest with hardly any restrictions and regulations to be administered by Bureau of Land Management. Correct me if I'm right or wrong. **(Comment No. 80074-889)**

Response To: Comment 80074-889

All of the alternatives including the No Action alternative include important management protection. 43 CFR 2361.1(a) gives BLM the authority to take such action, including monitoring, as deemed necessary to mitigate or avoid unnecessary surface damage and to minimize ecological disturbance throughout the Reserve consistent with the requirements of the Act for the exploration of the Reserve. Restrictions and mitigation developed under this authority are developed and imposed through the permitting process. In addition, alternatives A and B developed lease stipulations which would become part of the lease contract as well as Required Operating Procedures that would apply not just to an individual lessee but to all permittees.

Comment From: Public Meeting on DEIS - Fairbanks, Alaska (Comment Letter No. 80076)

Two things the Wildlife Habitat Alternative does not address are wilderness and subsistence. The conservation community calls on BLM to further refine this alternative by conducting a more thorough review of wilderness and wild and scenic river potential than was previously done for the Draft-EIS. We also call on BLM to not roll back stipulations that safeguard the Arctic environment. And finally, we call on BLM to write a supplemental Draft-EIS to incorporate and consider the impacts of this balanced and sensible middle ground alternative. Let me reiterate, the Northern Alaska Environmental Center is not asking for the entire Northwest Planning Area to be locked up. Instead, we are asking for a responsible balance between protection of this area's spectacular wildlife and wilderness values, and oil development. The Wildlife Habitat Alternative strikes this balance while providing significantly more industry access to areas of high oil and gas resource potential than BLM's conservation alternative. **(Comment No. 80076-897)**

Response To: Comment 80076-897

Please see the responses to comments 249-524 (Stipulations, Required Operating Procedures and Mitigations), 251-325 (Stipulations, Required Operating Procedures and Mitigations)and 80014-858 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: Public Meeting on DEIS - Fairbanks, Alaska (Comment Letter No. 80076)

I can conclude by saying that I don't think you're at a stage where you can present three scenarios and ask us to say which one's best because I think you're going to have to do more work and include more information than you have up until now in order for a judgment to be made in a fair way by all interests; oil interest, environment interest, the general public, the Native people, hunters, fishermen, everyone else. **(Comment No. 80076-904)**

Response To: Comment 80076-904

Please see comment response 80014-858 (Stipulations, Required Operating Procedures and Mitigations).

Comment From: Alaska Oil and Gas Association (Comment Letter No. 248)

Fourth, if either Alternative C or the proposed Wildlife Habitat Alternative were to be adopted, such a territorial exclusion would significantly reduce the likelihood of successful oil and gas exploration and development. It also would not provide any significant additional protection of the environment beyond that afforded by the stipulations that would govern in the absence of the proposed exclusion. Both the BLM Alternative C and what is being referred to as "the Wildlife Habitat Alternative" proposed by Audubon Alaska would exclude nearly all of

the high prospective acreage from the lands available for oil exploration and development. Unlike the full territorial exclusion, however, the application of specific stipulations would permit surface activities to occur in a manner that is protective of the environment and traditional land use. Allowing facilities on these limited areas, with modern exploration and development techniques including horizontal and extended reach drilling would permit the recovery of the hydrocarbons located in this high prospective area. Thus, specific operational requirements and restrictions rather than wholesale territorial exclusion can protect wildlife and traditional uses of the land while, at the same time, permitting the discovery and removal of oil and gas deposits in a manner consistent with the original intent behind the creation of the National Petroleum Reserve-Alaska. **(Comment No. 248-922)**

Response To: Comment 248-922

Under the Preferred Alternative all areas are available to lease.

11. TOPIC : CONSULTATION WITH OTHER FEDERAL AGENCIES

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

It is not clear from the description in the draft IAP/EIS how the appropriate resource/regulatory agencies will be consulted or give input as decisions are made on how stipulations and ROPs will be implemented. The final IAP/EIS should include a list of agencies with resource protection and/or regulatory/permitting responsibilities and discussion of how they will be consulted in the determination and implementation of stipulations on DOI/BLM leases. **(Comment No. 261-82)**

Response To: Comment 261-82

Copies of the draft IAP/EIS were mailed directly to appropriate resources/regulatory agencies and their comments were solicited during the public review and comment period. Representatives of BLM, both management and staff specialists, met with various Federal, State, and Borough representatives to discuss their comments and concerns. In addition, as required by Section 7 of the Endangered Species Act, formal consultation was initiated with both the U.S. Fish and Wildlife Service and the NOAA Fisheries. Consistent with the National and State Programmatic Agreements and protocols, BLM also consulted with the State Historic Preservation Officer. In accordance with Executive Order 13175, Government-to-Government Relationships with Native American Tribal Governments, representatives of BLM met with the representative of the potentially affected Native villages of the North Slope to discuss their comments and concerns, as well as to discuss the development of the Preferred Alternative. A list of the agencies with resource protection and/or regulatory/permitting responsibilities is provided in Appendix 4. Interrelationships of various laws and regulatory agencies are discussed in Section II.F. An overview of consultation and coordination for this IAP/EIS is provided in Section 6.

12. TOPIC : LAND EXCHANGE

Comment From: Arctic Slope Regional Corporation (Comment Letter No. 186)

4. ASRC has submitted to the Secretary of Interior a proposal for a land exchange, and wants the BLM to recognize that some of the lands in the Planning Area may be acquired by the proposed exchange. **(Comment No. 186-561)**

Response To: Comment 186-561

As Section I indicates, land exchanges are beyond the scope of this plan.

Comment From: Arctic Slope Regional Corporation (Comment Letter No. 186)

ASRC Proposed Land Exchange Our testimony would not be complete without commenting on ASRC's proposed land exchange. ASRC has submitted a proposal to the Department of Interior for a land exchange and asks that BLM recognize that some of the lands in the Planning Area may be acquired by the proposed exchange. It is no secret that ASRC has continued to acquire lands within the NPRA that were excluded to us during our initial ANCSA selections. The lands within NPRA and the Planning Area that ASRC would like to acquire through exchange are in areas that we consider to be our traditional use area; the areas that are used by our shareholders for subsistence activities. These same lands are considered as having 'high oil and gas potential' within the Planning Area. By acquiring lands within this area ASRC is accomplishing two things; rectifying the wrong done to us by taking away our ability to select our traditional use lands, and providing for the economic freedoms of our Iñupiat shareholders by owning high resource potential lands. We are asking that the Department of Interior return some of these lands over to native ownership through our exchange proposal. **(Comment No. 186-565)**

Response To: Comment 186-565

Please see our response to 186-561 (Land Exchange).

Comment From: The North Slope Borough (Comment Letter No. 80065)

It is very important to Borough residents that the Arctic Slope Regional Corporation's (ASRC's) land exchange proposals to acquire title to lands within the NPR-A traditionally used for subsistence, cabins, campsites, and other purposes be implemented as part of the broad management planning for the area. The lands sought within the NPR-A include subsistence use areas continually used by the Inupiat people for centuries and cultural and historic sites of great significance. The injustice of ASRC being prohibited under the 1971 Alaska Native Claims Settlement Act from selecting lands under its entitlement near villages located or elsewhere within the NPR-A must be addressed and remedied. **(Comment No. 80065-576)**

Response To: Comment 80065-576

The land exchange issue was considered but eliminated from further analysis because it is beyond the scope of the Northwest NPR-A IAP/EIS. This is discussed in Section II.G.5 of the IAP/EIS.

Comment From: Hearing -Anaktuvuk Pass (Comment Letter No. 80072)

MR. MORRY: My name is Mark Morry again. Our speaker mentioned that, you know, the wilderness where it is that there would never be a land exchange. With our Park Service land exchange, is that going to be any different' They're both Federal government right, and they're always negotiating. And I think that if NPR-A, that we designate a place where the calving grounds are as wilderness, we'll put stipulations that there'll never be a land exchange within that area. Because you know we had a land exchange with the Park Service, that's Federal

government, too, and land owners of the NPR-A, are Federal government too. So I would like to see the land exchange never happen, designate it wilderness. **(Comment No. 80072-984)**

Response To: Comment 80072-984

Please see response to 80072-982 (Wilderness Areas).

13. TOPIC : SITE CLEARANCE AND REQUIREMENTS FOR RESTORATION

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

BLM has an overall restoration goal of returning the disturbed land to its previous primary uses as fish and wildlife habitat and for subsistence use by native villagers; however, it has yet to develop specific DR&R requirements to implement that goal. In addition, BLM currently uses minimum bond amounts that do not reflect differences in oil company experience and financial viability and are unlikely to cover the potential restoration costs that could be incurred (General Accounting Office. Report to Congress: Requirements for restoring Lands after Oil Production Ceases. Washington: 2002). In order to ensure that the lands of the Reserve are properly restored after oil and gas activities cease, we recommend BLM issue specific dismantlement, removal, and restoration requirements that will allow BLM to meet its overall goal of returning the land to a condition that will sustain its previous us es including fish and wildlife habitat and subsistence uses. In addition, we recommend BLM review its existing financial assurances for oil and gas activities in the Reserve to determine whether they are adequate to assure the availability of funds to achieve its overall restorative goal. **(Comment No. 253-375)**

Response To: Comment 253-375

Specific dismantlement, removal, and restoration requirements will be evaluated in the further NEPA analysis that will accompany each development action. It is too specific an issue to determine in detail before specific developments are proposed. There are (very likely) situations where total removal of facilities is not what would provide the greatest public benefit; and restoration to an original condition may not be a realistic expectation under a number of circumstances. Some examples are the airstrips and gravel pads created in the 1970s and 1980s for the federal government oil and gas exploration program that are in use as administrative sites for BLM today. More importantly permanent facilities must be carefully placed and created with design tools that minimize their presence on the landscape.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

To me, I don't think I would approve anything or even ask them to get into that territory because what they have already done since the 1940s to the present, they haven't cleaned up yet, properly. I think if they can isolate and pinpoint all the areas where they have introduced contaminants that are dangerous to the human health, not recognizing or elaborating on the ones that are in the waters that are bio-accumulated into the fish, and we subsistence hunters, we fish and hunt and eat and some of the fish are partially contaminated and they bio-accumulate when we consume it. And in 30 years somebody who's supposed to be very healthy suddenly gets sick and dies of cancer. I think it would be real nice if they get real serious about doing a very serious cleanup job instead of partial. **(Comment No. 80075-505)**

Response To: Comment 80075-505

There is no simple inventory of everything that may have been brought to the Arctic and left and we don't know specifically where contaminants may be located in NPR-A. We certainly know of some places, and where we know of places we go about presenting that information for funding or to develop other agency interest to provide for cleanup. We also know that there are toxic substances carried by the winds, originating from other countries found in the Arctic. These are so dispersed across the landscape of the Arctic and perhaps all of the globe, that cleanup is not possible.

Comment From: American Society of Mammologists (Comment Letter No. 249)

The draft EIS contained absolutely no mention or consideration of environmental restoration of oil and gas exploration and development facilities and associated infrastructure and lands following facility closure. This is a serious issue to ignore, particularly in light of the fact that all oil and gas facilities have limited life spans and that the facilities themselves and their associated infrastructure must be removed and lands restored or environmental effects will continue to persist. The high probability of failure of all leasees to restore the lands they leased for oil and gas development was brought to light by the recent National Academy of Sciences report (Orians et al. 2003). **(Comment No. 249-520)**

Response To: Comment 249-520

Under all of the alternatives in the draft IAP/EIS, Stipulation G-1 in Table II-02 requires all facilities to be removed and sites rehabilitated upon field abandonment. Stipulation G-1 in the Preferred Alternative also addresses this issue.

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

The NAS report noted a paucity of information available on the remediation of production areas, and just from anecdotal areas that I have served in overflights in Prudhoe Bay and elsewhere. I think that there is a question as to whether or not a complete or adequate restoration of production areas to their original condition can be accomplished in such a fragile ecosystem as the Arctic Alaskan North Slope area. **(Comment No. 80082-542)**

Response To: Comment 80082-542

Under all of the alternatives in the draft IAP/EIS, Stipulation G-1 in Table II-02 requires all facilities to be removed and sites rehabilitated upon field abandonment. Stipulation G-1 in the Preferred Alternative also addresses this issue. Specific dismantlement, removal, and restoration requirements would be evaluated in the site-specific NEPA analysis that would accompany each proposed development action. Please also see the response to comment 253-375 (Site Clearance and Requirements for Restoration).

14. TOPIC : POSSIBLE NORTHEAST NPR-A AMENDMENT

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

We also understand, however, through various media reports that after the Northwest NPRA IAP/EIS is completed, BLM proposes to rewrite the terms and conditions presently governing development in the Northeast NPR-A (which were set by the Record of Decision for the Northeast NPR-A IAP/EIS) in order to conform them to

the forthcoming Northwest NPRA Record of Decision. We strongly and will vigorously oppose any such attempt to make wholesale revisions to stipulations and conditions on development. The Northeast NPR-A stipulations and conditions were the product of lengthy, intense and thorough study specific to the Northeast NPR-A Planning Area and which were established following extensive public input. We see no reason to change them just as the protections that they were intended to afford us and our subsistence resources are about to come into play. Even taking into account the arguably greater richness and sensitivity of the Colville River Delta, Teshekpuk Lake, Fish Creek and Judy Creek and the Colville River areas, we think that the Northeast NPR-A protections should be extended to the Northwest, rather than gutting both. It is grossly unfair and not conducive to good, longterm relationships between residents and the oil industry, to try to change the rules for development after local support for new leasing had once been obtained. We can assure you that if the limited subsistence protections of Alternatives A and B had been all that were offered when the Northeast IAP/EIS was open to public comment, the public comment would have been harshly critical and opposed instead of largely supportive. **(Comment No. 254-614)**

Response To: Comment 254-614

The BLM published a Notice of Intent (Notice) to amend the Northeast NPR-A Plan and complete a supplemental EIS in the Federal Register on June 23, 2003. Changes to the terms and conditions presently governing development in the Northeast NPR-A Planning Area will be addressed through the NEPA process and any decisions on changes to the Northeast NPR-A Plan would be made subsequent to that NEPA process. The NEPA process provides for multiple opportunities for public input and consultation with stakeholders.

15. TOPIC : CABINS AND CAMPS

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

People in this area own cabins and camp sites that may or may not be Native allotments on Native allotments and we, as permanent occupants must have a clear understanding of how BLM or industry is going to deal with this and we need to know this now and not after the fact. Because my family has, you know, my uncles and aunties and my mother and family have Native allotments or just camp sites and we need to know what will happen to those areas. **(Comment No. 80075-506)**

Response To: Comment 80075-506

We have considered your comments in developing the Preferred Alternative; see Section H of the General Lease Stipulations and Required Operating Procedures. The consultation process does not differentiate between Native Allotment and Non-Native Allotment cabins/camp sites.

16. TOPIC : STATUS AND ALLOTMENTS

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

Also I'd like to say that there should be no action done up here until all the answers are met.The questions and answers are met. And also the allotments that haven't been patented or conveyed to the applicants by BLM. And there should be no leases until they are conveyed or patented. **(Comment No. 80075-495)**

Response To: Comment 80075-495

A Native allotment conveys the surface estate but reserves the oil and gas resources to the United States. An oil and gas lease grants the lessee rights to the oil and gas resources but does not grant access across private property. Any conflicts that may arise would be handled as part of the consultation process. See Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures under the Preferred Alternative.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

In the recent court decisions, Alaska versus U.S., in regards to NPR-A have implications on lands which Native Village of Barrow and the Bureau of Land Management have an understanding on ownership of lands north and west of the Porcupine, Yukon, Kuskokwim Rivers, which is known as the PYK line. As a stakeholder involvement is important, Native Village of Barrow is respectfully requesting that there be further studies to analyze and to ensure decision-makers have the environmental information necessary to make timely decisions and to clarify Native Village of Barrow's territorial boundaries. **(Comment No. 80075-499)**

Response To: Comment 80075-499

Clarifying the Native Village of Barrow Territorial Boundaries is outside the scope of the BLM planning process.

Comment From: Wainwright Tribal Council (Comment Letter No. 80012)

The pending land allotments must be considered so that Veterans applying for their allotment will be honored. This should also address those that have pending allotments that have not been recognized. There are cabins that the hunters use for their subsistence hunting and gathering, there are shelters that hunters have put up for emergency shelter should they break down or be caught in a storm, any seismic groups should be made aware of these cabins before doing seismic activity. **(Comment No. 80012-1029)**

Response To: Comment 80012-1029

Please see responses to comments 80012-1029 (Status and Allotments), 80075-495 (Status and Allotments), 80075-506 (Cabins and Camps), and 80076-905 (Status and Allotments).

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

The Northwest NPR-A consists of the majority of the Native allotment owners which will greatly have impact with the development. Native allotment owners are the landlords, subject to be protected under the U.S. Trust Responsibility Act, okay. And we have obligation to protect the lands we are given. So this is some of the things that I would like to state. **(Comment No. 80074-892)**

Response To: Comment 80074-892

Please see the response to comment 80075-495 (Status and Allotments).

Comment From: Public Meeting on DEIS - Fairbanks, Alaska (Comment Letter No. 80076)

I'd like to discuss five issues. I support Alternative A. If there's any of the State land selection that was done in 1993 through this area, I'd like to have that supported and go through fruition rather than being precluded. To enforce the issues of ANILCA which is no more. No more add-ons of reserve areas and so on. ANILCA specified in 1980 that it was gone. If there's any RS2477 issues that are through this area, they need to be addressed and formalized and finalized. To ensure that the 90/10 royalty issue that was part of the Statehood Compact will be addressed and held up by BLM as part of their studies. **(Comment No. 80076-905)**

Response To: Comment 80076-905

There are no valid State selections within NPR-A and NPR-A has never been available for State selection under authority of Sec 6 of the Alaska Statehood Act. ANILCA states in Sec 101(d) that the need for future legislation designating new conservation system units, new conservation areas, or new national recreation areas has been obviated (with passage of the Act) and further states in Sec 1326(b) that no further studies of Federal Lands in the State of Alaska for the single purpose of considering the establishment of a conservation system unit, national recreation area, national conservation area or for related or similar purposes shall be conducted unless authorized by that Act or further act of Congress; but ANILCA also states in Section 1320 that the Secretary of Interior is authorized to identify lands in Alaska which the Secretary determines are suitable for wilderness. To date no claims for R.S. 2477 rights within the NPR-A have been asserted by the State of Alaska or other qualified party. Within NPR-A 50%, not 90%, of all receipts from sales, rentals, bonuses, and royalties on leases are paid to the State (PL 96-514; 94 Stat. 2963).

17. TOPIC : MINING

Comment From: Anchorage Sand and Gravel Steven M. Lovs (Comment Letter No. 80088)

This area should be opened to mineral entry under the general mining laws and leasing laws. **(Comment No. 80088-1026)**

Response To: Comment 80088-1026

See response to comment 80076-906 ((Mining).

Comment From: Public Meeting on DEIS - Fairbanks, Alaska (Comment Letter No. 80076)

The area should also be open to mineral entry. You only have it for oil and gas right now, but I'd like you to consider mineral entry under the general mining laws and leasing laws. **(Comment No. 80076-906)**

Response To: Comment 80076-906

Please refer to the IAP/EIS, Section II.G.4 Legislative Action to Open the Planning Area to Mineral Entry (Hardrock). The proposal for legislation to change the statutory management direction on hardrock minerals is

outside of the scope of this IAP/EIS.

18. TOPIC : SUBSISTENCE ADVISORY PANEL

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

The draft IAP/EIS describes the Subsistence Advisory Panel (SAP) and its work on subsistence issues. Multi-agency working groups, such as this one, can provide valuable links to subsistence communities and their concerns. After 10 years of Native testimony in public forums, numerous SAP meetings, and the extensive Traditional Knowledge database, EPA believes that more effective stipulations and ROPs, offering greater protections for migrating animals and subsistence activities, should be developed and applied to Alternatives A, B and C in this draft IAP/EIS and as well as future DOI/BLM EIS documents. With stipulations and/or ROPs that specifically address subsistence harvesting protections, DOI/BLM can fulfill its charge under the Alaska National Interest Land Conservation Act (ANILCA) Section 810(a)(3) as discussed in Appendix 5. A good example of this is the Beaufort Sea Planning Area Oil and Gas Lease Sale 144 final EIS, developed by DOI Mineral Management Services (MMS), which demonstrates that stipulations can be developed to meet the needs of subsistence communities and include their involvement. Stipulation No. 4, Industry Site-Specific Bowhead Whale- Monitoring Program, was developed to mitigate the effects of exploration activities (including noise) on migrating bowhead whales and includes the involvement of the North Slope Borough and the Alaska Eskimo Whaling Commission. This added protection of a subsistence resource addresses the whale hunting concerns of disproportionately impacted subsistence hunters. EPA recommends that stipulations/ROPs be developed for each alternative that focus on protecting each of the impacted subsistence resources. We believe that this approach will meet the environmental justice intent of incorporating what was heard by the impacted public into the decision- making about the project. We believe it is possible, in the proposed project area, to provide more than adequate protection for subsistence resources and simultaneously encourage cost-effective resource development.
(Comment No. 261-105)

Response To: Comment 261-105

The BLM acknowledges the importance of the Northwest NPR-A as an area for subsistence activities. Comments by the USEPA and Native communities, as well North Slope residents, have been taken into consideration in developing the Preferred Alternative. The Preferred Alternative includes additional protection for migrating birds and subsistence activities, as well as requirements for subsistence consultation; see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Note that it has been stated to us informally by a BLM official this winter that BLM considered informing the Subsistence Advisory Panel of activities to be sufficient to comply with the consultation requirement. For the reasons stated below, we vehemently disagree with that position, if it indeed represents BLM's position.
(Comment No. 254-639)

Response To: Comment 254-639

Stipulation 61 of the NE Plan states: "Prior to submitting an exploration plan or development and production plan (including oil spill contingency plans) to the BLM, the lessee shall consult with potentially affected subsistence communities (e.g., Barrow, Nuiqsut, Atqasuk, or Anaktuvuk Pass), NSB and the Subsistence Advisory Panel to discuss potential conflicts with the siting, timing, and methods of proposed operations and safeguards or

mitigating measures that could be implemented by the operator to prevent unreasonable conflicts". The BLM has always required permit applicants to consult with local communities and the NSB, in addition to the SAP, and will continue to do so. This language is included in the Northwest Plan, along with more precise requirements and expectations by the BLM. The BLM will also strive to ensure that all employees are aware of the policies, stipulations, and required operating procedures stated in the various land use plans that are used to manage the NPR-A.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

As to the first of these root causes, we recognize that the Subsistence Advisory Panel performs an important function benefitting the North Slope communities in the NPR-A, but consultation solely with the Subsistence Advisory Panel is not equivalent to consultation with affected communities. The Subsistence Advisory Panel is put together to advise the BLM, not to speak for the communities or to make sure that information on upcoming operations received by the Advisory Panel is disseminated to everyone in the community. When BLM gets advise from the Advisory Panel, all it reflects is the opinion of one member from each of the represented communities, not the collective opinion of the community. As far as the flow of information back to the community is concerned, the Subsistence Advisory Panel is virtually worthless. For one thing, each community has only one representative. For another thing, that representative has no budget and no staff for communicating with the community and is not paid to do so. The whole community expects and needs to be included in consultation related to activities outside our village. After all, these are our ancestral lands and the inheritance of our children. From the standpoint of the personal safety of everyone in the community and from the standpoint of minimizing industry/community tensions, consultation with the Subsistence Advisory Panel is simply not sufficient. Running mobile industrial operations in the vicinity of subsistence and recreational uses without proper notification is simply not safe. That is obviously true of seismic and other mobile exploratory operations, but the need does not end when development is complete, since there are irregular hauling and construction activities connected with ice roads, facility upgrades and other activities. **(Comment No. 254-651)**

Response To: Comment 254-651

The BLM agrees that consultation with only the NPR-A Subsistence Advisory Panel is not adequate (see response to Kuukpik 254-652 (Monitoring for Compliance). The NPR-A Subsistence Advisory Panel met this past winter in January 2003, and held a two-day planning workshop in order to identify ways to improve the SAP and make it a more effective entity. One of the primary topics discussed was information sharing, both from the BLM and Industry to the SAP, and from the SAP members to their individual communities. Toward the result of better communication, the SAP voted to amend their bylaws to include the following duty: Keep local communities informed about planned oil and gas activities and Panel, agency and lessee actions designed to protect subsistence resources and uses. This includes attending, at a minimum, one local government or tribal meeting following the SAP meeting to give an update/review to the local community. The Subsistence Advisory Panel members feel that they perform and fulfill a very important role, both within the BLM and the communities of the North Slope. The SAP will continue to hold yearly planning workshops to discuss ways to improve and enhance this role.

Comment From: Patricia Phillips (Comment Letter No. 170)

Has the North Slope Regional Advisory Council for Federal Subsistence Management been briefed on this EIS and given the opportunity to comment through the FACA process' **(Comment No. 170-970)**

Response To: Comment 170-970

The BLM relies on its Subsistence Advisory Panel, which includes subsistence users from all of the North Slope villages, to provide local input on subsistence issues. There is no requirement that the North Slope Regional

Advisory Council be briefed on this plan.

19. TOPIC : LEGAL

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

BLM relies on the NRPRA for authority to conduct lease sales in the Planning Area. The statute does not mandate a particular progam at this time or demonstrate a need for aggressive leasing and exploration in the absence of adequate information. In fact, the 1980 appropriations rider calling for 'an expeditious program of competitive leasing of oil and gas,' 42 U.S.C. § 6508, does not authorize leasing at this time. Rather, it authorized only the lease sales in the early 1980s, and those leases have expired. The 1980 rider does not continue to authorize lease sales in the NPR-A.. **(Comment No. 253-40)**

Response To: Comment 253-40

The NPRPA, 42 U.S.C. § 6508, provides the necessary legal authority for BLM to conduct oil and gas lease sales in the NPR-A. It and other applicable laws also provide authority for BLM to require adequate protections for the important surface resources in the region. The issue of BLM's authority to lease was decided in Wilderness Society, Inc. v. Babbitt, No. 1:98-02395 CV (D.D.C). The district court in that case found in favor of the United States on summary judgment, holding that the leasing authority in the NPRPA did not expire in the 1980's, as the plaintiffs had argued, but rather continues to the present time. Thus, the NPRPA provides continuing authority for holding new oil and gas lease sales. The BLM also is not restricted by the NPRPA as to the number of or locations where these lease sales may be held. Before making the decision to lease for oil and gas, BLM complies fully with NEPA and other environmental requirements and completes an extensive analysis of environmental impacts, including consideration of areas to be excluded from leasing and other requirements for appropriate protective measures for sensitive surface resources.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Consistent with this trust responsibility, the agencies within the Department of Interior that manage public lands in Alaska, such as the BLM, must refuse to take land management actions if they find that the actions would cause significant restrictions to subsistence uses and those actions cannot be mitigated unless those actions are otherwise clearly compelled by other law. **(Comment No. 253-330)**

Response To: Comment 253-330

Section 810 of ANILCA requires that BLM evaluate the effect of leasing for oil and gas or other management actions in the NPR-A "on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes." 16 U.S.C. § 3120. The BLM has prepared an ANILCA § 810 analysis of the effects on subsistence from its proposals and included it in Appendix 5 to the IAP/EIS. Because the analysis finds that one or more of the alternatives, together with the cumulative impacts, "may significantly restrict subsistence uses," ANILCA § 810 requires that BLM give appropriate notice, hold hearings in the vicinity of the area involved, and make determinations as to whether the proposed action is "necessary, consistent with sound management principles for the utilization of the public lands, . . . will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and [that] . . . reasonable steps will be taken to minimize the adverse impacts upon subsistence uses and resources resulting from such actions." 16 U.S.C. § 1320(a)(3). The BLM has complied with all these steps in connection with this IAP/EIS process.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Properly interpreted, the subsection (A) 'necessary' determination should allow significant restrictions to subsistence only where something more specific than agency policy goals compels them. The 'necessary' requirement demands something more specific than a discretionary agency goal. **(Comment No. 253-332)**

Response To: Comment 253-332

The BLM has correctly applied ANILCA § 810 to this proposed action. It has completed the analysis, given notice, held hearings, and made the determinations required by § 810(a)(3), before proceeding with any leasing of public lands in the Northwest NPR-A Planning Area. The Ninth Circuit Court of Appeals has provided definitive guidance as to the proper interpretation of the "necessary, consistent with sound management principles for the utilization of the public lands" determination in § 810(a)(3). Hoonah Indian Association v. Morrison, 170 F.3d 1223, 1226-27 (9th Cir. 1999). In that case, the court found that an agency has the authority to proceed in implementing competing multiple-use management objectives (in that case, timber sales) on the public lands, even where there may be adverse impacts to subsistence uses from the action. The NPRPA authorizes and directs BLM to open the NPR-A for oil and gas exploration and development as well as to impose measures for the protection of the important surface resources of the region, including subsistence resources. The alternatives in the IAP/EIS propose various ways to undertake these objectives, including the development of reasonable measures designed to minimize any adverse impacts on subsistence uses and resources from authorized oil and gas activities.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Similarly, the 'minimal amount of public lands' determination should require the Department of the Interior to select the alternative that uses the least public land that would accomplish the general purposes of the action, taking into account the relative importance of different lands for subsistence uses. **(Comment No. 253-333)**

Response To: Comment 253-333

The BLM has made a proper determination that the proposed action satisfies the "minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition" requirement in § 810(a)(3). The basis for the ANILCA § 810 determination is explained in Appendix 5 to the IAP/EIS. Consistent with sound multiple use management principles, BLM has made available the minimal lands necessary for oil and gas leasing to meet energy production goals while still ensuring that adequate protections are in place to protect valuable surface resources and to minimize any adverse effects on subsistence uses and resources.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Contrary to assertions in the DEIS Congress gave broad authority in 1976 to the Secretary to manage and protect the wildlife, wilderness, and other resources of the NPRA. 42 U.S.C. §§ 6503, 6504. Other statutes, such as FLPMA, 43 U.S.C. §1732, also give the Secretary the authority to manage the multiple resource values of NPRA land, a complete wilderness review was specifically authorized in the 1980 Alaska National Interest Lands Conservation Act (ANILCA). The DEIS is a multiple purpose land management document, which addresses a variety of issues, including oil and gas leasing. BLM can not arbitrarily ignore the discretion restored by Interior Secretary Bruce Babbitt and originally granted by Congress in ANILCA § 1320. BLM has explicit authority to consider wilderness under ANILCA § 1320. **(Comment No. 253-343)**

Response To: Comment 253-343

Wilderness reviews of BLM-managed lands in Alaska have been guided by unique statutory provisions applicable only to public lands in Alaska. In § 6508 of the NPRPA (42 U.S.C. § 6508) and § 1320 of ANILCA (43 U.S.C. § 1784), Congress provided that, notwithstanding any other provision of law, section 603 of FLPMA (the wilderness review provision) does not apply to any lands in Alaska. Therefore, BLM is not required to conduct wilderness reviews for the lands it manages in Alaska (one exception was a wilderness study specifically required by § 1001 of ANILCA for certain lands north of 68 degrees north latitude and east of the western boundary of the NPR-A. This study was completed in the late 1980s). Section 1320 of ANILCA provides instead that for public lands in Alaska, including the NPR-A, the Secretary "may identify areas in Alaska which he determines are suitable as wilderness and may, from time to time, make recommendations to the Congress for inclusion of any such areas in the National Wilderness Preservation System, pursuant to the provision of the Wilderness Act." 43 U.S.C. § 1784. This leaves it in the Secretary's discretion whether to identify, study and recommend any particular public lands in Alaska for wilderness designation. The BLM exercised its discretion under § 1320 of ANILCA in the Northwest NPR-A Integrated Activity Plan by choosing to consider certain lands in the southern part of the Planning Area for wilderness designation in one of the alternatives (Alternative C). The wilderness values of the entire Planning Area are discussed in Section III of the IAP/EIS, and the possible impacts on wilderness values of the Alternatives are discussed in Section IV. In addition, it is relevant to note that Secretary Norton recently issued a new Department policy on BLM wilderness reviews in Alaska. On April 11, 2003, the Secretary issued a memorandum to the Director of BLM which instructs BLM to: "consider specific wilderness study proposals in Alaska, as part of any new or revised resource management planning effort, if the proposals have broad support among the State and Federal elected officials representing Alaska. Absent this broad support, wilderness should not be considered in these resource management plans. This approach allows me or my successors to take into consideration the views of the State of Alaska, through its elected representatives, in determining when it makes sense to conduct wilderness studies." The Secretary's April 11, 2003 memorandum also clarifies that with respect to the Northwest NPR-A IAP/EIS, "one of the four alternatives in the [draft] Plan considers additional wilderness restrictions and BLM will continue to consider that alternative in developing the Final IAP/EIS." Memorandum from Secretary to Director, BLM, (April 11, 2003). Finally, the commenter references certain sections of the BLM Wilderness Inventory and Study Procedures Handbook, H-6310-1 (January 10, 2001). However, under the terms of a recent settlement of litigation in the State of Utah, BLM is required to rescind this handbook and several implementing directions, decisions, policies and bulletins. State of Utah v. Norton, No. 2:96CV0370 B (D. Utah) (Order approving Stipulation, and Granting Joint Motion to Dismiss Third Amended and Supplemented Complaint, dated April 11, 2003).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Even if BLM chooses not to recommend designation of any wilderness study areas within the Planning Area, NEPA requires BLM inventory all of resource values in the Planning Area including wilderness. Secondly, NEPA requires BLM analyze the impacts to wilderness values of oil and gas development for the entire affected environment. This DEIS fails to adequately describe the wilderness resource or analyze the adverse impacts of oil and gas leasing on wilderness resources. **(Comment No. 253-344)**

Response To: Comment 253-344

Section III.C.8 discusses the wilderness inventory process that BLM used in preparing the draft document. This process included updating a comprehensive wilderness evaluation that was done in compliance with section 105(c) of the NPRPA. The results of this inventory are presented on map 88 and table III-35. Assessments of the impacts to wilderness resources from possible development activities are presented for each alternative in the draft and for the Preferred Alternative in this document.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Furthermore, the DEIS violated NEPA because it fails to consider as reasonable alternative, potential wilderness designations in the Northern portion of the planning area. 'The creation of wilderness is a reasonable alternative.' Sierra Club v. Lyons, No. J00- 0009-CV (D. Alaska March 30, 2001) (holding that Forest Service violated NEPA when it failed to consider new wilderness recommendations in Forest Plan). **(Comment No. 253-345)**

Response To: Comment 253-345

The Sierra Club v. Lyons case, No. J00-0009-CV (D. Alaska March 30, 2001) does not require that BLM consider additional alternatives proposing potential wilderness designations in the northern portion of the Northwest NPR-A Planning Area. The statutes and regulations applicable to the Forest Service in the preparation of national forest plans and applied by the court in the Sierra Club case are quite distinct and different from the statutes and regulations applicable to the NPR-A. As explained in response to comment 253-343 (Legal),§ 1320 of ANILCA exempts the public lands in Alaska from the wilderness review requirements of FLPMA and leaves it within BLM's discretion whether to study and recommend any specific public lands in Alaska for wilderness designation. The BLM has exercised that discretion in the Northwest NPR-A Planning Area Integrated Activity Plan by choosing to consider certain lands in the southern portion of the Planning Area for wilderness designation, but not the entire Planning Area. The BLM has sound management reasons for this choice. In addition to notable differences in landscape and scenic variety between the northern and southern regions, wilderness designation of the northern portion of the Planning Area would preclude all oil and gas leasing and exploration in the highest potential portion of the Planning Area.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

The Department of the Interior (acting here through the BLM) has been given the task of seeing that the NPR-A is developed only if appropriate conditions, restrictions and prohibitions on activities undertaken by an oil and gas lessee are in place to protect the NPRA's surface and subsistence resources from significant adverse effects. Congress has declared, that federal lands in Alaska, including NPR-A, shall be utilized in such a way to 'cause the least adverse impact possible on rural residents who depend upon subsistence uses of the resources of such lands." Similarly, the taking of wildlife for subsistence is given a preference, and other forms of taking of wildlife are to be restricted if necessary to assure the 'continued viability of a fish or wildlife population or the continuation of subsistence uses of such populations.' Harm to wildlife by oil and gas-related activities is considered a "taking," and must be so restricted if necessary to maintain such populations of fish and wildlife and our subsistence uses. **(Comment No. 254-608)**

Response To: Comment 254-608

42 USC Sec. 6508 says there shall be conducted an expeditious program of competitive leasing of oil and gas in the National Petroleum Reserve Alaska provided that "activities undertaken pursuant to this section shall include or provide for such conditions, restrictions, and prohibitions as the Secretary deems necessary or appropriate to mitigate reasonably foreseeable and significantly adverse effects on the surface resources of the National Petroleum Reserve in Alaska". We believe the Preferred Alternative, while allowing for a program of competitive oil and gas leasing includes the conditions, restrictions, and prohibitions deemed appropriate by the Secretary to mitigate foreseeable and significantly adverse effects on the surface resources.

20. TOPIC : PURPOSE AND NEED

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS fails to demonstrate that leasing for oil and gas development in the Northwestern Planning Area is necessary at this time. BLM states that it is undertaking this NEPA process to fulfill the mandates of the President's energy policy, to meet its obligations under various federal laws, and to meet the country's energy needs. None of those statutes or proposals adequately demonstrates a need at this time for the large-scale leasing program contemplated by the agency, especially in light of the scientific and economic uncertainty regarding the impacts of a decision to lease. **(Comment No. 253-20)**

Response To: Comment 253-20

As an agency of the federal government, BLM is responsible for implementing the President's National Energy Policy to expedite oil and gas leasing and development in NPR-A, as well as meeting our obligations under federal law. Public concerns about meeting the country's energy needs have been prominent since at least the 1970's. The U.S. currently imports about half its oil supply, and the U.S. Department of Energy projects that the proportion of oil coming from overseas will near 68 percent by 2025. One way to address these concerns is to develop a leasing program within the National Petroleum Reserve-Alaska, which was established for this purpose in 1923.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS also fails to quantify and/or qualify the current activity on the North Slope in the Purpose and Need discussion (DEIS p. I-3). **(Comment No. 253-57)**

Response To: Comment 253-57

Current activity on the North Slope is summarized in Section IV.F.7 Major Factors Considered in the Cumulative Effects Analysis. Additional description of recent and current activities can be found in Section IV.A.1.b.2 Oil and Gas Exploration and Development Activities.

Comment From: NANA Development Corporation (Comment Letter No. 80025)

Leasing In The Petroleum Reserve Enhances The Nation's Energy And Economic Security. Congress originally designated the land contained within the Northwest portion of the Petroleum Reserve for the past 80 years for future production of energy resources. With the instability in the Middle East, there has never been a better time for increasing America's domestic supply of oil and reducing our dependency on foreign exports. Moreover, development of the Petroleum Reserve has the potential to generate thousands of jobs and provide an additional source of domestic fuel for Americans. **(Comment No. 80025-962)**

Response To: Comment 80025-962

Please see the response to comment 267-1034 (Preferred Alternative).

21. TOPIC : WILDERNESS AREAS

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS fails to comprehensively consider wilderness potential for the Northwest Planning Area. BLM dismisses millions of acres of the planning area's potential wilderness with no review or analysis (DEIS p. II-40). Contrary to assertions in the DEIS Congress gave broad authority in 1976 to the Secretary to manage and protect the wildlife, wilderness, and other resources of the Reserve (42 U.S.C. §§ 6503). Other statutes, such as FLPMA, 43 U.S.C. §1732, also give the Secretary the authority to manage the multiple resource values of the Reserve, a complete wilderness review was specifically authorized in the 1980 Alaska Natio nal Interest Lands Conservation Act (ANILCA). **(Comment No. 253-26)**

Response To: Comment 253-26

The BLM inventoried all lands within the Northwest Planning Area for their wilderness values. These lands were first inventoried in 1977-78 under the guidance of section 105 (c) of the Naval Reserve Production Act of 1976, and inventoried again on a much smaller scale in 2001. See Section III.C.8 for a full discussion of the wilderness values of the Planning Area. The inventory in 1977-78 was not for the purposes of identifying lands for wilderness designation, but for the purpose of identifying wilderness characteristics. The NPR-A Production Act of 1976 directed BLM to manage, among other values, wilderness resource values to the extent allowed for in the Act. FLPMA section 603 directed BLM to inventory all BLM lands for their wilderness values and make recommendation for wilderness designation. BLM lands in Alaska were exempted from this mandate. ANILCA, section 1004, directed the Secretary to review BLM lands in Alaska for their suitability or non-suitability for preservation as wilderness. However, the Act was very specific as to what BLM lands were to be reviewed and they were: "Federal lands north of 68 degrees north latitude and east of the western boundary of the National Petroleum Reserve–Alaska, other than lands included in the National Petroleum Reserve–Alaska and in conservation system units established by this Act." Therefore, no authority was given to inventory lands within the NPRA for wilderness designation by ANILCA. ANILCA, section 1320 stated: "However, in carrying out his/her duties under section 201 and 202 of FLPMA, the Secretary may identify areas in Alaska which he/she determines are suitable as wilderness and may, from time to time, make recommendations to the Congress . . .". It is this section of ANILCA that BLM is using to look at wilderness as a part of the Northwest NPR-A plan. Given the Secretary has latitude to identify areas for wilderness suitability and given the reasons for the NPRA withdrawal (for oil and gas reserves), a conscientious decision was made to balance oil and gas potential with potential wilderness areas by eliminating high potential oil and gas lands from further wilderness discussion. (The reasons for this decision are discussed in Section II.G.2 of the IAP/EIS).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Further, the DEIS states that, under all alternatives, the area will continue to be designated as an 'Extensive Recreation Management Area,' in which motorized vehicles are allowed, and that studies, such as 'inventory and monitoring of resource populations and conditions,' will be conducted. (DEIS p. II-2.) No more specific information is provided about those studies or management requirements. Thus, while they might be part of a 'multiple-use management' scheme, even together with the uses proposed under the different alternatives, those activities do not constitute comprehensive management. **(Comment No. 253-60)**

Response To: Comment 253-60

The statements you reference were not intended to constitute a comprehensive management plan, they were simply presented in the Introduction to Section II as two actions that would continue regardless of the management plan finally chosen. The statement that the Planning Area would continue to be managed as an Extensive Recreation Management Area (ERMA) is consistent with BLM policy to consider any lands not

designated as a Special Recreation Management Area to be an ERMA and that under any management proposal the Planning Area would meet the definition of an ERMA as found in Bureau Manual 8320. An ERMA is an area where dispersed recreation is encouraged and where visitors have a freedom of recreational choice with minimal regulatory constraint; significant public recreation issues or management concerns are limited; and minimal management, consistent with BLM's stewardship responsibilities, is adequate. Detailed planning is not usually required. More specific information related to inventory and monitoring is presented in Appendix 1 of the IAP/EIS.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

The draft IAP/EIS proposes to designate the Foothills and Mountain areas adjacent to the Colville River as Wilderness Areas under Alternative C. EPA supports DOI/BLM's proposal to designate the Foothills and Mountain regions as Wilderness Study Areas due to their importance for raptor nesting habitat. DOI/BLM should designate these wilderness areas in the Preferred Alternative. Special management considerations should be developed for these wilderness areas. **(Comment No. 261-90)**

Response To: Comment 261-90

Any area that should become designated wilderness requires a management plan. Any special management considerations would be addressed in the wilderness plan and could be incorporated as long as it does not compromise the values and directions laid out in the Wilderness Act. The Preferred Alternative does not recommend areas for wilderness designation. It does include measures to protect Raptor habitat. See Stipulation K-1 and Required Operating Procedure K-7.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

However, the DEIS fails to comprehensively consider wilderness potential for the Northwest Planning Area. **(Comment No. 253-342)**

Response To: Comment 253-342

Please see the response to comment 253-26 (Wilderness Areas).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Given BLM's stated purpose of considering multiple use management, excluding the majority of the planning area is arbitrary. Wilderness is a reasonable use that should be considering. Writing off the majority of the planning area from wilderness consideration without any analysis is inconsistent with the purpose of the IAP/EIS. Where BLM does acknowledge wilderness attributes the DEIS makes sweeping assumptions and contradictions illustrating further the failure to adequately consider wilderness potential. A few examples follow. • The DEIS fails to consider suitable wilderness in the Planning Area claiming wilderness designation prevents traditional access and subsistence. Yet the DEIS acknowledges that Wilderness designation does not preclude traditional access and susbsis tence activities a few pages later (DEIS p. III-139). In fact the 105(c) study specifically states that Wilderness is compatible with traditional access and subsistence. • The DEIS fails to consider the economic value of wilderness, significant national demand for wilderness and wilderness as a piece of our cultural heritage. The 105(c) studies consider each of the elements in the 1979 report. • The DEIS claims old seismic trails prevent wilderness recommendations yet Alternative C suggests seismic activity and ice roads should be allowed in WSAs since there is no impairment for future wilderness designation. We urge BLM to adhere to Secretary

Babbitt's direction and the intent of Section 1320 of ANILCA, and to ascertain the full extent of the Planning Area's wilderness resource values in a revised DEIS. In addition we urge BLM to include in the revised DEIS an adequate impacts analysis of all of the suitable wilderness lands. **(Comment No. 253-346)**

Response To: Comment 253-346

The BLM does not feel we arbitrarily excluded a majority of the Planning Area from wilderness considerations. Please see the response to comment 253-26 (Wilderness Areas) to understand the reasoning for finding a balance of oil and gas leasing and considerations for wilderness designations. Each bullet of this comment is addressed individually below. • Traditional access and subsistence activities are allowed in designated wilderness in Alaska. They would also be allowed in any designated wilderness within the Northwest NPR-A Planning Area. We are not sure where the commenter found language in the Draft IAP/EIS to the contrary. Traditional access and activities are allowed in Alaskan wilderness areas, as outlined in ANILCA section 1110. • The economic value of designated wilderness in the NPR-A was not quantified, because it is not expected to be of any great economic value. The NPR-A is far removed from any major population area. It is very expensive to reach and there are no road systems to the area. Very few people come to the area now (outside of subsistence users) and it is not expected to attract more people just because the area may be a designated wilderness. It is true that designating a wilderness area would add to the wilderness system and add to our cultural heritage. And to that end, BLM does have an alternative (Alternative C) that allows the public the opportunity to comment on the designation of a portion of the Northwest NPR-A as wilderness. • Old seismic trails do not in themselves prevent an area from being designated wilderness. Multiple passes of vehicles used for seismic work made most of the seismic trails. By definition, this does not constitute a road. A road (improved and maintained by mechanical means) would in fact, be grounds to eliminate an area from wilderness consideration. We are not sure where the commenter found verbiage in the Draft IAP/EIS that says "old seismic trails prevent wilderness recommendations," however seismic trails in and of themselves do not eliminate an area from wilderness designation. Secretary Babbitt's direction on addressing wilderness as a resource in this land use plan has been superceded by new direction from Secretary Norton. Under that direction BLM has preceded to consider Wilderness designation for portions of the Planning Area. Prior to this plan, BLM Alaska lands were not to be looked at for potential wilderness designation (Secretary James Watt directive, 1980) in any plan or management of BLM lands. Section 1320 of ANILCA gives the Secretary discretion to look at wilderness in Alaska should he/she choose to. In exercising this discretion and trying to balance the requirements to encourage oil and gas leasing (within the petroleum reserve) with the need to protect resources, including wilderness resources, BLM decided not to consider for Wilderness designation lands in the northern part of the Planning Area with high potential for oil and gas resources (see section II-41). Please also see the responses to comments 253-343(Legal) and 253-345 (Legal).

Comment From: John Stroud (Comment Letter No. 246)

On past maps the BLM has shown that the two areas representing possible Wilderness are directly related to the Low and Medium potential areas for oil and gas. The standards outlined by the Wilderness Act effectively reveal nearly 99% of the NPRA to be Wilderness. Why then would the BLM 1) no longer show the "high, medium, and low" oil potential polygons since they have been available in the past, and 2) replace them with possible wilderness areas' I could not locate the data nor did the information in the Draft IAP showing that the two wilderness areas I outlined on your map have higher wilderness values than anywhere else in NPRA. Please reveal the evidence of why these two proposed WSA's are located where they are. **(Comment No. 246-557)**

Response To: Comment 246-557

The BLM did share working draft maps with high, medium and low oil and gas potential areas. These maps were inadvertently left out of the draft IAP/EIS. These maps have been included in the final IAP/EIS. Please see the last two paragraphs of the response to comment 253-26 (Wilderness Areas) and Section II.G.2 of the IAP/EIS for an explanation of why the potential wilderness areas selected are only within areas of moderate and low hydrocarbon potential. In any inventory area for wilderness, we select boundaries based on manageability. In

other words we ask "if the area were to be designated wilderness, could BLM effectively manage the area to protect the wilderness values"' In addition, BLM also uses definable boundaries. We tried to use drainages and geographical boundaries within the low and moderate oil and gas potential areas to define wilderness areas. This is why the two wilderness areas (Foothills and Mountain units) follow roughly the same boundary lines as shown for low and moderate oil and gas boundaries.

Comment From: The North Slope Borough (Comment Letter No. 80065)

The issue of potential sub-area designations has also been a complex one for us to consider. It is our conclusion that a wilderness designation is neither called for, nor necessary to protect the values of the most sensitive portions of the planning area. With such a designation would come the potential for inappropriate restrictions on the use of the area for subsistence or the methods and means used by subsistence users to access areas or harvest resources. As subsistence users, experience has shown us that with industrial expansion there comes some measure of explicit or de facto limitation on use or access. We do not need, and will oppose any designation that adds addition limitations. Other designations, including special areas and wild and scenic river designations, appear more flexible in the sense that they could be structured not to limit subsistence use while placing reasonable restrictions on industrial and other facilities and uses. Given the apparent impermanence of lease sale stipulations, we are open to discussions of these designations as potential tools for protecting very limited critical areas. The starting point for such consultation must be that there can be no further restrictions on subsistence use or access. **(Comment No. 80065-573)**

Response To: Comment 80065-573

It is true that "...wild and scenic river designations could be structured not to limit subsistence use while placing reasonable restrictions on industrial and other facilities and uses." However, after reviewing all available information, the decision was made not to pursue the possibility of formal long-term designations, and to focus instead on developing stipulations that would protect key surface resources and subsistence use while encouraging (as much as possible) exploration and development of oil and gas resources in the Planning Area. This decision is reflected in the Preferred Alternative and stipulation package. While subsistence activities within the Wilderness Areas are protected under ANILCA, the Preferred Alternative does not recommend any areas for Wilderness designation.

Comment From: Wainwright Tribal Council (Comment Letter No. 80012)

The concerns that were brought up during the meetings on the NPRA-NW were: there should be no designated wilderness areas, this due to the fact Anaktuvuk Pass experienced when wilderness areas were designated in their hunting areas and they were restricted in using the only available transportation they had. The residents of Wainwright opposed the designation of Wilderness Areas. Please show respect to our request. **(Comment No. 80012-1027)**

Response To: Comment 80012-1027

The Preferred Alternative does not recommend areas for wilderness designation. See especially responses to comments 80065-573, 253-346, and 261-90 (All in Wilderness Areas).

Comment From: Michael North (Comment Letter No. 80003)

Furthermore, the majority of the NPR-A is wilderness - not legally defined Wilderness - but inherent

ecologically-defined wilderness. Some part of the NPR-A should receive legal Wilderness designation as compensatory mitigation for the loss of real wilderness. The draft EIS is insufficient unless it addresses concepts of mitigation on this magnitude **(Comment No. 80003-851)**

Response To: Comment 80003-851

The IAP/EIS presents a range of alternatives, one of which (Alternative C) includes wilderness recommendation for lands within the Northwest NPR-A Planning Area. Should this alternative be chosen, the Secretary would recommend over three million acres to the president and congress for wilderness designation.

Comment From: The Sierra Club (Comment Letter No. 80014)

The BLM must comprehensively consider wilderness potential for the NW Planning Area. Instead, the DEIS erroneously dismisses millions of acres within the planning area without review of analysis. **(Comment No. 80014-862)**

Response To: Comment 80014-862

Please see the response to comment 253-26 (Wilderness Areas).

Comment From: Hearing -Anaktuvuk Pass (Comment Letter No. 80072)

Okay, the comment related to this, there's a wilderness designated in Alternate C in Southeastern Portion, that large tract called Wilderness, it should be redesignated to the --under the wilderness area by Kasegaluk Lagoon, where the caribou calving area is. That's Mark Morry's comment. Yeah, that makes sense. **(Comment No. 80072-982)**

Response To: Comment 80072-982

No areas are recommended for Wilderness status in the Preferred Alternative.

22. TOPIC : TIMING

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Petroleum Operations ' Timing. This section should provide timelines showing what activities are expected during development and production throughout each month of the year, so that the environmental effects on wildlife and human communities and subsistence can be more clearly understood. The DEIS should make clear that oil production activities on the North Slope take place throughout the year, particularly air and road transportation access to the oil fields, and the production of oil. **(Comment No. 253-93)**

Response To: Comment 253-93

The scenarios offered in this document are plausible, but speculative, views of the future. Trying to predict the exact timing of future activities is highly speculative because of changing economic conditions that influence industry actions. A general timetable for a typical development project similar to the Alpine field is given in Table IV-02, but a variety of factors could change this example by many years. A schedule given at a monthly scale would be ridiculous and misleading. Typical schedules for exploration, development, and production activities are discussed on a seasonal level in Section IV.A.1.a. Briefly, exploration is expected to largely occur in winter months (December to May) at sites scattered throughout the area. Development (construction) activities are also expected to occur in winter because of transportation feasibility. Production operations (including well drilling and oil production) would occur year-round for perhaps decades. Table IV-03 provides a general life-span timetable for typical petroleum activities in northern Alaska.

23. TOPIC : SEASONAL ROADS AND DRILLING PADS

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Exploration ' Seasonal roads and drilling pads . This section needs to describe the constraints to ice road use for parts of the Northwest Plan area where there are few lakes (the southern part); the full water needs for gravel pads, ice road networks, and ice airstrips should be described here. Furthermore, if the entire Northwest Planning Area is located more than 50 miles from existing oil field road networks, and the 'maximum practical length of overland ice roads is less than 50 miles, considering permitting requirements, opening dates for tundra travel, ice road construction time, and the seasonal window for winter drilling,' (DEIS p. IV-13) then the DEIS needs to explain the degree to which ice roads will be used. The DEIS is not clear at all about how much reliance there will be on ice roads, compared with driving directly on the tundra ('rolligon trails' or 'off- road travel') or construction of permanent roads. If indeed, access is more likely to be done by driving directly onto the tundra, with hundreds of trips with very heavy loads needed for moving drillrigs, etc., this needs to be explained as one of the assumptions and the impacts of the likely transportation modes need to be discussed fully. **(Comment No. 253-95)**

Response To: Comment 253-95

The scenarios offered in this document are plausible, but speculative, views of the future. Trying to predict the exact timing of future activities is highly speculative because of changing economic conditions that influence industry actions. A general timetable for a typical development project similar to the Alpine field is given in Table IV-02, but a variety of factors could change this example by many years. A schedule given at a monthly scale would be ridiculous and misleading. Typical schedules for exploration, development, and production activities are discussed on a seasonal level in Section IV.A.1.a. Briefly, exploration is expected to largely occur in winter months (December to May) at sites scattered throughout the area. Development (construction) activities are also expected to occur in winter because of transportation feasibility. Production operations (including well drilling and oil production) would occur year round for perhaps decades. Table IV-03 provides a general life-span timetable for typical petroleum activities in northern Alaska.

24. TOPIC : DEVELOPMENT FIELD LAYOUT

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Development- Field layout. The DEIS presents a muddled picture regarding whether ice roads will be used at all for access for development, given that 'for practical and economic reasons, winter ice roads are likely to be

limited to 50 to 100 mi in overall length,' (p. IV-17), a distance far exceeding the distance away from existing gravel road network. Therefore, the DEIS needs to assess the environmental impact of construction of permanent gravel roads in the Northeast Planning area, or in the Northwest Planning area, or both. The DEIS states that a permanent road connecting this area to the coast or to the Northeast Planning Area is unlikely (DEIS p. IV-34), yet it also provides the data that shows ice roads are infeasible. Analysis of the effects of permanent roads, both within oil fields, connecting to satellites, and connecting outside the planning area should be done since there are no prohibitions of this infrastructure. **(Comment No. 253-97)**

Response To: Comment 253-97

The practical distance for seasonal ice roads construction is commonly assumed to be approximately 50 miles on land and 100 miles on near-shore grounded ice. Because the Northwest Planning Area is located beyond this distance from existing Prudhoe-Kuparuk infrastructure, the commenter incorrectly assumes that ice roads would not be feasible. However, there is no requirement that all ice roads emanate from existing infrastructure on State lands. Ice roads could connect remote sites to other staging areas (e.g., Barrow, a new coastal base, inland gravel airstrips, or new production facilities) in the Northwest Planning Area. Potential staging sites are shown on Map 107. Regarding permanent gravel roads, it is important to distinguish the types and use of the roads. It is very likely that gravel roads would connect drilling/production pads (a few miles apart) within individual oil fields. It is possible that some gravel roads would connect outlying satellite fields (within 20 miles or so) to central processing facilities. It is less likely that long gravel roads would be constructed across NPR-A to connect oil field infrastructure or villages in the area. Several factors (construction cost, availability of gravel, cost-benefit, and environmental effects) would limit the feasibility of long gravel roads across NPR-A. Without firm plans to build such roads it is premature to evaluate their potential environmental impacts simply because "there are no prohibitions of this infrastructure". Economics would largely dictate character of new infrastructure (including gravel roads) in NPR-A.

25. TOPIC : WELL DRILLING

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Development and Production- Well Drilling. The assumptions given for extendedreach wells document a number of limitations that cast into doubt the likelihood that the best available technology will actually be used for field development. The DEIS states that 'extended-reach drilling methods are rarely employed for exploration wells, because they are far more costly than vertical wells'alternative field designs must consider the cost tradeoffs between fewer pads with more extended-reach wells as opposed to more pads containing conventional wells. In most instances, it is more practical and cost effective to drill conventional wells from an optimum site, [than] it would be to drill ERD wells from an existing drill site.' (P. IV-20, IV-21). As well, the DEIS has dropped an important stipulation from the NE Plan related to this issue, Stip 32. Lessees shall use maximum economically feasible extended-reach drilling for production drilling to minimize the number of pads and the network of roads between pads. **(Comment No. 253-101)**

Response To: Comment 253-101

The utility of extended-reach drilling (ERD) is discussed in the document (Section IV.A.1.b.(4)(d)). For exploration wells, there are a number of issues other than cost that limit the usefulness of ERD wells. For production drilling, project designs attempt to balance the higher costs for ERD wells with the cost of additional pads and connecting roads. Basic economics imply that companies would try to lower the development costs as much as possible. For example, if part of an oil field extended under a large river, it probably would be cheaper to drill ERD wells than it would be to construct a pad and connecting road, bridge, and pipeline across the river. Economic forces have a greater effect than the vaguely worded stipulation contained in the Northeast NPR-A Plan

26. TOPIC : WATER DEMAND

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Development and Production ' Water Demand. This section only addresses water used for drilling and camp use, but ignores water needed for ice roads in the event that production sites are not located on a road network. If ice roads are not needed during the production phase because roads will be built, this should be clearly stated. **(Comment No. 253-106)**

Response To: Comment 253-106

Water requirements are discussed under several sub-heading in Section IV. Section IV.A 1.b.(3)(a) discusses water demand for seasonal ice roads (1.0-1.5 million gallons per mile). Section IV.A 1.b.(3)(d) discusses water demand associated with exploration drilling and camps. Section IV.A 1.b.(4)(f) discusses water demand for construction and development drilling. Section IV.A 1.b.(5)(c) discusses water demand for waterflooding operations during production. The commenter is encouraged to read the document before questioning the completeness of the analysis.

27. TOPIC : TRANSPORTATION

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Transportation. This section fails to identify clearly the extensive air transportation requirements for access during exploration, as well as development and production. Many permanent airstrips will be required during production, especially if oil fields are not connected together with permanent gravel roads. .It also fails to analyze the potential effects of much heavie r reliance on rolligon trails with very heavy loads, and the damage that such repeated traffic within a winter season, or from traffic year after year. The term 'roadless' development is misleading because both Alpine and Badami do contain permanent gravel roads within the oil field, connecting together various drill sites or production pads. The DEIS fails to analyze the potential impacts if a permanent road is built connecting with the existing Kuparuk oil field network, from Nuiqsut, from Barrow, or from the edge of the NE Plan area. Based on existing experience on the North Slope, it is likely that road networks will be built incrementally in a piecemeal basis from one oil field connecting to the next. **(Comment No. 253-108)**

Response To: Comment 253-108

Due to its remoteness, the Northwest Planning Area is likely to experience higher levels of air and marine transport activities than the Northeast Planning Area. It is unlikely that permanent gravel roads would be constructed "piecemeal" across the area because of economic and other constraints. The impacts of permanent roads are difficult to address when the number, location, and construction schedules are unknown. However, the EIS considers the impacts of reasonable scenarios for roads and the cumulative impact section discusses the impacts of a permanent road connection to the Dalton Highway. The character of the roads would be strongly influenced by the size and location of future discoveries which may not be developed for a decade more. Minor service roads in the Northeast Planning Area are now being studied in the Environmental Impact Statement for the Alpine Satellite Plan. Some of this information is relevant to future roads in the Northwest Planning Area, and has been considered in this IAP/EIS.

Comment From: Audubon Alaska (Comment Letter No. 213)

Transportation Infrastructure The DEIS does not adequately describe potential transportation infrastructure within the northwestern planning area and how this will be integrated within the planning area, North Slope communities, and eventually the southwestern portion of NPR-A. While existing oilfields (including Kuparuk, Milne Point and Endicott) may have initially been described and even constructed as distinctly separate fields, over time the industry has argued successfully for connecting roads to the main Prudhoe field and Trans-Alaska pipeline terminus. There is simply no evidence to indicate fields within the NPR-A would not be connected to each other and to existing development to the east. Past experience has dictated that these connecting roads have been necessary for safety (including pipeline spill response), and for economic considerations related to costs of hauling gravel for construction and maintenance and transportation of workers and supplies. It is unreasonable to assume they will not be built. The assumptions underlying the transportation infrastructure within NPR-A are very important for evaluating longterm cumulative effects within the northwestern planning area as well as NPR-A as a whole. The Alaska Department of Transportation and Public Facilities recently completed a resource transportation analysis for northwestern Alaska. The draft map of this area identified two separate transportation corridors connecting the Dalton Highway with Nuiqsut at the eastern boundary of the NPR-A. The impacts of a network of connecting access roads, as well as the extraction of gravel needed to construct these roads have not been adequately addressed. **(Comment No. 213-357)**

Response To: Comment 213-357

The location and extent of potential transportation infrastructure within the Northwest NPR-A would be a function of the location and quantity of recoverable hydrocarbons as well as a function of the timing of the development. The location and extent of any discovery is a matter of speculation. Potential transportation issues related to exploration and development activities would be mitigated through Stipulations and Required Operating Procedures (ROP's). These stipulations and ROP's would be put in place to provide BLM the flexibility to deal with any effects related to those transportation requirements that may arise from potential development activities. Regarding potential roads identified in the Northwest Transportation Plan, a permanent road between the Dalton Highway and Nuiqsut has been added to the cumulative scenario as a reasonably foreseeable future impacting factor. The additional cumulative impact of this road has been incorporated into the appropriate resource analyses and these have been considered in the cumulative effects analysis.

Comment From: State of Alaska (Comment Letter No. 251)

Section III, Page III-149-150, Transportation. The first sentence of the second paragraph in this section which states that "within the NPR-A there are few roads, identified rights-of-way" should be modified to include the Alpine Satellite Development Project proposal for a gravel road to the Lookout drill site in NE NPR-A and the community road corridors identified in the Northwest Plan between Barrow-Atqasuk-Wainwright. **(Comment No. 251-373)**

Response To: Comment 251-373

The Alpine Satellite Development Project is currently under NEPA review and at this time construction on new roads in Northeast NPR-A has not begun. Roads in the Northwest NPR-A Planning Area are still in the proposal stage and detailed descriptions of these future roads are not available. Chapter III describes the existing environment. Please also see the response to comments 213-357 (Transportation) and 251-315 (Right of Way).

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-28, Paragraph 3. This paragraph states that hovercraft may be available for pipeline or other infrastructure repairs, but while the hovercraft is an excellent tundra vehicle, there are areas of broken terrain where the hovercraft. would not be able to access infrastructure. BLM may want to direct an inquiry to Lynden Transportation, a hovercraft. expert to refine this statement. **(Comment No. 251-382)**

Response To: Comment 251-382

As the commenter noted, there are areas (and conditions) where hovercraft would not be able to access infrastructure. This statement holds true for all modes of transportation. A detailed listing of design capabilities for hovercraft is beyond the scope of this programmatic analysis. Site-specific conditions (location and seasonal factors) would dictate the most efficient method of transportation to remote areas.

28. TOPIC : INFRASTRUCTURE

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Inaccurate portrayal of infrastructure and activities. The accuracy of future projections is questionable since the existing infrastructure and currently proposed fields are not accurately portrayed or described. For example, map 25, North Slope oil and gas fields and pipelines, does not even show the existing facilities for the fields nearest to the NPR-A, including Alpine, Tarn, and Meltwater. This map fails to portray the fields within the Northeast planning area as reasonably foreseeable for development, despite the fact that ConocoPhillips Alaska, Inc. has already proposed development of three fields for this area plus two in the adjacent Colville River delta adjacent to NPR-A and BLM has initiated an environmental impact statement process. In its application, the oil company said that as many as 15 additional fields may be produced for the northeast portion of the Northeast Planning Area and the adjacent Colville River delta, but none of these are portrayed in the DEIS. (ConocoPhillips Alaska, Inc. and Anadarko. September 2002). **(Comment No. 253-110)**

Response To: Comment 253-110

Although 15 additional fields in the Northeast Planning Area have been assumed for full field development, the existence of all these new fields has not been confirmed by exploration drilling. The proposal submitted to Federal and State of Alaska agencies identifies only two "drill sites" in the Northeast NPR-A Planning Area. Facilities and pads at these drill sites would support development drilling of the Lookout and Spark oil and gas pools. Lookout development drilling would be conducted from the Colville Delta 6 drill site (CD-6) and Spark development would be conducted from the CD-7 drill site. Drill sites CD-1 through CD-7 as well as the roads proposed to link these drill sites have been added to Map 25. The "15 additional fields" referred to by the commenter are unspecified exploration well sites within NPR-A and State of Alaska lands in the greater Colville delta area. These are representative sites for purposes of environmental analysis; there are no specific locations for these fields. Some may never be drilled. Some or all may not contain commercial pools of oil or gas. ConocoPhillips Alaska, Inc. provides this estimate of future drill sites as an indicator of the potential for undiscovered resources in the greater Colville delta area. Map 25 shows actual facilities and roads on the North Slope, not speculative infrastructure. The satellite fields proposed in the Northeast Planning Area and the new fields south of Kuparuk (Lookout 1, Lookout 2, Spark 1, Spark 1A, Moose's Tooth C, Rendezvous A, and Rendezvous 2) can be accurately located and these fields have been added to Map 25. Publicly-announced discoveries are listed in Table III-01 and are their locations are shown on Maps 26, 99, 100, 101, 102, 103, and 104. The recent public announcement of test results for Lookout 2 will be added to Table III-01.

29. TOPIC : GLOBAL WARMING

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The cumulative impacts analysis inexplicably fails to include a serious discussion of global warming. This is a serious oversight given the speed of global warming and its potential to impact ice dependent species. The brief discussion of global warming dismisses the phenomenon as the subject of 'ongoing scientific debate.' While the extent of the human contribution to global warming is still open to debate, the fact that the climate is warming is settled. And in the case of the Arctic, the change is particularly pronounced. The NRC notes that the rate of warming on the North Slope 'exceeds the estimate of mean global warming by a factor of 3 or so.' NRC Report at 91. Indeed, MMS itself has acknowledges the dramatic decrease in the length of the season in which ice roads can be used. Environmental Assessment: EA: AK-023-03-008. National Petroleum Reserve-Alaska (NPR-A) Exploration Drilling Program Puviaq #1 and #2 at 4- 22. Global warming has the potential to have dramatic impacts on the natural environment and the industrial development on the North Slope. The DEIS should have discussed how global warming will impact oil development. Further, the cumulative impacts analysis should have considered how the impact of past oil and gas development, the impact of global warming, and the impacts of further development in the Northwest area will impact wildlife, the environment, and subsistence. Due to global warming, the ice cover of the Arctic has been shrinking at a rate of 3% per decade. The NRC warns that this 'loss of sea ice would reduce critical habitat for marine mammals and seabirds that use ice shelves and flows as platforms for feeding, resting, reproducing, and molting.' NRC Report at 92. The DEIS does not discuss how changes caused by global warming will impact oil and gas development. The NRC has concluded that 'climate warming at predicted rates in the Beaufort Sea region is likely to have serious consequences for ringed seals and polar bears, and those effects will accumulate with the effects of oil and gas activities in the region.' NRC Report at 169. The DEIS should have discussed the additional impacts to ice dependent species from oil and gas development in the context of impacts from global warming. Global warming could also have a serious impact on subsistence, beyond the population level effect it could have on various species. According to the NRC, 'if migrations of bowhead whales (Balaena mysticetus), for example, were to shift farther offshore and if populations of seals near the coast were to be seriously reduced, the consequences for coastal human subsistence cultures could be dramatic.' NRC Report at 92. The effect of distribution of subsistence species altered by offshore activities combined with the effects of global warming on subsistence need to be discussed in the cumulative impacts analysis. **(Comment No. 253-212)**

Response To: Comment 253-212

For our discussion on Global Warming, please see updated discussions to Sections IV.F.8.j., Mammals, IV.F.8.n., Subsistence-Harvest Patterns, IV.F.8.o., Sociocultural Systems, and IV.F.8.p. Environmental Justice.

30. TOPIC : JURISDICTIONAL ISSUES

Comment From: State of Alaska (Comment Letter No. 251)

Section III, Page III-125, Federal Jurisdiction. As noted earlier, AS 31.05 gives the AOGCC authority on land where the state has police power. This includes the NW NPR-A planning area. **(Comment No. 251-436)**

Response To: Comment 251-436

Please see the response to comment 251-434 (Permitting).

31. TOPIC : ALTERNATIVES- GENERAL

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Audubon's December 2002 report, Alaska's Western Arctic: A Summary and Synthesis of Resources, and its February 2003 "Wildlife Habitat Alternative" contain significant new information and analyses not included in the DEIS. This additional information includes substantial areas recommended for protection that are not part of the BLM alternatives, including Alternative C. The Audubon Alternative should be the basis of additional alternatives in a revised DEIS. **(Comment No. 253-25)**

Response To: Comment 253-25

The Audubon's Alaska's Western Arctic: A Summary and Synthesis of Resources (December 2002) was published after the draft IAP/EIS was at the printer. The information in this report is considered in the analyses in the final IAP/EIS. The Audubon's "Wildlife Habitat Alternative" has been considered, along with all other public comments received on the Alternatives, in development of the Agency Preferred Alternative.

Comment From: Audubon Alaska (Comment Letter No. 213)

Summary: Audubon strongly recommends designating four new special areas within the Northwest Planning Area of the National Petroleum Reserve-Alaska. We believe the above recommendations, combined with best management practices throughout the area, will help minimize future impacts from industrial development on valuable fish and wildlife resources. In addition, the areas recommended for no- leasing zones will conserve sensitive habitats and populations as well as provide scientific benchmarks for long-term ecological research and monitoring. Audubon's wildlife habitat alternative provides significantly more industry access to areas of high oil and gas resource potential than BLM's Alternative C. **(Comment No. 213-232)**

Response To: Comment 213-232

After completion of the public meetings on the Draft Plan, members of the core planning team, resource staff, and management met specifically to discuss the Preferred Alternative. Our starting point was a look at the proposals submitted by Audubon and others related to a "Wildlife Habitat Alternative". Resource information submitted by Audubon was considered consistent with our own information and that submitted by others, including the U.S. Fish and Wildlife Service, the State of Alaska, and the North Slope Borough. Recommendations by Audubon for new special areas and corresponding restrictions were evaluated in light of our oil and gas resource information. While it was felt some proposals were too restrictive, especially in the high prospective area in northeast portion of the Planning Area, it was also felt that the Preferred Alternative must look carefully at protections for brant, spectacled and stellar's eiders, yellow-billed loon, peregrine falcon, caribou, and the coastal bays and lagoons and that protections must in some cases be fairly prescriptive and quantitatively defined (e.g., 1/2-mile setbacks on rivers). As discussions proceeded and additional information and input were received, the Preferred Alternative evolved. BLM believes the end result is a balanced and environmentally responsible alternative. Also, please see comment response 213-202 (Special Designation Areas).

Comment From: City of Barrow (Comment Letter No. 80015)

The City of Barrow appreciates this opportunity to provide comments on the Draft Integrated Activity Plan

(IAP)/Environmental Impact Statement (EIS) prepared by the Bureau of Land Management (BLM) for the Northwest Planning Area of the National Petroleum Reserve-Alaska (NPR-A). The Draft presents information and analyzes a range of options for management of the 8.8 million-acre Planning Area. The document focuses primarily on the potential effects of oil and gas leasing, exploration, and development within the area. The entire planning Area has been occupied by the Inupiat people for centuries and encompasses traditional subsistence areas used intensively by our community's residents today. The majority of the population of the City of Barrow residents arc Inupiat and live a traditional subsistence lifestyle, which is dependent upon our continued unobstructed access to healthy fish and wildlife resources. We have reviewed the comments prepared by the North Slope Borough, including the North Slope Alternative, and support them in their entirety as per attached Resolution 04-2003. We also support fill area leasing, but will continue to do so only if sufficient lease conditions are adopted, remain in place, and are enforced to ensure that exploration and development activities will not significantly impact the health of the environment, the area's wildlife resources, or our subsistence activities. We look forward to continuing close consultation with the BLM as a Final IAP/EIS is prepared and decisions are made by the Secretary and other officials of the Department of the Interior. **(Comment No. 80015-1011)**

Response To: Comment 80015-1011

Please see the responses addressing the North Slope Borough's recommendations. 80065-570 through 573 80065-575 through 577 80065-584 through 590 80065-592, 593, 595, 597, and 600.

Comment From: City of Atqasuk (Comment Letter No. 257)

We have reviewed the comments prepared by the NSB, including the North Slope Alternative, and support them in their entirety. We also support full area leasing, but will continue to do so only if sufficient lease conditions are adopted, remain in place, and are enforced to ensure that exploration and development activities will not significantly impact the health of the environment, the area's wildlife resources, or our subsistence activities. We look forward to continuing close consultation with the BLM as a Final IAP/EIS is prepared and as management decisions are made by the Secretary and other officials of the Department of the Interior. **(Comment No. 257-1025)**

Response To: Comment 257-1025

Please see the comments addressing the North Slope Borough's recommendations. 80065-570 through 573 80065-575 through 577 80065-584 through 590 80065-592, 593, 595, 597, and 600.

Comment From: Sierra Student Coalition (Comment Letter No. 149)

The BLM must develop more alternatives because the full-scale development plan they have proposed for the Western Arctic is irresponsible and unbalanced. BLM must develop leasing alternatives that will ensure protection in areas where development proceeds and fully protect special places such as the Meade River/Dease Inlet, Techekpuk Lake, Peard Bay, Kasegauk Lagoon, and the Colville River. **(Comment No. 149-1035)**

Response To: Comment 149-1035

The BLM has developed a Preferred Alternative and General Lease Stipuluation and Required Operating Procedures that we believe is/are balanced and support the development of oil and gas resources while protecting the environment from impacts associated with development.

Comment From: Inupiat Community of the Arctic Slope (Comment Letter No. 264)

We have reviewed the comments prepared by the North Slope Borough, including the North Slope Alternative, and support them in their entirety. We also support full area leasing, but will continue to do so only if sufficient lease conditions are adopted, remain in place, and are enforced to ensure that exploration and development activities will not significantly impact the health of the environment, the area's wildlife resources, or our subsistence activities. We look forward to continuing close consultation with the BLM as a Final IAP/EIS is prepared and as management decisions are made by the Secretary and other officials of the Department of the Interior. **(Comment No. 264-948)**

Response To: Comment 264-948

United States Department of the Interior BUREAU OF LAND MANAGEMENT NORTHERN FIELD OFFICE 1150 University Avenue Fairbanks, Alaska 99709-3899 May 30, 2003 Mr. Nathan Olemaun, Executive Director Inupiat Community of the Arctic Slope P.O. Box 934 Barrow, AK 99723 Dear Mr. Olemaun, I appreciate the opportunity to meet the Executive Board of the Inupiat Community of the Arctic Slope. The purpose of my visit is to consult with the Executive Board on a government-to-government basis concerning the Bureau of Land Management's (BLM) draft Preferred Alternative for the Northwest National Petroleum Reserve-Alaska Integrated Activity Plan (NW NPR-A Plan). The draft Preferred Alternative NW NPR-A Plan differs from the Draft Integrated Activity Plan and Environmental Impact Statement that was released for public review in January. Many of the Lease Stipulations and Required Operating Procedures have changed as a result of comments received during the public comment period, public meetings and subsistence hearings held in communities across the North Slope. We incorporated many of these comments into the draft Preferred Alternative. Enclosed are two documents which help explain the draft Preferred Alternative. The first document contains the Lease Stipulations and Required Operating Procedures we propose to use to implement the plan. The second document is a proposed decision map. Together, these documents form the basis of the draft Preferred Alternative NW NPR-A Plan. Before describing the contents of these documents, it is important to understand how Lease Stipulations and Required Operating Procedures differ. Lease Stipulations are required actions that apply only to the land that is actually leased for oil and gas activity. Required Operating Procedures are requirements that apply both on and off the land that is leased. Compliance with both Lease Stipulations and Required Operating Procedures is mandatory. Both Lease Stipulations and Required Operating Procedures are 'Performance Based.' That is, the BLM has established management objectives we want to achieve. These objectives are based on: 1) current legal requirements, 2) comments received from Federal and State government, the North Slope Borough, and Native Tribal Governments, and 3) comments received from industry, non-government organizations, ANSCA native corporations and the general public. Some requirements and standards are very specific. Others provide guidelines for industry to follow. Successful implementation is achieved when industry is able to carry out its activities and identified management objectives are also met. The Lease Stipulation and Required Operating Procedures document is divided into three (3) sections. The first section deals with Exception Language and Criteria for Lease Stipulation and Required Operating Procedures. It is the BLM's intention to provide a solid framework for the oil and gas industry to operate in NW NPR-A while providing an opportunity to adapt as technology changes or we obtain better information on which to base future decisions. This section spells out how and by what criteria exceptions to stipulations and required operating procedures will be considered and granted. The second section contains General Lease Stipulations and Required Operating Procedures. These stipulations and requirements apply to all areas of NW NPR-A. The general stipulations and required operating procedures cover a broad range of topics from subsistence consultation to facility design and construction to oil field abandonment. The third and final section contains Area Specific Lease Stipulations and Required Operating Procedures. From public comments and our own experience, we acknowledge there are areas of NW NPR-A that are more sensitive than others. In these areas, we have developed more site-specific requirements for industry to follow. When reviewing these Area Specific Lease Stipulations and Required Operating Procedures, it is helpful to use the accompanying decision map as a reference. The BLM has not made any final decisions on the NW NPR-A Plan. We expect to issue a Record of Decision in October of 2003. I am requesting the Executive Board of the Inupiat Community of the Arctic Slope review the draft Preferred Alternative. In this regard, it might be helpful to re-review the Draft Northwest NPR-A Integrated Activity Plan we released in January as this document served as the basis for developing the draft Preferred

Alternative. I am requesting that you provide me with any written comments you deem appropriate by July 31, 2003 so that they can be considered prior to finalizing the Record of Decision in October. Again, I appreciate the opportunity to meet with you and the Executive Board of the Inupiat Community of the Arctic Slope. Thank you for your time and interest. Sincerely, Robert W. Schneider Field Manager Northern Field Office

32. TOPIC : BIRDS

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Maps 36, 37, 38, 39, 40, 41, 42, 43, 46, and 62 The Onshore Density for different bird species identified on each map indicate categories of "High," "Medium High," "Medium," and "Low." We recommend making this more quantitative by clarifying under each category the number of birds per square mile (square kilometer). **(Comment No. 261-130)**

Response To: Comment 261-130

The BLM believes that the qualitative categories describing bird densities are adequate for the purposes of this IAP/EIS. Sufficient data does not exist for accurately displaying density on a pe-square-km basis; such a presentation would imply a greater resolution than is possible currently.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Alternative A, Birds, Gravel, Page IV-149. This section states gravel will be mined from river drainages in summer and transported to development sites in winter. The State recommends that the gravel be mined off-channel and transported in winter. This approach would eliminate problems such as water quality effects, impacts to wetlands from material stockpiling, and double-handling of material if gravel were dredged or excavated from a site in summer. **(Comment No. 251-164)**

Response To: Comment 251-164

Like most projects with the potential to affect a variety of natural resources, altering the season or area to benefit one species may increase the negative effects on other species. In this case, gravel extraction from off-channel areas removed some distance from a river could adversely affect more birds and heavily used bird habitats than if extraction was accomplished from within a river drainage.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Alternative B, Birds, Effects of Oil and Gas Activities, Page IV-277. The first paragraph in this section states the planning area would be open to oil and gas leasing and exploration in the Kasegaluk Lagoon proposed special area under Alternative B. However, the description of Alternative B in Section II, page II-10 states the proposed Kasegaluk Lagoon Special Area would not be available for leasing and no permanent oil and gas facilities would be allowed in the Special Area. This discrepancy needs to be rectified. **(Comment No. 251-173)**

Response To: Comment 251-173

The typographical error concerning potential for leasing and exploration in the proposed Kasegaluk Lagoon Special Area has been corrected. The Kasegaluk Lagoon Special Area would not be offered for lease under Alternative B.

Comment From: State of Alaska (Comment Letter No. 251)

Map 45, Raptor Nesting Sites in NPR-A and Map 92 Raptor Nesting and Foraging Habitat in NW NPR-A. Map 45 depicts raptor (peregrine falcon) nesting sites along the upper Topagoruk River and lower Titaluk River. However, Map 92 shows no raptor nesting or foraging habitat along these rivers. These two map pages should be adjusted to ensure the correct information is presented on both maps. **(Comment No. 251-175)**

Response To: Comment 251-175

These maps have been revised.

Comment From: Audubon Alaska (Comment Letter No. 213)

Key Wildlife Concerns : The DEIS used inappropriate nesting survey data for waterbirds. Increase in predator populations, including gulls, ravens, and foxes, around oilfield infrastructure will reduce populations of ground nesting birds. Impacts to waterbirds from a major oil spill in nearshore waters represent a significant conservation concern for the NPR-A. **(Comment No. 213-203)**

Response To: Comment 213-203

Most of the maps and text descriptions of waterbird distribution and abundance presented in the draft IAP/EIS are derived from USFWS annual eider aerial surveys in mid-June (William Larned, USFWS, personal communication) and/or annual breeding pair aerial surveys in late June-early July (Edward Mallek, USFWS, personal communication). Some maps include additional data. Aside from some aerial surveys performed by environmental consultant companies that target a few particular species, the sources cited above provide the principal data available on waterbirds nesting on the Arctic Coastal Plain, and thus are entirely appropriate sources for this type of information. It is true that if predator populations (e.g., gulls, ravens, foxes) increase around oilfield infrastructure, ground-nesting bird populations in these areas may be reduced as a result of increased predation; however, it is not a clearly demonstrated relationship in many cases. In recent years, waste food availability has been controlled more carefully through the use of covered waste containers, frequent burial of material deposited in landfills, and worker education. The availability of nest/burrow sites on oilfield structures is a potential problem not yet fully addressed by industry or regulatory agencies. However, a USFWS-sponsored workshop concerning human influences on predators of nesting birds on the North Slope of Alaska, held on 17 April 2003, examined many aspects of this potential problem including identifying what research is needed, what management actions can be implemented, and the roles of industry and government agencies. Also, some of the potential problems are addressed by Required Operating Procedure (ROP) A-1 (attracting wildlife to food and garbage prohibited), ROP A-2 (burial of garbage prohibited), and potentially by ROP I-2 (orientation program). Impacts on waterbirds from a large oil spill in nearshore waters are discussed in IAP/EIS Section IV.C.9.b. Although there is a 33 and 38 percent chance of one or more large oil spills occurring under Alternatives A and B, respectively, under the $30/bbl oil price scenario, it is most likely that no spills would occur.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The cumulative impacts analysis of birds is cursory and fails to even differentiate between the numerous, diverse species that inhabit the planning area. The section talks about 'birds' generically, but in its conclusion limits its references to ducks and other water birds.' DEIS at IV-417. Thus, the analysis apparently fails completely to analyze shorebirds. Shorebirds are already impacted by onshore development, and may be vulnerable to the effects of an oil spill. Current oil development on the North Slope displaces 5% of shorebirds. See NRC Report at 195. Shorebirds also likely have been affected by the loss of food caused by contamination of wetlands by reserve pits. Id. Success for ground nesters is lower in oil fields than in other undisturbed areas. Id. Particular species of concern include the buff-breasted sandpiper and the dunlin. One half of the world's population of buff-breasted sandpipers nest on the North Slope. This species is currently under consideration for listing under the Endangered Species Act. The dunlin has been impacted by loss of wintering and staging habitat in Asia. Id. This should have been discussed as a cumulative impact that may interact with impact from increased offshore oil exploration and development. **(Comment No. 253-213)**

Response To: Comment 253-213

BLM is aware that shorebirds form an important segment of the Arctic Coastal Plain (ACP) avifauna. However, the agency feels that some details included in this comment overstate what actually is known concerning the biology of certain species or realistically can be extracted from the cited references. For example, the comment states that "Current oil development on the North Slope displaces 5% of shorebirds" citing the 2003 NRC report on Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope. As a source for this value, this report cites an earlier study that claims a substantial percentage reduction of shorebirds within the overall oilfield perimeter, and a later study that discounts much of this percentage but agrees that 5% is the best available estimate of "displacement," which includes those individuals that would be displaced from areas buried by gravel, and some indeterminate number that would be displaced from the area adjacent to gravel structures by construction disturbance and subsequent activity on them. The latter study points out that determination of reduction in numbers within the oilfield area by the earlier study was beyond its scope of sampling, the implication being that displaced birds don't necessarily move very far. This is supported by observations that a) shorebird distributions often indicated displacement from roadside areas but resettlement in nearby areas beyond the zone of disturbance, and b) most banded birds tracked after displacement by construction were found to have resettled in nearby areas. The latter study concludes that "Overall there is rearrangement of birds (following gravel placement and disturbance) but probably no net change in bird abundance within the oil field." Future oil and gas developments on the North Slope are expected to resemble Phillips' Alpine development rather than development in the Prudhoe Bay area, with a much smaller footprint (e.g., 100 acres vs North Slope development to date of about 9,500 acres), and thus are not likely to displace substantial numbers of shorebirds. The comment correctly points out that the buff-breasted sandpiper is an uncommon species of concern, however it is not currently under consideration for listing under the ESA as stated.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

We believe that the DEIS does not adequately address potential impacts to selected bird species or provide sufficient protection for their habitats. **(Comment No. 253-219)**

Response To: Comment 253-219

The IAP/EIS analysis has addressed potential impacts to particular species adequately. For those species for which certain data to more precisely determine potential impacts are lacking, the assumption is made that they would experience impacts similar to those described for closely related species that display similar behavioral and ecological traits and/or habitat preferences. Additional data bearing on the adequacy of the impact analyses that comes to the attention of BLM will be incorporated into the final document. Several Stipulations and ROP's in the IAP/EIS would provide protection for these species and their habitats. The necessity for additional protection would depend in part upon the types of activities that would occur in particular areas; additional stipulations may be specified at the subsequent exploration and development stages.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS states that "(a)pproximately one million birds representing approximately 70 species occur annually in Beaufort Sea and Chukchi Sea offshore and nearshore marine habitats, and Arctic Coastal Plain (ACP) aquatic and terrestrial habitats'" Although a number of citations follow this statement, the basis for and accuracy of the statement are questionable. For example, in the introduction to The Birds of the Beaufort Sea (1989, BP Exploration [Alaska], Inc.), Johnson and Herter note that "(a)t least 10 million individuals of over 120 species of terrestrial and aquatic birds migrate through the Beaufort Sea area, nest on the adjacent islands, coastal plain, and foothills, or molt in the lagoons and large lakes along the coast." The first sentence of the second paragraph states that "(t)here is at least one area in the Northwest NPR-A Planning Area of high-density water bird groups," but then it fails to identify that area. Table III-07, which is referenced in the next sentence, also does not identify that area. **(Comment No. 253-221)**

Response To: Comment 253-221

Please see the response to comment 213-256 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Discussion of population trends for various waterbird species makes reference to two sets of aerial surveys: the Eider Breeding Population Survey, Arctic Coastal Plain (Larned et al., 2001) and the Aerial Breeding Pair Surveys of the Arctic Coastal Plain of Alaska (Mallek et al., 2002). The timing of the two surveys is different, as noted in the DEIS, but it is unclear why BLM chose to reference both and present conflicting data for the same species. Further, BLM apparently selected the eider surveys for purposes of the maps in Volume 2 (e.g., Map 42 for long-tailed duck), even through the eider sur veys may not be the best source of information on distributions and densities of waterbirds other than of eiders. In fact, the U.S. Fish and Wildlife Service advised Audubon that the eider surveys are most appropriately used in regard to eiders and that the aerial breeding pair surveys are most appropriately used in regard to waterbirds other than eiders. **(Comment No. 253-223)**

Response To: Comment 253-223

Please see the response to Comment 213-258 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

In the second paragraph, the DEIS describes the importance of Arctophila habitats, which only account for 0.5 percent of the Planning Area. Reference is made to Table III-06, but this table does not give the reader information on where those habitats are distributed within the Northwest NPR-A Planning Area. The third paragraph makes reference to the "lesser golden plover," which reflects outdated nomenclature. The lesser golden plover has been divided into Pacific golden plover (Pluvialis fulva) and American golden-plover (P. dominica), both of which probably occur in parts of NPR-A. **(Comment No. 253-224)**

Response To: Comment 253-224

Please see the response to Comment 213-259 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The description of the yellow-billed loon should give greater recognition to the fact that the yellow-billed loon has a very small world population, perhaps as few as 16,650 (Fair, 2002, The Wilderness Society and Trustees for Alaska, Anchorage, Alaska). Hence, not only does NPR-A have the "primary nesting area" for the U.S. population, but it is one of the most important nesting areas in the world. Further, by using the Eider Breeding Population Survey as the source of data on distribution in Map 37, the DEIS apparently has missed an important high-density area southeast of Atqasuk and west of the Ikpikpuk River. See Fig. II.2-1 in Alaska's Western Arctic: A Summary and Synthesis of Resources (Schoen and Senner [eds.], 2002, Audubon Alaska, Anchorage, Alaska). In addition, both the yellow-billed and redthroated loons are on the Alaska WatchList of declining and vulnerable bird populations (2002, Audubon Alaska, Anchorage, Alaska). **(Comment No. 253-226)**

Response To: Comment 253-226

Please see the response to Comment 213-260 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The discussion of brant fails to indicate that the Alaska population of about 125,000 individuals is significantly below the desired population level of 150,000 for this species in the Pacific. This fact heightens the level of concern for any impacts on this species where it nests, rears broods, molts, or stages in NPR-A and specifically in the Northwest Planning Area. Although the DEIS mentions that fallstaging brant concentrate in Beaufort Sea lagoons, bays and deltas, explicit mention should be made of Kasegaluk Lagoon, which may harbor nearly half of all Pacific brant at a single time (Johnson, 1993, Journal of Field Ornithology 64:539-548). The DEIS also fails to note that the brant that gather in NPR-A to molt come from a variety of locations (e.g., Yukon-Kuskokwim Delta, Siberia, and Canada). This fact again underscores the importance of NPR-A habitats for the larger Pacific population of brant. **(Comment No. 253-228)**

Response To: Comment 253-228

Please see the response to Comment 213-261 (Birds).

Comment From: Audubon Alaska (Comment Letter No. 213)

Additional Waterbird Stipulations : Two high-density waterbird nesting areas occur south of the recommended Dease Inlet-Meade River Special Area (Fig. 1). One area, south of Atqasuk, is an important spectacled eider nesting area. The other area, west of Ikpikpuk River, is an important yellow-billed loon nesting area. Both of these areas are identified in Figure 2 and should receive special stipulations to prevent impacts to waterbird nesting habitat. We recommend that specific stipulations for waterbird nesting areas be developed in consultation with appropriate experts at the U.S. Fish and Wildlife Service. **(Comment No. 213-229)**

Response To: Comment 213-229

We have taken your comments into consideration in developing the Preferred Alternative. Please also see the response to comment 213-232 (Alternatives General). Nesting area densities of spectacled eiders south of

Atqasuk and yellow-billed loons west of the Ikpikpuk River noted by Audubon range from medium to medium-high, rather than high, on maps generated from aerial survey data by the USFWS. As indicated in the response to Comment 213-225 (Special Designation Areas), several stipulations and ROP's in the IAP/EIS (most notably E-11) would provide protection for these nesting species. The necessity for additional protection would depend in part upon the types of activities that would occur in this area; additional specific stipulations for waterbird nesting areas, as suggested by Audubon, are one approach. This will be considered at subsequent approval stages if necessary.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

In regard to the greater white-fronted goose, your choice of the Eider Breeding Population Survey does not reveal the importance of onshore wetlands south of Peard Bay, in the area between Wainwright and Atqasuk. Please review data from the Aerial Breeding Pair Surveys (see Fig. II.2-2 in the Audubon report), which indicate high and medium- high densities of this species in this area. The DEIS also should summarize the migrations and wintering areas for species discussed, so that the public fully understands the linikages between birds using habitats in NPR-A and the birds harvested by sport hunters and viewed at various locations in the "Lower 48" or elsewhere. For example, it is important to know that the greater white-fronted geese using NPR-A probably contribute to the mid-continent wintering population of white- fronts. **(Comment No. 253-230)**

Response To: Comment 253-230

Please see the response to Comment 213-262 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The northern pintail is another species that is well below desired population levels, in this case at the continental scale. On p. III-48, the DEIS makes reference to the North American Waterfowl Plan, which presents information on continental waterfowl populations. The fact that there is much concern about numbers of pintails heightens the level of concern for any impacts on this species in the Northwest NPR-A Planning Area. **(Comment No. 253-231)**

Response To: Comment 253-231

Please see the response to Comment 213-264 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The long-tailed duck is on the Alaska WatchList, a copy of which is enclosed for your information. Outside of the Arctic Coastal Plain, data from the North American Waterfowl Breeding Pair Surveys indicate declines of about 5.5 percent per year in surveyed portions of Alaska since 1977 (Migratory Bird Management, 1999, U.S. Fish and Wildlife Service, Anchorage, Alaska). There is broad concern about the status of "sea ducks," and the DEIS should give greater recognition to the importance of North Slope habitat for and populations of the long-tailed duck and other sea ducks. **(Comment No. 253-233)**

Response To: Comment 253-233

Please see the response to Comment 213-266 (Birds).

Comment From: Audubon Alaska (Comment Letter No. 213)

The BLM is currently planning leasing in the Northwest Planning Area of the National Petroleum Reserve-Alaska (BLM 2001), which includes most spectacled eider breeding habitat in the western Arctic. Spectacled eiders raft up (aggregate) in numbers between 10,000 and 300,000 (Petersen et al. 1999) during molting and winter. Oil spills and other toxic contamination in gathering areas, including Ledyard Bay, where adult females molt (Larned et al. 1995b), could result in significant impact (BP 2001, Balogh, personal communication 2002). King and Sanger (1979) rated spectacled eiders 78 out of 100 on their oil vulnerability index, making this species the tenth most vulnerable of 176 marine birds rated. Changes to benthic food sources caused by competing species, commercial fishing, and oceanic warming may affect winter survival and energy budgets. Breeding and molting habitats for the largest population of spectacled eiders (Russia) are likely at risk of degradation (W. Larned, USFWS, Kenai, AK, personal communication, 2002). **(Comment No. 213-235)**

Response To: Comment 213-235

Petersen, Larned, and Douglas (1999) reported aggregations of 202 to 33,192 and 32,698 to 363,030 spectacled eiders in Ledyard Bay molting and St. Lawrence wintering areas, respectively. As noted in the comment, a large oil spill entering Ledyard Bay when adult females are molting and extremely vulnerable could result in significant losses. Competition from other species, along with commercial fishing and oceanic warming potentially could decrease food resources and result in lower winter survival and breeding success.

Comment From: Audubon Alaska (Comment Letter No. 213)

Protection from development of coastal corridor habitats (for premigratory staging and feeding) and nearshore marine spill events may be highly important for avoiding impacts to the population of buff-breasted sandpipers. The high level of breeding range overlap with current and potential oil development in the western Arctic predisposes this species to significant cumulative impacts from the effects of oil development. Oil field development in the western Arctic could potentially reduce sandpiper populations through habitat loss, fragmentation, and enhanced predation (Meehan 1986, Martin 1997, Day 1998). **(Comment No. 213-236)**

Response To: Comment 213-236

Because terrestrial habitats near the coast and marine littoral habitats of the Northwest NPR-A are important for the buff-breasted sandpiper and overlap areas of high oil and gas potential, development of coastal shorebird habitats and stranding of an oil spill along the marine coastline of the Northwest NPR-A could reduce the population of this species. Site-specific measures to mitigate potential impacts reduce the risk of spills, and to keep accidental spills from entering habitats are developed during the environmental review at the permitting stage for specific proposed activities.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

With reference to king and common eiders, both species are on the Alaska WatchList. The DEIS misses a very important reference in regard to Beaufort Sea populations of both species: see Suydam et al., 2000, The Condor 102:219-222. Based on migration counts, Beaufort Sea populations of both species declined on the order of 50 percent during the period 1976-1996. This is important information, which should be discussed in the DEIS. **(Comment No. 253-237)**

Response To: Comment 253-237

Please see the response to Comment 213-268 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

There is no mention here of the buff-breasted sandpiper, which has a world population on the order of 15,000 individuals. Hence, the number and distribution of this species within NPR-A is of great interest, especially since it nests on dry tundra (as noted on p. III-48), which is often where oilfield infrastructure is located in order to avoid wetlands. For this reason'plus its small population and vulnerability to enhanced predation around oilfields'this species is at risk from oil development throughout its range on Alaska's North Slope. **(Comment No. 253-238)**

Response To: Comment 253-238

Please see the response to Comment 213-270 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS fails to mention that the Arctic peregrine falcon was recently delisted from its status under the Endangered Species Act, and that numbers of this subspecies have increased greatly in NPR-A, based on surveys conducted in 1977 and again in 1999 (Ritchie and Wildman, 2000, as cited in DEIS). Audubon placed the Arctic peregrine on its Alaska WatchList because of the need to monitor it closely to ensure that its recovery is sustained. Concern about its recovery is heightened by a decline in productivity on the Colville River over the last decade or so (Ted Swem, pers. com., in Audubon report). Given the large number of Arctic peregrines nesting along the Colville and Ikpikpuk rivers within the Northwest NPR-A Planning Area, BLM should acknowledge this special need and its own responsibility to maintain numbers of this subspecies. **(Comment No. 253-240)**

Response To: Comment 253-240

Please see the response to Comment 213-278 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The golden eagle is on the Alaska WatchList, primarily because of concern about habitat fragmentation and loss on this species' wintering grounds in the continental interior in the Lower 48 states (e.g., the Front Range of the Rocky Mountains in Colorado). The DEIS should incorporate data on the movements of subadult golden eagles on Alaska's North Slope, including within NPR-A, as per Carole McIntyre at Denali National Park. **(Comment No. 253-241)**

Response To: Comment 253-241

Please see the response to Comment 213-281 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

There are no citations to support the statement that "(m)ost bird species are likely to be displaced from within 700 ft to about 3,000 ft of large summer encampments, causing a local decline in nest attempts and success." **(Comment No. 253-242)**

Response To: Comment 253-242

Please see the response to Comment 213-283 (Birds).

Comment From: Audubon Alaska (Comment Letter No. 213)

In general, the DEIS failed to acknowledge and address many important papers in the avian disturbance literature. Important studies that should be included in the FEIS include the following. Belanger, L. and J. Bedard. 1989. Responses of staging greater snow geese to human disturbance. J. Wildlife Management 53:713-719. **(Comment No. 213-243)**

Response To: Comment 213-243

Additional references have been added as appropriate.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

There is only brief mention of enhanced predator populations and possible effects of such predators on birds. This possible effect is dismissed as "negligible," without supporting justification. The effect of predation, for example, on snow geese nesting at Howe Island, near the Endicott Causeway, has hardly been negligible over the last decade or so (Streever and Wilson, 2001, BP Exploration [Alaska], Inc.). The recent National Research Council report (2003) on the Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope gives much more weight to the effects of enhanced predator populations on birds. BLM should reconsider this issue in view of the NRC findings, especially in regard to vulnerable species, such as those on the Alaska WatchList or the U.S. Fish and Wildlife Service list of "Birds of Conservation Concern." **(Comment No. 253-244)**

Response To: Comment 253-244

Please see the response to Comment 213-283 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

BLM must quantify routine aircraft flight into large camps before the potential effects of such flights can be evaluated. Given the information provided here, there is no justification for dismissing the effects of routine aircraft flights as "minor." To the extent that flights are to and from or over areas of high densities of nesting, molting or brood- rearing birds, depending on the species, the effects could be significant. **(Comment No. 253-245)**

Response To: Comment 253-245

Please see the response to Comment 213-289 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Again, there is no justification presented here for the conclusion that the "cumulative effect of repeated disturbance'could result in minor local and regional population- level effects'." In the next paragraph, 1) Bird Concentrations, the DEIS acknowledges that disturbance effects "may be particularly serious in areas where there are higher densities of several species'." However, there is no attempt to quantify impacts on specific species at risk, such as those on the Alaska WatchList or on the U.S. Fish and Wildlife Service list of "Birds of Conservation Concern." **(Comment No. 253-246)**

Response To: Comment 253-246

Please see the response to Comment 213-294 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS suggests that if aircraft are flown at higher altitudes, that the number of flights is reduced, and that high density areas areas are avoided, "effects of aircraft operations are likely to be reduced substantially." However, what is BLM's authority to regulate the number, altitude and routes of such flights' If the authority rests with the Federal Aviation Administration (FAA), does BLM have the cooperation of and commitment from the FAA' Is that agency willing to impose restrictions to help minimize effects on birds, consistent with public safety considerations' **(Comment No. 253-247)**

Response To: Comment 253-247

Please see the response to Comment 213-296 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Given that gravel is a scarce resource in NPR-A (DEIS pp. IV-18 & 19), what is the chance for adverse effects on raptors due to disturbance (e.g., blasting) as a result of increased mining of gravel along rivers where raptors are nesting' The southern Ikpikpuk River, with its high concentration of peregrine falcons, might be an area of particular concern. Based on the minimal analysis presented here (in 4), there is no justification for the conclusion that effects are likely to be "negligible." **(Comment No. 253-248)**

Response To: Comment 253-248

Please see the response to Comment 213-298 (Birds).

Comment From: Audubon Alaska (Comment Letter No. 213)

_____. 1990. Energetic cost of man- induced disturbance to staging snow geese. J. Wildlife Management 54:36-41. Jensen, K.C. 1990. Responses of molting Pacific black brant to experimental eaircraft disturbance in the Teshekpuk Lake Area, Alaska. Ph.D. Thesis, Texas A&M University, College Station. Miller, M.W., K.C. Jensen, W.E. Grant, and M.W. Weller. 1994. A simulation model of helicopter disturbance of molting Pacific black brant. Ecological Modelling 73:293- 309. Ward, D.H., R.A. Stehn, W.P. Erickson, and D.V. Derksen. 1999. Response of fall staging brant and Canada geese to aircraft overlflights in southwestern Alaska. J. Wildlife Management 63:373-381. **(Comment No. 213-253)**

Response To: Comment 213-253

Additional references have been added as appropriate.

Comment From: Audubon Alaska (Comment Letter No. 213)

p. III-47. The DEIS states that "(a)pproximately one million birds representing approximately 70 species occur annually in Beaufort Sea and Chukchi Sea offshore and nearshore marine habitats, and Arctic Coastal Plain (ACP) aquatic and terrestrial habitats'" Although a number of citations follow this statement, the basis for and accuracy of the statement are questionable. For example, in the introduction to The Birds of the Beaufort Sea (1989, BP Exploration [Alaska], Inc.), Johnson and Herter note that "(a)t least 10 million individuals of over 120 species of terrestrial and aquatic birds migrate through the Beaufort Sea area, nest on the adjacent islands, coastal plain, and foothills, or molt in the lagoons and large lakes along the coast." The first sentence of the second paragraph states that "(t)here is at least one area in the Northwest NPR-A Planning Area of high-density water bird groups," but then it fails to identify that area. Table III-07, which is referenced in the next sentence, also does not identify that area. **(Comment No. 213-256)**

Response To: Comment 213-256

The portion of the Draft IAP/EIS statement concerning occurrence of approximately one million birds in arctic marine and terrestrial areas is as difficult to substantiate as the 10 million stated by Johnson and Herter in Birds of the Beaufort Sea, who cited no supporting documents. The approximate number of species (70) expected to occur annually was determined as those likely to be present in reasonably substantial numbers, whereas Johnson and Herter's total exceeding 120 species includes, for example, many seabirds, ducks, passerines, and members of many other groups that are very uncommon to rare or vagrant in this region. The sentence concerning a high-density bird area is a mis-statement resulting from loss of portions of the sentence during the publication process. The statement has been revised in the Final IAP/EIS.

Comment From: Audubon Alaska (Comment Letter No. 213)

p. III-48. Discussion of population trends for various waterbird species makes reference to two sets of aerial surveys: the Eider Breeding Population Survey, Arctic Coastal Plain (Larned et al., 2001) and the Aerial Breeding Pair Surveys of the Arctic Coastal Plain of Alaska (Mallek et al., 2002). The timing of the two surveys is different, as noted in the DEIS, but it is unclear why BLM chose to reference both and present conflicting data for the same species. Further, BLM apparently selected the eider surveys for purposes of the maps in Volume 2 (e.g., Map 42 for long-tailed duck), even through the eider surveys may not be the best source of information on distributions and densities of waterbirds other than of eiders. In fact, the U.S. Fish and Wildlife Service advised Audubon that the eider surveys are most appropriately used in regard to eiders and that the aerial breeding pair surveys are most appropriately used in regard to waterbirds other than eiders. **(Comment No. 213-258)**

Response To: Comment 213-258

The BLM chose to discuss data from both USFWS Eider (mid-June) and Breeding Pair (late June-early July) surveys, as well as some data obtained by environmental consulting companies, to indicate all the data that is available, and to illustrate in the former case that datasets obtained in a similar fashion at different times of year may suggest conflicting population trends for some species. Each data set represents the situation at the time it was obtained; to determine which is the more correct at representing the true annual trends for all species surveyed would require a large increase in survey effort. Bird species distribution and abundance presented in the IAP/EIS were mapped using the eider survey data for the sake of consistency presumably inherent in one dataset since, as noted, eider distribution and abundance are accurately obtained only during the earlier period. The BLM has reviewed the data from both surveys and revised the maps according to USFWS guidance as needed to represent these two parameters. Section III.B.2 provides a discussion of vegetative cover on the NPR-A, including Arctophila wetlands heavily used by waterbirds. The landcover classification developed by BLM and Ducks Unlimited has a resolution of 30m pixels. It is likely that any map portraying this area classified by the cited scheme would show such wetlands scattered throughout the NPR-A. Although there is a general trend from north to south for landcover type to change, most of the 17 cover classes are present at some frequency in most all areas of the NPR-A. A map at this level of resolution would not add anything of value to the vegetation analysis, and would require a much larger map than is practical to include in the IAP/EIS. However, the report detailing the map's production has been published and is available as a BLM Technical Report from BLM External Affairs in Anchorage: USDOI, BLM and Ducks Unlimited. 2002. National Petroleum Reserve - Alaska earth cover classification. Technical Report 40. BLM, Anchorage, AK. It is not practical to give the locations of this vegetative type, which comprises only 0.6 percent of the Planning Area, in tabular format.

Comment From: Audubon Alaska (Comment Letter No. 213)

p. III-49. In the second paragraph, the DEIS describes the importance of Arctophila habitats, which only account for 0.5 percent of the Planning Area. Reference is made to Table III-06, but this table does not give the reader information on where those habitats are distributed within the Northwest NPR-A Planning Area. The third paragraph makes reference to the "lesser golden plover," which reflects outdated nomenclature. The lesser golden plover has been divided into Pacific goldenplover (Pluvialis fulva) and American golden-plover (P. dominica), both of which probably occur in parts of NPR-A. **(Comment No. 213-259)**

Response To: Comment 213-259

The oversight concerning use of an older name for the golden plover has been corrected.

Comment From: Audubon Alaska (Comment Letter No. 213)

p. III-50. The description of the yellow-billed loon should give greater recognition to the fact that the yellow-billed loon has a very small world population, perhaps as few as 16,650 (Fair, 2002, The Wilderness Society and Trustees for Alaska, Anchorage, Alaska). Hence, not only does NPR-A have the "primary nesting area" for the U.S. population, but it is one of the most important nesting areas in the world. Further, by using the Eider Breeding Population Survey as the source of data on distribution in Map 37, the DEIS apparently has missed an important high-density area southeast of Atqasuk and west of the Ikpikpuk River. See Fig. II.2-1 in Alaska's Western Arctic: A Summary and Synthesis of Resources (Schoen and Senner [eds.], 2002, Audubon Alaska, Anchorage, Alaska). In addition, both the yellow-billed and red-throated loons are on the Alaska WatchList of declining and vulnerable bird populations (2002, Audubon Alaska, Anchorage, Alaska). **(Comment No. 213-260)**

Response To: Comment 213-260

Table III-07 gives yellow-billed loon estimates for Arctic Coastal Plain and NPR-A. Figures for the estimated world population have been added to text. Bird species distribution and abundance presented in the IAP/EIS were mapped using the USFWS eider survey data for the sake of consistency presumably inherent in one dataset. Although the maps generated from these two datasets are similar, there are a few noticeable shifts in distribution. The data from both the eider survey and the breeding pair survey has been reviewed and the maps have been revised according to USFWS guidance to represent these two parameters.

Comment From: Audubon Alaska (Comment Letter No. 213)

pp. III-50 & 51. The discussion of brant fails to indicate that the Alaska population of about 125,000 individuals is significantly below the desired population level of 150,000 for this species in the Pacific. This fact heightens the level of concern for any impacts on this species where it nests, rears broods, molts, or stages in NPR-A and specifically in the Northwest Planning Area. Although the DEIS mentions that fall-staging brant concentrate in Beaufort Sea lagoons, bays and deltas, explicit mention should be made of Kasegaluk Lagoon, which may harbor nearly half of all Pacific brant at a single time (Johnson, 1993, Journal of Field Ornithology 64:539-548). The DEIS also fails to note that the brant that gather in NPR-A to molt come from a variety of locations (e.g., Yukon-Kuskokwim Delta, Siberia, and Canada). This fact again underscores the importance of NPR-A habitats for the larger Pacific population of brant. **(Comment No. 213-261)**

Response To: Comment 213-261

Additional details included in the comment regarding brant have been added to the Final IAP/EIS. It is not clear how Audubon derived the "desired population level of 150,000 for this species." The draft EIS acknowledges that brant from outside the area molt in the NPR-A (page III-51 of the draft IAP/EIS).

Comment From: Audubon Alaska (Comment Letter No. 213)

p. III-51. In regard to the greater white-fronted goose, your choice of the Eider Breeding Population Survey does not reveal the importance of onshore wetlands south of Peard Bay, in the area between Wainwright and Atqasuk. Please review data from the Aerial Breeding Pair Surveys (see Fig. II.2-2 in the Audubon report), which indicate high and medium- high densities of this species in this area. The DEIS also should summarize the migrations and wintering areas for species discussed, so that the public fully understands the linikages between birds using habitats in NPR-A and the birds harvested by sport hunters and viewed at various locations in the "Lower 48" or elsewhere. For example, it is important to know that the greater white-fronted geese using NPR-A probably contribute to the mid-continent wintering population of white-fronts. **(Comment No. 213-262)**

Response To: Comment 213-262

Bird species distribution and abundance presented in the IAP/EIS were mapped using the USFWS eider survey data for the sake of consistency presumably inherent in one dataset. Although the maps generated from these two datasets are similar, there are a few noticeable shifts in distribution. The data from both the eider survey and the breeding pair survey has been reviewed and the maps revised as needed according to USFWS guidance to achieve a more satisfactory representation of these two parameters. Significant details included in the comment regarding distribution outside this region that may influence this and other species have been added to the Final IAP/EIS.

Comment From: Audubon Alaska (Comment Letter No. 213)

p. III-52. The northern pintail is another species that is well below desired population levels, in this case at the continental scale. On p. III-48, the DEIS makes reference to the North American Waterfowl Plan, which presents information on continental waterfowl populations. The fact that there is much concern about numbers of pintails heightens the level of concern for any impacts on this species in the Northwest NPR-A Planning Area. **(Comment No. 213-264)**

Response To: Comment 213-264

In view of its substantial current population size, BLM does not feel that the northern pintail population is well below the desired population size. On the basis of aerial breeding pair surveys, Mallek (2002) stated that the indicated northern pintail population was significantly above its 15-year population mean in 2001; the breeding ratio was at the highest level ever recorded for the second consecutive year.

Comment From: Audubon Alaska (Comment Letter No. 213)

The long-tailed duck is on the Alaska WatchList, a copy of which is enclosed for your information. Outside of the Arctic Coastal Plain, data from the North American Waterfowl Breeding Pair Surveys indicate declines of about 5.5 percent per year in surveyed portions of Alaska since 1977 (Migratory Bird Management, 1999, U.S. Fish and Wildlife Service, Anchorage, Alaska). There is broad concern about the status of "sea ducks," and the DEIS should give greater recognition to the importance of North Slope habitat for and populations of the long-tailed duck and other sea ducks. **(Comment No. 213-266)**

Response To: Comment 213-266

On the basis of aerial breeding pair surveys on the arctic coastal plain, which is the focus of this IAP/EIS, Mallek (2002) stated that the indicated long-tailed duck population was significantly above its 15-year population mean in 2001. This estimate indicated a reversal of a four-year decline, and the calculated breeding ratio was the highest level ever recorded and significantly higher than the previous 15-year mean. The BLM has included this information in the final document

Comment From: Audubon Alaska (Comment Letter No. 213)

p. III-53. With reference to king and common eiders, both species are on the Alaska WatchList. The DEIS misses a very important reference in regard to Beaufort Sea populations of both species: see Suydam et al., 2000, The Condor 102:219-222. Based on migration counts, Beaufort Sea populations of both species declined on the order of 50 percent during the period 1976-1996. This is important information, which should be discussed in the DEIS. **(Comment No. 213-268)**

Response To: Comment 213-268

The substantial declines of eiders in previous decades is mentioned in the bird section introduction; Suydam et al., 1997 is cited as the supporting document. The indicated article in the journal Condor has been added as further documentation, and a statement has been added to the eider sections.

Comment From: Audubon Alaska (Comment Letter No. 213)

pp. III-53 & 54. There is no mention here of the buff-breasted sandpiper, which has a world population on the order of 15,000 individuals. Hence, the number and distribution of this species within NPR-A is of great interest, especially since it nests on dry tundra (as noted on p. III-48), which is often where oilfield infrastructure is located in order to avoid wetlands. For this reason'plus its small population and vulnerability to enhanced predation around oilfields'this species is at risk from oil development throughout its range on Alaska's North Slope. **(Comment No. 213-270)**

Response To: Comment 213-270

The buff-breasted sandpiper, a rare breeder in NPR-A, is mentioned in Section III.B.4.c(2)(b). Information on the buff-breasted sandpiper has been added to the habitat use discussion.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Moreover, this failure to evaluate fully the adverse impacts of potential oil and gas operations implicates the agency's Endangered Species Act obligations. Given the inadequate analysis in the DEIS, BLM is unable to establish that the development alternatives in the DEIS will be consistent with the agency's ESA obligations to avoid jeopardy to listed species and to prevent unauthorized take of such species. **(Comment No. 253-275)**

Response To: Comment 253-275

The BLM has analyzed the potential impacts of the levels of routine activities associated with oil and gas exploration and development that could reasonably be expected to occur associated with the IAP/EIS for the Northwest Planning Area and within the framework of available data. Although the commenter fails to define evaluate fully, it is not considered useful to speculate about potential impacts that could result from a worst-case scenario incident or activity when there is an extremely low probability of occurrence. With regard to BLMs obligation to avoid a jeopardy conclusion in the U.S. Fish and Wildlife Service (USFWS) Biological Opinion (BO) and prevent unauthorized takes of listed species, please referred to the non-jeopardy opinion contained in Appendix 10 . The BO was developed with the IAP/EIS analysis. This IAP/EIS and related BO are just the first steps in an incremental ESA consultation process with USFWS. If exploration and development were to be proposed, consultation would be reinitiated at that time.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Until the BLM completes an adequate assessment of the full potential impacts of the development alternatives, it cannot demonstrate compliance with these obligations to conserve the spectacled and Steller's eiders and the bowhead. **(Comment No. 253-277)**

Response To: Comment 253-277

The BLM considers the analyses to be adequate and appropriate to the decisions to be made. The U.S. Fish and Wildlife Service (USFWS), by issuing a non-jeopardy BO for this portion of the plan, apparently is in agreement that the analyses are adequate. Please also see the response to Comment 253-275 (Birds).

Comment From: Audubon Alaska (Comment Letter No. 213)

p. III-55. The DEIS fails to mention that the Arctic peregrine falcon was recently delisted from its status under the Endangered Species Act, and that numbers of this subspecies have increased greatly in NPR-A, based on surveys conducted in 1977 and again in 1999 (Ritchie and Wildman, 2000, as cited in DEIS). Audubon placed the Arctic peregrine on its Alaska WatchList because of the need to monitor it closely to ensure that its recovery is sustained. Concern about its recovery is heightened by a decline in productivity on the Colville River over the last decade or so (Ted Swem, pers. com., in Audubon report). Given the large number of Arctic peregrines nesting along the Colville and Ikpikpuk rivers within the Northwest NPR-A Planning Area, BLM should acknowledge this special need and its own responsibility to maintain numbers of this subspecies. **(Comment No. 213-278)**

Response To: Comment 213-278

Some revision of the peregrine falcon description with regard to the points raised in the comment can be accommodated. However, BLM notes that the arctic peregrine falcon was delisted from its threatened status in October 1994, and that the USFWS is only obligated to monitor its status for five years following its removal. Since we are well beyond the end of this period, and numbers of this subspecies have increased greatly, it does not appear necessary to repeat the fact of its delisting in the description of each NPR-A project.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Table II-02 (Stipulations and Required Operating Procedures) are in place and enforced. No support, historical or otherwise, is provided to show this is a valid assumption rather than an optimistic hope. **(Comment No. 253-280)**

Response To: Comment 253-280

Potential impacts were analyzed without assuming that stipulations or required operating procedures were in place. The potential effects of these protective measures are discussed in a separate section following the analysis. Most of those that apply to listed species are not discretionary.

Comment From: Audubon Alaska (Comment Letter No. 213)

p. III-56. The golden eagle is on the Alaska WatchList, primarily because of concern about habitat fragmentation and loss on this species' wintering grounds in the continental interior in the Lower 48 states (e.g., the Front Range of the Rocky Mountains in Colorado). The DEIS should incorporate data on the movements of subadult golden eagles on Alaska's North Slope, including within NPR-A, as per Carole McIntyre at Denali National Park. **(Comment No. 213-281)**

Response To: Comment 213-281

Available data on golden eagle movements in the NPR-A area has been added to the IAP/EIS description.

Comment From: Audubon Alaska (Comment Letter No. 213)

pp. IV-145. There are no citations to support the statement that "(m)ost bird species are likely to be displaced from within 700 ft to about 3,000 ft of large summer encampments, causing a local decline in nest attempts and success." There is only brief mention of enhanced predator populations and possible effects of such predators on birds. This possible effect is dismissed as "negligible," without supporting justification. The effect of predation, for example, on snow geese nesting at Howe Island, near the Endicott Causeway, has hardly been negligible over the last decade or so (Streever and Wilson, 2001, BP Exploration [Alaska], Inc.). The recent National Research Council report (2003) on the Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope gives much more weight to the effects of enhanced predator populations on birds. BLM should reconsider this issue in view of the NRC findings, especially in regard to vulnerable species, such as those on the Alaska WatchList or the U.S. Fish and Wildlife Service list of "Birds of Conservation Concern." **(Comment No. 213-283)**

Response To: Comment 213-283

Because there are likely to be a variety of bird species occupying the immediate vicinity of large summer camps--each probably with a particular range of distances within which it displays disturbance behavior in response to various human activities--designation of any such range is rather speculative, and is included here only to give a general indication of potential level of sensitivity. References with information bearing on this issue have been added to the text. Potential predator enhancement at the level of development projected for the Northwest NPR-A Planning Area is not likely to be even remotely similar to the Prudhoe Bay area where Endicott is located. The statement concerning the effect of predators on snow geese near Endicott does not demonstrate predator enhancement. The Streever and Wilson reference cited in support of the statement is not listed in the references cited attachment to the comment. Development sites are likely to be scattered, practices that have allowed artificially enhanced predator populations in the past are likely to be tightly controlled, and the USFWS Biological Opinion for this IAP/EIS requires that there be no predator access to food at development sites and that current technology be used to eliminate predator nesting, denning, and sheltering sites. Although regional predator enhancement effects that include the Prudhoe Bay area may be more substantial, local NPR-A population effects are expected to be negligible.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Furthermore, the DEIS states that it assumes that the probability of crude oil being released during exploration is zero (DEIS p. IV-177). The agency has a responsibility to analyze all potential impacts, not just the optimistic best-case scenario. **(Comment No. 253-285)**

Response To: Comment 253-285

Although stipulations or ROP's that allow discretionary application may not always be applied in their most restrictive form, most applicable with regard to birds are not discretionary. To keep the analysis within reasonable bounds, discretionary measures were considered to be applied in their most restrictive form, rather than in every possible form, to demonstrate at least one effect of the measure. As noted, the statistical probability of a crude oil spill during exploration is zero; however, unless a spill is assumed for purposes of analysis, a realistic analysis of all potential effects of development and production phases is not possible. By analyzing potential impacts of an oil spill, the IAP/EIS does not simply analyze only an optimistic best-case scenario as is evident from the analysis located in Section IV.C.11.c(2), Effects of Oil Spills. Although about 975 oil spills from all sources have occurred on the North Slope, their average size is 2.7 bbl. The BLM considers that analysis of a 900-bbl oil spill scenario is sufficiently inclusive to cover the impacts of all potential spill size scenarios, up to and including this volume.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

This assumption also seems unsupported by history. The total number of oil spills from activities on the North Slope from 1989 to 1996 was 975. (DEIS p. IV-430). It is inappropriate and counter to the spirit and intent of NEPA to perform an impacts analysis based on these unwarranted and unsupported assumptions. **(Comment No. 253-288)**

Response To: Comment 253-288

Please see the respones to 253-288 (Birds).

Comment From: Audubon Alaska (Comment Letter No. 213)

pp. IV-146. BLM must quantify routine aircraft flight into large camps before the potential effects of such flights can be evaluated. Given the information provided here, there is no justification for dismissing the effects of routine aircraft flights as "minor." To the extent that flights are to and from or over areas of high densities of nesting, molting or brood- rearing birds, depending on the species, the effects could be significant. **(Comment No. 213-289)**

Response To: Comment 213-289

The BLM agrees that to accurately evaluate the potential effects of aircraft traffic associated with camps, routine traffic needs to be quantified. At this point it is not possible to estimate this number with precision. Air traffic to scattered camps in operation for a few weeks plus brief aerial survey overflights are expected to have mainly a local effect, and thus result in a minor effect on any regional population. Within the requirements of safety, BLM requires flights to be routed so as to minimize impact to major/sensitive bird concentrations.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Each of these activities potentially could pose grave risks to the viability of this at-risk species. It is of crucial importance to recognize that because the spectacled and Steller's eider populations have experienced a more than 50% decline, that all the impacts the DEIS characterizes as negligible may have a moderate to large effect on the population's chance of long-term survival. **(Comment No. 253-293)**

Response To: Comment 253-293

The BLM considers that it has fairly represented and analyzed available data and characterized the potential impacts of various factors. There is little evidence to suggest that impacts characterized as negligible are in fact moderate or large.

Comment From: Audubon Alaska (Comment Letter No. 213)

pp. IV-147. Again, there is no justification presented here for the conclusion that the "cumulative effect of repeated disturbance'could result in minor local and regional population- level effects'." In the next paragraph, 1) Bird Concentrations, the DEIS acknowledges that disturbance effects "may be particularly serious in areas where there are higher densities of several species'." However, there is no attempt to quantify impacts on specific species at risk, such as those on the Alaska WatchList or on the U.S. Fish and Wildlife Service list of "Birds of Conservation Concern." **(Comment No. 213-294)**

Response To: Comment 213-294

In the absence of critical studies that would demonstrate quantitatively the effects of repeated exposure to aircraft flights or of flights over areas where multiple species are concentrated, BLM must address some potential impact issues with logic. For example, a smaller number of flights over a given area is likely to result in a less severe effect than would a larger number of flights. At this point it is not possible to estimate this number with precision, since monitoring programs that would yield data bearing on the issue have not been performed. Air traffic to scattered camps in operation for a few weeks per summer, plus brief aerial survey overflights, are expected to have mainly a local effect, and thus result in a minor effect on any regional population involved. The BLM requires industry to route flights so as to minimize impact to major/sensitive bird concentrations, however air traffic control requirements of the FAA would take precedence over any attempt to avoid wildlife concentrations when poor flight conditions prevail. Regarding the conclusions presented in the IAP/EIS, without an attempt to reach reasonable conclusions the document would lose much of its assessment function.

Comment From: Audubon Alaska (Comment Letter No. 213)

The DEIS suggests that if aircraft are flown at higher altitudes, that the number of flights is reduced, and that high density areas areas are avoided, "effects of aircraft operations are likely to be reduced substantially." However, what is BLM's authority to regulate the number, altitude and routes of such flights' If the authority rests with the Federal Aviation Administration (FAA), does BLM have the cooperation of and commitment from the FAA' Is that agency willing to impose restrictions to help minimize effects on birds, consistent with public safety considerations' **(Comment No. 213-296)**

Response To: Comment 213-296

The FAA regulates air traffic activity so that flight operations are carried out under safe conditions. Flights into remote camps are more similar to Alaska bush flights than to scheduled airline service, and as such may be more amenable to follow corridors that avoid wildlife concentrations, as suggested by BLM, if conditions permit and doing so does not compromise safety. It is not likely that the FAA would impose flight restrictions to help minimize effects on birds, and BLM is not suggesting they do so.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS fails to take a hard look at the these potentials impacts and fails to look at the indirect impacts from an oil spill to aquatic crustaceans, aquatic insects, plant materials and mollusks such as razor clams which constitute the majority of the eiders diet. **(Comment No. 253-297)**

Response To: Comment 253-297

Although it seems unlikely that a single exposure to an oil spill would result in significant chromosomal damage (unless reference is being made to egg contact), BLM has reviewed the cited publication and included relevant material in the analysis. The potential for reduced productivity in a given year could exist if local reproductive success is decreased as a result of oil contact with eggs; however, it is unlikely that this would translate into significant reduced productivity in future years. The stated effects from exposure to oil are discussed in the IAP/EIS in Section IV.C.11.c.(2). The BLM is not certain exactly what additional analysis is involved in taking a "hard look" at potential impact-producing factors since the subjective term is not defined by the commenter. Impacts to prey organisms that could result in an indirect impact on eiders are possible, but data are not available

to allow other than speculative conclusions concerning such indirect effects. In the 30 days following a spill entering a waterbody, 40% of the volume evaporates, 38% remains on or near the surface, and 22% is dispersed in the water column (Table App 9-10). Nearly all of the oil dispersed into the water column floats within a few centimeters of the surface; a small proportion of the oil dispersed into the water column could contact bottom organisms under unusual circumstances. Except in very shallow water where eiders seldom forage, relatively little oil is expected to reach the bottom even under strong mixing conditions. Also, after 30 days, the oil has weathered considerably and is unlikely to cause the death of extensive prey populations, and such populations are widely available for eiders to exploit away from any given oil spill locality.

Comment From: Audubon Alaska (Comment Letter No. 213)

pp. IV-149. Given that gravel is a scarce resource in NPR-A (pp. IV-18 & 19), what is the chance for adverse effects on raptors due to disturbance (e.g., blasting) as a result of increased mining of gravel along rivers where raptors are nesting' The southern Ikpikpuk River, with its high concentration of peregrine falcons, might be an area of particular concern. Based on the minimal analysis presented here (in 4), there is no justification for the conclusion that effects are likely to be "negligible." **(Comment No. 213-298)**

Response To: Comment 213-298

Critical studies demonstrating a serious quantitative effect of raptor exposure to gravel extraction operations are lacking. However, because most gravel extraction would be accomplished during the winter season when the birds are absent, it is likely this activity would pose a negligible risk. Also, it is likely that lessees would attempt to locate a gravel source as near the areas of higher oil and gas potential in the northern portion of the Planning Area as possible (Maps 105 and 106), at least initially, to decrease transport cost. Thus the northern Ikpikpuk River, and perhaps a few others in the northern portion of the Planning Area, may serve as gravel sources; however, current survey data does not indicate that this area has any substantial raptor population. This in turn suggests that effects on raptors from gravel mining in this area would be negligible regardless of season.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS claims that eiders will not be impacted by seismic surveys since they will occur in winter months, 'except under exceptional timing circumstances' for exploration (DEIS p. IV-181). This offers the public no guarantee that these surveys will not routinely be done in summer months. Seismic surveys that have the potential to impact eiders should not occur during summer months under any circumstances! **(Comment No. 253-299)**

Response To: Comment 253-299

Seismic surveying is expected to occur during December to May. Seismic surveying occurs during winter because the operational logistics make summer surveying extremely difficult in this area of poorly drained tundra with abundant shallow lakes. Summer tundra travel in support of seismic surveying operations is not provided for in this IAP/EIS. The infrequent operation that might extend into spring is not likely to extend beyond May and would pose a potential impact to only a small portion of the population with a negligible result.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Given that the long-term survival of spectacled and Steller's eiders is at risk, we are very concerned about habitat loss associated with all the action alternatives. This includes burial of nesting habitat associated with gravel material sites, the construction of pads, roads and other facilities which all have the potential to negatively

impact these at risk populations. The DEIS fails to provide a sense of scale or magnitude regarding such development. Under Alt A and B, more than 95% of the Planning Area has the potential for eventual development. The DEIS fails to account fully for the cumulative short and long-term impacts to the at-risk eider populations that will result from this level of activity and associated infrastructure . The DEIS also fails to take into account that cumulative impacts of past seismic activities in the NPR-A also has altered some undeveloped tundra lands. Surface disturbance of the tundra caused by industrial activities on the North Slope typically increases surface moisture and primary plant productivity, such changes may indirectly impact the eiders. **(Comment No. 253-301)**

Response To: Comment 253-301

Potential habitat loss from gravel placement is discussed in Section IV.A.1.b(4)(c). As portrayed in the IAP/EIS, any development in the Northwest NPR-A is expected to be accomplished with a relatively small footprint similar to that used for the Alpine development on the Colville River delta. Typically, this would involve a main pad and small satellite drilling pad(s) connected by a road/airstrip and ranging in size from 50-200 acres depending upon the number of satellite pads. In addition, a moderate acreage would be required for small pipeline support pads and possibly a pump station if recoverable quantities of oil were found. However, although early exploration disrupted some tundra areas, current exploration and most heavy equipment transport is accomplished during winter using ice pads and roads causing minimal surface disturbance. stipulations and required operating procedures would restrict development near eider nesting habitats. Proposal-specific mitigation measures would further protect nesting habitats. It is unlikely that habitat burial by numerous development/production facilities throughout the NPR-A would occur in the reasonably foreseeable future; hence any serious threat to listed eiders, which currently have substantial extant populations, is likely to require many decades.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Numerous studies have shown that predation is an important cause of nest failure in waterfowl. In extreme cases, nest predation can seriously limit waterfowl production and even cause population declines. The DEIS fails to analyze the increased predation that may occur from increased human activity (including hunting access) and facilities development. The DEIS also fails to adequately address the increase of predation from foxes, gulls, rave ns etc on eider breeding grounds. An increase in these predators has been correlated with human activity including facilities construction and garbage dumps, food around shelters, trash etc. For example, the construction of facilities associated with oil and gas development, may be disrupting the natural predator relationship by allowing Common ravens to breed in otherwise unsuitable habit. This predation may result in complete nest failures during incubation or reduced productivity. Poor eider nest success has been documented near Barrow where only 15-18% of nests located between 1991-2000 survived until hatching. Predation is suspected to be the primary cause for this nest failure. The Recovery Plan for the spectacled eider recognizes that increased predation is a major concern for the recovery of this species. Predation is a major concern for eider viability, but rather than analyze this issue in detail, the DEIS provides a cursory and insufficient surface discussion. **(Comment No. 253-302)**

Response To: Comment 253-302

The potential for increased predator presence is discussed under the No Action Alternative (Section IV.B.9). Required Operating Procedures A-1 and A-2 prevent supplemental food source availability that could attract predators and increase their reproductive success. In addition, the USFWS Biological Opinion requires that food and refuse should not be made available at oil and gas facilities, and that permittees use current technology to prevent facilities from providing artificial nesting and denning habitat to potential avian and mammalian predators. See specifically ROP E-9.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Increased helicopter and air traffic associated with the development alternatives pose risks to eiders. The DEIS recognizes that nesting eiders have been known to react negatively to helicopters (DEIS IV-176). An information void exists regarding how brooding or incubating birds may react to aircraft noise from fixed-winged aircraft or helicopter noise. These activities are often done in summer months, the time when eiders are most likely to be disturbed. Such activity is not consistent with the notake provision of the ESA. **(Comment No. 253-303)**

Response To: Comment 253-303

Stipulation E-1 (Alternatives B and C) requires that if significant resources (e.g., listed eiders) occur in wildlife habitat areas of significant concern, additional design features or mitigation developed through project-specific NEPA analysis (including setbacks within which activities are restricted) would be required to minimize impacts. The stipulation lists numerous rivers, deepwater lakes, waterfowl nesting, brood-rearing, and molting areas, and nearshore marine areas as potential areas of concern. Required Operating Procedure F-1 requires for all alternatives that aircraft use be conducted in a manner that would minimize impacts to birds; maintaining aircraft altitude of 1,500 feet AGL over caribou insect-relief areas also may reduce stress to eiders where such areas overlap eider sensitive use areas. These requirements would reduce the potential for violation of the ESA incidental take provision. See specifically Stipulations K-1, 2, 3, 6, 8, and ROPs K-4 and 7.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS fails to take a hard look at the potential impacts to nesting and other eider behavior resulting from hazardous material, fuel spills and solid material removal and remediation. These activities often entail the use of large machinery including drill rigs, hydropunches and backhoes, all which may impact eider habitat and behavior. **(Comment No. 253-305)**

Response To: Comment 253-305

Activity associated with removal and remediation of an oil spill on a pad or tundra would affect only a relatively restricted area, thus it is not likely that a significant impact on a regional eider population would occur.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Throughout the DEIS, the threats discussed above are dismissed as minor or negligible. What the DEIS fails to recognize that even a 'minor' change in population may have a major impacts for species, such as the spectacled and Steller's eiders whose future viability is already threatened. Furthermore, the DEIS fails to consider that the cumulative effect of each of these minor disturbances, may have a large impact on the species survival. **(Comment No. 253-306)**

Response To: Comment 253-306

In the IAP/EIS, potential impacts to listed eiders ("threats") are analyzed using currently available data. Because quantitative models for estimating more precise numerical effects are not available for most factors that could affect most species, a professional best estimate is made in most instances, and a subjective term for seriousness is attached to this level of potential impact. When the overall stated impact is considered minor or negligible, this is the level that such analysis has determined—-in no case is an effect "dismissed" as minor or negligible unless this is the impact level determined.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Surfacing, respiration, and diving cycles are also affected (Richardson and Malme 1993). Without making a link to onshore activities, I'm not sure how this is relevant to the NPRA program. Can we say that onshore develop may increase offshore boat traffic, or is it just relevant to a full assessment of cumulative impacts? **(Comment No. 253-309)**

Response To: Comment 253-309

Only under exceptional circumstances (fall migration of some individuals very near shore) would bowhead whales be expected to be exposed to approaching vessels. Please also see the response to Comment 253-308 (Birds).

Comment From: Audubon Alaska (Comment Letter No. 213)

The DEIS (p IV-417) states 'The effects of various cumulative factors on seaducks and other waterbirds are likely to be substantially greater than for any activities associated with any individual oil and gas lease sale.' On p IV-418, the DEIS states 'Cumulative effects of oil- industry activities on birds potentially could be substantial in the case of loon species and king eider, and significant in the case of long-tailed duck and king and common eiders'primarily as a result of mortality in the unlikely event a large oil spill were to occur.' However, later in the paragraph the DEIS states that none of the management activities'are likely to cause significant population effects.' This is confusing and need clarification. Clearly, it appears that cumulative effects on some bird species, including threatened Steller's and spectacled eiders (p IV-444) are possible if not likely. **(Comment No. 213-360)**

Response To: Comment 213-360

The referenced statements have been revised. The BLM differentiates between routine management actions, which may have substantial effects, and accidental events involving an oil spill, which are assumed to have significant effects on vulnerable and ESA-listed species.

Comment From: The North Slope Borough (Comment Letter No. 80065)

Very small amounts of crude oil contacting eggs can be embryotoxic, and could devastate entire colonies as oiled adult breeding birds attempt brood-rearing or other mechanisms transport oil to nesting sites (wind, water, peat, etc.). Oil can easily contact eggs via adult birds, soil/sediments, water and air. Considering that the persistence of oil is not well known for North Slope brackish and freshwater systems, impacts on nesting birds could be longer than predicted in the text. (2) Effects of Oil-Spill Prevention and Response (a) Blowout During Open-Water Conditions Habitat disruption from clean up efforts could last much longer than predicted with respect to nesting quality, and prey quantity and quality. This requires further assessment and this uncertainty should be expressed in the IAP/EIS. **(Comment No. 80065-595)**

Response To: Comment 80065-595

While the toxic effects of an oil spill on adult birds, or small amounts of oil contacting eggs, can have a devastating impact on bird colonies, any large spill that occurs in Northwest NPR-A is not expected to reach

sizeable bird colonies. In late summer and fall, it is possible that oil could contact substantial numbers of molting or staging birds in coastal areas. However, released oil weathers fairly quickly and becomes much less toxic. The BLM has added some further discussion of post-spill activity to this section.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The 'Barrow Triangle' includes approximately 673,000 acres, or 7.6 percent, of the Northwest Planning Area. Given the concentration of Steller's eiders near Barrow, we are concerned that significant development within this area could jeopardize the continued existence of the listed Alaska breeding population. Obviously, the best way to avoid jeopardizing the species' survival and recovery is to exclude development from areas of extreme importance to the species. At the time development is proposed, Section 7 consultation will be required and the Service will evaluate whether the cumulative, direct and indirect effects will jeopardize the species survival and recovery. Any resulting Biological Opinions will contain reasonable and prudent measures to avoid or minimize adverse effects. **(Comment No. 260-645)**

Response To: Comment 260-645

The BLM agrees that the Steller's eider is best dealt with via Stipulations and Required Operating Procedures developed in this IAP/EIS and through the project-specific ESA consultation process, which should result in reasonable and prudent measures to protect this species.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The second paragraph of this section states that 'There is at least one area in the Northwest NPR-A Planning Area of high-density water bird groups.' It is not precisely clear what is intended by this sentence, but the Service contends that there are many areas of the Northwest Planning Area which receive high-density use by many species of birds. The use of these areas vary seasonally and by species. Some, such as low-centered polygonous tundra, lake edges and islands are used during nesting, while other habitats such as salt-mash, estuaries, coastal lagoons, and nearshore waters are used during brood-rearing and molt. Much reference is made in this section and throughout the document to Table III-07. The table should be modified in several ways: 1. The most recent data should be incorporated into the table (Larned et al. 2003, Mallek et al. 2003, Dau and Anderson 2002). 2. The table mixes and matches data from several surveys that cannot be directly compared. For example, the table uses Mallek et al. data for estimated mean population and Larned et al. data for estimated breeding density. 3. Breeding density estimates are based on population estimates that are not corrected for visibility bias; thus, estimated density is not a true density, rather, it provides an index to density. 4. The estimated Northwest Planning Area population is not a statistic that is calculated in any of the referenced aerial surveys. It is unclear how the authors of the DEIS obtained their estimate. If Larned's survey data was manipulated to produce this estimate, the authors should be aware of the limited geographic extent of this survey. 5. None of the columns cite the specific data source. Population estimates from the Arctic Coastal Plain survey are mixed with density data from the eider surveys. In addition, population estimates of molting brant and common eiders are not made during the eider or ACP surveys. The table should be clearly labeled to identify the source of the data. 6. The data source for the brant density estimate should be clearly identified. The species column notes that the molting brant population will be presented, but the density column presents breeding density. Molting and breeding populations are very different. For example, some brant migrate to the North Slope to molt after breeding on the Yukon-Kuskokwim Delta. 7. Aerial surveys do not attempt to estimate densities of small passerine birds such as lapland longspurs. The column that is labeled 'Estimated ACP Breeding Density' has an associated footnote indicating that this data comes from aerial survey data. The Bird and Endangered Species (spectacled and Steller's eiders) sections have fundamental errors which should be addressed. Specifically, the authors mix and match results from two North Slope aerial surveys, the eider survey and the ACP survey, and frequently do not cite the source of the results. The North Slope eider survey is designed specifically for eiders and; therefore, is restricted to eider habitat in the northern portion of the coastal plain. The results of the eider survey should not be extrapolated to the Arctic coastal plain as a whole, as is done in the DEIS. The eider survey, timed to

correspond to the presence of eider pairs, is conducted in early June to mid-June. This survey has been conducted annually since 1992. The eider survey is also designed to detect population trend not abundance, yet the DEIS cites population estimates and densities of eiders based on these surveys. The ACP survey is designed to monitor waterbird species other than eiders. Accordingly, the survey has a broader geographic extent than the eider survey and is conducted in late June to early July, to correspond to the presence of non-eider waterfowl pairs. This survey has been conducted annually since 1986. **(Comment No. 260-660)**

Response To: Comment 260-660

The text has been revised. Please also see the response to comment 213-256 (Birds). The USFWS faults the presentation of data from several sources in Table III-07. Because a single report often does not contain all of the various datasets or transformations of interest, use of data from various sources was required. The table does not actually "directly compare" data from different sources; rather it presents available data in an attempt to describe general occurrence, abundance, and density of common species and those of particular concern. The densities, taken from the Larned et al. report, probably do not reflect entire breeding season densities since they were obtained in mid-June before the bulk of many returning species are evident; however; the values give a comparison of relative densities and are the only readily available multiple-species dataset that is obtained annually, thus providing a current estimate of this aspect of biological communities over a large area. In the final IAP/EIS, sources and any data manipulation will be more clearly indicated on the revised table, which also will be updated with recent data. The brant data was inadvertently labeled as molting birds; this has been corrected. Lapland longspur densities are not derived from aerial survey data. The clarifications presented by FWS have been included to the extent that can be done without overwhelming the basic intent to convey some idea of the diversity and abundance of bird populations in the NPR-A. The BLM is aware of the numerous caveats that make comparison of these two important datasets problematic.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Throughout the Bird section of the DEIS the authors compare trends between the two North Slope surveys using non-significant trends, species that are not accurately monitored by the surveys, and without acknowledging inherent differences between surveys that would influence such trends. Reasons for apparent differences in population trends between the surveys are more extensive than described in the DEIS. It is critical to understand that the two surveys cannot be directly compared for the following reasons: comparisons should only be made between trends that are statistically significant; the geographic area covered by the two surveys is different, although there is some overlap in the northern area of the ACP survey; the time period from which trends are calculated is different between the two surveys (eider survey 1992-2002; ACP survey 1986-2002); the eider survey does not use visibility correction factors to calculate population estimates as does the ACP survey; seasonal differences in the surveys likely affect visibility of the birds due to increasing secretive behavior as the season progresses. The DEIS only acknowledges the visibility issue described above as a reason for caution. The surveys have geographic and temporal differences, which result in trends that are estimated based on different time lines. Therefore, results of the two surveys should not be compared. **(Comment No. 260-663)**

Response To: Comment 260-663

The BLM will verify with the surveyors, and qualify, or delete any comparisons between the two FWS aerial survey datasets appearing in the text.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

In general, the DEIS under-emphasizes the importance of the NPR-A to shorebirds. Consequently, the potential impacts associated with oil and gas development on shorebirds also are minimized. In Section III B 4 c (2) (page

III-53) the following points should be emphasized: 1. Shorebirds represent over 90 percent of the over 5 million waterbirds that occur on the Arctic Coastal Plain of the NPR-A. 2. The U.S. Shorebird Conservation Plan (Brown et al. 2001) identified 14 'Species of High Concern' in Alaska. Seven of these species occur in the NPR-A, including breeding American golden-plovers, ruddy turnstones, sanderling, red knot, bar-tailed godwits, whimbrels and buff-breasted sandpipers. 3. The buff-breasted sandpiper breeds throughout much of NPR-A. This species has experienced a marked decline from hundreds of thousands at the turn of the twentieth century to less than 15,000 worldwide. The species is being petitioned for inclusion on the threatened and endangered species list. Buff-breasted sandpipers may be particularly vulnerable to impacts associated with oil and gas development because of tendencies to nest in drier habitats, which are frequently used for industry roads and pads. 4. Breeding species that are abundant in the NPR-A include black-bellied plover, semipalmated sandpiper, Baird's sandpiper, pectoral sandpiper, dunlin, long-billed dowitcher, red-necked phalarope, and red phalarope. 5. The Arctic race of the dunlin, which migrates to Asia, is recognized by the Alaska Shorebird Working Group (2000) as a species of high conservation concern. 6. The Alaska Shorebird Working Group (2000) has identified oil and gas development as the primary threat to the conservation of shorebirds in the Arctic. **(Comment No. 260-685)**

Response To: Comment 260-685

The BLM is aware that shorebirds form an important segment of the Arctic Coastal Plain avifauna. However, there appears to be relatively little current, wide-ranging, and readily available information. The BLM has elected not to stress data presented in older sources because numbers may have change dramatically since obtained in, for example, the 1970's. Any species of concern that were omitted inadvertently have been added to the document. Any new data that FWS can provide will be incorporated. The BLM is unaware of literature documenting the presence of over five million waterbirds occurring on the Arctic Coastal Plain of the NPR-A.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Map 36 in Volume 2 of the DEIS depicts the shorebird distribution across the Northwest Planning Area. As the only reference in the bibliography associated with the map pertains to polar bears, it is impossible to derive the source of the data for the map. The assumption is that the data were derived from aerial surveys, which are a poor means for counting shorebirds. The Service suggests that the map be reconfigured, using data from more accurate ground-based surveys. **(Comment No. 260-686)**

Response To: Comment 260-686

Map 36 has been revised to specify large shorebirds. These data were obtained from USFWS aerial surveys in 2002 (Larned), hence the notation does not indicate a specific report or publication. Any data on shorebirds the FWS contributes will be incorporated.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

In Table III-09, only one author is cited (Derksen et al. 1981) to indicate which species are present near Barrow. There are many additional references which should be reviewed regarding the distribution of shorebirds in the NPR-A, including review papers by Frank Pitelka, unpublished reports from industry-sponsored work in the eastern NPR-A, and unpublished data from the Fish and Wildlife Service. **(Comment No. 260-687)**

Response To: Comment 260-687

There actually are two citations given as sources for this table. The BLM's interest was in presenting a listing of

the most common species or those with other attributes recommending inclusion, rather than an exhaustive list of all species observed in the region.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The DEIS states that 'potential impacts to birds from oil and gas development may result in minor local and regional population-level effects, although these usually are difficult to separate from natural variation in population numbers.' This gives the impression that an inability to detect a population-level impact is equivalent to a minor impact. Not all impacts to birds are masked by natural variation. Impacts to specific components of avian biology such as breeding success, for example, can be measured effectively irrespective of natural population fluctuations. Recovery from oil spills also can be estimated on the basis of existing population models. In some cases baseline information may not be sufficient to detect impacts, however, given enough time and effort, this can be overcome. The ability to detect change is both a function of the size of the change and the effort involved in measuring the change. **(Comment No. 260-688)**

Response To: Comment 260-688

The comment has incorrectly quoted the text in the EIS. The actual text is "Various species could be affected to some extent by disturbance events (e.g., passage of aircraft), although most incidents are expected to result in negligible effects from which individuals would recover within hours to 1 day. However, the cumulative effect of repeated disturbance could extend for longer periods and potentially may adversely affect physiological condition, molt, nest success, and productivity. Ultimately this could result in minor local and regional population-level effects although these usually are difficult to separate from natural variation in population numbers." The minor effects that may be masked by natural variation are specifically the effects of disturbance events as defined in the section and not from oil and gas development as a whole, as the comment incorrect presents as a quote. In any case, stating that minor effects may be indistinguishable from natural variation is not equivalent to claiming that any effects that cannot be distinguish from natural variation must be minor effects. If natural variation is great enough, it could mask moderate to severe effects.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

We recommend that a more thorough analysis of the potential impacts of the three Alternatives on shorebirds be included in the DEIS. Considering several of the species that breed in the NPR-A are on the Service's list of Birds of Conservation Concern and/or are recognized as species of high to moderate concern in the U.S. and Alaska Shorebird Conservation Plans, additional information and analysis is needed regarding the effects of the action Alternatives on shorebirds. The assumption might be that because these species are widespread and in many cases abundant, there will be no noticeable population-level effects regardless of the Alternative selected. However, for those species which are declining and already have small populations, the impacts could be severe. For example, the buffbreasted sandpiper is declining and has a population estimated to be around 15,000. This species may be severely impacted because most development is sited in habitat used by this species (i.e., drier habitats). The DEIS should address the possible impacts associated with each Alternative on shorebird populations in the NPR-A. **(Comment No. 260-689)**

Response To: Comment 260-689

The BLM has reviewed shorebird sections and made revisions as appropriate. With relatively little relevant information available on many species' abundance and distribution, it is difficult to estimate potential impacts with greater certainty. The BLM believes the level of detail in the analysis is appropriate in support of the pending leasing decisions. A greater level of detail would likely be available for a subsequent environmental review at the permitting stage for a proposed activity.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section II. B. 6. This section refers the reader to distribution maps of yellow-billed and red-throated loons (Map 37), brant and white-fronted geese (Map 40), king eider (Map 43), and spectacled eider (Map 62). Although the data presented in these maps appears to be based on the Fish and Wildlife eider surveys, there are no figure captions referencing the data source. In addition, Map 63 presents Steller's eider distribution, however, this map is not linked to the text and no data source is given in the figure caption. The source(s) of these data should be clarified both within the text and on the figure captions. **(Comment No. 260-719)**

Response To: Comment 260-719

The data sources for each map are listed under the figure legend, marked source. The Stellers eider Map 63 is referenced in Section III.B.6.c.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 4. c (1) (a) paragraph 1. The text and tables in this paragraph do not correspond. The text states population estimates are from aerial surveys between 1992 and 1996, then directs the reader to Table III-07, a table that is based on mean estimates between 1986-2000. Neither text nor tables cite the source of data. **(Comment No. 260-721)**

Response To: Comment 260-721

For consistency, all maps were taken from Larned's eider aerial surveys, which in the cited report is 1992-1996 (updated report has been used in the final document). This avoids some problems; data from Mallek's ACP aerial surveys 1986-2001 (updated report) will be used for the final maps for non-eiders. Data sources are given in the two introductory paragraphs to this section. Table III-07 lists data sources in footnotes below the table.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Table III-07. This table cites population estimates from the ACP survey and density data based on the eider survey. This table should be clearly labeled to allow the reader to understand sources of data. **(Comment No. 260-722)**

Response To: Comment 260-722

Table III-07 has been revised.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 4. c (1) (a) paragraph 2 and Table III-07. The data should be updated in the text and table to reflect most recent Service survey data from the North Slope (Larned et al. 2003). **(Comment No. 260-723)**

Response To: Comment 260-723

Data portrayed on maps and in tables and text has been updated as noted in the response to comment 260-721 (Birds).

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 4. c (1) (a) paragraph 2. Density data presented here is based on yellow-billed loon surveys across the northern portion of the North Slope. Density data for yellow-billed loons within the Northwest NPR-A Planning Area is more applicable. Contact Service biologist Bill Larned at 907- 262-9863 for details. **(Comment No. 260-724)**

Response To: Comment 260-724

As noted in the response to comment 260-721 (Birds) maps, tables, and text related to non-eider species used data from the Mallek's ACP surveys.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 4. c (1). Failure to cite the source of data is a problem throughout this section. The authors refer to breeding pair surveys interchangeably without indicating which survey they are citing. Citations should reflect either the eider surveys conducted by Bill Larned or the ACP survey conducted by Ed Mallek. **(Comment No. 260-725)**

Response To: Comment 260-725

Data sources are identified in the introductory paragraphs. Please also see the response to comment 260-721 (Birds).

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 4. c (1). (d). In reference to white-fronted geese, the authors state that 'Following hatch, males care for the young from about six weeks or until they fledge in late August.' Although males are dominant, both parents care for their young. **(Comment No. 260-727)**

Response To: Comment 260-727

The text has been revised.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 4. c. (1). (f). 4). Mallek et al. (2002) states that his survey is not appropriately designed to monitor

common eiders. Making common eider population estimates from these surveys is inappropriate. Dau and Anderson (2002) conduct surveys specific to common eiders and is a more appropriate source. **(Comment No. 260-728)**

Response To: Comment 260-728

Dau and Anderson (2002) is used for population estimates of common eiders, although the highest number from Mallek et al. (2002) is also specified.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 6 b (1). The eider survey conducted by Bill Larned is designed to estimate population trend and is not corrected for detection bias; thus the survey presents a minimum population estimate that is useful to track trends, not abundance. In addition, the most recent survey data should be cited (Larned et al. 2003). **(Comment No. 260-731)**

Response To: Comment 260-731

The statement concerning estimated size of the Arctic Coastal Plain spectacled eider population has been qualified to indicate that it represents a minimum population estimate, and the citation has been updated to the most recent survey report.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 6 b (4) paragraph 1. Specify that June 22 was the median departure date for postbreeding males. **(Comment No. 260-733)**

Response To: Comment 260-733

The text has been corrected.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 6 b (4) paragraph 4. The use of the term 'Beaufort area' is confusing. The DEIS describes rapid movements through the Beaufort area, and supports this claim with on shore observations. **(Comment No. 260-734)**

Response To: Comment 260-734

The section has been revised to clarify the statements supporting the conclusion for eider movements.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 6 b (4) paragraph 4. Change estimated average population index.... to 'estimated average density.' **(Comment No. 260-735)**

Response To: Comment 260-735

The sentence has been revised to clarify that low spectacled eider numbers counted during USFWS aerial surveys are given as estimated density rather than as a population index.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 6 b (4) paragraph 4. It is not clear what is meant by 'relatively low proportion of initial locations of birds in the Beaufort Sea.' Please clarify what type of locations (satellite, etc.) are referenced. **(Comment No. 260-736)**

Response To: Comment 260-736

The statement concerning initial eider locations has been qualified as indicating initial locations of satellite-transmitter-equipped birds.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV C. 9. b. (1) (b). 1) Kasegaluk Lagoon should be identified as an area of high bird concentration and diversity. This area is of critical importance to many bird species and should be highlighted in this section. The DEIS should cite Johnson et al. (1993) which describes the importance of this area to waterbirds. **(Comment No. 260-751)**

Response To: Comment 260-751

References to Kasegaluk Lagoon were added to Sections III and IV.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV C. 9. b. (3) paragraph 2. The list of species of particular concern should be expanded to include yellow-billed loons and long-tailed ducks. **(Comment No. 260-752)**

Response To: Comment 260-752

The Yellow-billed loon and long-tailed duck have been added to the list of sensitive species.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV C. 11. c. (2) The authors acknowledge that if a spill were to reach coastal waters, effects on eiders could be more significant than if confined to onshore habitats. The DEIS should identify Smith Bay as an important staging area for female spectacled eiders. Recent satellite telemetry efforts have shown that most female spectacled eiders that breed in the central North Slope use this area during fall migration (TERA 2003). **(Comment No. 260-754)**

Response To: Comment 260-754

Smith Bay is identified as an area where eiders have been observed during aerial surveys in Section III; the report noted will be cited if a copy is made available.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV E. 11. c. In the first sentence of this paragraph, the word 'potentially' should be removed. Larned et al. (2001, 2002, 2003) showed that this area supports medium densities of spectacled eiders. **(Comment No. 260-757)**

Response To: Comment 260-757

The text has been revised.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV G. 9. This section should acknowledge that when birds contact spilled oil, mortality is the likely outcome. **(Comment No. 260-758)**

Response To: Comment 260-758

The BLM does not regard oil spills as unavoidable events. Please see Section IV.J.5.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV. J. 5. g. (1) paragraph 1. Common eiders are numerous in lagoon habitats throughout the summer. **(Comment No. 260-765)**

Response To: Comment 260-765

The indicated sentence states that the estimated relative numbers of each species mentioned are present for varying intervals; the latter has been further qualified to indicate that the period referred to is the entire summer and fall period. The present knowledge of the distribution and abundance of these species suggests that the statement indicating relative estimated numbers of each species present is as accurate a statement as currently can be made.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV. J. 5. g. (1) paragraph 1. Append the list of species that would be expected to contact oil to include red-throated and yellow-billed loons. **(Comment No. 260-766)**

Response To: Comment 260-766

A statement noting that red-throated and yellow-billed loons could also be contacted by oil has been added to this discussion.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV. J. 5. i. (2). (b). 1) paragraph 3. Recent data from satellite telemetry studies have shown that most female spectacled eiders that breed in the central Alaskan North Slope use the Beaufort Sea, particularly Smith Bay, for staging (TERA 2003). **(Comment No. 260-771)**

Response To: Comment 260-771

Please see the response to comment 260-754 (Birds).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-145, second para from bottom. The first sentence in this section says 'Most bird species are likely to be displaced from within 700 ft to about 3000 ft'causing a local decline in nesting attempts and success.' CPAI has studied bird displacement impacts from a variety of actual oilfield operations on the North Slope over the past 20 years. The most detailed and most relevant study to NPRA is the recently completed 6-year bird monitoring of the Alpine development. The Alpine airstrip and adjacent active camp are similar in design to this discussion of potential NPRA impacts from 'a large summer encampment.' The Alpine study concluded that most species of nesting birds did not show detectable differences in distribution relative to the airstrip, and that densities of waterbirds did not decline near the airstrip. Shorebird and passerine nest densities were found to be greatest in zones nearest to the airstrip. (Johnson et al 2003 in prep.) Nesting Greater White-fronted Geese did show displacement from the airstrip with nest densities reduced within about 3000 ft. These results are reported in Johnson et al (2003, in prep). In studies conducted in the Prudhoe Bay Unit, TERA found reductions in shorebird nests within 100 m of heavily traveled roads (TERA, 1993), and that nesting birds displaced by a well pad will nest in adjacent habitat away from the pad (Troy, D. and T. Carpenter, 1990). With this understanding of how these oilfield activities altered the distribution of some birds, but not 'most bird species,' CPAI believes the estimate used in this discussion, that "most birds are likely to be displaced out to 3000 ft'.' are excessive and do not reflect normal bird responses to this type of activity. While some displacement will occur near airstrips, monitoring data indicate that for many species, that zone is on the order of several hundred feet, not several thousand feet and that overall abundance is not reduced because of corresponding increases in numbers in adjacent habitat. **(Comment No. 255-832)**

Response To: Comment 255-832

The BLM has reviewed the recently completed Alpine avian monitoring study report for possible revision of this statement so that it conforms to the most recent research results. Some readers may object to deriving the potential effects of summer encampments from the reported effects of the Alpine airstrip study since the two

situations probably are not strictly comparable. Also, since we presume that shorebirds and passerines are not attracted to aircraft, it is assumed that placement of the facility in some manner modified their habitats to be more attractive to them or produced new habitat.

Comment From: Michael North (Comment Letter No. 80003)

First, I hope that the federal government will fully appreciate the irreplaceable natural resources that occur in the National Petroleum Reserve - Alaska (hereafter NPR-A). Among these resources is a unique molting area for four species of geese found north and east of Teshekpuk Lake. This area provides a predator-reduced environment containing a timely and unique nutrient-rich vegetation community that provides necessary minerals and vitamins for feather replacement. The fact that geese migrate hundreds of miles to this area from Canada, Siberia, and southwestern Alaska to utilize this resource for a short period of time provides empirical evidence that this unique combination of resources is not replicated anywhere else in western North America. The U.S. Fish and Wildlife Service has amply demonstrated through the use of experimental aircraft overflights the impacts that will occur to these molting geese if the former Lonely Defense Early Warning Radar Station is used for logistic support of oilflelds in the NPR-A. **(Comment No. 80003-844)**

Response To: Comment 80003-844

The Teshekpuk Lake Special Area used by molting brant and other goose species is located in the Northeast NPR-A, and is not likely to be affected by activities occurring in the Northwest NPR-A. The fact that substantial numbers of geese molt in this area does not entirely exclude the possibility that its combination of resources exists elsewhere in North America. The former Lonely DEW radar facility has not been proposed as logistical base for Northwest NPR-A development.

Comment From: Michael North (Comment Letter No. 80003)

The NPR-A also provides significant breeding habitat for federally listed Steller s and spectacled eiders. The NPR-A supports what is essentially the only viable breeding population of Stellers eiders in North America. It is also the core of the North Slope breeding range of spectacled eiders, which is one of only two areas in North America where concentrations of spectacled eider breeding occurs **(Comment No. 80003-845)**

Response To: Comment 80003-845

The welfare of the spectacled and Steller's eiders, listed as threatened under the Endangered Species Act, has been given considerable attention by BLM and the USFWS. The habitat requirements and biology of these species are discussed in Sections III.B.6, IV.C.11, and V.B of the BLM NW NPR-A IAP/EIS. The USFWS has completed and is continuing research projects covering the distribution, movements and biology of these eiders, and annually completes an aerial survey of the entire North Slope area, specifically targeting eiders.

Comment From: Michael North (Comment Letter No. 80003)

Approximately 80% of yellow-billed loon breeding in Alaska occurs in the NPR-A and adjacent Colville River delta. Within NPR-A, the Meade, Chipp and Ikpikpuk Rivers are extremely important concentration areas. It is also extremely important to note that, although there may be greater numbers of yellow-billed loons nesting in Canada and Siberia, there are no known greater numbers. Yellow-billed loon populations could be sensitive to impacts of oilfield development, including 1) activities that alter the tundra physically, resulting in lake tapping, as occurs naturally on the Colville River delta; 2) increased egg and chick loss due to increased predator

populations (particularly raven, gull, and fox populations that benefit from human garbage; 3) direct displacement from breeding territories due to human disturbance; and 4) introduction of contaminants from spills, blowouts, roads, etc. that could contaminate the food chain. The first and last impacts will be long-term impacts that outlast the life span of the oilfields, and it is not a matter of arguing whether these impacts may occur. They will occur; the impacts that have occurred at Prudhoe Bay provide empirical, prima facie evidence of this fact. The only issue is the frequency and magnitude and location of the impacts. **(Comment No. 80003-846)**

Response To: Comment 80003-846

The BLM is aware of these factors and their potential for causing adverse impacts on yellow-billed loons. Several of the stipulations and ROP's address these issues. For example, activity setbacks from waterbodies and streams (Stipulation E-1) are likely to decrease potential for lake tapping and disturbance/displacement of loons; ROP A-1 concerning attraction of wildlife (e.g., predators) to areas where loons could be impacted; stipulations A-1 to A-3 and ROP's A-3 to A-8 will decrease the potential for environmental contamination. As directed under the USFWS Biological Opinion, BLM cooperates with the USFWS to decrease nesting and denning sites at oil and gas facilities that could enhance predator populations.

33. TOPIC : AIR QUALITY

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.C.6.b.(1), Paragraph 7, Page IV-120. This section refers to relevant air emission details contained in the Beaufort Sea Planning Area Oil and Gas Lease Sale 144 Final Environmental Impact Statement. The Final IAP/EIS should provide a brief explanation of why the information from that EIS is appropriate to use here. **(Comment No. 251-194)**

Response To: Comment 251-194

The text has been revised to add to Section IV.C.6.b. (1) the following text: "Information from that Beaufort Sea Sale 144 Final EIS is relevant for Northwest NPR-A IAP/EIS because the Sale 144 EIS included the area immediately offshore from the Northwest NPR-A (as well as offshore of the Northeast NPR-A) and analyzed effects from a scenario including assumed greater oil development than assumed for the Northwest NPR A. Emissions analyzed for the Beaufort Sea also included some emission sources not applicable to operations on land in the NPR-A. Emissions from expected NPR-A operations would not include significant emission sources that were not analyzed for the Beaufort Sea Final EIS. Therefore, effects analyzed and pollutants analyzed are greater than would be expected for the Northwest NPR-A."

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.C.7.b.(1)(a)1), last Paragraph, Page IV-127. This paragraph inaccurately states that 16 square ft. is 0.006 acres. This should be 0.0004 acres. Any calculations in the document that use 0.006 acres should be rechecked. 251-197 **(Comment No. 251-197)**

Response To: Comment 251-197

The text has been revised.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The cumulative impacts section's analysis of air quality is cursory and superficial. See FEIS V-80 to V-82. In contrast to the DEIS dismissive approach to air quality issues, the NRC concluded that 'the most important potential accumulation of effects is likely to be a reduction in visibility and an increase in direct human exposures to pollutants caused by synergistic interactions between locally generated and globally transported contaminants.' NRC Report at 116. **(Comment No. 253-216)**

Response To: Comment 253-216

The cumulative impacts section referred to in the comment is that from the Beaufort Sea Final EIS, not from the Northwest NPR-A Draft IAP/EIS. Comments to the Beaufort Sea EIS were addressed therein. The cumulative impacts section in the current Northwest NPR-A Draft IAP/EIS (Section IV.F.8.f), however, is quite similar to the analysis in the Beaufort Sea EIS because it used that analysis extensively. The discussion includes a detailed analysis of cumulative air quality effects, including a discussion of visibility effects of Arctic haze and a rational prediction that any local contribution to that haze will probably decrease, due to a downward trend in expected regional oil production.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS does not discuss potential health effects from diesel exhaust that increased diesel engine equipment usage associated with oil and gas activities may cause. Diesel exhaust causes respiratory effects and is a carcinogen. EPA, Health Assessment Document for Diesel Engine Exhaust, EPA/600/8-90/057F (May 2002), 1-3 - 1-7. Because it might affect public health or safety of workers or local residents, or natural resources, even a 'marginal degradation' of air quality from diesel exhaust could be 'environmentally significant' and therefore must be discussed in the DEIS. See 40 C.F.R. § 1508.7 ('Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.'). It is noteworthy in this regard that the industrial diesel engines on the North Slope (such as those present during oil and gas exploration activities) use relatively high sulfur diesel fuel, and that Alaska is otherwise exempt from the low sulfur diesel fuel requirement applicable to mobile sources. High sulfur fuel produces a greater volume of particulate matter, and therefore creates a higher risk for the inhalation of carcinogenic particles from diesel exhaust. The EIS must evaluate this potential impact, therefore. **(Comment No. 253-348)**

Response To: Comment 253-348

Emissions standards have been promulgated by the U.S. Environmental Protection Agency and are enforced by the Alaska Department of Environmental Conservation. Table III-05 of the IAP/EIS shows the measured air pollutant concentrations at Prudhoe Bay over the years 1986 through 1996. In that Prudhoe Bay industrial complex area during those years (and even now) a considerable number of diesel engines were and are used--many more that we anticipate could be used in the Northwest NPR-A, which we believe has a significantly lower potential for oil and gas production than does (or did) Prudhoe Bay. Since air emissions in the Prudhoe Bay area, including emissions from all the diesel engines used there, are substantially below the maxima permitted by the National Ambient Air Quality Standards, we believe that the lower emissions predicted for the Northwest NPR-A will not cause any problems in maintaining satisfactory air quality. We note especially that the maximum sulfur dioxide pollution measured at Prudhoe Bay was only from one to four percent of the standards, and the inhalable particulate matter pollution was at most fifteen to twenty percent of the standards.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The EIS must discuss whether BLM intends to authorize the creation of so-called 'ambient air quality exclusion zones' around oil and gas facilities and what that will mean to existing air quality. In the Reserve's northeast corner, BLM authorized the creation of such zones in order to facilitate lessees' compliance with the National Ambient Air Quality Standards at oil exploration pads. This potential was never discussed, however, in the EIS for the northeast corner, which assured the reader that lessees would be required to comply with all air pollution laws. In fact, because it has allowed the creation of ambient air quality exclusion zones, BLM has not enforced compliance with the NAAQS at the edge of exploration ice pads where that compliance must, as a matter of both federal and state law, be enforced. If it intends to authorize such zones in the NW portion of the Reserve, BLM must discuss in the EIS the amount of additional pollution that will be allowed at each facility whenever an air quality exclusion zone is authorized at that facility. It also must identify the federal law or laws which it claims authorize it do devote federal lands in this manner, solely to accommodate a lessees desire to pollute more than might otherwise be necessary. If BLM intends to authorize the use of such zones in the NW of the Reserve, the EIS must explain why it is necessary to do so in lieu of requiring the lessee to use cleaner burning fuel, more modern equipment, best available pollution control technology, or better operational practices. **(Comment No. 253-349)**

Response To: Comment 253-349

The BLM does not have the authority or intention to designate any lands under its jurisdiction as "ambient air quality exclusion zones." Subject to both the Federal Land Policy and Management Act and the Clean Air Act, BLM cannot conduct or authorize any activity which does not comply with all applicable local, state, tribal and federal air quality laws, statutes, regulations, standards, and implementation plans. However, when establishing the Clean Air Act, the U.S. Congress determined that the National Ambient Air Quality Standards would not apply within industrial areas to which the general public does not have access. Alternatively, Occupational Safety and Health Standards for Air Contaminants apply to workers located within these areas. The ambient air quality standards are not applicable within areas to which the general public is excluded access. The U.S. Environmental Protection Agency has delegated the primary authority and responsibility for implementing the federal Clean Air Act to the State of Alaska, subject to EPA's continuing oversight. In addition, the State of Alaska has federal authority to establish ambient air quality standards which may be more (but not less) stringent than the federal standards. Therefore, BLM follows the guidance of EPA and the State of Alaska when determining whether or not its actions comply with applicable ambient air quality standards.

Comment From: NOAA Atmospheric Observatory Schnell (Comment Letter No. 183)

The Barrow Atmospheric Observatory is considered a national treasure and its future measurements would be compromised if drilling and oil production were to ever occur within the clean air sector. For instance, just one well or flare site in the Elson Lagoon would possibly force abandonment of the station. **(Comment No. 183-1032)**

Response To: Comment 183-1032

If and when exploration and/or development occurs in the areas in and around Elson Lagoon, a site-specific NEPA evalution would be performed and the proposed activities would be a component of the evaluation, and subject to rigorous mitigative circumstances.

Comment From: NOAA Atmospheric Observatory Schnell (Comment Letter No. 183)

Not leasing portions of the Beaufort Sea including Elson Lagoon that lie within the Barrow Atmospheric Baseline

Station Clean Air Sector. And, that this lease restriction be extended out 500 miles from the Barrow station within the arc of the clean air sector. **(Comment No. 183-1033)**

Response To: Comment 183-1033

Please see the response to comment 209-910 (Estuarine Water Quality) and 209-918 (Special Designation Areas).

34. TOPIC : IMPACT EVALUATION

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Audubon's December 2002 report, Alaska's Western Arctic: A Summary and Synthesis of Resources contains significant new wildlife information and analyses that should be included in a revised DEIS for the Northwest Planning Area. We recommend Audubon's "Wildlife Habitat Alternative" be considered as the basis for new alternatives in the revised DEIS and/or the FEIS. Unfortunately, the DEIS fails to provide a full and adequate description of the wildlife resources and ecological conditions found in the Planning Area. The evaluation of potential impacts from oil development activities in the Northwest Planning Area is based upon a series of proposed development scenarios that are incomplete and unrealistic when evaluated in the context of existing development in the region. As a result, the nature and extent of potential impacts to wildlife are significantly understated in the DEIS. The following analysis illustrates the vulnerability of specific species in the Planning Area and the subsequent need for BLM to adequately address these concerns in a revised DEIS. **(Comment No. 253-218)**

Response To: Comment 253-218

The BLM believes that the description of the affected environment (Section 3) is appropriate for this IAP/EIS and in accordance with the provisions of NEPA regulations to keep EIS's concise and no longer than absolutely necessary (40 CFR 1502.2(c)) and to evaluate broad actions generally (40 CFR 1502,4(c)(2)). The description of the environment establishes sufficient information for use in estimating the potential impacts of the activities projected in the hypothetical scenario.

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

The rapid development that has occurred has left permanent scars on the Arctic landscape, as evidenced in the recent report issued by the National Academy of Sciences. We must give more consideration to the impact on the land and the fauna that depend upon before rash decisions are made to move forward with development. **(Comment No. 80082-539)**

Response To: Comment 80082-539

The analysis in this Integrated Activity Plan/Environmental Impact Statement is intended to support a planning decision on the potential oil and gas leasing program in the Northwest National Petroleum Reserve-Alaska. The BLM believes that the analyses of potential impacts Are appropriate for the decision at hand. Site-specific environmental analyses will be prepared for proposed exploration and development activities. This "tiered" approach to NEPA compliance and decision making is encouraged by the NEPA regulations (see 40 CFR 1502.20 and 1508.28). The information and conclusions of the National Academy of Sciences National Research Council

(NRC) March 2003 report Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope report are considered in the cumulative analyses in the final IAP/EIS.

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

We need to carefully assess the potential impacts of the different types of soil, vegetation, aquatic environment, and terrain, not to mention the myriad species that depend upon it. **(Comment No. 80082-541)**

Response To: Comment 80082-541

We have taken your comments into consideration in developing the Preferred Alternative.

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

In light of the National Academy of Sciences report that came out just a few weeks ago, we see that the areas in which oil development has proceeded in Alaska's Northern Slope have been devastated, not just from an environmental standpoint but from a social standpoint as well. If anything, the National Academy of Sciences's report should tell us that before any more development proceeds we need to reexamine the way in which it has proceeded up in the Northern Slope of Alaska. **(Comment No. 80082-551)**

Response To: Comment 80082-551

The NRC (2003) report Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope was released after publication of the draft IAP/EIS. The information and conclusions of the NRC report are considered in the cumulative analyses in the final IAP/EIS. The NRC report is a review of current information and an assessment of that information. The report does not document significant adverse effects on the environment. Some of the conclusions in the report are not supported by the data presented in the report, and BLM and MMS subject matter experts do not necessarily concur with all of the conclusion presented in the report.

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

Just last week, however, the National Academy of Sciences released a study on the long term impacts of oil and gas development on the North Slope of Alaska. This study was requested by members of the oil industry and Alaska's own Senator, Ted Stevens. The conclusions of this report were loud and clear. Oil and gas development on Alaska's North Slope does, in fact, have a negative impact on the surrounding environment and the future of the North Slope as well. **(Comment No. 80082-554)**

Response To: Comment 80082-554

Please see the response to 80082-551 (above).

35. TOPIC : TERRESTRIAL MAMMALS

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Effects of the Cumulative Case, Terrestrial Mammals, Page IV-420. The first paragraph on this page states the potential construction of an east-west road from the Dalton Highway to Nuiqsut would add to the cumulative effects on the CAH by creating an east-west barrier to movement in addition to the existing north-south barrier created by the Dalton Highway. There is no evidence presented in this document that indicates the Dalton Highway is a barrier to caribou movement or that a Dalton Highway-Nuiqsut road would serve as a barrier to movement. This section should be rewritten to note that movements may be temporarily impeded or altered by traffic rather than the roads serving as a barrier to movements. **(Comment No. 251-174)**

Response To: Comment 251-174

The wording in the document has been revised.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS does not explicitly address how impacts of seismic exploration on denning bears can be minimized unless den locations are already known. **(Comment No. 253-257)**

Response To: Comment 253-257

Please see the response to comment 213-322 (Terrestrial Mammals).

Comment From: Audubon Alaska (Comment Letter No. 213)

The DEIS does not explicitly address how impacts of seismic exploration on denning bears can be minimized unless den locations are already known. **(Comment No. 213-322)**

Response To: Comment 213-322

Avoidance of dens is the only measure proposed to reduce impacts of seismic exploration on denning grizzly bears. The area of high oil potential has very low density grizzly bear habitat.

36. TOPIC : MARINE MAMMALS

Comment From: State of Alaska (Comment Letter No. 251)

Section III, Marine Mammals, Page III-64. This section briefly describes distribution and population status of marine mammals within the planning area. However, the information presented for ringed seal, spotted seal, bearded seal, and walrus is restricted to the Beaufort Sea reaches of the planning area. Information on the distribution and population status of these organisms that occur along the Chukchi Sea coastline and within Kasegaluk Lagoon also should be presented as a portion of the Northwest planning area contacts these waters. **(Comment No. 251-153)**

Response To: Comment 251-153

Information of the distribution of ringed seals, ice habitats, and other marine mammals in the Chukchi Sea off the Northwest NPR-A Planning Area, has been added to Maps 56, 57, and 59.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Development in the Northwest Planning Area has the potential for affecting populations of several mammal species including caribou, grizzly bears, foxes, polar bears, beluga whales, and spotted seals. We believe that the DEIS does not adequately address potential impacts to selected species or provide sufficient protection for their habitats. **(Comment No. 253-250)**

Response To: Comment 253-250

The BLM recognizes that the NPR-A provides important habitat for arctic mammal species and this is addressed in the IAP/EIS. Protective stipulations provide additional protection to these species and their habitats. In some cases, the text was modified to better address impacts to certain species.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

*The effects of global climate change on sea ice and ringed seals will directly affect polar bears throughout the Arctic (Sterling et al. 1999, Amstrup 2000, IUCN in press). The effects of climate change must be considered relative to other potential impacts to polar bears. The cumulative impacts of the potential threats described above are reason for concern and precautionary management of polar bears in the western Arctic.***(Comment No. 253-263)**

Response To: Comment 253-263

The IAP/EIS recognizes the potential effects on polar bears and ringed seals in the cumulative analysis. See Section IV.F.8.j.(2)(a) 8) Effects of Global Warming.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Polar bear- human interactions should be minimized, and proper bear deterrence employed at developed sites. Important habitats, including 'ice-edge' habitats and polynyas, barrier beaches, and maternal denning habitat should be protected and managed to minimize deleterious effects from industrial disturbance during periods of seasonal bear use, as well as from habitat degradation and contamination. The effects of industrial activity (particularly seismic exploration) on denning bears should be assessed, monitored, and avoided during future exploration activity. Some areas of potential maternal denning habitat may be interpreted from aerial photographs (Durner et al. 2001) for identification and protection from alteration and disturbance. **(Comment No. 253-265)**

Response To: Comment 253-265

Guidelines for oil and gas operations in polar bear habitats have been established (USDOI MMS, 1993). These guidelines, if followed, would minimize polar bear-human interactions and include proper bear deterrence at exploration and development sites. Offshore polar bear habitats such as polynyas and 'ice-edge" habitats are not likely to be exposed to development in the Northwest NPR-A Planning Area. The USGS Biological Resource Division scientists are developing Forward Looking Infra-Red Radar (FLIR) techniques to locate occupied polar bear dens in areas where seismic operations are planned. These techniques along with photo identification of potential den habitats would help to mitigate seismic and other industrial activity effects on denning polar bears in the NPR-A.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Caution must be exercised for future oil and gas and mineral development in important polar bear habitat along coastal and near-shore environments of the eastern Chukchi and southern Beaufort seas until oil and contaminant spills are more preventable and adequate spill cleanup methodology is developed. Effects of marine oil spills must be assessed as part of cumulative stress on this species. Other potential ecological concerns for polar bear conservation that should be assessed include the potential effects of global climate change, a Russian North Sea route, and expansion of commercial fishing and marine transportation (to move coal and minerals) in the Chukchi Sea. The cumulative effects of these activities should be evaluated for the ir influence on sea ice and seals, as well as directly on polar bears. **(Comment No. 253-267)**

Response To: Comment 253-267

Potential oil spills that may be associated with exploration and development in the Northwest NPR-A are likely to occur onshore along pipelines and near production facilities and not affect the marine environment. Cumulative effects of marine oil spills, global warming, and commercial fishing are discussed in Section IV.F.8.j (2)(a)3), 8),and 9), respectively.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Beluga coastal concentration areas should be clearly identified and protected from unnecessary disturbance, particularly from June through August. Other important coastal habitats used by beluga whales, including Kasegaluk Lagoon, should be identified and protected from habitat degradation and contamination. **(Comment No. 253-269)**

Response To: Comment 253-269

The importance of Kasegaluk Lagoon for various arctic animals has been addressed in the development of the Preferred Alternative, which would defer leasing in the Kasegaluk area for 10 years. The Preferred Alternative is analyzed in this Final IAP/EIS. Consideration of conservation strategies regarding possible port development and shipping activities related to possible OCS oil and gas exploration and development in the Chukchi Sea would be further addressed at the subsequent permitting stages for those activities.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS recognizes the risk for noise disturbance associated with development in the Reserve, but writes it off as negligible. Yet, the document fails to provide any scientific support for the assertion that such disturbance is not significant and therefore does not constitutes harassment under the ESA. Assessing the effect of industrial

noise on bowhead whales is complex. **(Comment No. 253-308)**

Response To: Comment 253-308

Potential noise impacts on the bowhead whale are not assessed as negligible for scientific reasons; rather, the low probability that most whales typically would approach land or even nearshore or lagoon waters (median distance = 32.2 km offshore) where seismic surveys or other sources of underwater noise (e.g., aircraft, other vessels, drill rigs) are in operation (essentially would occur primarily during fall migration, September and October) argues against whales being exposed to a significant source of industrial noise at a distance that would result in avoidance or impairment. The National Marine Fisheries Service (NOAA Fisheries, formerly NMFS), with which BLM consults on ESA on issues concerning the bowhead whale, does not consider this a significant issue.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS fails to take a hard look at noise impacts from boat and air traffic and fails to analyze the cumulative impact of such traffic on bowheads from this project in conjunction with other boating activity in the bowheads migration area. **(Comment No. 253-310)**

Response To: Comment 253-310

Only under exceptional circumstances (fall migration of some individuals very near shore) would bowhead whales be expected to be exposed to aircraft overflights or vessel noise associated with oil and gas development in the Northwest NPR-A. Please also see the response to Comments 253-308 and 253-309 (Birds).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS portrays that an oil spill is unlikely to reach or occur in the marine waters and therefore unlikely to impact bowheads (DEIS p. IV-181). The agency reasoning is that the bowhead does not frequent near shore waters often. This reasoning is a broad generalization. In fact, bowhead whales may swim very close to shore on some occasions. Bowheads have been observed feeding not more than 1,500 ft (457 m) offshore in about 15 to 20 ft (4.6 to 6 m) of water. Smaller whales may swim in water depths of 14 to 18 ft (4.3 to 5.5 m). In general, bowhead wha les seemed to migrate closer to shore in light ice years and farther offshore in heavy ice years. Furthermore, due to the fact that virtually the entire bowhead population funnels through a relatively narrow area in the Beaufort Sea twice per year, bowheads are more vulnerable to an oil spill here than anywhere else on their range. **(Comment No. 253-312)**

Response To: Comment 253-312

Regardless of whether some bowhead whales migrate in nearshore waters in exceptional years, it would be a rare random event for such an occurrence to be coincident with a substantial oil spill, which may have some probability of reaching marine waters but whose probability of occurrence is very low (estimated mean number of large spills = less than 1, Table App. 9-05).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

By failing to analyze the impacts of a commercial discovery being made, the DEIS is inadequate in its disclosure

of the potential impacts to bowheads. Furthermore, the DEIS tiers to the Beaufort Sea Sale 144 for a discussion of impacts of oil on whales. While we understand tiering is an accepted and often necessary technique we find it difficult to believe that more is not known about the impact of oil on whales in the seven years since the Beaufort Sea DEIS was issued. **(Comment No. 253-314)**

Response To: Comment 253-314

The Beaufort Sea Sale 144 Final EIS is cited as a source of basic analysis on the topic of potential effects of an oil spill on bowhead whales. Relatively little research has been done that would bear directly on the question of oil impacts on this species as it is extremely difficult to carry out realistic and statistically valid trials.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS fails to draws a conclusion at all regarding impact levels of oil spills on endangered bowhead whales ' one of the most important resources to local residents. BLM has not proven that it can respond adequately to a spill; furthermore, it does not fully understand the impacts of such a spill. -BLM must provide a realistic, balanced and scientific analysis regarding impacts to the bowhead from development of the western NPR-A. **(Comment No. 253-316)**

Response To: Comment 253-316

The IAP/EIS does consider the impacts of a possible oil spill on bowhead whales. The BLM considers it unnecessary to include a more extensive analysis concerning a highly unlikely event such as bowhead whale contact by an oil spill. Regardless of whether some bowhead whales migrate in nearshore waters in exceptional years, it would be a rare random event for such an occurrence to be coincident with a substantial oil spill, which may have some probability of reaching marine waters but whose probability of occurrence is very low (estimated mean number of large spills = less than 1, Table App. 9-05). A statement to this effect has been included in the conclusion.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS also fails to discuss disturbance to the bowhead from other discharges from wastes associated with the oil industry. **(Comment No. 253-319)**

Response To: Comment 253-319

Given modern oil exploration and development techniques, contact by a bowhead whale with discharges associated with oil and gas development onshore in the Northwest NPR-A is extremely unlikely--to the point of not having any remotely reasonable risk of occurrence.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS fails to consider adequately the impacts that oil development and exploration may have on the polar bear population in the Planning Area, and it fails to provide adequate protections for this sensitive species. Specifically, the DEIS fails to consider adequately or provide sufficient protection for potential impacts of: seismic activity on denning bears, impacts of oil spills on the population directly and on polar bear food sources,

human disturbance such as exposure and habituation to human food and DLP kills, bioaccumulation of toxics caused by releases into the air and water, and climate change. **(Comment No. 253-320)**

Response To: Comment 253-320

The BLM believes that the IAP/EIS adequately assesses the potential impacts of NPR-A oil and gas exploration and development on polar bears and their habitats and food sources. For the most part, few polar bears are likely to be exposed to these industrial activities because few polar bear dens have been located on NPR-A (See Map 51). There are no known denning concentration areas in NPR-A. The USFWS regulations require industrial activities such as seismic operations to avoid occupied polar bear dens by a distance of one mile. Other measures to protect polar bears from human interactions are expected to be enforced. Please also see the response to comment 253-265 (Marine Mammals). Cumulative effects of bioaccumulation of toxins released into the air and water and climate change are considered in Section IV.F.j.(2)(a)6) Effects of Atmospheric Environmental Contaminants and 8) Effects of Global Warming.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

This DEIS provides BLM with an opportunity to begin effective protection for the polar bear. The agency, however, has not taken that opportunity. Instead, the effort to mitigate the devastating effects of oil and gas activities on polar bears consists of a statement in the DEIS that the oil industry will be alerted to known denning locations. Notification does not protect habitat and is not the level of protection envisioned by Congress when ratifying the Agreement. Further, as oil and gas development continues to spread across Alaska's Arctic, including the proposed development of large portions of the Northwest NPR-A, threats to polar bears continue to mount. **(Comment No. 253-323)**

Response To: Comment 253-323

The projected, primarily onshore, oil and gas exploration and development poses little risk to the polar bear populations in the Beaufort and Chukchi seas. Information on polar bear use of the NPR-A indicates that few polar bears den in the Planning Area (see Map 51). There is no evidence that the projected activities would have any effect on polar bear populations. Few bears are likely to be exposed to these industrial activities. There is no indication that the projected activities would violate the Agreement of the Conservation of Polar Bears. This agreement does not prohibit industrial activities within the range of polar bears. Existing cumulative oil development in the Prudhoe Bay area over the past 30 years has resulted in the loss of only a few bears and has had no measurable effect on the polar bear population. Existing USFWS regulations and "take" regulations under the Marine Mammal Protection Act have been successful in minimizing effects on polar bears. The implementation of these regulations is expected to be equally successful on the NPR-A.

Comment From: The North Slope Borough (Comment Letter No. 80065)

Polar bears occur along the barrier islands, within the inlets and lagoons, and onshore. Given that large congregations and denning are well known in the Elson Lagoon and surrounding region, it is inaccurate to portray the polar bear as an exclusively offshore species. In recent years, observations of polar bears in and around the Barrow area have been common. Gray and beluga whales are well known to enter lagoon systems for feeding and other reasons. Spilled oil could impact the habitat of these animals. These lagoon and inlet systems would likely make the avoidance of oil spills more problematic with shallow areas, and limited entry and exit points. Greater than the predicted exposure and effects could result. The oil spill scenario is far too simplistic and does not appropriately consider documented marine mammal use in the coastal area. **(Comment No. 80065-601)**

Response To: Comment 80065-601

Elson Lagoon is not known as a concentration area for polar bear denning. The recent large concentration of polar bears at Point Barrow that was associated with subsistence whale carcasses was a temporary event that is not likely to be affected by industrial activities in the NPR-A to the east and south of Barrow. After freeze-up of the Beaufort Sea the bears move offshore on to the ice to be distributed broadly over the Beaufort and Chukchi Seas. Few polar bears are likely to be exposed to oil and gas activities on the NPR-A. Gray and beluga whales are not known to enter Dease Inlet and Elson Lagoon and thus are not likely to be exposed to a potential spill in this area. Gray whales also do not enter either Peard Bay or Kasegaluk Lagoon. Belugas do use Kasegaluk Lagoon but NPR-A oil and gas leasing activities are not expected to occur in these inlets and lagoons. If a spill did occur in one of these lagoons it would be more easily contained and cleaned up than if it occurred outside of the lagoon where it could easily spread. Information on beluga whale use of Kasegaluk Lagoon has been added to Section III.5.b(6).

Comment From: Polar Bear Futures (Comment Letter No. 80008)

Appropriate current scientific studies and applicable research be conducted that could then be used as part of the basis for public policy recommendations and management decisions. **(Comment No. 80008-672)**

Response To: Comment 80008-672

The MMS, in cooperation with USGS Biological Resources Division and USFWS, is funding the following scientific studies on polar bears and other Arctic research: polar den surveys using infra-red sensors to locate polar dens in order to protect the bears from seismic operations that would avoid denning areas, use of satellite data on polar bear locations and ice information to understand polar bear use of ice habitats, a polar bear feeding study to under stand the behavior and bear use of whale carcasses, and marine mammal tissue collection and analysis to determine contaminate levels in marine mammals in the Arctic and monitor pollutants in the marine environment.

Comment From: Polar Bear Futures (Comment Letter No. 80008)

Special areas be designed on and off shore as protected polar bear habitats,, particularly to protect polar bear maternity dens. **(Comment No. 80008-673)**

Response To: Comment 80008-673

Although some small number of polar bears dens were located on or near the coastal of the NPR-A Northwest Planning Area (See Map 51) there are no "special" polar bear habitat areas identified in the Planning Area. Polar bear den locations vary from year to year depending on snow conditions. The dens are generally distributed broadly along the coast with a small number of dens located inland. Existing regulations require industrial activities to avoid known dens.

Comment From: Polar Bear Futures (Comment Letter No. 80008)

BLM states that it has three major questions to answer: 1. What lands should BLM offer for oil and gas leasing' 2. What measures should be developed to protect important surface resources from oil and gas activities' 3. Consistent with the existing statutory direction for the area, what non oil and gas land allocations should be

considered for this portion of the NPRA' This draft EIS does not answer any of those three questions in regards to polar bears. **(Comment No. 80008-674)**

Response To: Comment 80008-674

Take or "harassment" regulations under the Marine Mammal Protection Act require industrial operations in the NPR-A to avoid significant effects on polar bears, and other marine mammals that occur within or adjacent to the planning area. The recent large concentration of polar bears at Point Barrow that was associated with subsistence whale carcasses was a temporary event that is not likely to be affected by industrial activities in the Planning Area to the east and south of Barrow. After freeze-up of the Beaufort Sea the bears move offshore on to the ice to be distributed broadly over the Beaufort and Chukchi Seas. Few polar bears are likely to be exposed to oil and gas activities in the Northwest NPR-A. Other than avoiding seasonal den locations that vary from year to year, the issue of protecting important surface resources is not relevant to polar bears.

Comment From: Polar Bear Futures (Comment Letter No. 80008)

This draft EIS further neither adequately considers polar bears alone as a species to be substantively addressed, it also does not consider polar bears as part of a continuum in the Arctic with synergistic effects. For example, polar bears cat ringed seals. The effect of oil and gas development, PCBs and global warming on ringed seals is not specified and what the subsequent effect of those factors would be on polar bears is not examined. There is no scientific basis for any conclusions regarding polar bears in terms of synergistic effects. There is no scientific evidence to verify the effects of global warming, oil and gas development and persistent pollutants on polar bears. Not that traditional western science is the only basis on which public policy can be based, but it is greatly missing as an element for management decisions in this draft EIS. **(Comment No. 80008-675)**

Response To: Comment 80008-675

The potential cumulative and possible synergistic effects of PCB's and global warming on polar bears and the arctic environment have not been verified and are beyond the scope of this IAP/EIS. In regard to global warming, the source of the current warming trend (natural or man-made) is uncertain and environmental pollutants that accumulate in the Arctic come from global industrial sources that are not relevant to the management decisions on the NPR-A. The use of PCB's has been banned in the United States and many other countries.

Comment From: Polar Bear Futures (Comment Letter No. 80008)

It will be very easy to destroy the northwest NPRA for short-term gain. It would be very difficult ten or twenty or more years from now to try to replicate its habitat. The draft ELS states "much of the NPRA bears little mark of human presence. This fact raises the possibility that most or all of the Northwest NPRA might be designed as wilderness". Special areas on and off shore to be protected as polar bear habitat should be considered.
(Comment No. 80008-676)

Response To: Comment 80008-676

Please see the response to 80008-674 (Marine Mammals).

Comment From: Polar Bear Futures (Comment Letter No. 80008)

Current scientific studies and applicable research should be conducted to provide a basis for substantive comprehensive public policy recommendations for polar bears. **(Comment No. 80008-677)**

Response To: Comment 80008-677

Please see the response to comment 80008-672 (Marine Mammals).

Comment From: Polar Bear Futures (Comment Letter No. 80008)

The increase in international shipping appears to increase exponentially with increased global warming and a greater number of routes opening through the Arctic. There are no recent scientific studies to document the effect of this shipping on polar bears. **(Comment No. 80008-678)**

Response To: Comment 80008-678

There is no evidence that global warming as yet, has resulted in an increase in international shipping in the Beaufort Sea adjacent to the NPR-A. An increase in shipping is not expected to affect polar bears, but the loss of ice habitat and decrease in availability of seals to polar bears would drastically affected polar bear abundance (see Cumulative Effects of Marine Mammals Section IV.F.8.j.(2)(a)8) Effects of Global Warming).

Comment From: Polar Bear Futures (Comment Letter No. 80008)

Current comprehensive studies must be conducted to thoroughly investigate the effects of chemicals on polar bears and polar bear reproduction. In "Marine Mammal Biology" by Hoelzel, it is stated that "The effects of chemical pollution on marine mammals are a growing concern but most research on the problem has consisted only of documenting tissue contaminant levels. Relatively little progress has been made towards understanding the nature of effects. Imunosuppression, thyroid hormone depiction and other non reproductive disorders have also been associated with the presence of contaminants in tissues of marine mammals. Focused studies are needed to combine immunology, toxicology and demography and that involves populations occurring over a gradient of environments from highly polluted to relatively pristine. **(Comment No. 80008-679)**

Response To: Comment 80008-679

Further study of the potential cause and effect relations between PCB's and other chemical pollutant levels in marine mammals and imunosuppression, thyroid hormone depletion and other disorders is impossible to determine without doing laboratory experiments on test marine mammals that would have to be sacrificed in order to clearly show cause and effect relationships. This issue is beyond the scope of the IAP/EIS.

Comment From: Polar Bear Futures (Comment Letter No. 80008)

The National Research Council in the document titled "Cumulative Environmental Effects of Oil and Gas Activities on Alaskas North Slope", dated March 2003, addresses these issues. "The main areas of concern with regard to effects on those animals from oil and gas activities are the potential for contamination and for disturbance caused by industrial noise in the air and water, pregnant females and those with newborn cubs in maternity dens both on land and on sea ice are sensitive to noise and vehicular traffic." There is a need for

scientific studies to determine how much noise, if any, polar bears can sustain without significant changes in their immune systems, physiology, denning habits and reproductive rates. **(Comment No. 80008-680)**

Response To: Comment 80008-680

Existing USFWS regulations require that industrial activities avoid known polar bear dens by one mile to avoid disturbance of denning bears.

Comment From: Polar Bear Futures (Comment Letter No. 80008)

S.C. Amstrup, USGS Alaska Science Center in his study on "Detecting Denning Polar Bears with Forward Looking Infra Red Imagery (FLIR)" has written that "polar bears give birth in snow dens in mid winter and remain in dens until early spring. Survival and development of neonates is dependent on the stable environment within the maternal den. Petroleum related activities currently span approximately 200 KM of the Alaskan Beaufort Sea coastal area. New and proposed developments are expected to dramatically expand the area influenced by petroleum activities, These activities are a potential threat to polar bears, especially as they might disturb denning females." **(Comment No. 80008-681)**

Response To: Comment 80008-681

The IAP/EIS recognizes the importance of maternity dens to newborn polar bear cubs see Section III.B.5.b(5) Polar Bears.

Comment From: Polar Bear Futures (Comment Letter No. 80008)

The National Research Councils report points out that "already there have been dramatic decreases in the extent and thickness of sea ice throughout the Northern Hemisphere and those trends are expected to continue throughout the next century. Negative effects on populations of truly arctic species (polar bears, ringed seals, and bearded seals) are likely to result from climate warming. Polar bears and ringed seals depend on sea ice and reductions in the extent and persistence of ice in the Beaufort Sea will almost certainly have negative effects on their populations. The earlier breakup gives hears a shorter feeding season. They are leaner when they come ashore and they must fast longer. Because of the close predator prey relationship between polar bears and ringed seals, decreases in ringed seal abundance can be expected to cause declines in polar bear populations. How these independent factors might combine to influence populations cannot be predicted with current knowledge. Climate warming at predicted rates in the Beaufort Sea region is likely to have serious consequences for tinged seals and polar bears, and those effects will accumulate with the effects of oil and gas activities in the region. **(Comment No. 80008-682)**

Response To: Comment 80008-682

The EIS recognizes the potential effects of global warming and climates change on polar bears and other marine mammals of the Beaufort Sea (see Section IV.F.8.j.(2)(a)8) Effects of Global Warming). The contribution of effects from potential activities in the Northwest NPR-A are expected to be insignificant or minor to the polar bear population.

Comment From: Polar Bear Futures (Comment Letter No. 80008)

The effects of global warming in just the last two or three years have dramatically changed the arctic environment for polar bears. There are no current studies of these effects and no projections based on scientific studies on which public policy could be reliability based **(Comment No. 80008-683)**

Response To: Comment 80008-683

Although there is evidence that the pack ice in the Beaufort Sea has been thinner in the past few years, there is currently no evidence that the polar bear population has been adversely affected. The number of polar bears has increased in recent years. There is no evidence that the polar bear environment in the Beaufort Sea has changed dramatically in recent years. The effects of global warming on polar bears in Hudson Bay have recently been studied (Stirling and Lunn, 2001).

Comment From: Polar Bear Futures (Comment Letter No. 80008)

There are numerous substantive changes in the Arctic that are recent and that directly effect polar bears and their habitat. They include an increase in international shipping, toxic chemical pollutants, increase in noise and industry, and global warming. Any one of these factors would require recent comprehensive studies to investigate the recent effects on polar bears. However, the real requirement is for studies of the cumulative and synergistic effects of all these changes combined on polar bears. There is insufficient data at this time to allow any greater stressors on the Arctic environment without the scientific information to determine if irreversible damage may already have been done to the polar bear population. **(Comment No. 80008-684)**

Response To: Comment 80008-684

There currently is no clear evidence that global warming and chemical pollutants have affected the distribution and abundance of polar bears throughout the Arctic. Climate warming has the greatest potential to adversely affect polar bears in Hudson Bay the most southerly part of their range (Stirling and Lunn, 2001). High PCB levels in Svalbard, Norway suggest that this polar bear population has been adversely affected (Cone 2003). However, lower PCB levels in polar bears in the Beaufort Sea adjacent to NPR-A haven't shown a decline in abundance or reproductive success but rather an increase in numbers of bears. The projected NPR-A oil and gas activities are not likely to significantly contribute to global warming nor significantly add chemical pollutants such as PCB's to the Arctic environment. The projected NPR-A activities are not likely to be a "greater stressor" on the Arctic environment in the Beaufort Sea. Projected NPR-A activities are not likely to add a "greater stress" to the polar bear population. In regard to existing oil and gas development in the Alaskan Beaufort Sea only three "lethal takes" of polar bears were related to industrial activities on the North Slope over the past 20 years (Gorbics, Garlich-Miller, and Schliebe, 1998). These small number of losses of polar bears have had no effect on the population. More than 40 exploration-drilling units (gravel islands, drill ships, and other platforms) have been installed or constructed in the Beaufort Sea as a result of past Federal and State oil and gas leases. These activities may have displaced a few bears during island construction but have had no detectable effect on the polar bear population. The Fish and Wildlife Service concluded that existing onshore development, proposed exploration activities, have negligible effects on polar bears (65 FR 16828). Oil and gas development in the NPR-A would potentially expose a small number of polar bears to industrial activities. These activities are not likely to have any lasting additive or synergistic effect on seal, walrus, beluga whale, and polar bear distribution and abundance in the Beaufort Sea.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The Service believes that the DEIS accurately reflects risks to polar bears from large spills in marine waters, given that most exploration and development activities are expected to occur on the mainland, and polar bears

would more likely be encountered along barrier islands further off shore. We recommend that the following information be added, however, on coastal habitat use by polar bears: 1) in recent years, an increasing trend of polar bear use of coastal areas along Alaska's Beaufort Sea has been noted (Amstrup and Gardner 1994, Amstrup et al. 2000); and 2) based on recent observations and anecdotal reports from residents of the North Slope, more polar bears are observed on land in years when pack ice is far removed from shore. Given global climate change patterns which have reduced both ice cover and thickness in the last 20 years, the likelihood of decreased pack ice near shore during fall months will increase. Hence, the likelihood of encountering more bears along the coast may also increase. **(Comment No. 260-690)**

Response To: Comment 260-690

As stated in the comment, an increase in polar bear use of habitats along Alaska's Beaufort Sea coast may be related to an observed decrease in pack ice. The increase trend in polar bear use of habitats along Alaska's Beaufort Sea coast may also relate to the availability of whale carcasses at subsistence whaling sites at Barrow, Barter, and Cross islands, Alaska. Recently, an estimated 60 bears congregated to feed on the abundance of whale carcasses at Barrow, Alaska. The text in Section III under polar bears has been changed to reflect this response.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

If Alternative habitats of similar quality are not available and marginal habitats are used, reproductive rates may be compromised. Therefore, we suggest that a statement should be included to indicate that cumulative impacts from oil and gas activities, depending upon the level, frequency, location, and duration of activity, may affect short and long term polar bear habitat use and den site selection. **(Comment No. 260-691)**

Response To: Comment 260-691

Existing cumulative oil and gas exploration and development on the North Slope of Alaska and in the nearshore areas of the Beaufort Sea (such as Northstar and Endicott offshore facilities) do not appear to have affected short- or long-term habitat use and den selection by polar bears. Existing USFWS regulations (1 mile buffer around known occupied dens) and Letters of Authorization on "taking" of marine mammals under the Marine Mammal Protection Act, are expected to continue to minimize disturbance of denning polar bears on the North Slope (including the NPR-A) and in the Beaufort Sea. Based on photo identification of landscape features suitable for the accumulation of enough snow for den excavation, bears have a variety of locations and habitats that they can use for denning (Durner, Amstrup, and Ambrosius, 2001). These landforms have included an abandoned oil field pad (Durner, Amstrup, and Fischbach, 2003).

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 5 b (4). We recommend replacing the word 'walruses' with 'Pacific walrus' to denote the difference between the Atlantic and Pacific stocks of this species. We further recommend that the first sentence be rewritten as follows: 'The current size and trend of the Pacific walrus population is unknown (U.S. Fish and Wildlife Service Stock Assessment 2002).' **(Comment No. 260-738)**

Response To: Comment 260-738

The text has been revised.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 5 b (5) paragraph 1. We recommend changing the words 'Icy Cape' to 'Point Hope' (U.S. Fish and Wildlife Service Stock Assessment 2002). **(Comment No. 260-739)**

Response To: Comment 260-739

The text has been revised.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 5 b (5) paragraph 1. Please add the following phrase to the end of the sentence: '...and come to shore to scavenge and feed on marine mammal carcasses during the fall open water period.' **(Comment No. 260-741)**

Response To: Comment 260-741

The text has been revised.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 5 b (5) paragraph 3. Please delete the words 'receiving consistent use' to reflect that, although den distribution in Alaska is not as concentrated as on Wrangel Island (note correct spelling), Russia, or Hudson Bay, Canada, the Alaska Beaufort Sea coast does consistently receive denning use. **(Comment No. 260-742)**

Response To: Comment 260-742

The text has been revised.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 5 b (5) paragraph 4. Please note that, in and adjacent to the NPR-A, dens have been reported to occur in the following locations: Colville River Delta, Atigaru Point, Cape Halkett, Smith Bay, Point Poleakoon, Lonely, Admiralty Bay, Kachiksuk Bluffs, Lake Sungovoak, Point Barrow, Nunuvak Bay, Hollywood, Walakpa Bay, Peard Bay, Skull Cliff, Point Franklin, Point Belcher, Sinaruruk River, Point Collie, Kuk River, Kilimantavi Point, Kasegaluk Lagoon, and Nokotlek Point (U.S. Fish and Wildlife Service Den Database, unpublished data). **(Comment No. 260-743)**

Response To: Comment 260-743

The text has been revised.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 5 b (5) paragraph 5. We recommend re-phrasing the first sentence as follows: 'Female polar bears do not usually use the same den sites each year, but they often do use the same substrate as their previous dens (either land, land-fast ice, or sea ice), as well as the same general geographic areas (Amstrup and Gardner 1994).' **(Comment No. 260-745)**

Response To: Comment 260-745

The text has been revised.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 5 b (5) paragraph 5. We recommend adding the following sentence: 'A recent trend for polar bears to increasingly use terrestrial habitat for denning along the Beaufort Sea coast has been observed (Stirling and Andriashek 1992, Amstrup and Gardner 1994).' **(Comment No. 260-747)**

Response To: Comment 260-747

The text has been revised.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 5 b (5) paragraph 6. Please change '1976' to '1973' and add the words 'on behalf of Greenland' after the word 'Denmark.' Please add the word 'former' in front of the phrase 'Union of Soviet Socialist Republics' (now known as 'Russia'). **(Comment No. 260-749)**

Response To: Comment 260-749

The text in Section III. B. 5. b. (5) paragraph 6 has been revised.

Comment From: Public Meeting on DEIS - Fairbanks, Alaska (Comment Letter No. 80076)

The impact on the marine environments of climate change is also tremendous, especially on the marine mammals and marine birds and, yet, we know little about the long-term consequences of this, but that is very much related to oil development and exploration. It's not that it can't occur, it has to be -- the problems have to be addressed and I don't think they've been adequately addressed in the report up to now. **(Comment No. 80076-902)**

Response To: Comment 80076-902

Please see responses to comments 80008-675 (Marine Mammals) and 253-212 (Global Warming).

Comment From: NOAA (Comment Letter No. 209)

Pg. IV-168, 169 Marine Mammals Please define or be consistent with the definition of short-term. For example paragraph 2 on page IV-168 states 'short-term (< 1 hour)' and page IV-169, paragraph 7 states 'short-term (< 1 year).' **(Comment No. 209-915)**

Response To: Comment 209-915

Both "< 1 hour" and "< 1 year" are considered to be short term in duration. Under Section b. Marine Mammals (1) Effects of Non-Oil and Gas Activities "short-term (< 1 hour)" displacement or harassment in the case of a particular event. Under (2) Effects of Oil and Gas Activities (a) Effects of Disturbances "short-term (< 1 year)" refer to more general and multiple disturbances events that may occur during one season.

Comment From: NOAA (Comment Letter No. 209)

Pg. IV-430 Bowhead Whale Commutative Analysis NOAA continues to be concerned with the cumulative effects of oil and gas activity on the Arctic population of bowhead whales. Repeated exposure of migrating bowhead whales to noise sources may be an example of synergistic impact. While whales may avoid a noise source by moving further offshore before resuming their normal course, and may make such avoidance movements around several sources (additive impact), at some point whales may remain offshore after exposure to multiple sources, even once noise is no longer present. Given the many potential noise sources associated with exploration, development, and production on the Beaufort Sea OCS, natives and scientists have considered this a real possibility. NOAA recommends further analysis of this issue in the final EIS. **(Comment No. 209-917)**

Response To: Comment 209-917

Exploration is expected to occur when bowhead whales are absent from the Northwest NPR-A Planning Area. There may be considerable difficulty in discriminating between cumulative and synergistic effects; however, there is little evidence for the latter from studies that have been completed thus far. Unless bowhead whales have a particular focus for resuming their migration along exactly the same route from which they were disturbed, such as to exploit a traditional foraging area, it would appear more efficient to continue the migration from the revised point of departure.

Comment From: Alaska Beluga Whale Committee (Comment Letter No. 271)

For these reasons, the Alaska Beluga Whale Committee strongly recommends that the northern end of Kasegaluk Lagoon within the Northwest Planning Area of NPR-A be designated a NO-LEASE area. We further recommend that Kasegaluk Lagoon be given permanent protection within NPR-A as a special area where no industrial development may take place. BLM's own analysis indicates that the Kasegaluk Lagoon area has LOW potential for oil and gas. Hence, protection of this area doesn't conflict with oil activity elsewhere. These recommendations will help to reduce future impacts of industrial development on beluga whales, the residents of coastal communities that rely on belugas for subsistence, and other important wildlife resources. **(Comment No. 271-961)**

Response To: Comment 271-961

Please see the response to comment 213-217 (Special Designation Areas).

37. TOPIC : CARIBOU

Comment From: State of Alaska (Comment Letter No. 251)

Section III, Terrestrial Mammals, Caribou, Population Status and Range, Page III-58. The 2002 population estimate for the Central Arctic Herd (CAH) is 31,857 caribou. **(Comment No. 251-150)**

Response To: Comment 251-150

The updated population information for the CAH has been included in Section III.

Comment From: State of Alaska (Comment Letter No. 251)

Section III, Terrestrial Mammals, Caribou, Population Status and Range, Page III-58. The 2002 population estimate for the Central Arctic Herd (CAH) is 31,857 caribou. **(Comment No. 251-151)**

Response To: Comment 251-151

The updated population information for the CAH has been included in Section III.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Alternative A, Mammals, Caribou, Page IV-158. The reference for the citation Cameron et al. (2002) is not included in the Bibliography. In the second paragraph on Page IV-158, the text notes the traditional Western Arctic Caribou (WAH) calving area is southwest of the Northwest planning area. Even so, in many years since at least the mid 1980's, up to 30,000 WAH caribou have wintered in the Wainwright-Atqasuk-Umiat area. Development in the Northwest planning area could reduce access to the calving grounds for caribou that winter in the extreme northeastern portion of their winter range. The text in this section devoted to the calving period focuses mainly on displacement of caribou from traditional calving areas. It should be noted that access into calving areas from wintering areas must be maintained to ensure herd viability. The third paragraph on Page IV-158 discusses caribou and insect interactions. There is substantial overlap between periods of mosquito and oestrid fly harassment, and responses to these insects are complex. As such, one should not discern between the effects of mosquitoes and oestrid flies on caribou movements and behavior, but should characterize the insect season as beginning when the first mosquitoes emerge and ending when the last oestrids disappear. **(Comment No. 251-165)**

Response To: Comment 251-165

The missing reference has been added. Additional data on WAH winter range has been included in Section III.B.5.a.(1). The text has been revised in Section IV.C.10.a. to better reflect potential impacts on caribou movements between winter and calving grounds.

Comment From: State of Alaska (Comment Letter No. 251)

The second sentence of this paragraph is erroneous. Caribou under extreme insect harassment initially move rapidly to insect relief terrain. However, they usually do not simply stop when they reach the coast or a ridge top. Instead, they often travel rapidly along the coast (or through the mountains). This is an important point regarding insect avoidance by caribou: running per se is an avoidance mechanism that often results in long distances traveled. This paragraph correctly notes that caribou move inland (when they are in coastal relief habitat) after insect harassment abates. The paragraph fails to note that caribou are insensitive to disturbance under extreme insect harassment. It is when caribou are released from the strong stimulus of insect harassment and are drifting inland to feed, that roads and traffic may become temporary barriers to movement. **(Comment No. 251-166)**

Response To: Comment 251-166

The text has been revised in Section IV.C.10.a. to better reflect caribou behavior and potential impacts of development.

Comment From: State of Alaska (Comment Letter No. 251)

The last paragraph on page IV-158 notes important insect relief habitat from Smith Bay to the west side of Dease Inlet. The area west of Barrow also is an insect relief area. People commonly travel by boat in this area and hunt caribou that are along the coast for insect relief. In most years, probably 95% of the Teshekpuk Lake Caribou Herd (TLH) use the area between Kogru River and Dease Inlet, but in 2002 about 30% of the TLH used the area west of Barrow for insect relief. **(Comment No. 251-167)**

Response To: Comment 251-167

Reference to insect-relief habitat west of Barrow has been added to Section IV.C.10.a.

Comment From: State of Alaska (Comment Letter No. 251)

Within paragraph 2 on page IV-159, it is an oversimplification to say that mosquitoes always cause caribou to aggregate and oestrid flies cause them to disperse. Aberrant running and group fragmentation occur only under extreme oestrid harassment, and even small groups of caribou reconstitute into large aggregations. Coastal areas clearly provide critical insect relief habitat and movement corridors for caribou. Similarly, stating that caribou are more dispersed in mid July as oestrid fly harassment increases is an oversimplification. Although caribou are not at their maximum degree of aggregation in mid July (which occurs during the first two weeks of July), the Western and Central caribou herds are still far more concentrated than during fall and winter. Rates of travel can still be very high when insect harassment occurs. Caribou movements are affected by roads, gravel pads, and shaded areas beneath pipes and other structures that provide insect relief habitat under moderate harassment, and by roads, pipelines, and by development complexes that may act as temporary barriers to movement inland after insect harassment abates. **(Comment No. 251-168)**

Response To: Comment 251-168

The text has been revised to better reflect caribou behavior and potential impacts. However, by necessity, it remains somewhat of an oversimplification. Impacts on caribou would be further addressed during the NEPA

process during the environmental review of specific development facilities.

Comment From: State of Alaska (Comment Letter No. 251)

State of Alaska NW NPR-A Comments Page 16 Section IV, Alternative A, Mammals, Multiple Sales, Page IV-167. The second paragraph in this section is a mix of accurate and inaccurate statements regarding movements of WAH caribou during summer. The first two sentences are correct. The third sentence is inaccurate: during the first two weeks of July, the WAH is more concentrated than at any other time of year. Short term movement patterns seem less predictable for the WAH than for the CAH. Even so, for many years the WAH has exhibited a consistent general movement pattern during summer. The WAH has: 1) calved in the Utukok uplands during early June; 2) made a directed post-calving movement west to the Lisburne Hills during mid to late June; 3) formed large aggregations in the western De Long Mountains and western North Slope during early July; 4) moved rapidly through the De Long Mountains and associated foothills toward Howard and Anaktuvuk Pass during the 2nd week of July through August; 5) dispersed north and west onto the North Slope during late August and September; and 6) migrated southwest beginning in mid August toward winter habitat. This movement pattern would expose many WAH caribou to development structures multiple times during the course of each summer. Caribou movement patterns would sometimes parallel linear structures, (e.g. roads or pipelines), while at other times be perpendicular to them. **(Comment No. 251-171)**

Response To: Comment 251-171

Additional information on WAH movement patterns has been added to Section III.B.5.a.(1). Section IV.C.10.a. has been revised to better reflect potential impacts of development on WAH caribou. The comment described the general movement pattern of the WAH and stated that these movement patterns would expose WAH caribou to development structures multiple times during the summer. However, based on the description of these general movement patterns, most of the WAH is outside the Planning Area until late summer. These movement patterns are based on a limited number of satellite collars and do not reflect the movements of all the caribou in the WAH. Perhaps 10 percent of the herd would use the Planning Area during insect-relief season and be exposed to development structures during the peak insect season.

Comment From: Audubon Alaska (Comment Letter No. 213)

Changes to caribou distribution from industrial infrastructure and disturbance May reduce productivity of two caribou herds within NPR-A. Potential negative synergistic effects on the Teshekpuk Lake Caribou Herd could result if habitat protections around Teshekpuk Lake are relaxed in combination with disruptions to insect relief habitat east of Dease Inlet. **(Comment No. 213-204)**

Response To: Comment 213-204

Future changes to existing habitat protections around Teshekpuk Lake are not discussed in the cumulative impact analysis because such changes are speculative at this time and beyond the scope of this document. Any proposed changes would be addressed in a separate NEPA document and any decisions on changes would be made subsequent to that NEPA process. This IAP/EIS does discuss the cumulative effects on TLH caribou from all past, present, and reasonably foreseeable development that would impact that herd.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Development in the Northwest Planning Area has the potential for affecting populations of several mammal

species including caribou, grizzly bears, foxes, polar bears, beluga whales, and spotted seals. We believe that the DEIS does not adequately address potential impacts to selected species or provide sufficient protection for their habitats. **(Comment No. 253-249)**

Response To: Comment 253-249

The BLM recognizes that the NPR-A provides important habitat for arctic mammal species and this is addressed in the IAP/EIS. Protective stipulations provide additional protection to these species and their habitats. In some cases, the text was modified to better address impacts to certain species.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS does not adequately evaluate the cumulative effects of industrial development on caribou associated with both the Northwest and Northeast planning areas. It also does not address the potential of rolling back habitat protection for calving grounds within the Northeast Plan. **(Comment No. 253-251)**

Response To: Comment 253-251

Please see the response to Comment 213-300 (Caribou).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS did not adequately address the long-term potential impacts of oil and gas development on the WAH. **(Comment No. 253-252)**

Response To: Comment 253-252

Please see the response to Comment 213-307 (Caribou).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Assessment of cumulative impacts for any development within any portion of the TCH range must reflect current vulnerability to weather stress (Carroll 2002) and include all biological factors noted above and cumulative effects of all development and industrial growth in the western Arctic and throughout the TCH range. **(Comment No. 253-254)**

Response To: Comment 253-254

Please see the response to Comment 213-313 (Caribou).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Effects on Arctic caribou of roads and pipelines, their physical specifications, separation, orientation to caribou routes and to each other, and traffic types and rates must be investigated and monitored. **(Comment No. 253-255)**

Response To: Comment 253-255

Please see the response to Comment 213-317 (Caribou).

Comment From: Audubon Alaska (Comment Letter No. 213)

Caribou: Two caribou herds would be potentially affected by development in the Northwest Planning Area'the Western Arctic Herd (WAH) and Teshekpuk Lake Caribou Herd (TCH). Audubon's most significant concerns regarding the Northwest Plan DEIS include minimizing impacts of development on WAH and TCH summer ranges, the potential effects of new development on the TCH calving grounds within the Northeast Planning area, and the overall long-term cumulative effects of industrial development on both herds. The DEIS does not adequately evaluate the cumulative effects of industrial development on caribou associated with both the Northwest and Northeast planning areas. **(Comment No. 213-300)**

Response To: Comment 213-300

The text has been revised to better address effects of the alternatives on the Western Arctic Herd. Given the low potential for oil reserves under the WAH summer range, the level impact to this herd from the oil and gas operations in the Northwest Planning Area is expected to be minor. Currently most of the TLH core calving area is closed to leasing and/or surface occupancy. The effect of changing the status of these lands is beyond the scope of this document. Please also see the response to comment 213-204 above. The National Research Council (2003) noted in their cumulative effects analysis of the North Slope that major expansion of industrial activity into the WAH primary summer range or calving grounds is unlikely within the next 25 years, and effects should be minor and not accumulate significantly. Industrial development in the WAH calving grounds and primary summer range (in south NPR-A) is considered to be speculative at this time and is beyond the scope of this document. Stipulations in the Preferred Alternative provide additional protection to the TLH insect-relief habitat. Design requirements for pipelines, roads, and other facilities in the Planning Area would reduce impacts to caribou on the TLH summer range and peripheral WAH summer/winter range in the Northwest NPR-A Planning Area.

Comment From: Audubon Alaska (Comment Letter No. 213)

The DEIS did not adequately address the long-term potential impacts of oil and gas development on the WAH. **(Comment No. 213-307)**

Response To: Comment 213-307

Most of the WAH habitat lies outside of the Planning Area. A small percentage of the herd (about 10%) uses the Planning Area for wintering or for summer range (Jim Dau, personal communication). The primary calving ground and core insect-relief habitat (Lisburne Hills, De Long Mountains and Brooks Range) lie outside the Planning Area (either outside of NPR-A or in South NPR-A Planning Area). Future energy development in South NPR-A is considered too speculative at this time to include in the cumulative effect analysis for this document. Please also see the response to comment 213-300 (Caribou).

Comment From: Audubon Alaska (Comment Letter No. 213)

Assessment of cumulative impacts for any development within any portion of the TCH range must reflect current vulnerability to weather stress (Carroll 2002) and include all biological factors noted above and cumulative effects of all development and industrial growth in the western Arctic and throughout the TCH range. Nellemann and Cameron (1998) described a greater reduction of caribou tolerance to disturbance as development complexes grew. Cumulative and long-range effects of development impact on Arctic caribou may involve an increase of cumulative energy cost to a point where survival or productivity are significantly reduced (Yokel 1997). **(Comment No. 213-313)**

Response To: Comment 213-313

Additional discussion on vulnerability of caribou to weather stress has been added to the cumulative analysis. Future changes in the management of the Teshekpuk Lake herd (TLH) calving grounds are beyond the scope of this document. Please also see the response to comment 213-204 (Caribou). Stipulations in the Preferred Alternative provide additional protection to the TLH insect-relief habitat.

Comment From: Audubon Alaska (Comment Letter No. 213)

Many additional questions remain unanswered. Effects on Arctic caribou of roads and pipelines, their physical specifications, separation, orientation to caribou routes and to each other, and traffic types and rates must be investigated and monitored. Effects include impacts on caribou mortality, recruitment, movements, use of calving grounds, and nutrition and energy balances in all seasons. Effects of aircraft traffic and corridors must be assessed, particularly near calving grounds, before regular operation. Effects of pipeline spill cleanup are largely untouched in the literature (Yokel 1997). Potential effects of North Slope strip mining on permafrost and adjacent habitat and drainages must also be investigated. **(Comment No. 213-317)**

Response To: Comment 213-317

The BLM understands that many questions about the effects of oil and gas development on terrestrial mammals remain unanswered. Last September, the NPR-A Research and Monitoring Team (RMT) recommended the following two caribou projects among its highest priorities. These studies would address some of the concerns raised in your comment. 1. "Study of caribou demography, distribution and movement in relation to oil field infrastructure." This is a six-year study, to be conducted by ADFG with support from BLM and several other entities. 2. "Literature review of effects of pipeline height on crossing success of caribou." This effort was intended to review and synthesize all of the studies conducted on this subject over the last 20+ years. The BLM has withheld funding pending completion of a much broader literature review contracted out this winter. The BLM has not discussed research on the subject of aircraft vs. caribou, although there may be some work done in this area around the ConocoPhillips Alaska, Inc. Alpine facility. The BLM addresses this concern with seasonal stipulations on aircraft use to mitigate impacts to terrestrial mammals. The BLM has no current plans for research on the impact of pipeline spills cleanup. The NRC report (2003) states that since most spills have been small, have occurred on gravel pads, and have been cleaned up, the ecological effects of onshore spills have been small and localized, and hence have not accumulated. The IAP/EIS includes numerous stipulations and required operating procedures regarding handling of hazardous materials and response to spills. At this time, BLM has no plans to investigate the impacts of strip mining on permafrost and adjacent habitat and drainages. Strip mining would remove the permafrost in the affected area The environmental review of each gravel mining permit application would require that the gravel pit is sited so as to preclude drainage of nearby water bodies. Mined out gravel pits may eventually be attached to a stream to provide overwintering habitat for fish.

Comment From: Audubon Alaska (Comment Letter No. 213)

Although the significance of observed short-term effects on Arctic caribou from oil exploration and development is debated by the oil industry because some caribou still use habitats within the Prudhoe Bay and Kuparuk oil fields, particularly during the postcalving period (Cronin et al. 2000), the potentia l long-term and cumulative effects on caribou nutrition, reproduction, and mortality may be significant. Wolfe et al. (2000) have reviewed the extensive scientific literature regarding the response of reindeer and caribou to human activities. **(Comment No. 213-318)**

Response To: Comment 213-318

The National Research Council (2003) noted that cumulative effects from oil and gas development have negatively affected the CAH and may continue to do so unless the degree to which development disturbs caribou can be reduced. The majority of the potential cumulative effects on the CAH would be from ongoing and potential future development on State lands east of NPR-A. The additional cumulative impact from activities in the Northwest NPR-A on the CAH would be limited to a potential off-site pipeline to either Kuparuk or TAPS and would not constitute a significant addition to cumulative effects. Currently, 51 to 74 percent of the defined TLH calving grounds is either closed to leasing or designated as no surface occupancy. Stipulations provide additional protection for caribou in the Northeast NPR-A. Given this protection of calving grounds and proposed stipulations in the TLH insect-relief habitat within the Northwest NPR-A Planning Area, cumulative impacts to this caribou herd should not be significant. The NRC (2003) found that if the TLH calving grounds were protected, direct conflicts with parturient females are unlikely provided their movements are not impeded. Stipulations in the IAP/EIS requiring that oil and gas infrastructure and facilities be designed to facilitate caribou movements would reduce effects on caribou movements. Future changes to habitat protections around Teshekpuk Lake are not discussed in the cumulative impact analysis because such changes are speculative at this time and beyond the scope of this document. Any proposed changes would be addressed in a separate NEPA document and any decisions on changes would be made subsequent to that NEPA process. The NRC (2003) noted in their report that major expansion of industrial activity into the WAH primary summer range or calving grounds is unlikely within the next 25 years, and that effects should be minor and not accumulate significantly. Industrial development in the WAH calving grounds and primary summer range (in South NPR-A) is considered to be speculative at this time and is beyond the scope of this document.

Comment From: Audubon Alaska (Comment Letter No. 213)

On p IV-422, the DEIS identifies likely long-term cumulative effects on caribou calving distribution, representing a functional 'loss of habitat that may result in long-term effects of the caribou herd's productivity and abundance.' If global warming occurs, the DEIS suggests that 'much longer effects on Arctic terrestrial mammals may occur.' **(Comment No. 213-361)**

Response To: Comment 213-361

Additional information has been added to the cumulative effects section.

Comment From: Western Arctic Caribou Herd Working Group (Comment Letter No. 80004)

The Western Arctic Caribou Herd Working Group requests that BLM give recognition and apecial consideration in the Northwest Plan to the long-term conservation of the Western Arctic Caribou Herd. It also is important that development doesn't interfere with people's ability to access hunting areas or hinder people's subsistence opportunities. Two caribou herds would be potentially affected by development in the Northwest Planning Area--the Western Arctic Herd (WAH) and Teshekpuk Lake Caribou Herd (TLH). The Working Group's most

significant concerns regarding the Northwest Plan DEIS include minimizing impacts of development on WAH summer range within the Northwest Planning Area and the overall long-term cumulative effects of industrial development on caribou associated with the Northwest Plan. **(Comment No. 80004-527)**

Response To: Comment 80004-527

The BLM recognizes the importance of North Slope caribou herds for subsistence and this is reflected in the IAP/EIS. Stipulations in the IAP/EIS are aimed at maintaining access to both the TLH and WAH for subsistence hunting. The BLM recognizes that development in the Northwest NPR-A Planning Area could potentially affect both WAH and TLH caribou and this is reflected in the IAP/EIS. Stipulations in both the Northeast NPR-A IAP/EIS and the Northwest NPR-A IAP/EIS provide additional protection for TLH caribou and their important habitats. The BLM shares the Working Group's concern about minimizing the effects of long-term, cumulative effects of industrial development on the WAH. Given the low potential for oil reserves under the WAH summer range, impacts to this herd from Northwest NPR-A activities are expected to be minor. The National Research Council (2003) noted in their cumulative effects analysis of the North Slope that major expansion of industrial activity into the WAH primary summer range or calving grounds is unlikely within the next 25 years, and effects should be minor and not accumulate significantly. Industrial development in the WAH calving grounds and primary summer range (in south NPR-A) is considered to be speculative at this time and is beyond the scope of this document.

Comment From: Western Arctic Caribou Herd Working Group (Comment Letter No. 80004)

Although the significance of observed short-term effects on Arctic caribou by oil exploration and development is debated by the oil industry because some caribou still use habitats within the Prudhoe Bay and Kuparuk oilfield, particularly during the post calving period, the potential long-term and cumulative effects on caribou nutrition, reproduction, and mortality may be significant. The National Research Council (2003) recently prepared a report on the cumulative environmental effects of oil and gas activities on Alaska's North Slope. The Committee's consensus report summarized the following effects on caribou. "The combined effects of industrial activity and infrastructure and the stress imposed by insects in some summers reduced calf production in the Central Artic caribou herd and may have contributed to the reduction in hderd size from 1992 through 1995. In contrast, the herd increased in size from 1995 to 2001, when insect activity was lower." **(Comment No. 80004-528)**

Response To: Comment 80004-528

The National Research Council (2003) noted that cumulative effects from oil and gas development have negatively affected the CAH and may continue to do so unless the degree to which development disturbs caribou can be reduced. The majority of the cumulative effects on the CAH are from ongoing and potential future development on State lands east of NPR-A. The additional cumulative impact from the Northwest NPR-A IAP/EIS on the CAH is limited to a potential off-site pipeline to either Kuparuk or TAPS and will not constitute a significant addition to cumulative effects.

Comment From: The North Slope Borough (Comment Letter No. 80065)

The text fails to mention a possible decline in caribou harvest at Nuiqsut after 1993 (See Figure 1 below). This could be due to the displacement of subsistence hunters from the Kuparuk Oilfield area or a disruption of caribou migration into the traditional Nuiqsut hunting grounds. 0 200 400 600 800 1976 1984-5 1993 1994-5 year Figure 1. Numbers of caribou harvested at Nuiqsut by year. Note the possible trend in decreasing harvest numbers. Some hunters have attributed this to oilfield effects. The caribou harvest estimate for Nuiqsut in 1992 from Fuller and George (1997) should be included in this analysis. **(Comment No. 80065-588)**

Response To: Comment 80065-588

The text has been revised to discuss a possible decline in caribou harvest at Nuiqsut and to indicate a fourth possible explanation for the decline, i.e., disruption of caribou migration into traditional Nuiqsut harvest areas. Caribou harvest numbers for Nuiqsut in 1992 from Fuller and George have been included in the analysis in Section III.D.(5)(g).

Comment From: The North Slope Borough (Comment Letter No. 80065)

The text does not appropriately take into account the disturbance to caribou associated with clean up efforts. In some areas, alternate insect relief areas are not widely available, and a loss of preferred foraging habitat for two weeks or more is not incidental for an animal that is attempting to accumulate caloric (fat) and mineral body stores at a very fast rate in the short summer. This is a critical nutrional period prior to decreases in fall forage quality and in preparing for the harsh fall and winter. This loss of habitat is not just associated with oiled areas but the areas that will become disturbed by clean up operations. Increased susceptibility to winter conditions should also be considered as disturbed caribou may enter that stressful time of year in poor condition, resulting in mortality or potentially reduced calving success. **(Comment No. 80065-600)**

Response To: Comment 80065-600

Please see the response to comment 251-169 (Effects of Spills).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

The proposed Alternatives contain internal conflicts. The Draft EIS/IAP says that the wide open approach in Alternative A would most likely have only a minor impact on wildlife and subsistence activities unless development occurs within areas used by caribou for insect relief or there is an oil spill. Yet Alternative A does not address development in caribou insect relief habitat despite the fact that there is significant overlap between the areas with a high potential for oil and gas and areas used by the Teshekpuk Lake Caribou Herd (TLH) as insect relief habitat. A highly likely development scenario is effectively ignored. The Draft EIS/IAP even recognizes the dire consequences of Alternative A, concluding that cumulative oil and gas activities combined with Alternative A can cause long-term displacement and functional loss of caribou and in turn, 'this important subsistence resource [the caribou] could become unavailable, undesirable for use, or experience long-term population and productivity effects for a period longer than 5 years - a significant adverse effect. **(Comment No. 254-616)**

Response To: Comment 254-616

More specific language has been added to the text (please see Sections IV.C.10.a (2)(a) and Section V.B.10.a.(b)) relating to impacts to TLH caribou from development in the insect-relief habitat.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

We would like to see, and the Draft EIS/IAP supports the need for, stipulations protecting caribou calving and insect avoidance areas. The Draft EIS/IAP indicates that large groups of insect-harassed caribou changed their behavior over the course of 12 years in an 'moderate to high effects could be expected on the productivity of TLH

if development takes place in critical insect relief areas. If caribou populations become unavailable, undesirable for use, or experience population reductions for a period greater than 2 years, effects [SIC] subsistence-harvest patterns would elevate from low effects to moderate or high effects over the long-term. The Arctic Refuge Coastal Plain Terrestrial Wildlife Research Summaries, and the draft of the National Academy of Science Cumulative Impact Study also indicate that this is a very real concern. For these reasons, the protection of the TLH calving and insect relief areas in the Northwest NPR-A should be one of the BLM's top priorities. The protection of the sensitive areas where the TLH seeks refuge from insect harassment or calve their newborns can be accomplished with "No Permanent Improvement" zones covering the most heavily used areas. There should be no disagreement on this because the Draft EIS/IAP says 'cumulative impacts to caribou could be reduced by not allowing leasing in the most sensitive areas' in NPR-A. Since we would like to see oil and gas extracted from these areas if it can be done in an environmentally sound manner, we are not opposed to a stipulation allowing leasing and winter-only exploration, but prohibiting permanent surface facilities. If oil and gas is discovered in the No Permanent Improvement zone protecting sensitive caribou areas, horizontal drilling techniques can be used to extract some or all of any discovery. Even if today's technology cannot reach oil and gas in these areas, industry will be given an incentive to strive for horizontal drilling technological breakthroughs. effort to avoid Kuparuk's core industrial areas and instead now move primarily along Kuparuk's outer edges instead of through the center as the caribou once did. We have witnessed this change first hand and recently we have observed seen a reduction in the number of caribou on the Colville River Delta. Given historic fluctuations in caribou migration and populations, it is too soon to draw final conclusions, but we believe that this change is longterm and was caused by the construction of the Meltwater and Tarn pipelines, which create barriers to migration patterns. We are concerned that development in the TLH's insect relief habitat in the Northwestern NPRA will have a similar impact. In addition the Draft EIS/IAP concludes that development in the Prudhoe Bay-Kuparuk area has caused a shift in CAH calving distribution away from the oil fields. Unpredictability and changes in caribou movement negatively impact the success of our subsistence harvest. The Draft EIS/IAP notes that unpredictable movements of the Central Arctic and Teshekpuk Lake Caribou Herds among other things have caused Nuiqsut' s annual caribou harvest to fluctuate markedly. The shifting movement of caribou caused by Kuparuk and now Meltwater and Tarn is the type of unpredictable movement that negatively impacts hunting success. The Draft EIS/IAP shows that animals from the TLH are harvested by residents from many of the North Slope Communities inside the NPR-A. About one third of the subsistence food eaten by Nuiqsut residents are caribou harvested on the coastal plain. In recent years, due to poor fish harvests, caribou has been relied upon even more. With such a large part of our diet coming from caribou, our health and the health of the caribou is increasingly intertwined. The Draft EIS/IAP supports this concern saying:'moderate to high effects could be expected on the productivity of TLH if development takes place in critical insect relief areas. If caribou populations become unavailable, undesirable for use, or experience population reductions for a period greater than 2 years, effects [SIC] subsistence-harvest patterns would elevate from low effects to moderate or high effects over the long-term. The Arctic Refuge Coastal Plain Terrestrial Wildlife Research Summaries, and the draft of the National Academy of Science Cumulative Impact Study also indicate that this is a very real concern. For these reasons, the protection of the TLH calving and insect relief areas in the Northwest NPR-A should be one of the BLM's top priorities. The protection of the sensitive areas where the TLH seeks refuge from insect harassment or calve their newborns can be accomplished with "No Permanent Improvement" zones covering the most heavily used areas. There should be no disagreement on this because the Draft EIS/IAP says 'cumulative impacts to caribou could be reduced by not allowing leasing in the most sensitive areas' in NPR-A. Since we would like to see oil and gas extracted from these areas if it can be done in an environmentally sound manner, we are not opposed to a stipulation allowing leasing and winter-only exploration, but prohibiting permanent surface facilities. If oil and gas is discovered in the No Permanent Improvement zone protecting sensitive caribou areas, horizontal drilling techniques can be used to extract some or all of any discovery. Even if today's technology cannot reach oil and gas in these areas, industry will be given an incentive to strive for horizontal drilling technological breakthroughs. **(Comment No. 254-621)**

Response To: Comment 254-621

The TLH calving grounds are located outside of the Planning Area. The majority of the TLH calving grounds is currently closed to leasing or is designated as no-surface occupancy. Stipulations in the Preferred Alternative provide additional protection to the TLH insect-relief habitat.

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

Can wildlife and oil development coexist' Absolutely. The Central Arctic Caribou Herd whose summer range includes the Prudhoe Bay oil field has grown from 5,000 in 1974 to 32,000 today, an increase of a staggering 537 percent. **(Comment No. 80073-1006)**

Response To: Comment 80073-1006

Caribou populations normally fluctuate over time depending upon a wide variety of factors. The onset of oil development in the Prudhoe Bay area happened to coincide with a low point in the CAH population. The WAH grew from 75,000 to 463,000 animals over the same general time period and they were not exposed to oil and gas development.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page II-33. "Development in the 'TLH insect-relief'area could interfere with caribou movements and have adverse reproductive consequences.' While this level of interference potentially may happen, CPAI believes that there are many proven designs and operational techniques available to fully eliminate this potential impact. Knowing that the caribou disturbance is primarily associated with pipeline height, pipeline/road separation, and traffic stress, CPAI believes that proper road and pipeline designs, combined with traffic controls during the insect season, can fully eliminate this interaction. **(Comment No. 255-795)**

Response To: Comment 255-795

The BLM recognizes that proper road and pipeline design can greatly reduce impacts to free movement of caribou through oil field facilities; however, these measures will not totally eliminate such impacts. While under extreme insect harassment, caribou are relatively insensitive to disturbance and may readily move through oil field facilities. When caribou are released from the strong stimulus of insect harassment and are drifting inland to feed, facilities, roads, and traffic may become temporary deterrents to caribou movement. A gravel road bed raised above the flat coastal plain presents a visual barrier that may temporarily deter caribou while they are still some distance from the road. Implementation of traffic controls could further reduce caribou delays at road crossings. Traffic controls are not part of the proposed stipulation package being analyzed in this IAP/EIS and for analysis purposes, it is assumed that no traffic controls are in place. Traffic controls may be implemented as a result of environmental review during permitting.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-420, first para. This discussion states "' construction of a road from the Dalton to Nuiqsut...would create a barrier to caribou movement.'" All caribou monitoring studies have found that roads alone do not cause "barriers." The Dalton Highway does not cause a "barrier" as stated. High traffic rates do cause delays and some deviations. It is not clear if the point in this statement is that this potential road will have traffic at sufficient rates to cause these crossing delays. We believe it would be unrealistic to expect this road would have traffic at such high rates. This sentence needs to be clarified. **(Comment No. 255-952)**

Response To: Comment 255-952

The wording in the document has been clarified.

Comment From: Kellie Ward (Comment Letter No. 80023)

Open space is essential to migration patterns of certain species, such as the caribou. The coastal regions are crucial migration routes that can easily be disturbed with human interference. Road building and pipelines are very detrimental to these species and cause displacement. Alternative B and especially alternative A would likely have a negative impact on the migration patterns of these animals. A community of species within an ecosystem are very interactive with each other, therefore a potential loss of caribou would likely equate to a loss of its predators, including the brown bear, wolf and golden eagle **(Comment No. 80023-836)**

Response To: Comment 80023-836

The BLM recognizes that open space and coastal areas are essential for certain species, and that roads and pipelines may disrupt movements of some species. This is reflected in the draft IAP/EIS. The BLM does not anticipate any significant decreases in caribou populations under any of the alternatives. Therefore, no corresponding decrease in predator populations is expected. Additional text indicating that caribou are an important prey species for wolves and bears has been added to Section III.B.5.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

My biggest concerns are the substructures of what they're going on and stuff like that, like right now they're trying to change the standard ones when they come across the river and start going that way, moving them, what they call them, their sensors above and then make the pipeline like five feet and stuff and then right now it's living proof that when you go to Deadhorse now with the pipeline going from west to east that it acts like a snow fence and then you know the snow is building up underneath. And those are some of the things that concerns me. Are they going to be putting in any substructures because we're almost -- well, with NPR-A road and stuff like that, if they introduce that, we'll be impacted so much from all sides. **(Comment No. 80077-928)**

Response To: Comment 80077-928

The IAP/EIS addresses potential impacts to caribou movements and subsistence use access in the Planning Area (see Sections V.B.10.a and V.B.14). The protective measures developed for the Preferred Alternative (Section II.C.5) are intended to mitigate those impacts. For example, ROP E-7 minimizes impacts by requiring that roads and pipelines be designed to allow free movement of caribou and safe passage of people participating in subsistence activities. ROP H-1 requires the lessee/permittee to consult directly with affected communities to help prevent conflicts between subsistence uses and oil/gas development.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-420, 2nd para. We know of no study that has found that calving is reduced near pipelines without roads. **(Comment No. 255-953)**

Response To: Comment 255-953

The text has been revised.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-421 first para. The second half of this paragraph presents the hypothetical assumption presented in the early 1990s by one caribou biologist that caribou cows in the western segment of the CAH had reduced body weights relative to the eastern segment of the CAH, and that this condition would lead to reduced herd productivity. We believe if these hypothetical assumptions from 10 years ago are presented, then the current factual information that the CAH has grown at an above average rate since 1995, and is now larger than it has ever been at over 30,000 animals also needs to be presented so readers understand this issue. **(Comment No. 255-954)**

Response To: Comment 255-954

The information on the population size of the CAH is shown in Section III.B.5.a(1).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-421, 3rd para. The end of this paragraph talks about functional loss of TLH calving habitat, and displacement of calving caribou from disturbance from their calving habitat. This discussion is confusing and we don't clearly follow the linkage used to make this conclusion, since we understood that the entire TLH calving area is completely protected under the Northeast Planning Area leasing boundaries and stipulations and no surface facilities will be built, nor will any surface or aerial activity occur in that area during the calving season. **(Comment No. 255-955)**

Response To: Comment 255-955

These sections refer to cumulative effects on all three caribou herds, not just the TLH. Although surface facilities are prohibited in most of the TLH calving grounds (Map 48), a portion of the area historically used by the herd during calving is outside of the Teshekpuk Lake Special Protection Area. The CAH calving grounds are open to leasing. Some TLH and CAH caribou calving habitat could be affected by cumulative development on the North Slope.

Comment From: Hearing -Anaktuvuk Pass (Comment Letter No. 80072)

HEARING OFFICER BROWER: The gentleman's name is Gilbert Lincoln. Pertaining to the height of the pipeline, if the pipeline is built in the NPR-A. He knows that when a caribou is going to run for safety, they jump six to seven feet and they have their racks on so they have to be able to get underneath the pipeline if they're going to cross freely. So this is a rule of thumb that he would like to entertain in this hearing so that the caribou may not harm itself when it's running away if the pipeline's too low with its racks it could be running and hit the pipeline and then shear off its horns and it could cause it permanent or lethal damage to itself. **(Comment No. 80072-979)**

Response To: Comment 80072-979

Pipelines in the Planning Area will be designed to allow for free movement of caribou. The standard height is 5 feet above ground level to the bottom of the pipeline. Curatolo and Murphy (1986) reported no selection for particular surface-to-pipe clearances within the range of 1.5 to 4.3 meters (5 to 14 feet), indicating that the

standard of 5 feet is generally sufficient (Cronin et. al., 1994). Cronin et. al. (1994) evaluated the effectiveness of oilfield mitigation measures. One potential effect on caribou that they considered was accidental death. They did not report any accidental death or injury to caribou crossing under elevated pipelines. Under the Preferred Alternative, an average height of 7 feet is the design standard. Please see specifically Required Operating Procedure E-7.

38. TOPIC : THREATENED AND ENDANGERED SPECIES

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Moreover, this failure to evaluate fully the adverse impacts of potential oil and gas operations implicates the agency's Endangered Species Act obligations. Given the inadequate analysis in the DEIS, BLM is unable to establish that the development alternatives in the DEIS will be consistent with the agency's ESA obligations to avoid jeopardy to listed species and to prevent unauthorized take of such species. **(Comment No. 253-271)**

Response To: Comment 253-271

The BLM has analyzed the potential impacts of the levels of routine activities associated with oil and gas exploration and development that could reasonably be expected to occur associated with the IAP/EIS for the Northwest Planning Area and within the framework of available data. Although the commenter fails to define "evaluate fully," it is not considered useful to speculate about potential impacts that could result from a worst-case scenario incident or activity when there is an extremely low probability of occurrence. With regard to BLM's obligation to avoid a jeopardy conclusion in the U.S. Fish and Wildlife Service (USFWS) Biological Opinion (BO) and prevent unauthorized takes of listed species, please refer to the non-jeopardy opinion contained in Appendix 10 . The BO was developed with the IAP/EIS analysis. This IAP/EIS and related BO are just the first steps in an incremental ESA consultation process with USFWS. If exploration and development were to be proposed, consultation would be reinitiated at that time.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Until the BLM completes an adequate assessment of the full potential impacts of the development alternatives, it cannot demonstrate compliance with these obligations to conserve the spectacled and Steller's eiders and the bowhead. **(Comment No. 253-276)**

Response To: Comment 253-276

The BLM considers the analyses to be adequate and appropriate to the decisions to be made. The U.S. Fish and Wildlife Service (USFWS), by issuing a non-jeopardy BO for this portion of the plan, apparently is in agreement that the analyses are adequate. Please also see the response to comment 253-271 (Threatened and Endangered Species).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Table II-02 (Stipulations and Required Operating Procedures) are in place and enforced. No support, historical or otherwise, is provided to show this is a valid assumption rather than an optimistic hope. **(Comment No. 253-279)**

Response To: Comment 253-279

Potential impacts were analyzed assuming that stipulations and required operating procedures were in place. The potential effects of these protective measures are discussed in a separate section following the analysis. The application of stipulations and required operating procedures to oil and gas operations is not discretionary, but those that require, for example, preparation of a plan indicating how an operator will satisfy the stated requirements/standards, which will require the approval of an Authorized Officer, may involve some discretion where part or all of the requirements/standards are not explicitly defined (e.g., "Sufficient oil-spill cleanup materials shall be stored at all fueling points ....." ROP A-4).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Furthermore, the DEIS states that it assumes that the probability of crude oil being released during exploration is zero (DEIS p. IV-177). The agency has a responsibility to analyze all potential impacts, not just the optimistic best-case scenario. **(Comment No. 253-284)**

Response To: Comment 253-284

Although stipulations or ROP's that allow discretionary application may not always be applied in their most restrictive form, most applicable with regard to birds are not discretionary. To keep the analysis within reasonable bounds, discretionary measures were considered to be applied as stated, rather than in every possible form, to demonstrate at least one effect of the measure. As noted, the statistical probability of a crude oil spill during exploration is zero; however, unless a spill is assumed for purposes of analysis, a realistic analysis of all potential effects of development and production phases is not possible. By analyzing potential impacts of an oil spill, the IAP/EIS does not simply analyze only an optimistic best-case scenario as is evident from the analysis located in Section IV.C.11.c(2), Effects of Oil Spills. Although about 975 oil spills from all sources have occurred on the North Slope, their average size is 2.7 bbl. The BLM considers that analysis of a 900-bbl oil spill scenario is sufficiently inclusive to cover the impacts of all potential spill size scenarios, up to and including this volume.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

This assumption also seems unsupported by history. The total number of oil spills from activities on the North Slope from 1989 to 1996 was 975. (DEIS p. IV-430). It is inappropriate and counter to the spirit and intent of NEPA to perform an impacts analysis based on these unwarranted and unsupported assumptions. **(Comment No. 253-287)**

Response To: Comment 253-287

Although stipulations or ROP's that allow discretionary application may not always be applied in their most restrictive form, most applicable with regard to birds are not discretionary. To keep the analysis within reasonable bounds, discretionary measures were considered to be applied as stated, rather than in every possible form, to demonstrate at least one effect of the measure. As noted, the statistical probability of a crude oil spill during exploration is zero; however, unless a spill is assumed for purposes of analysis, a realistic analysis of all potential effects of development and production phases is not possible. By analyzing potential impacts of an oil spill, the IAP/EIS does not simply analyze only an optimistic best-case scenario as is evident from the analysis located in Section IV.C.11.c(2), Effects of Oil Spills. Although about 975 oil spills from all sources have occurred on the North Slope, their average size is 2.7 bbl. The BLM considers that analysis of a 900-bbl oil spill scenario is

sufficiently inclusive to cover the impacts of all potential spill size scenarios, up to and including this volume.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

We are concerned about the cumulative impact additional oil and gas leasing and other development will have on the spectacled and Steller's eiders and the bowhead whale. In order to satisfy NEPA, an EIS must evaluate in detail the 'cumulative effects of a proposed action with other proposed actions.' See Muckleshoot Indian Tribe V. U.S. Forest Service, 177 F. 3d (9th Cir 1999). The agency must analyze connected and similar actions affecting lands adjacent to the NW Planning Area including all past, present and future development on federal, state and private lands. In discussing the proposed plans, the DEIS must fully disclose analysis of how the direct and secondary impacts of each past, present, and reasonably foreseeable future action will affect the spectacled eider, Steller's eider and bowhead whale. Should a sale go forward as a result of this planning process, this would be the seventh lease sale in this area since 1993. (DEIS p. IV-173). One hundred twenty nine wells have been drilled in the NPRA to date. Thirteen of which were drilled between 2000 and 2002. In addition another 688 leases exist as part of federal offshore Beaufort Sea sale of which 52 are still active. The offshore Northstar facility is also now in operation in the area. While the DEIS does have a cumulative impacts section for T&E species, it fails to take the requisite 'hard-look' required by NEPA. The DEIS chooses to focus its assessment of impacts on threatened and endangered species on the leasing and exploration phases rather than the development and production phases. Since the greatest potential for impacts to these T&E species is associated with development and production, this analysis is fatally flawed. Exploration is expected to take 8 years, development 14 years and production is expected to last 22 years. Limiting the analysis in the DEIS to an 8 year rather than a 30 year time frame has enormous implications. Rather than confront the issues, the DEIS states that further consultation will occur in the future should commercially viable quantities of oil be discovered. Artificially limiting the scope of the DEIS analysis regarding impacts to T&E species to leasing and exploration, prevents the agency from educating itself and others about the larger context in which decisions affecting the species are made, thereby limiting the effectiveness of the NEPA process. For example, in discussing impacts to eiders, the DEIS states that initial development is likely to occur in the extreme northern portion of the Planning Area where a 'substantial number of spectacled eiders could be affected.' (DEIS p. IV-180). However, at the same time the DEIS limits its analysis to the leasing and exploration phases, conveniently enabling the agency to not take a hard look at such impacts as required. The discussion on development and production in relation to T&E species is cursory at best and clearly does not meet the 'hard- look' standard of NEPA. Limiting the scope of the EIS is inconsistent with the purpose, goals, and procedures of NEPA. The failure to take a look at all the foreseeable impacts that development in the area might have on the resources and uses prevents this DEIS from contributing to the quality of the agency's decision, in violation of the goals and 'action-forcing' purpose of NEPA. **(Comment No. 253-291)**

Response To: Comment 253-291

The analysis considers potential impacts of development as well as exploration, and thus has not been limited to the latter. The expanded timeframe thus considered still suggests that only one oil spill would occur offshore and five onshore within the reasonably foreseeable future, hence BLM considers the analysis adequate. The final document has been reviewed to assure adherence to required content. In the absence of definitive data, speculating beyond the scenario time frame serves little purpose. As stated, future proposed development would require reinitiation of endangered species consultation, at which time more specific information is likely to be available.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

We are concerned about the cumulative impact additional oil and gas leasing and other development will have on the spectacled and Steller's eiders and the bowhead whale. In order to satisfy NEPA, an EIS must evaluate in detail the 'cumulative effects of a proposed action with other proposed actions.' See Muckleshoot Indian Tribe V. U.S. Forest Service, 177 F. 3d (9th Cir 1999). The agency must analyze connected and similar actions affecting lands adjacent to the NW Planning Area including all past, present and future development on federal, state and

private lands. In discussing the proposed plans, the DEIS must fully disclose analysis of how the direct and secondary impacts of each past, present, and reasonably foreseeable future action will affect the spectacled eider, Steller's eider and bowhead whale. Should a sale go forward as a result of this planning process, this would be the seventh lease sale in this area since 1993. (DEIS p. IV-173). One hundred twenty nine wells have been drilled in the NPRA to date. Thirteen of which were drilled between 2000 and 2002. In addition another 688 leases exist as part of federal offshore Beaufort Sea sale of which 52 are still active. The offshore Northstar facility is also now in operation in the area. While the DEIS does have a cumulative impacts section for T&E species, it fails to take the requisite 'hard-look' required by NEPA. The DEIS chooses to focus its assessment of impacts on threatened and endangered species on the leasing and exploration phases rather than the development and production phases. Since the greatest potential for impacts to these T&E species is associated with development and production, this analysis is fatally flawed. Exploration is expected to take 8 years, development 14 years and production is expected to last 22 years. Limiting the analysis in the DEIS to an 8 year rather than a 30 year time frame has enormous implications. Rather than confront the issues, the DEIS states that further consultation will occur in the future should commercially viable quantities of oil be discovered. Artificially limiting the scope of the DEIS analysis regarding impacts to T&E species to leasing and exploration, prevents the agency from educating itself and others about the larger context in which decisions affecting the species are made, thereby limiting the effectiveness of the NEPA process. For example, in discussing impacts to eiders, the DEIS states that initial development is likely to occur in the extreme northern portion of the Planning Area where a 'substantial number of spectacled eiders could be affected.' (DEIS p. IV-180). However, at the same time the DEIS limits its analysis to the leasing and exploration phases, conveniently enabling the agency to not take a hard look at such impacts as required. The discussion on development and production in relation to T&E species is cursory at best and clearly does not meet the 'hard- look' standard of NEPA. Limiting the scope of the EIS is inconsistent with the purpose, goals, and procedures of NEPA. The failure to take a look at all the foreseeable impacts that development in the area might have on the resources and uses prevents this DEIS from contributing to the quality of the agency's decision, in violation of the goals and 'action-forcing' purpose of NEPA. **(Comment No. 253-292)**

Response To: Comment 253-292

The analysis considers potential impacts of development as well as exploration, and thus has not been limited to the latter. The expanded timeframe thus considered still suggests that only one oil spill would occur offshore and five onshore within the reasonably foreseeable future, hence BLM considers the analysis adequate. The final document has been reviewed to assure adherence to required content. In the absence of definitive data, speculating beyond the scenario time frame serves little purpose. As stated, future proposed development would require reinitiation of endangered species consultation, at which time more specific information is likely to be available.

Comment From: American Society of Mammologists (Comment Letter No. 249)

the draft EIS contains little real consideration of possible impacts of oil and gas activities on the endangered bowhead whale (Balaena mysticetus), an inhabitant of the coastal marine habitats adjacent to the NW NPR-A. None of the Stipulations listed in the draft EIS specifically apply to bowhead whales. Past and present oil and gas seismic exploration activities on Alaska's North Slope have significantly altered the fall migration routes of bowheads, which, in turn, may affect other associated behavioral traits such as feeding (Orians et al. 2003). This species is strictly protected by the Endangered Species Act and Marine Mammal Protection Act and absolutely requires fuller consideration in this draft EIS. Further, **(Comment No. 249-522)**

Response To: Comment 249-522

Consideration of potential impacts to bowhead whales in the IAP/EIS is in relation to the likelihood that these whales would be affected by activities primarily ongoing within the Northwest NPR-A Planning Area. Bowhead whales could respond to occasional supply vessel presence, but this is not likely to result in significant changes in

their distribution, nor does it appear to require specific stipulations. Treacy et al., (2000) has determined that the fall bowhead migration route (distance offshore) is principally affected by sea ice extent and severity. Only local course deflections have been recorded near sites of seismic exploration and drilling in the Beaufort Sea, thus it is unlikely that the fall migration route has been altered significantly.

Comment From: The North Slope Borough (Comment Letter No. 80065)

The section states that under most circumstances, contact of whales migrating through offshore waters during the open-water season likely would be brief.' This qualification as 'brief' is misleading as a shortterm expsoure may cause for severe effects from volatile components, especially via the pulmonary route. The section also states that 'based on conclusions from studies that have examined the effects of oil spills on cetaceans, exposure to spilled oil is unlikely to have serious direct effects on baleen whales.' This is a very misleading statement, as most of the studies were performed on small toothed whales (odontocetes) using small scale captive studies. Extrapolating from these studies to free ranging mysticetes in the Arctic is not justified. It is quite feasible that baleen whales traveling in heavily iced nearshore conditions could be forced to interact with oil at the surface. Multiple exposures to the respiratory and other critical systems (e.g., ocular) could occur. The effects of these interactions with oil could be lethal or very debilitating. The text does not make appropriate reference to the dramatic differences between bowhead baleen and the baleen of the four whale species that were the subject of the studies referred to. There is no data to suggest that fouling of bowhead baleen, which is long, flexible, and characterized by many hairlike filaments, should not be a significant concern in the event of an oil spill. **(Comment No. 80065-603)**

Response To: Comment 80065-603

The discussion of effects of oil on bowhead whale has been revised to include additional potential effects and/or severity.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Spectacled eiders and the Alaska breeding population of Steller's eiders were listed as threatened under the Endangered Species Act of 1973, as amended, in 1994 and 1997, respectively. The Northwest Planning Area of the NPR-A provides nesting and brood-rearing habitat for significant numbers of threatened Steller's and spectacled eiders. The Service estimates that about 90 percent of the Alaska breeding population of Steller's eiders and about 70 percent of the North Slope population of spectacled eiders nest within this area. Given the uncertainty surrounding how much development may occur, how that development would be managed (Stipulations and Required Operating Procedures (ROPs)), and how Steller's and spectacled eiders may be affected by development, it is difficult to evaluate potential impacts of any of the Alternatives on these two species. If significant development occurs within areas of high concentrations of either species, we believe the potential for population-level impacts is high for North Slope breeding spectacled eiders and for the listed Alaska breeding population of Steller's eiders. **(Comment No. 260-644)**

Response To: Comment 260-644

Although it is difficult to forecast the absolute amount of oil and gas development that might occur in the Northwest NPR-A, it is likely that the northern portion surrounding Dease Inlet-Admiralty Bay, where potential is rated high and existing infrastructure is more accessible, will be explored first. Aerial survey data indicate highest spectacled eider densities to the west of the inlet mainly on Native Corporation and split estate lands, with a few areas to the east. This might suggest that some high density spectacled eider (Native Corporation) areas could be questionable for oil and gas activity in the future; at this point the likelihood of development on Native Corporation lands is unknown. The level of exploration and development expected is not likely to cause

population level impacts to the spectacled eider. Distribution of Steller's eider sightings is sufficiently diffuse to suggest that few would be impacted by the relatively low level of near term development expected.

Comment From: Michael North (Comment Letter No. 80003)

I am particularly troubled by evidence that previous recent leases of oil and gas in the NPR-A have ignored mitigation proposed by wildlife professionals, and have not included any safeguards for yellow-billed loons. To me, that demonstrates the inadequacy of existing regulatory mechanisms. Combine that with the present potential to threaten destruction or modification of the species habitat, the potential for increased predation, and the potential to introduce long-term and large-scale contamination of the species habitat (i.e., other man-made factors) and you have met four of the five criteria - any one of the which - that may be used for listing under the Endangered Species Act (16 U.S.C. 1533(a)). A key theorem that has emerged in both the regulated and regulatory public over the last decade or so is that it is better to undertake proactive measures in order to avoid having to list species. The NPR-A Planning Team has the opportunity to structure the locations, extent, and conditons of leases in the NPR-A in order to eliminate or greatly reduce threats to a sustainable yellow-billed loon population. It is my profound hope that you will take these required steps. **(Comment No. 80003-853)**

Response To: Comment 80003-853

Several stipulations and ROP's address mitigation of various factors (e.g., habitat modification, disturbance, environmental contamination, increased predator populations) that could have adverse effects on the yellow-billed loon (please also the response to comment North-3). Some protection by virtue of greater awareness of the species' sensitivity is accorded by its listing as a species of conservation concern by the USFWS.

39. TOPIC : OIL SPILLS AND SCENARIO

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.2.c, Page IV-39. The State recommends that the Final IAP/EIS explain why an oil spill is not expected to occur in association with natural gas exploration or production. Fuels and other petroleum products will be used during natural gas exploration and production, just as they are with oil exploration and production. It is reasonable to expect that spills associated with petroleum transportation, storage, and use for natural gas exploration and production will occur. The effects of such spills would be the same as those already described in the Draft IAP/EIS. **(Comment No. 251-181)**

Response To: Comment 251-181

A large oil spill is not expected to occur in association with natural gas exploration and production. There are no large oil spills associated with any Alaska North Slope blowouts. The BLM agrees with the commenter that a refined petroleum product spill(s) could be expected to occur. The effects of refined spills during gas production are the same as those during oil production and are discussed in Section IV Environmental Consequences. We have added text to the EIS directing the reader to the analysis of small refined spills.

Comment From: State of Alaska (Comment Letter No. 251)

In addition, a well blowout could produce natural gas condensates and crude oil also. The potential effects from a

gas exploration or production well blowout should be analyzed and described in the Final IAP/EIS. **(Comment No. 251-182)**

Response To: Comment 251-182

Gas production is not anticipated to occur during the period analyzed in this IAP/EIS. Section IV.A.1.b.(8)(a) describes possible but unlikely scenarios, including the unexpectedly aggressive development of gas resources. Currently, there is no infrastructure (pipeline) for getting gas to market. If an exploration well discovered gas, and a company proposed a development, a gas blowout would be further evaluated during the environmental process.

Comment From: State of Alaska (Comment Letter No. 251)

It is essential that BLM consider these road proposals. We recommend that potential allseason community roads and mainline/trunk roads for oil and gas exploration and development be included in the alternatives and appropriately analyzed for human and environmental impacts as required by the National Environmental Policy Act. The assumption in the Draft IAP/EIS that private sector financing of roads makes roads unlikely needs to be revised in recognition that the State may finance roads in whole or part. In addition to providing overland transport of vehicles, the road corridors identified through the Northwest Plan may also function as electrical energy, consumer gasline and communications distribution routes. This potential infrastructure should be considered as well. **(Comment No. 251-201)**

Response To: Comment 251-201

Please see the response to comment 213-357 (Transportation).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Furthermore, the DEIS states that it assumes that the probability of crude oil being released during exploration is zero (DEIS p. IV-177). The agency has a responsibility to analyze all potential impacts, not just the optimistic best-case scenario. **(Comment No. 253-286)**

Response To: Comment 253-286

Although stipulations or ROP's that allow discretionary application may not always be applied in their most restrictive form, most applicable with regard to birds are not discretionary. To keep the analysis within reasonable bounds, discretionary measures were considered to be applied in their most restrictive form, rather than in every possible form, to demonstrate at least one effect of the measure. As noted, the statistical probability of a crude oil spill during exploration is zero; however, unless a spill is assumed for purposes of analysis, a realistic analysis of all potential effects of development and production phases is not possible. By analyzing potential impacts of an oil spill, the IAP/EIS does not simply analyze only an optimistic best-case scenario as is evident from the analysis located in Section IV.C.11.c(2), Effects of Oil Spills. Although about 975 oil spills from all sources have occurred on the North Slope, their average size is 2.7 bbl. The BLM considers that analysis of a 900-bbl oil spill scenario is sufficiently inclusive to cover the impacts of all potential spill size scenarios, up to and including this volume.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

This assumption also seems unsupported by history. The total number of oil spills from activities on the North Slope from 1989 to 1996 was 975. (DEIS p. IV-430). It is inappropriate and counter to the spirit and intent of NEPA to perform an impacts analysis based on these unwarranted and unsupported assumptions. **(Comment No. 253-290)**

Response To: Comment 253-290

Although stipulations or ROP's that allow discretionary application may not always be applied in their most restrictive form, most applicable with regard to birds are not discretionary. To keep the analysis within reasonable bounds, discretionary measures were considered to be applied in their most restrictive form, rather than in every possible form, to demonstrate at least one effect of the measure. As noted, the statistical probability of a crude oil spill during exploration is zero; however, unless a spill is assumed for purposes of analysis, a realistic analysis of all potential effects of development and production phases is not possible. By analyzing potential impacts of an oil spill, the IAP/EIS does not simply analyze only an optimistic best-case scenario as is evident from the analysis located in Section IV.C.11.c(2), Effects of Oil Spills. Although about 975 oil spills from all sources have occurred on the North Slope, their average size is 2.7 bbl. The BLM considers that analysis of a 900-bbl oil spill scenario is sufficiently inclusive to cover the impacts of all potential spill size scenarios, up to and including this volume.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Each of these activities potentially could pose grave risks to the viability of this at-risk species. It is of crucial importance to recognize that because the spectacled and Steller's eider populations have experienced a more that 50% decline, that all the impacts the DEIS characterizes as negligible may have a moderate to large effect on the population's chance of long-term survival. **(Comment No. 253-295)**

Response To: Comment 253-295

The BLM considers that it has fairly represented and analyzed available data and characterized the potential impacts of various factors. There is little evidence to suggest that impacts characterized as negligible are in fact moderate or large.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.2, Page IV-35, Oil Spills, Second Paragraph. "Large spills have some moderate chance of occurring during the lifetime of the field. Small spills are expected to occur&" What science or historical data supports this statement' As with the Northstar EIS, the author does not have sufficient data relative to North Slope operations or the history of spills on the North Slope, and is probably using a hundred year average for the Gulf of Mexico. This leads the reader to an unrealistic assumption that oil spills are a typical occurrence on the North Slope, when in fact this is one of the most prestigious oil and gas developments in the world. **(Comment No. 251-417)**

Response To: Comment 251-417

The text has been revised regarding large spills to indicate this is the chance of occurrence for the $30.00/bbl price level scenario. Assumptions for large spills (>500 bbl) from production in the Northwest NPR-A Planning Area are based on the historic spill sizes from onshore Alaska North Slope industry spills from 1985 to 2000. The text has been changed to state that the data used is the history of spills on the Alaska North Slope as described in Appendix 9 of the IAP/EIS. The MMS contracted with Hart Crowser Inc to collect and document oil spills greater than or equal to 100 barrels from the Alaska North Slope, Trans Alaska Pipeline, and Arctic Canada. The Alaska

North Slope oil-spill analysis includes onshore oil and gas exploration and development spills from the Point Thompson Unit, Badami Unit, Kuparuk River Unit, Milne Point Unit, Prudhoe Bay West Operating Area, Prudhoe Bay East Operating Area, and offshore Duck Island Unit (Endicott). North Slope data include spills from onshore pipelines and offshore and onshore production and gathering facilities.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.2, Oil Spills, Page IV-35. The third paragraph states: "For analysis purposes, this IAP/EIS assumes no oil spill clean-up occurs." This statement is not only unreasonable, but extremely unrealistic. Before, during, and frequently for some period after any exploration or development activity, oil spill response equipment is stationed in strategic locations to prevent the migration of oil from an unlikely spill event, and oil spill response personnel are also on-site and on-call throughout any activity. This Draft IAP/EIS assumption predicates a worst-case scenario that simply would not occur, and goes on to elaborate its effects to the reader. **(Comment No. 251-418)**

Response To: Comment 251-418

The statement "For analysis purposes, this IAP/EIS assumes no oil spill clean-up occurs" is specifically referring to the analysis of impacts from the spilled oil. By assuming no clean-up, the analysis addresses the impact of the total estimated volume of the spill. For the analysis, we do not try to reduce the volume of oil in the environment by a certain percentage based on an assumed effectiveness of spill response. The analyses also address potential impacts of spill response, which we acknowledge would be required. The large spill sizes analyzed in the IAP/EIS are 500 or 900 barrels. Having regulations that require spill prevention and response and trained personnel does not guarantee that the oil will be cleaned up. Oil-spill cleanup estimates range from as low as none to as high as 99.0 percent. The variability in the amount of oil cleaned up is tremendous. The oil spills are analyzed without regard to cleanup because the variability is so high. The BLM acknowledges that the Northwest NPR_A is a remote area in a harsh climate. It is primarily a roadless area, limiting support for spills that spread by rivers, on lakes or lagoons, or into the Beaufort Sea. The area is noted for high winds in winter, currents, and the seasonal presence of moving ice in certain areas. The BLM acknowledges that there would be limits to current technology for responding to spills in adverse conditions. Historically, only a small percentage of spilled oil has been recovered at remote sites and in broken ice. Recently, higher recovery rates are being reached, but rates still typically do not exceed 80 percent. Response time and environmental conditions at the time of the spill are the two most critical factors in determining whether or not a spill effectively can be cleaned up at sea. Oil Discharge Prevention and Contingency Plans are required for exploration and development plans. At that time specific oil spill and response scenarios are outlined and evaluated prior to their approval.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-492, Introduction. The AOGCC Senior Petroleum Engineer is familiar with both the Mallory and Fairweather documents and confirms the information that each presents. As noted, the Fairweather study covers a longer time period and tallies more incidents. Both studies account for the same number of incidents during the period studied by Mallory. The key point that both studies make is that in modern times, no blowout has resulted in a liquid hydrocarbon release. **(Comment No. 251-448)**

Response To: Comment 251-448

The comment has been noted in the text.

Comment From: The North Slope Borough (Comment Letter No. 80065)

The introduction to this section states that 'a very large oil spill is a low-probability event with the potential for severe effects.' It is critical that the actual risk, expressed as a probability over a specific time period, and associated confidence intervals (e.g. 95% C.I.), be clearly stated. The methods used to determine this risk should be clearly cited and explained. The North Slope Borough (NSB) Science Advisory Committee (SAC) (NSB-SAC-OR-130, February 7, 2003) recently reviewed the methodology used by the Minerals Management Service (MMS) in risk assessment and oil spill probability estimates. The review revealed significant shortcomings in the MMS approach, including a failure to provide an indicator of the reliability of the figures presented. In the case of the Northwest NPR-A Planning Area, the increase in pipeline mileage and pad numbers would intuitively increase the overall probability of small and major oil releases on the North Slope, and their impacts in combination with the accumulated effects already associated with expanded industrialization would be felt that much more severely. Throughout the entire Draft IAP/EIS, the presumption of predicted low risks is the foundation of many 'no impact' conclusions. If this low risk assumption is flawed, then so are the 'no impact' determinations based upon it. **(Comment No. 80065-591)**

Response To: Comment 80065-591

The recent review by the North Slope Borough Scientific Advisory Committee focused on Anderson and LaBelle (2000) and Bercha Group Inc. (2001). These reports were used in the analysis of spills for the cumulative case for Beaufort OCS and TAPS tankers in the Northwest NPR-A Draft IAP/EIS. The MMS is currently trying to address certain concerns of the North Slope Borough Scientific Advisory Committee regarding Anderson and LaBelle (2000) and Bercha Group Inc. (2001). The MMS has outlined to the North Slope Borough anticipated goals for addressing their concerns. The primary analysis of spills for Northwest NPR-A is based on the Alaska North Slope spill rate. Unlike the offshore, where no historical data exists, there is plenty of historical data for spills on the Alaska North Slope. The IAP/EIS has presented the best available information regarding very large spill occurrence from the oil and gas industry on the Alaska North Slope. The text does not present a quantitative risk analysis with confidence intervals. No quantitative estimates of spill probabilities are presented other than to summarize the existing available data. The purpose is to provide an order of magnitude comparison to rates for other areas and spill sizes. As listed in the text of this section there have been no large crude oil spills greater than 925 barrels on the North Slope of Alaska from 1985-2000 and even to date. The sample size for spills greater than or equal to 120,000 barrels is zero for the Alaska North Slope. Of the five blowouts that occurred while drilling approximately 4,600 wells on the Alaska North Slope none released hydrocarbons. The sample size for blowouts greater than or equal to 120,000 barrels for the Alaska North Slope is zero. The largest spill from a platform facility on the OCS is the Santa Barbara spill, which was 80,000 barrels. This spill occurred more than 30 years ago. Since that time, regulations have been implemented to prevent blowouts in general and specifically of that magnitude. The sample size for platform spills greater than or equal to 120,000 barrels for the OCS is 0. In order to estimate a probability for spills greater than 120,000 barrels you have to look at worldwide blowouts. For these blowouts or spills, the causes are due to war or drilling practices that are not allowed in the U.S. To spend a lot of time doing statistical analysis on spills that have causes that aren't relevant seems unnecessary. The analysis of the impacts of an oil spill assumes that the spill occurs. The analysis then goes on to describe the impact of that size spill on a particular environmental, social or economic resource. The analyst then frames the analysis by stating the likelihood of the event. The likelihood of an event occurring does not diminish the impact of an oil spill.

Comment From: The North Slope Borough (Comment Letter No. 80065)

It appears that the coastal regions of the planning area are among the highest hydrocarbon resource potential areas being considered for leasing. If these areas are offered for lease, the nearshore and offshore marine system beyond lagoons should be considered a target for oiling in the event of a spill. We question models which project that spilled oil would remain along the coast. Also, more than one concurrent point of oil release or the potential for a single release to result in mutiple entry points into marine and freshwater systems should be considered, and the corresponding impact on response efforts and environmental effects addressed. **(Comment No. 80065-592)**

Response To: Comment 80065-592

The assumptions for analysis do not include that the oil will remain along the coast. Several analysts state that an oil spill starting in the inlet or along the shore could transport oil offshore and contaminate marine waters. No trajectory analysis was performed for this analysis. Data from Launch Area (LA) 1 and in the Beaufort Multisale EIS, Appendix A (USDOI, MMS, 2003) provides information about trajectory analysis adjacent to Dease Inlet. A spill in the area of LA2 has a 10 to 17 percent chance of contacting shoreline, approximately 20 to 30 miles east and west of Dease Inlet, after 30 days during summer. Environmental Resource Area (ERA) 23 approximately 30 miles west of Barrow has a 3 percent chance of contact after 30 days during summer. There is an 11 percent chance of contacting ERA 30, 45 miles east of Dease Inlet, after 30 days during summer. There is a 3 percent chance of contacting ERA's 31 and 54/67, 75 miles east of Dease Inlet, after 30 days during summer.

Comment From: The North Slope Borough (Comment Letter No. 80065)

It is well documented that cattle, sheep, and horses utilizing grazing lands that support oil extraction operations are occasionally exposed to oil, and that this exposure can result in mortality and morbidity. This exposure may be to crude oil, but also may involve heavy metals, salt water, caustic chemicals, grease and other petroleum distillates. Ingestion typically results in pulmonary aspiration that can be acutely lethal or predispose the animal to infections. This exposure can also affect the CNS, digestive tract, and skin. This type of exposure should be considered in large spill and chroniclow level spill scenarios. See: Edwards, WC. (1985) Toxicology problems related to energy production. Vet Hum Toxicol 27 (2): 129-132 Edwards et al. 1979. Toxicoses related to the petroleum industry. Vet Hum Toxicol. 21: 328-337 **(Comment No. 80065-597)**

Response To: Comment 80065-597

Potential toxicology and other detailed effects of an oil spill on marine mammals reference OCS reports MMS 85-0031 and MMS 92-0012 for detailed discussion of this type of effects (See Section IV. C. 10. b. (2) (b) Effects of Oil Spill. Additional information has been added to Sections IV.J.5.h. (1).

40. TOPIC : ROADLESS AREAS AND DEVELOPMENT

Comment From: State of Alaska (Comment Letter No. 251)

Section III, Page III-139(2), Roadless. This section outlines the characteristics of a roadless area and states that the planning area meets the test for roadless. While this may be a correct statement in general terms, the desire of the communities to have road and electrical/communications transmission line infrastructure developed in the planning area should be recognized as well. ADOTPF, in concert with the NSB, will work closely with BLM to identify specific transportation/utility corridors that need to be established for future use. **(Comment No. 251-321)**

Response To: Comment 251-321

When inventorying lands for potential wilderness designation, BLM looks for roadless areas at the time of inventory. If the area is roadless and meets the definition of roadless, then the area meets one of the first hurdles for possible wilderness designation. The ADOTPF should certainly contact BLM and discuss future concerns as related to utility and transportation corridors, as wilderness areas would certainly preclude this type of

development. The BLM needs to evaluate through the EIS process the need for this type of development versus the need for wilderness designation. Not knowing exactly where these future transportation corridors may be located makes it difficult to analyze.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-18 (c), Gravel Requirements. This section needs to include a discussion about the need for inter-community roads. **(Comment No. 251-380)**

Response To: Comment 251-380

This section specifically addressed the assumptions and scenarios for the Alternatives under consideration in this IAP/EIS. Inter-community roads within the Northwest NPR-A Planning Area are mentioned in the cumulative scenario and are considered speculative. The justification and feasibility of inter-community roads in NPR-A is beyond the scope of the present IAP/EIS. The BLM acknowledges that such studies are in progress with State DOT oversight. The final route selection, material requirements, and environmental impacts will undergo thorough NEPA review before ROW permits are approved.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-394 (3) Transportation for 'Roadless' Development. This section needs to be reviewed and revised consistent with recent proposals to construct permanent roads to CD-South and to the Lookout Drillsite within the NW NPR-A. **(Comment No. 251-391)**

Response To: Comment 251-391

The proposed permanent roads to CD-South and Lookout Drillsite are within the Northeast NPR-A, not the Northwest NPR-A.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-512, Bullet 7. The statement in this section that "the road system east of Nuiqsut would be partially funded with State of Alaska or Federal funds and open to the public' should be modified consistent with Section 118 (e) of the Transportation Enhancement Act (TEA-21). TEA-21 authorizes the expenditure of federal funds for resource development road construction projects without regard to the traditional 'public funds equals public access' caveat. It allows industrial use designation of these roads that precludes or limits public access eventhough state or federal funds are used. ADOTPF is now investigating the full implications of this statute on the North Slope roads development program currently underway. **(Comment No. 251-400)**

Response To: Comment 251-400

The State-advocated road between the Dalton Highway and Nuiqsut has been incorporated as a reasonably foreseeable activity under the cumulative scenario. This text has therefore been moved. Text has been added in the cumulative scenario to present the information on TEA-21 provided in the comment. The assumption in Bullet 7 has not been changed. In consideration of the history of the Dalton Highway relevant to the question of "public funds equals public access," the BLM believes that the assumption that a federally funded road between the

Dalton Highway and Nuiqsut would be open to public use is a reasonable assumption.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-512, Bullet 8.
The State recommends that the language in this section regarding the funding and construction of a road system west of Nuiqsut by the lessees and closed to general public use be modified in recognition that ADOTPF funding from state and federal sources may be used to develop roads west of Nuiqsut into NPR-A. **(Comment No. 251-403)**

Response To: Comment 251-403

The State-advocated road between the Dalton Highway and Nuiqsut has been incorporated as a reasonably foreseeable activity under the cumulative scenario. This text has therefore been moved. Text has been added in the cumulative scenario to present the information on TEA-21 provided in the comment. The assumption in Bullet 7 has not been changed. In consideration of the history of the Dalton Highway relevant to the question of "public funds equals public access," the BLM believes that the assumption that a federally funded road between the Dalton Highway and Nuiqsut would be open to public use is a reasonable assumption.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-512, Scenario for a Possible Permanent Road Connecting Northwest NPR-A to Outside of the Planning Area. The State recommends that this section be revised to incorporate: 1) the development of community roads between Barrow-Atqasuk-Wainwright that may also be used for oilfield development mainline of trunk road functions. This potential is well within the stated 15 to 20-year period used for modeling in the Draft IAP/EIS. 2) economic modeling for road access connecting to transportation systems outside the NPR-A consistent with possible public funding for a mainline or truck road development into NPR-A. As noted earlier, the economic model used in the Draft IAP/EIS that assumes roads are unlikely in the planning area because they are uneconomic to the private sector is flawed and should be reevaluated given that the State may choose to finance roads in whole or part. **(Comment No. 251-406)**

Response To: Comment 251-406

AK-069 Inter-community roads within the Northwest NPR-A Planning Area are mentioned in the cumulative scenario and are considered speculative at this time. The BLM acknowledges that such studies for such roads are in progress with State DOT oversight. The final route selection, material requirements, and environmental impacts will undergo thorough NEPA review before ROW permits are approved. The section referred to in the comment is on the Scenario for a Possible Permanent Road Connecting Northwest NPR-A to Outside of the Planning Area. The Barrow-Atqasuk-Wainwright road would be wholly within the Planning Area. The economic modeling for this IAP/EIS addressed activities under consideration in the Alternatives and the past, present, and reasonably foreseeable cumulative activities. As stated above, inter-community roads within the Northwest NPR-A Planning Area are considered speculative at this time.

41. TOPIC : CULTURAL RESOURCES

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Cultural Resource Sites Page III-83 indicates that about 400 cultural sites have been identified within the Northwest NPR-A Planning Areas. We realize the importance of maintaining the anonymity of these sites is critical for their protection. However, we recommend include a list of these cultural sites as a table. **(Comment No. 261-142)**

Response To: Comment 261-142

There are about 400 known cultural sites in the Northwest NPR-A Planning Area. The numbers for these cultural sites are the locators for the sites in the database of the State Historic Preservation Officer (the Alaska Heritage Resource Survey), which cannot be accessed by the public. In fact, publication of those numbers could very well jeopardize the FOIA exemption for those sites.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

According to the DEIS, cultural resources are protect through a number of means, 'such as restricting development along the Meade and Chipp Rivers and along the Kuk and Ikpikpuk Rivers and their major tributaries, or making these areas unavailable for leasing' (DEIS, p II-5). However, Alternative A shows no areas that are unavailable for leasing and no stipulations which restrict development along the listed rivers. Therefore, no means of protecting these resources has been established for this alternative. **(Comment No. 253-324)**

Response To: Comment 253-324

Section 106 of the National Historic Preservation Act (as amended) and the Archaeological Resource Protection Act provide protection for cultural resources in regard to any undertaking on the public lands of the United States. Section 106 requires consultation with the State Historic Preservation Officer and possibly other interested parties to develop ways to mitigate the adverse affect on significant resources; the Archaeological Resource Protection Act also makes it illegal to disturb archaeological sites. These requirements exist in law and need not be stipulated.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

50 The DEIS, BLM repeatedly makes reference to the fact that BLM is unsure about the severity of impact on cultural resources that would come from oil exploration and development, citing the scattered natural of the cultural deposits and the unknown locations of many deposits (DEIS, p. IV-193). However, in each case BLM acknowledges that such activities may have an impact on cultural resources. In addition, the DEIS notes that the more oil and gas associated activities, the greater the chance that locales of cultural resources would be impacted (DEIS, p. IV-449). Yet despite this, no effort has been made to protect the cultural resources in Alternative A. We urge BLM to ensure protection of these resources in the chosen alternative through stipulations specific to cultural resources as well as restricted development along the above-mentioned rivers. **(Comment No. 253-326)**

Response To: Comment 253-326

Please see the response to comment 253-324 above.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

In addition, BLM acknowledges that 'the single greatest potential impact to cultural resources in the Northwest Planning Area is the construction of a permanent road' both in terms of lineal coverage of ground and excavation of gravel (DEIS, p. IV-523). According to the DEIS, 'gravel deposits ' mineral material - that have surface exposure almost always support one or more cultural resource sites' (DEIS, p. IV-523) and 'therefore, the more gravel deposits that are excavated for the construction of permanent facilities associated with development, the more chances that significant impacts to cultural resources would occur' (DEIS, p. IV-450). While BLM goes on to explain that the construction of permanent gravel pads, roads or airstrips is considered unlikely (DEIS, p. IV-511), such construction is allowable under both Alternatives A,B and C. Plus, in light of the February 18 announcement by BLM of Conoco-Phillips' request to develop three fields within the Reserve and to connect them by permanent gravel road to Alpine, we believe the chances of such permanent roads in the Northwest is considerably higher than BLM has implied. In fact, the DEIS itself notes, if a road within the Northwest Planning Area 'were to be linked to a road traversing the Northeast Planning Area, which in turn were to be connected to a road tying into the Dalton Highway the potential impacts to the regional cultural resources would increase exponentially' (DEIS, p. IV-524). For these reasons, cultural resourcespecific stipulations and protections must be more adequately present in the chosen alternative. **(Comment No. 253-327)**

Response To: Comment 253-327

Please see the response to comment 253-324 (Cultural Resources).

42. TOPIC : ANILCA

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS does not provide an adequate basis for determining compliance with section 810 of ANILCA. 16 U.S.C. § 3120. **(Comment No. 253-328)**

Response To: Comment 253-328

Section 810(b) of ANILCA states "If the Secretary is required to prepare an Environmental Impact Statement pursuant to section 102(2)(c) of the National Environmental Policy Act, he shall provide notice and hearing and include the findings required by subsection (a) as part of such environmental impact statement." It is because of this policy that EIS analyses and ANILCA 810 evaluations have been historically and inextricably linked. When an EIS is prepared, an ANILCA 810 analysis must accompany the EIS. Therefore, an ANILCA 810 finding was required, pursuant to ANILCA 810(b) and not necessarily NEPA. As a result, just as the EIS/IAP was a draft document, so was the ANILCA Analysis. Section 810(a) of ANILCA states that: "In determining whether to withdraw, reserve, lease or otherwise permit the use, occupancy or disposition of public lands under any provisions of law authorizing such actions, the head of the Federal agency having primary jurisdiction over such lands or his designee shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which reduce or eliminate the use, occupancy, or disposition of public lands for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be affected until the head of such federal agency— (1) gives notice to the appropriate State

agency and the appropriate local committees and regional councils established pursuant to section 805 (2) gives notice of, and holds, a hearing in the vicinity of the area involved; and (3) determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal mount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions." Step (1) has been accomplished, with letters being sent out in December 2002/January 2003 to both the state and the local governments on the North Slope (this letter accompanied the flyers that were sent to various community governments announcing the ANILCA 810 Hearing/Public Meetings). Step (2), the holding of the Hearings, was accomplished in February 2003. All of the information that was collected at the ANILCA 810 Hearings/Public Meetings will be used to craft the final ANILCA 810 analysis, which will also analyze the preferred alternative. The determination of (3), above, could not be accomplished, because the hearings had not occurred. ANILCA 810(b) requires the ANILCA analysis be included in the IAP/EIS. Therefore, if the ANILCA analysis did not accompany the draft document, we would be in violation of ANILCA. It is BLM policy to complete a thorough and exhaustive ANILCA 810 analysis once the preferred alternative has been determined and to include the analysis in the Final IAP/EIS. This analysis includes all decisions required by ANILCA 810(a). During the 30-day review period between publication of the Final document and publication of the Record of Decision (ROD), the document will be available to the public for comment.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

First, as an initial defect the Analysis in Appendix 5 does not discuss how ANILCA 810 interrelates with the Environmental Justice Executive Orders, and the various Environmental Justice discussions in 1 DEIS Sections III and IV do not discuss this either. This failure must be corrected in the revised DEIS and/or FEIS. **(Comment No. 253-334)**

Response To: Comment 253-334

A section pertaining to how the ANILCA 810 corresponds to Environmental Justice statutes will be included in the Final IAP/EIS.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Fourth, the DEIS makes an inadequate showing on the necessity and minimal land factors. As noted above, once an initial determination is made that subsistence uses may be significantly restricted, as the DEIS Appendix 5 so finds for some of the Alternatives and the Cumulative case, Section 810 requires that the Secretary give notice, hold hearings and make certain findings before the proposed activity can proceed. Specifically, the Secretary must determine that such a restriction is 'necessary and consistent with sound management principles for the utilization of public lands.' The Secretary must further determine that the proposed activity will involve the minimal amount of land necessary and that reasonable steps have been taken to minimize the effects on subsistence uses. Here, the DEIS fails to specify the size, frequency and timing of sales, making such a determination all but impossible. The DEIS does not contain sufficient justification for a conclusion that reasonable mitigation measures would be taken to minimize the effects on subsistence uses. Finally, as previously discussed, the DEIS has completely failed to demonstrate that this particular leasing program is necessary at this time. Thus, as a matter of both NEPA and ANILCA analysis, at the present time there is an insufficient basis for resolving the second tier requirements of ANILCA 810. **(Comment No. 253-338)**

Response To: Comment 253-338

Please see response to comments 253-40 (Legal) and 253-328 (ANILCA).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

The ANILCA Section 810 Analysis in Appendix 5 reaches a nearly identical finding that 'if development occurs in the insect relief areas of the TLH, significant impacts to the productivity of the herd could result, thus affecting an important subsistence resource." **(Comment No. 254-618)**

Response To: Comment 254-618

The BLM believes that Alternative A is potentially the most disruptive to TLH caribou. The BLM has developed a Preferred Alternative that incorporates greater protection for caribou and provides more mitigation for their protection, as well.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

BLM's role under ANILCA is to assure that such consequences will not fall on our subsistence lifestyle, so we are a little bothered that the Draft EIS/IAP says that this Alternative's impact will be minor while simultaneously identifying some potentially major, longterm impacts. These conclusions give us little or no confidence that Alternative A will protect subsistence resources and NPR-A communities. Alternative B fundamentally provides no more assurances to subsistence users than Alternative A. **(Comment No. 254-619)**

Response To: Comment 254-619

Please see the response to comment 254-618 (ANILCA).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Because its proposed management of the Northwestern NPRA may substantially restrict subsistence use, the BLM has prepared an ANILCA section 810 analysis. This analysis is buried in the appendices to the Draft EIS/IAP. We feel that this should have been provided to the communities in the NPRA separately from the Draft EIS/IAP. Burying this analysis in an appendix to a complex two volume, several thousand page Draft EIS/IAP is not the way to get the word out to the North Slope's NPRA communities that their interests may be in jeopardy. **(Comment No. 254-668)**

Response To: Comment 254-668

Section 810(b) of ANILCA states "If the Secretary is required to prepare an Environmental Impact Statement pursuant to section 102(2)(c) of the National Environmental Policy Act, he shall provide notice and hearing and include the findings required by subsection (a) as part of such environmental impact statement." It is because of this policy that EIS analyses and ANILCA 810 evaluations have been historically and inextricably linked. Indeed, every EIS that has been produced in Alaska since 1985 contains an appendix that is the ANILCA 810 analysis. The ANILCA 810 analysis is included in Volume II of the IAP/EIS in Appendix 5: ANILCA Section 810 Analysis of Subsistence Impacts. Information on which the 810 evaluation is based must also be included as part of the environmental impact statement. Please see the response to comments 254-669 and 254-671 regarding comments made by local communities and tribal governments on the final ANILCA 810 Evaluation.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Opportunity to comment (written and oral) on the Section 810 ANLICA analysis has been combined with public comment on the Draft EIS/IAP. This does not solicit meaningful comments from North Slope residents. This is especially true in a region where, for many adult residents, English is a second language. ANILCA and the National Environmental Policy Act ('NEPA') require different analysis. NEPA focuses on consideration of alternatives and the affected environment, but the impact to subsistence is only a small part of a much larger overall analysis. ANILCA section 810 requires an evaluation focusing on and limited to the effects on subsistence, the alternatives to the impacts on subsistence, and the reasonable steps necessary to minimize any such effect. Frankly, marrying the analysis of alternatives required in NEPA with the analysis of impacts to subsistence under ANILCA only muddies the waters and distracts attention from the Section 810 analysis. As a matter of policy and fairness, analysis and public comment on the Section 810 analysis needs to be separated from the NEPA EIS process. Subsistence rights and access are complex issues on the North Slope, issues that have remained unsolved by the State of Alaska for years. Adding several layers of hypothetical development scenarios on top of the enormous documentation and complexity of the EIS analysis is patently unhelpful and deprives subsistence communities of the ability to comment effectively. Those of us who are even aware of the existance of BLM's ANILCA Section 810 analysis are unable to effectively comment on it because it is not an analysis of how the BLM will actually manage the Northwestern NPRA planning area. We are left to discuss among ourselves and representatives from other Villages an analysis that is based on abstract alternatives, none of which are likely to reflect the way that the Northwest NPR-A Planning Area will be managed. Nor is it clear that we will get an opportunity in the future to comment on BLM's Section 810 findings or if BLM intends to consider this the required public process, then make the Section 810 findings without ever giving the affected Inupiaq the opportunity to review and comment on the specific findings before they become final and BLM considers the process completed. BLM has reserved from the present Section 810 analysis its determination of three critical factors factors that are preconditions for compliance. Under Section 810(a)(3), BLM must (1) determine whether restrictions on subsistence are necessary, consistent with sound managment, (2) whether the proposed activity will involve the minimal amount of public lands necessary, and (3) whether reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources. This is, of course, the heart of the whole discussion, but BLM has not yet given the public its analysis of those factors, but has simply pursued the separate notice and hearing portions of the requirements, thus raising the spectre that the only notice and public hearing may come at a point when no member of the public has BLM's analysis of the critical factors. The Draft EIS/IAP is silent on whether there will be an opportunity to review and comment on BLM's proposed findings and analysis on these three critical factors before BLM' s actual Section 810 conclusions are reached. Due to its failure to adequately notify and involve the affected communities of its ANILCA Section 810 analysis and the infirmity of conducting such an analysis based on abstract NEPA alternatives which are probably not representative of the management plan that will be adopted, we feel that the BLM should do a separate ANILCA 810 analysis once it reaches a decision on how it will manage the Northwest NPR-A. This is the only real way to incorporate Inupiaq input into the determination of what impacts the management of the Northwest NPR-A will have on subsistence, whether this management is consistent with sound management practices, and what steps should be taken to minimize impacts to subsistence. **(Comment No. 254-669)**

Response To: Comment 254-669

The meetings that were held after the release of the Draft IAP/EIS this past spring were two types: 1) Public Meetings, and 2) joint ANILCA 810 Subsistence Hearing/Public Meetings. Every meeting that was held on the North Slope (in the communities of Point Lay, Wainwright, Atqasuk, Anaktuvuk Pass, Nuiqsut, and Barrow) was an ANILCA 810 Subsistence Hearing/Public Meeting. The hearing officer at all of these meetings was Arnold Brower, Jr. (who also provided translation). Flyers, radio announcements, and letters sent to the various communities specified that the meetings were combined ANILCA 810 Subsistence Hearings/Public Meetings. At each hearing/meeting, BLM gave a PowerPoint presentation explaining that the meeting was an ANILCA 810 Subsistence Hearing/Public Meeting. Additionally, and as required by policy, the hearing officer read a statement before he began to take public comments in which it was stated that the purpose of the hearing was in response to the ANILCA 810 evaluation, but if anyone wanted to comment on other aspects of the plan, they could do so. The decision to combine the ANILCA 810 hearings with a joint public meeting was made for several reasons: 1. Most

communities on the North Slope have commented that they are experiencing "meeting burnout" in that too many meetings occur, and it is difficult to discern what information is actively being solicited at each. It was felt that if we had two separate meetings, one ANILCA 810 hearing, and one public meeting about the draft NW NPR-A Plan, that the same information, concerns, and issues would be identified at each, and we would be contributing to this burnout. 2. Precedent had been set, in that during the public meetings for the NE NPR-A, the ANILCA 810 hearing occurred simultaneously. Therefore, the decision of the planners to hold a joint Public Meeting/ANILCA 810 hearing was viewed as acceptable, since it had occurred before on the North Slope with no complaint. 3. ANILCA 810 provides that the notice, hearings, and findings required by that statute be presented as part of the EIS.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

We would ask that the final EIS/IAP specifically state that there will be an opportunity to so review and comment on BLM' s proposed findings on these three critica factors under the Section 810 analysis, as we do not believe any other procedure would comply with the purposes and language of Section 810. This opportunity is critical because, as this letter demonstrates, the Alternatives in the Draft EIS/IAP do not incorporate all of the reasonable steps that will minimize impacts to subsistence. **(Comment No. 254-671)**

Response To: Comment 254-671

When an EIS is prepared, an ANILCA 810 analysis must accompany the EIS. Therefore, an ANILCA 810 finding was required, pursuant to ANILCA 810(b) and not necessarily NEPA. As a result, just as the EIS/IAP was a draft document, so was the ANILCA Analysis. Section 810(a) of ANILCA states that: "In determining whether to withdraw, reserve, lease or otherwise permit the use, occupancy or disposition of public lands under any provisions of law authorizing such actions, the head of the Federal agency having primary jurisdiction over such lands or his designee shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which reduce or eliminate the use, occupancy, or disposition of public lands for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such federal agency— (1) gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to section 805 (2) gives notice of, and holds, a hearing in the vicinity of the area involved; and (3) determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions." Step (1) has been accomplished, with letters being sent out in December 2002/January 2003 to both the state and the local governments on the North Slope (this letter accompanied the flyers that were sent to various community governments announcing the ANILCA 810 Hearing/Public Meetings). Step (2), the holding of the Hearings was accomplished in February 2003. All of the information that was collected at the ANILCA 810 Hearings/Public Meetings will be used to craft the final ANILCA 810 analysis, which will also analyze the preferred alternative. The determination of (3), above, could not be accomplished, because the hearings had not occurred and a Preferred Alternative had not yet been selected. ANILCA 810(b) requires the ANILCA analysis be included in the IAP/EIS. Therefore, if the ANILCA analysis did not accompany the draft document, we would be in violation of ANILCA. It is BLM policy to complete a thorough and exhaustive ANILCA 810 analysis once the preferred alternative has been determined and to include the analysis and findings in the Final IAP/EIS. This analysis includes all findings required by ANILCA 810(a). During the 30-day review period between publication of the Final document and publication of the Record of Decision (ROD), the document will be available to the public for further comment.

Comment From: City and Native Village of Nuiqsut (Comment Letter No. 80026)

NPR-A IAP/EIS and ANILCA 810(a): The complex issues brought about by the need for subsistence determinations under ANILCA 810(a) are very difficult for our community to grapple with at the same time as dealing with the stipulations and issues with the NPR-A IAP EIS. The ANILCA 810(a) issue is very technical and should be the subject of a process separate from the Northwest NPR-A IAP/EIS as much as possible, and the subject of at least one additional separate public hearing in our community. **(Comment No. 80026-1018)**

Response To: Comment 80026-1018

Please see responses to comments 253-328 (Criterial for Range of Alternatives), 254-668 (ANILCA), and 80077-946 (Government-to-Government). See also the General Lease Stipulations and Required Operating Procedures for the Preferred Alternative, specifically Required Operating Procedures H-1 and H-2.

Comment From: Public Meeting on DEIS - Wainwright, Alaska (Comment Letter No. 80079)

HEARING OFFICER BROWER: There's a provision in ANILCA that would protect all of the subsistence. They would have to go around it. (In Native) **(Comment No. 80079-987)**

Response To: Comment 80079-987

The BLM depends on its Subsistence Advisory Panel to help bring local issues to our attention.

43. TOPIC : ENVIRONMENTAL JUSTICE

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

While the draft IAP/EIS clearly reflects efforts taken to achieve meaningful public participation during the scoping process, the section which addresses Environmental Justice does not provide the public and decision maker with a clear understanding of the efforts taken to: 1. identify low income and people of color communities that will be impacted by the project; 2. identify whether the impacts of this project will be disproportionate on low income and/or people of color communities; and 3. describe the efforts that were taken to inform the communities about the impacts, what was heard from the community about the project, and how what was heard, was (or will be) incorporated into the decisions that were made about the project. Documentation of such efforts and analysis is needed to determine if federal Environmental Justice (EJ) requirements have been met. EPA recommends that the final IAP/EIS provides the detailed discussion on the criteria used in developing the EJ analyses for the final IAP/EIS. For your information, EPA's National Guidance for Conducting Environmental Justice Analyses (1998 Peer Review Version) contains recommended methodologies for conducting EJ analyses that may prove useful in the further development of the final IAP/EIS. This guidance (henceforth referred to as EPA's EJ Guidance) also provides the basis for our review of the EJ analyses presented in the draft IAP/EIS. We would be happy to provide a copy of this guidance document upon request. **(Comment No. 261-99)**

Response To: Comment 261-99

The BLM believes that the explanation in Section IV.C.16. Environmental Justice adequately details the criteria used to identify low income and people of color communities that potentially could be impacted by the project. This section, as well as Sections IV.D.16, IV.E.16, and IV.F.8.p, also clearly identifies any potential disproportionate impacts from activities in the Northwest NPR-A on low income and people of color

communities. This approach is in keeping with Executive Order 12898 for Environmental Justice, and with the latest Council on Environmental Quality and current EPA guidance for assessing disproportionate impacts on low income, minority populations. The EPA's new draft guidelines have never been finalized and have not been circulated, reviewed, and adopted by agencies other than EPA. Meaningful public participation by potentially affected low income, minority communities is discussed in detail in Section III.C.5 Environmental Justice and again in Section IV.C.16. Because the IAP/EIS is not a decision document and must be completed before a decision is made, it cannot reflect final decisions made about the leasing process or how community input affected that decision. Community input was considered in development of the Preferred Alternative. Please see Section VI.D of the IAP/EIS.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

While the draft IAP/EIS indicates that the population within the planning area is "homogeneous,"the final IAP/EIS should present the source(s) of information that form the basis for such a statement. As presently written, the draft IAP/EIS does not present this information. The draft IAP/EIS also uses 1993 average household income data for the State of Alaska to begin analysis of income, yet provides no discussion of why these data (now 10 years old) are still applicable and appropriate for use in the EJ analysis. The reasoning for use of these data, particularly when 2000 Census data are readily available, should be included in the final IAP/EIS. Income data must also be specific to the communities in the planning area. **(Comment No. 261-112)**

Response To: Comment 261-112

The BLM believes that the discussion provides adequate context for the population being characterized as "homogeneous." The 1993 income data are used to indicate the trend in the amount household and per capita incomes from then until 1999 (an increase). Borough data for 1999 and 2000 Census data are also cited in the text.

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

And that paragraph, I humbly request the Environmental Justice Order 12898 dated February 11, 1994, by President Clinton to be inserted in the final decision for Northwest EIS. Further executive summary indicated under subsistence activities, particularly hunting and fishing in the planning area are exceedingly important to the Native people of the Alaska North Slope and are vital toward the survival of an indigenous tribal existence. The Executive Order, I repeat Executive Order 12898 charges to identify subsistence consumption of our Inupiat nation. **(Comment No. 80074-887)**

Response To: Comment 80074-887

The BLM acknowledges the great importance of the Planning Area to Inupiat subsistence hunting and fishing and the importance of these subsistence activities to "the survival of an indigenous tribal existence." The BLM will include the text of Executive Order 12898 on Environmental Justice in the text of the Final EIA/IAP, and, if legal protocol allows, in the Record of Decision.

44. TOPIC : SUBSISTENCE

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Section II. D. of the draft IAP/EIS indicates that Alternatives A, B or C would all have high, disproportionate impacts on subsistence users in the project area. Although the draft IAP/EIS indicates that, for the most part, impacts would be short-term, minor or negligible in the general analysis, we have concerns that impacts ranging from one season to five years on a subsistence resource may not be 'minor' or 'negligible,' especially when that resource constitutes 50-80% of subsistence food supplies. **(Comment No. 261-107)**

Response To: Comment 261-107

The subsistence-harvest patterns and Environmental Justice analyses for Alternatives A through C do not say that impacts ranging from one to five seasons on a subsistence resource would be considered "minor" or "negligible." For Alternatives A and B, the text states that if development occurred in critical insect-relief areas, the Teshekpuk Lake Caribou Herd could experience long-term population and productivity effects—up to 5 years or longer. Because many critical habitats and harvest areas would be unavailable for leasing under Alternative C, potential population and productivity effects on the Teshekpuk Lake Caribou Herd would not be expected.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The level to which subsistence resources will be degraded by oil and gas exploration and development is inextricably linked to the impact these activities will have on fish and wildlife resources both throughout the planning area and at sites specifically used for subsistence. As discussed previously, the DEIS fails to adequately assess the impact of oil and gas exploration and development on these resources, and on subsistence usage, on a site-specific basis. This failure to adequately disclose and analyze impacts to subsistence on a site-specific basis also violates NEPA. An adequate assessment of impacts would likely conclude that proposed activities under all Alternatives that allow any exploration (including seismic exploration allowed under one version of the No Action alternative) or development activities will, in fact, significantly restrict subsistence uses without regard to the cumulative case. In addition, given the uncertainty of information available concerning impacts on many wildlife species, BLM simply cannot justify any conclusion other than that a significant restriction may occur under each exploration and development **(Comment No. 253-336)**

Response To: Comment 253-336

Please see response to comment 253-328 (ANILCA).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

53 Third, the Analysis does not discuss the Naval Petroleum Reserves Production Act (NPRPA). The NPRPA requires the Secretary of the Interior to give 'maximum protection' to 'any significant subsistence ... fish and wildlife ... values.' 42 U.S.C. § 6504(b). The House Report accompanying passage of NPRPA says that the statute requires that the 'Secretary of the Interior should take steps to minimize any adverse effects on native subsistence requirements and associated fish and wildlife values", and suggests scheduling of exploration activities as one way to reduce such impacts. U.S. House of Representatives, Interior and Insular Affairs Committee, House Report No. 94-81, Part I, p. 21 (March 18 and April 22, 1975), to accompany H.R. 49. The NPRPA, therefore, provides an independent basis for requiring the Secretary to chose an alternative, and mitigation measures, that satisfy any legitimate NPRPA oil and gas leasing objectives but which offers the maximum protection possible to subsistence resources. The ANILCA 810 discussion does not take into account the Secretary's NPRPA additional obligations concerning subsistence. **(Comment No. 253-337)**

Response To: Comment 253-337

A section pertaining to how the ANILCA 810 corresponds to the Naval Petroleum Reserves Production Act will be included in the Final IAP/EIS.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

I also participated in the planning process of the Northeast Section of NPR-A. My general feeling about the two is that in the Northeast area there were very important wildlife issues because of the critical calving and insect relief areas for the Teshekpuk Herd and waterfowl molting and nesting areas. In the Northwest area there are wildlife issues but the major issue here is impact to the people that live here. Most of the residents of the North Slope live, hunt and camp in the Northwest region, so there is potential to impact more people. Because of this potential impact, the first thing I would like to request is enough time for us to have a town meeting and assistance from BLM to have a subsistence workshop to discuss how local people want to deal with potential impacts. The public process has been very rushed and I don't think most people really understand the implications of this new stage of development. During the planning process for the northeast region, we had a subsistence workshop in Nuiqsut and it gave us a good opportunity to discuss mitigation measures. It would be very useful if we could have a well-attended workshop in Barrow where people could discuss various options for how to minimize the impact of exploration and development on hunting and fishing camps and wildlife resources. It seems like we still have time before March 18th to have a town meeting and workshop and submit the recommendations that come from it. **(Comment No. 80075-412)**

Response To: Comment 80075-412

As requested at the Barrow Hearing, a Barrow community workshop was held on March 7, 2003. The meeting was organized jointly by the North Slope Borough, City of Barrow, Native Village of Barrow, and the Inupiat Community of the Arctic Slope. Staff from the Bureau of Land Management attended the meeting and provided a briefing for participants. Staff also made themselves available as the meeting progressed to answer questions or provide clarification when questions arose. With regard to scheduling a subsistence workshop similar to the meeting held in Nuiqsut for the Northeast NPR-A planning process, the information developed at that meeting was utilized during the scoping process. One of the recommendations adopted at the Nuiqsut meeting was the establishment of a NPR-A Subsistence Advisory Panel. Consequently, during scoping for the Northwest NPR-A plan, a subsistence workshop was conducted in Barrow in conjunction with a scheduled NPR-A Subsistence Advisory Panel meeting. Specific issues concerning access, cabins, and wilderness were posed to the panel and the audience. Information was recorded and made part of the scoping process.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

Even though I know that it is legal, you know, from going to public meetings and stuff that it's legal for people to hunt within industrial activity and industry says that they're going to ensure that people could hunt and do what they normally do or have done in the past. But the big thing is that people aren't going to want to go there. If there is a pad there with a -- I'm not sure what the terminology is but if industry is there I'm not going to want to go there. I'm going to want to go someplace to camp or to hunt. So subsistence activity hunting patterns that have been traditional for a long time where people go, where families go like my family, may change. And I think it's the responsibility of BLM as well as industry to deal with this issue and to come up front with it because I don't want this to happen to our people. Pretty soon there's not going to be no place else to go. **(Comment No. 80075-507)**

Response To: Comment 80075-507

Please see the response to comment 254-612 (Subsistence).

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

And then the implications on subsistence hunter during, right now, there is a horrific impact going on to the hunters in so much that they are suspended from that area because of the seismic and that's the same impacts that is going to be associated in an area in the high use -- in the high area where you plan to have the most -- where we expect the most lease sales in the map on the right-hand, that has the low, high and moderate areas. The high area has to be the concentrate of the most likelihood of impacts and therefore when you impact a subsistence hunter that's gone on a small boat, you have created some liability for that man's life, for the family's life. Those are not taken into consideration. **(Comment No. 80075-511)**

Response To: Comment 80075-511

Please see the responses to comments 254-612 (Subsistence) and 80075-508 (Stipulations, Required Operating Procedures, and Mitigations).

Comment From: American Society of Mammologists (Comment Letter No. 249)

Further, the alteration of migration route in bowheads has negatively impacted the native Inupiat, whose culture depends on whale hunting. Instead of boating 1-2 miles out on the Arctic Ocean to hunt bowheads, the Inupiat are forced to travel 30 or more miles out on the Arctic Ocean to find bowheads, which can lead to increased mortality rates in the hunters. This factor must also be considered. **(Comment No. 249-523)**

Response To: Comment 249-523

For effects on bowhead whales, see Section IV.C.11.b.(1). This section states that "...only under exceptional circumstances—when whales migrate near the coast coincident with the presence of barge traffic, or possibly air traffic to supply a shoreline camp or aerial surveys along barrier islands or offshore areas—is it likely bowheads would be disturbed by activities associated with the management plan...effects from such exposure are likely to be negligible." As to negative impacts on Native subsistence whaling due to alteration in the bowhead migration route, no citation is offered by the commenter and no corresponding text is presented in Orians et al., 2003. Bowhead whale quotas have been consistently met for the last 15 years, and Inupiat have only rarely been forced to travel 30 miles or more. There is no existing evidence to suggest this effort has led to increased whaler mortality. More specifically, as Northwest NPR-A development would concentrate onshore and bowhead whale migration is typically well offshore, it is unlikely that whales would experience intense or even frequent disturbance from noise originating from Northwest NPR-A activities (see Sec. IV.C.14.b.(1) Effects on Subsistence-Harvest Patterns). In the longer term, Section IV.F.8.n., Cumulative Effects on Subsistence-Harvest Patterns states: "Limited monitoring data prevent effective assessment of cumulative subsistence-resource damage; resource displacement; changes in hunter access to resources; increased competition; contamination levels in subsistence resources; harvest reductions; and increased effort, risk, and cost to hunters. Effects cannot be properly projected without monitoring harvest patterns and the effectiveness of mitigating measures, and any effective monitoring regime must include serious attention to traditional Inupiat knowledge of subsistence resources and practices. Development already has caused increased regulation of subsistence hunting, reduced access to hunting and fishing areas, altered habitat, and intensified competition from nonsubsistence hunters for fish and wildlife (Haynes and Pedersen, 1989)." Orians et al. (2003) concurs with this lack of baseline information. The USDOI Minerals Management Service has begun the study "Quantitative Description of Potential Impacts of OCS Activities on Bowhead Whale Hunting and Subsistence Activities in the Beaufort Sea" to address just these issues.

Comment From: The North Slope Borough (Comment Letter No. 80065)

It is not our intention to allow permanent surface facilities in the entire planning area. In certain limited areas, we do not believe that such facilities and their associated activities can be made compatible with critical resource concentrations or subsistence uses. **(Comment No. 80065-571)**

Response To: Comment 80065-571

The BLM agrees that in certain critical habitat and harvest areas permanent surface facilities would never be compatible. With this in mind, BLM developed a Preferred Alternative that gives greater protection to critical areas for caribou and marine mammals. Given the present agency policies on oil development, it is difficult to guarantee the permanence of restrictions of any kind.

Comment From: The North Slope Borough (Comment Letter No. 80065)

This section states that 'seismic activities, overland moves, and exploratory drilling all occur during the winter when the ground is frozen and snow-covered and many species have migrated out of the area. These activities can briefly impact the species that remain through the winter.' It must be emphasized that the fall and winter represent a time when fish and wildlife resources are available to subsistence users beyond the coast and rivers that generally provide access in the summer. This expanded range of subsistence activities allows the harvest of ungulates and furbearers over a wider range than in the summer. The potential for industry and hunter contact and disruption of subsistence activities is therefore in some areas more likely in the winter. It is also likely that in the winter, wildlife resources are more vulnerable to natural environmental stresses. Many experience limited forage and thermoregulatory challenges, including severe cold, high winds, compacted snow and ice cover. The effect of addition stresses resulting from industrial activities may be more pronounced during this time. **(Comment No. 80065-584)**

Response To: Comment 80065-584

The text in the Executive Summary and in the effects discussions for the No Action Alternative (Sec.IV.B.14.b(2)), Alternative A (Sec.IV.C.14.a.), and Alternative B (Sec.IV.D.14.a) has been changed to include additional potential winter impacts to ungulates and furbearers from seismic activities.

Comment From: The North Slope Borough (Comment Letter No. 80065)

It is said that 'Alternative A will have the greatest impact primarily because it would likely lead to the most seismic surveys, exploratory drilling, and development', and the conclusion is reached that 'impacts to subsistence and recreation generally are classified as no more than minor.' It is unclear how such a conclusion can be reached if exploration and development are permitted in the entire planning area, including areas containing concentrations of subsistence cabins, camps, and use sites. As evidenced by the experience of our village of Nuiqsut, industrialization clearly displaces subsistence users from traditional use areas even if no legal impediments to access are imposed. Most subsistence use areas are concentrated along the seacoast, rivers, and lakes. Permitting development to occur in these areas would create a likelihood that large numbers of subsistence users would be displaced from traditional use sites, including cabins and campsites, which in some cases have been utilized for many generations. Such displacement would certainly constitute a far greater than minor impact. **(Comment No. 80065-586)**

Response To: Comment 80065-586

The statement that effects on subsistence resources and harvests would be no more than minor is based on the premise that exploration and development would not be permitted in the entire Planning Area. If exploration and development occurred in caribou insect-relief areas, effects are expected to increase to moderate or high levels. Stipulations prevent exploration and development from impacting subsistence cabins, camps, and use sites and provide setbacks along rivers and lakes. The Preferred Alternative defers exploration and development in Kasegaluk Lagoon and Peard Bay, and establishes restrictions on oil and gas activities in Dease Inlet, Admiralty Bay, and other coastal areas, thus reducing potential displacement of hunters from their traditional use sites. The text in Sections IV.C.14.d and IV.C.14.f and IV.D.14.d and IV.D.14.f has been changed to indicate potential impacts to subsistence cabins, camps, and traditional use sites.

Comment From: The North Slope Borough (Comment Letter No. 80065)

At the end of the summary of cumulative effects on Page Summary-v, it is stated that 'access to subsistence-hunting areas and subsistence resources, and the use of subsistence resources could change if oil development reduces the availability of subsistence resources or alters their distribution patterns.' The certainty of displacement under those circumstances must be clearly indicated in the document. **(Comment No. 80065-587)**

Response To: Comment 80065-587

The text has been revised in the Executive Summary and Section IV.F.8.n. to stress the certainty of displacement under the circumstances described.

Comment From: The North Slope Borough (Comment Letter No. 80065)

We do not agree that non-oil and gas activities will result in 'little net change' to community activities and subsistence hunting. We say this because such effects have been noted already in at least the three communities of Kaktovik, Nuiqsut and Barrow. Aerial surveys by fixed wing aircraft and helicopters have disturbed subsistence hunting. This section should cite interviews with subsistence hunters that have described such effects. In Kaktovik, hunters have noted that biological research was one of the most disruptive activities within the Arctic National Wildlife Refuge during a period of intensive research by the U.S. Fish and Wildlife Service in the 1980s and 1990s. **(Comment No. 80065-590)**

Response To: Comment 80065-590

The BLM analysts have read many scoping and public meeting transcripts over the years, and we are unaware of the body of comments that describe impacts on subsistence hunting in Nuiqsut and Barrow from fixed wing aircraft and helicopter aerial surveys. We are aware of the problems in Nuiqsut from increased flights by industry aircraft to and from the Alpine development. We have noted hunter concerns in Kaktovik from U.S. Fish and Wildlife biological research aircraft, but Kaktovik is too distant to experience effects from aerial surveys or potential exploration and development overflights from the NPR-A. The BLM would ask the commenter to provide BLM with the sources for these interviews with Barrow and Nuiqsut hunters where they describe impacts on subsistence from aircraft so this information can be included in future EIS analyses.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Ultimately, the need for subsistence protections in Northwest NPR-A is only going to grow. As indicated in the increasing population figures in the Draft EIS/IAP, populations in the affected communities are rising, which increases demand on the subsistence resources. In addition, development is squeezing the Kuukpikmiut out of portions of our traditional subsistence range, which will force us west into the Northwest NPR-A. There has been substantial evidence, including that set out in our March 6, 2002 comment letter on the first two Alpine satellites ("March 6, 2002 EA Letter), that Nuiqsut subsistence users have been treating areas around the Alpine pipeline and other facilities as off limits to subsistence uses, probably as a result of past run ins with oil field security personnel at Prudhoe Bay and Kuparuk. pp. 17-18, 25. There have been no studies examining either the size of the areas Curtis Wilson April 2, 2003 Page 7 of 25 that have thus effectively been excluded from the Kuukpikmiut' s subsistence range or the impacts of the increased concentration of uses in the remaining areas. How big an area is being avoided' What does this do to the economics of subsistence, such as to the out-of pocket costs of fuel and outboard and snowmachine maintenance, especially if we are forced into travelling the longer distances from Nuiqsut into Northwest NPR-A' If the 5 proposed Alpine Satellites are constructed, how much more of our traditional subsistence range will be effectively eliminated' If even half of the other 10 possible Alpine Satellites which BLM has identified in the Alpine Satellite Development Plan are eventually constructed, there will be even more impacts. Based on the direct experience that we have had with the oil industry on Kuukpik-owned land and on lands within our traditional subsistence range, we want more established rules and more protections included as terms within leases, not less.16 **(Comment No. 254-612)**

Response To: Comment 254-612

The BLM acknowledges the need for additional subsistence protections in the Northwest NPR-A. To this end BLM formed the Subsistence Advisory Panel (SAP) and the Research and Monitoring Team (RMT) as part of the mitigation protocol for Northeast NPR-A leasing and exploration. The SAP is made up of area-wide members from local subsistence communities who report subsistence issues to BLM. Under a RMT study mandate, BLM held a North Slope Subsistence Impact Monitoring Program Workshop in Barrow in April 2003 with the intention of establishing and funding a cooperative monitoring program that would address local subsistence concerns slope-wide. These issues and concerns would be reported to BLM for action. See response to comment 80077-946 (Government to Government)for a discussion of the developing North Slope Science Strategy--a BLM research initiative that has superceded the RMT. One issue to be addressed by this program will be areas rendered off limits by exploration and development activities, especially by security personnel. The issue of potential conflicts between subsistence activities and security needs continues to exist. ROP H-1 in the Preferred Alternative outlines a procedure to address these potential conflicts. The MMS studies "Quantitative Description of Potential Impacts of OCS Activities on Bowhead Whale Hunting and Subsistence Activities in the Beaufort Sea," and "Subsistence Mapping of Nuiqsut, Kaktovik, and Barrow: Past and Present Comparisons" will address reductions in subsistence harvest areas, overconcentration in remaining harvest areas, and the changes in subsistence costs due to changes in areas. The BLM welcomes Kuukpik to submit written suggestions for further mitgation and protections that it believes should be attached to the terms of leasing.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Draft EIS/IAP p. IV.458 (Emphasis supplied.) A similar dire sounding conclusion is reached on the cumulative sociocultural impacts if alternative A is adopted. Draft EIS/IAP IV-462 says: Because of the primary dependence of Point Lay, Wainwright, Barrow, Atqasuk, and Nuiqsut on the subsistence caribou harvest from the CAH, TLH, and WAH caribou, cumulative effects could potentially chronically disrupt sociocultural systems in the community for a period longer than 5 years - a significant effect. Effects from industrial activities, changes in population and employment, and the accompanying changes in subsistence-harvest patterns, social bonds, and cultural values would be expected to disrupt community activities and traditional practices for harvesting, sharing, and processing subsistence resources, but they would not be expected to displace sociocultural institutions, social organization, or sociocultural systems. This conclusion is not internally consistent. How could chronic disruption of the caribou herds not displace our sociocultural systems' **(Comment No. 254-617)**

Response To: Comment 254-617

The distinction being made here is between the "disruption" of sociocultural institutions, organizations, and practices and the "displacement" (or "replacement") of sociocultural institutions, organizations, and practices. The BLM believes that effects on caribou lasting 5 years or longer would produce a significant effect on sociocultural systems, but we do not believe that the practice of caribou hunting would be displaced or replaced. It would remain an important subsistence activity.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Roads create easy avenues that can be used by outsiders who are not North Slope residents to compete with North Slope residents for caribou and other resources. To the extent that roads are permitted, BLM should prohibit a permanent road in the Northwest NPRA planning area from connecting with a road system or dock outside the Planning Area unless the local communities are in favor of it. More may be needed to protect local subsistence users from outside competition. If a road in the NPR-A is connected to a commercial airport, it would be fairly easy for Anchorage or Fairbanks sport hunters to access caribou in the NPRA by catching a commercial flight to Barrow and then renting or borrowing a highway vehicle. For this reason we ask that the BLM seriously consider whether protection of subsistence resources also requires that no permanent road in the Northwestern planning area connect to a commercial airport (although we recognize local communities may value access for themselves over impacts from access by other). Competition for subsistence resources can also come from the oil and gas workers temporarily brought to the North Slope to work. The BLM should adopt a stipulation prohibiting hunting and trapping by a lessee's employee, agents and contractors while on work status. This is standard oil industry practise across the North Slope, but it would be preferable to have it clearly stated in the leases. **(Comment No. 254-633)**

Response To: Comment 254-633

If roads are constructed for Northwest NPR-A activities, BLM's intent is that they will not connect with commercial airports or be open to public travel. These restrictions would prevent sport hunters from urban Alaskan areas from competing with local subsistence hunters.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

The Kuukpikmiut have already been cut off from approximately a third of our traditional subsistence hunting range by the closure of the Prudhoe Bay area to hunting and by our interactions with security guards at Kuparuk.52 Having lost so much already, we do not want to also lose any more of our traditional subsistence range to the oil industry. The impact of oil and gas infrastructure on subsistence hunting is not limited to restrictions on access. As noted above and as recognized by Phillips, Nuiqsut residents avoid oil facilities even where hunting is permitted. As facilities and infrastructure spread West from Kuparuk and Alpine into NPR-A, they will occupy areas used by more and more North Slope residents in Atkasuq, Barrow and Wainwright. The same avoidance mechanism that Nuiqsut has experienced will start reducing the subsistence ranges of those communities by far more than the footprint and legal buffer around the facilities. These impacts need to be taken into account in any cumulative impacts analysis, as well as in designing stipulations for subsistence protection. Facilities in the Northwest Planning Area will be among the greatest concentration of communities on the North Slope. Simply put, stipulations must build in buffers keeping oil facilities away from areas of high subsistence use (which may not be coterminous with the areas of high resource value, which should also have such buffers). **(Comment No. 254-635)**

Response To: Comment 254-635

Please see the responses to comments 254-612 and 249-523 (both in Subsistence).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

The Draft EIS/IAP notes that Nuiqsut residents have testified in the past that development in Prudhoe Bay and Kuparuk has already cut them off from a third of their traditional subsistence hunting range. Draft EIS/IAP p. IV.212. The lack of a stipulation guaranteeing subsistence users access to areas occupied by industry indicates to us that the BLM does a good job recording our concerns but a poor job addressing them. **(Comment No. 254-1009)**

Response To: Comment 254-1009

The BLM has considered your comment in developing the Preferred Alternative, see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures.

Comment From: Olgoonik Corporation (Comment Letter No. 169)

The subsistence maps that are not in the draft should be updated as well as the cabins, campsites and designated historical sites. **(Comment No. 169-711)**

Response To: Comment 169-711

The subsistence harvest areas and the cabins, campsites, and historical sites on the maps in the draft EIS represent the best available information from the North Slope Borough, the ADF&G, and the recent subsistence report Passing on the Knowledge: Mapping Human Ecology in Wainwright, Alaska (Kassam, 2001). The BLM would appreciate any further map updates the community could provide.

Comment From: Paul Hugo (Comment Letter No. 187)

It is important that you are aware that we are directly affected, since this is our food. We all hunt them during both migration, storing the meat for winter and drying them during the fall season, as in the spring migration we again store and dry the meat for the summer season. **(Comment No. 187-963)**

Response To: Comment 187-963

The BLM is aware of concerns about potential effects on subsistence activities. The IAP/EIS evaluates potential impacts to subsistence resources, subsistence-harvest patterns, and sociocultural systems (see Section IV.B for the No Action Alternative analyses, Section IV.C for the Alternative A analyses, Section IV.D for the Alternative B analyses, Section IV.E for the Alternative C analyses, Section V for the Preferred Alternative analyses, and Section IV.F for the cumulative analyses). Additional measures to mitigate impacts to subsistence activities were developed for the Preferred Alternative.

Comment From: Public Meeting on DEIS - Wainwright, Alaska (Comment Letter No. 80079)

MR. BODFISH: My name is Homer Bodfish from Wainwright. I'm a tribal member of Wainwright. Here, I've got evidence of a book that you should know Passing the Knowledge, Mapping Human Ecology in Wainwright, Alaska. Plus we got a whole bunch of people that make this book a couple years ago. If you want to see it it's been in BLM. **(Comment No. 80079-985)**

Response To: Comment 80079-985

The BLM is aware of the report "Passing on the Knowledge. Mapping Human Ecology in Wainwright Alaska" by Kassam, K. and the Wainwright Traditional Council. It was been cited numerous times in the Subsistence-Harvest Patterns discussions in the Draft and Final IAP/EISs.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

The Draft EIS/IAP notes that Nuiqsut residents have testified in the past that development in Prudhoe Bay and Kuparuk has already cut them off from a third of their traditional subsistence hunting range. Draft EIS/IAP p. IV.212. The lack of a stipulation guaranteeing subsistence users access to areas occupied by industry indicates to us that the BLM does a good job recording our concerns but a poor job addressing them. Kuukpik-28 **(Comment No. 254-994)**

Response To: Comment 254-994

The BLM has considered your comments in developing the Preferred Alternative, see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures.

45. TOPIC : FISH

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Figure III-25 depicts many of the fish species found in the arctic environment. The draft IAP/EIS describes the life histories of the freshwater (e.g., lake trout, arctic grayling, blackfish, northern pike, stickleback, etc.), anadromous and amphidromous (e.g., pink and chum salmon, arctic cisco, least cisco, rainbow smelt, humpback whitefish, etc.), and marine (arctic cod, saffron cod, arctic flounder, etc.) fish species in the NW Planning Area. Both the public and decision makers would benefit from maps identifying fish species and their distribution, summer and overwintering habitat, and spawning areas be included in the final IAP/EIS. In particular, some of the water bodies important for the migration, rearing, and spawning of anadromous fish may be available by the Alaska Department of Fish and Game (ADFG) in their anadromous stream catalogue. In addition, EPA recommends strengthening existing stipulations and ROPs to minimize potential adverse impacts to sensitive fish species and their habitat areas. Sampling of NPR-A lakes revealed that lakes or ponds deeper than 6-ft, with suitable spawning substrate, appeared to support the largest and most diverse populations of arctic fish (p. III-43). Map 11 and Map 89 identify the locations and depths of lakes and ponds in the NW NPR-A. Deep water lakes and ponds deeper than 6- ft, which provide for overwintering habitat should be managed under special considerations, such as appropriate and effective buffers, no water withdrawals, no gravel extraction, etc. EPA recommends that additional stipulations and ROPs, set backs and other measures be developed to manage deep water lakes and ponds based on best available information. **(Comment No. 261-125)**

Response To: Comment 261-125

The stipulations for setbacks (buffer zones) for deep-water lakes under the Preferred Alternative have been established at ¼ mile (Section II.C.6). This would prohibit gravel removal from the beaches of these lakes without special authorization. Waterbodies used by anadromous species as listed in the ADF&G Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes have been added to Map 86. Also, stipulations for water withdrawals have been revised to be consistent with ADNR and AOGCC.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, No Action Alternative, Fish, Effects of Disturbances, Page IV-59. This section discusses the possible impacts to fish populations from seismic operations. References that report the results of the described studies are listed below: Greene, C.R. 2000. Vibrator sounds in a frozen arctic lake during a winter seismic survey. Greeneridge Sciences Inc. San Francisco. Nyland, D.L. 2002. Water column pressures induced by vibrators operating on floating ice. The Leading Edge. Vol. 21:751-754. **(Comment No. 251-160)**

Response To: Comment 251-160

The suggested reference related to seismic operations (vibroseis) has been added.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

This symbol represents stipulations required in the Northeast Planning Area Record of Decision but dropped from the Northwest Planning Area DEIS without adequate analysis or rationale. In a few instances the dropped stipulation was replaced with a weaker stipulation or 'required operating procedure.' That change is noted in the following analysis directly beneath the dropped stipulation. **(Comment No. 253-363)**

Response To: Comment 253-363

The stipulations for water withdrawals (Section II.C.5) have been revised in the Preferred Alternative to be in agreement with State DNR and Alaska Department of Fish and Game, as to the restrictions applied to water usage where overwintering fish are present. No pumpage from rivers would be permitted. In this document, the term "resident" fish refers to species that spend most or all of their life in freshwater.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The NRC (2003) concluded that there was inadequate information on water withdrawals to accurately assess the impacts on fish and aquatic ecosystems and that 'because of a lack of information it is not possible to determine whether biota associated with North Slope lakes are protected by regulations that cap water withdrawal from lakes' (p. 210). Therefore, such studies are necessary prior to completion of this draft NW Plan. **(Comment No. 253-365)**

Response To: Comment 253-365

Preliminary monitoring studies done by both BP and ConocoPhillips Alaska, Inc. indicates that there are no measurable effects when less than 15% of the under-ice water volume is removed. Currently, there is no data

available that would demonstrate that limited water withdrawals from deep-water lakes are harmful to overwintering fish.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

On the essential fish habitat it is stated in a lot of public meetings such as this that they will not adversely affect the habitat and that have read the assessment but it does not guarantee anything. We are very concerned that disturbing habitat in this area may be contributing to the decline of fish and other subsistence resources that our tribal members depend on. **(Comment No. 80075-477)**

Response To: Comment 80075-477

The stipulations from this plan that create buffer zones along major subsistence fishing rivers and deep lakes are intended to minimize the chance of contaminating or degrading fish habitat.

Comment From: The North Slope Borough (Comment Letter No. 80065)

The assumption that of an estimated recovery of 3 to 5 years for fish (marine, anadromous, or freshwater) from a major oil spill does not consider that multiple cohorts (age, size) could be acutely and severely depleted. The reproducitve performance would likely not recover in that time frame considering the longevity and the very delayed age of sexual maturation of certain arctic species as compared to more southerly species of fish (e.g., many years may be required to replace a local stock's reproducive cohort). Severe oiling may also produce unsuitable habitat and fish will not return or be reproductively succesful well beyond 3 to 5 years. The persistence of oil in these North Slope brackish and freshwater ecosystems (weathering, biodegradation, etc.) is not known, and given that oil can penetrate many of the abiotic matrices (e.g., peat in lowland tundra, crevaces), the effects on fish can not be predicited with any certainty and could certainly persist beyond 3 to 5 years. **(Comment No. 80065-593)**

Response To: Comment 80065-593

The text has been revised per the comment to indicate recovery times may require a decade or more for essential fish habitat and marine fisheries resources to recover from an oil spill. Published and peer-reviewed studies confirm the discrepancy identified by the commenter.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Stipulations should also be put in place to protect fish from harm caused by the withdrawal of water. In a land where lake ice can be more than 5 feet thick, overwintering habitat for fish is very important. To protect fish overwintering habitat the BLM should prohibit any water withdrawal from lakes less than 7 feet deep that are tapped, or tappable, by fish bearing streams or rivers. These lakes create only marginal overwintering habitat that cannot withstand the withdrawal of any water. Because fish bearing lakes change from year to year, depending on factors such as flooding, we believe that all marginal lakes should be protected. In other words, we simply are not comfortable with any relaxation of stipulations if the proponent of such activity has some evidence that no fish were present because fish may be introduced to a lake after it has been surveyed (through annual spring flooding, when rivers overflow their banks and spread out over large areas of the flat, already water-saturated tundra). When a lake is deeper than 7 feet, limited amounts (but not more than 15%) of the unfrozen water may be withdrawn before impacting fish overwintering habitat. Water withdrawal from these lakes in the Northwest NPR-A should be limited accordingly by stipulation. In addition, the compaction or

removal of snow from fish bearing lakes (except at approved ice road crossings) should be prohibited in order to prevent the lake or river from freezing even deeper. A stipulation should prohibit the withdrawal of water (not including ice chips taken from grounded ice) from streams and rivers. These water sources, and their fish spawning habitat, are too sensitive to be drawn from directly. Finally, to prevent the accidental introduction of fuel and other contaminants into the rivers and lakes in the NPRA, winter exploration camps and the refueling of winter exploration equipment should be set back a 500 feet from frozen rivers or lakes. **(Comment No. 254-662)**

Response To: Comment 254-662

Please see the response to comment 253-363 (Fish) above.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Lakes less than 7 feet deep are still important for use in the construction of ice roads and ice pads, which can be done in a manner that is fully protective of fish. Our research has found that the majority of lakes less than 7 feet deep do not support fish populations that could be sensitive to water withdrawal (broad whitefish, grayling, etc.) unless it has a seasonal connection to a stream. The fish that are in the more shallow lakes are typically nine-spined stickleback or Alaska blackfish, both species known to be resistant to water withdrawal. The literature has demonstrated that these fish can tolerate lower dissolved oxygen concentrations than other less resistant fish on the north slope (Lewis et al, 1972). **(Comment No. 255-760)**

Response To: Comment 255-760

Stipulations for water withdrawals (Section II.C.5) in the Preferred Alternative have been revised to be in agreement with ADNR and ADF&G regulations. Stipulations to address ice chip removal and shallow lake water withdrawals where nine-spine stickleback or Alaska blackfish reside are included under the Preferred Alternative.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Pages IV-99 & IV-136. Gravel Removal Section. See Comment #3 above. Recent studies by the U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game recognize there are potential benefits to local fish and bird populations from locating and rehabilitating gravel pits within floodplains. **(Comment No. 255-824)**

Response To: Comment 255-824

Required Operating Procedure E-8 recognizes the potential benefits of gravel pits located within floodplains.

Comment From: NOAA (Comment Letter No. 209)

Pg. IV-61 Essential Fish Habitat Evidence exists of viable, self-sustaining salmon populations in the Northwest Planning Area that constitute an important subsistence food source. The Essential Fish Habitat (EFH) section needs to clarify whether the action will have an 'adverse effect' on EFH. A finding that the action may adversely affect EFH triggers an EFH Assessment and requires consultation with NOAA Fisheries. **(Comment No. 209-909)**

Response To: Comment 209-909

Additional discussion of EFH has been added to Section III of the final IAP/EIS. Based on that discussion and given the protection provided by the mitigation measures formulated for this IAP/EIS, the Preferred Alternative is not expected to adversely impact salmon or their habitat and has been assigned the EFH determination: May affect, not likely to adversely affect. That designation has been added to the EFH discussion in Section IV.

Comment From: NOAA (Comment Letter No. 209)

Pg. IV-143 Effects of Spills Paragraph 2. The concentration of petroleum in the water is one of many factors that measure the severity of oil or fuel spill impacts. The time of year, type of material spilled, the location of the spill, and exposure time are some other factors. In the arctic environment the potential for oil and fuel related spills to remain for long periods is high. Coastal bays and lagoons sheltered by barrier islands are natural traps for oil and fuel spills. Any oil under ice or in broken ice flows has a high chance of persisting. **(Comment No. 209-912)**

Response To: Comment 209-912

The recommended verbiage has been added to the EIS.

Comment From: NOAA (Comment Letter No. 209)

Pg. IV-144 Effectiveness of Stipulations and Required Operating Procedures, paragraph 1 The last sentence in this paragraph contradicts the first sentence and earlier statements. 'The potential for fuel and oil spills to contact marine fish would be mitigated for Alternative B by waste prevention, handling, and disposal requirements and spill stipulations (A-1 through A-3) and ROPs (A-3 through A-8). However, for the reasons explained above, fuel and oil spills associated with this alternative are not expected to have any measurable effect on marine fish. Hence, these stipulations are not expected to have any beneficial effect for marine fish populations.' Earlier statement - 'Waste prevention, handling, and disposal and spill stipulations A-1 through A-3 and ROP's A-3 through A-8 would be most likely to benefit marine fish populations [Pg. IV- 61, paragraph 3].' We recommend you revise this text, as well as the same statement on Pg. IV-275, to reflect the mitigative value of the measures you have identified. **(Comment No. 209-913)**

Response To: Comment 209-913

The contradictory statements have been revised. The Stipulations and ROP's have the potential to greatly mitigate the potentially adverse effects of introducing wastes and chemical spills into waters inhabited by marine fishes, by minimizing potential vectors of introduction to aquatic habitats, and by being prepared to respond to spills in a timely manner.

Comment From: NOAA (Comment Letter No. 209)

Pg. IV-275 Conclusion ' First Sale, paragraph 1 The DIAP/EIS estimates a 120,000 bbl oil spill from one sale in Alternative B, yet under the multiple sale section (next page) the estimate projects up to a 476 bbl spill. Please clarify or adjust these figures if they are incorrect. **(Comment No. 209-916)**

Response To: Comment 209-916

The Draft IAP/EIS provides an analysis for a very large (i.e., 120,000 bbl) oil spill. However, a very large spill is a low-probability event (see Section IV.J). The Draft IAP/EIS estimates a single large oil spill of 500 or 900 bbl, and multiple smaller spills (Table IV-19 and IV-20) as a result of the first sale. Multiple sales may result in additional spills as indicated in the tables.

46. TOPIC : RESEARCH AND MONITORING TEAM

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS fails to clearly define and clarify the role of monitoring within the Reserve or provide a summary of what has been accomplished to date and a time line for additional monitoring in both the Northeast and Northwest Planning Areas. The monitoring program for the Reserve is inadequate and significantly behind schedule. To date, the Resource Monitoring Team (RMT) has focused largely on evaluating research priorities. Little, if any, work has been allocated to monitoring. **(Comment No. 253-29)**

Response To: Comment 253-29

The following list includes long-term monitoring studies that BLM has conducted in NPR-A: 1. Long-term monitoring of cliff-nesting raptors along the Colville River (surveys since 1952 and annually since 1978). 2. Monitoring of the Teshekpuk Lake Caribou Herd; movements, range use and demography (20+ year cooperative effort among ADFG, BLM and North Slope Borough Dept. of Wildlife Management). 3. Monitoring of impacts to tundra vegetation from seismic exploration and ice road construction in the NPR-A (since 1999). 4. Monitoring of land bird populations in the Umiat area. Since its beginning the Research Monitoring Team has been active in the development of BLM's monitoring program. The BLM's NPR-A Research and Monitoring Team provided a number of recommendations to the BLM in 2002, many of which the BLM has since begun to implement. These include the continuation of some existing efforts and the implementation of some new projects. They also included a suggestion for three workshops to bring together experts for discussion in specific areas: the impacts of oil and gas exploration activities on arctic tundra vegetation, the design and implementation of a cooperative monitoring program to document and mitigate the impacts of oil and gas exploration and development on subsistence activities, and the standardization of methods for aerial bird surveys conducted on Alaska's North Slope. Most of the projects recommended involved work with birds. These included studies to determine the relative importance of avian nest predators on the reproductive success of ground-nesting birds, the density and productivity of yellow-billed loons (a "rare" species) in the NPR-A, and the influence of oil and gas development on the nest success of shorebirds. The population distribution of molting geese in the Teshekpuk Lake area, which was studied in the late 1980's, will be looked at again to assess any changes and document selection of specific shoreline habitats. Another study will look at data on tundra swan distribution, collected since the mid-1980's, to see if there has been any shift in nesting distribution in response to oil field facility development and whether swan population trends in the oil fields differ from trends for swans throughout Alaska's North Slope. Finally, it was recommended that a long-term monitoring effort of cliff-nesting raptors along the Colville River be continued. Besides studies of birds, efforts were recommended in several other areas. Two studies related to subsistence users included a summary of existing data on subsistence harvest and seasonal land use activities for Nuiqsut, Barrow and Atqasuk, and a comprehensive effort to document local knowledge on the life histories of fish species important to subsistence. Another effort involving fish is a project to determine the impacts to fish overwintering in lakes of seismic exploration activities ("vibroseis") on the lake's frozen surface. And on the mammalian front, it was recommended that the BLM support a larger effort to study caribou demography, distribution, movement and reproductive success in relation to oil field infrastructure.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

EPA supports the ongoing efforts of the Research and Monitoring Team and their continued efforts for monitoring effectiveness of stipulations in the NW NPR-A. The team should be expanded to include other interested stakeholders such as Tribes, industry, and non-governmental organizations. **(Comment No. 261-81)**

Response To: Comment 261-81

The Research and Monitoring Team (RMT) has been replaced with a new organization that BLM is developing with additional Federal agencies, the State, the North Slope Borough and others. Please see section II.F.8. in the Final IAP/EIS for a description.

Comment From: Audubon Alaska (Comment Letter No. 213)

Monitoring: Audubon is very concerned that the monitoring program for the NPR-A is inadequate and significantly behind schedule. To date, the RMT has focused largely on evaluating research priorities. Little, if any, work has been allocated to monitoring. We request that BLM clearly define and clarify the role of monitoring within the NPR-A and provide a summary of what has been accomplished to date and a time line for additional monitoring in both the Northeast and Northwest planning areas. **(Comment No. 213-208)**

Response To: Comment 213-208

Please see discussions regarding the past and current efforts as well as the future role of the Research and Monitoring Team in responses 253-29 and 261-81 (Both in Research and Monitoring Team).

Comment From: Audubon Alaska (Comment Letter No. 213)

The Research and Monitoring Team will help guide the monitoring effort in the planning area.' To date, the RMT has focused largely on evaluating research priorities. Little, if any, work has been allocated to monitoring. Audubon is very concerned that the monitoring program for the NPR-A is inadequate and significantly behind schedule. Aud ubon requests that BLM clearly define and clarify the role of monitoring within the NPR-A and provide a summary of what has been accomplished to date and a time line for additional monitoring in both the Northeast and Northwest planning areas. **(Comment No. 213-367)**

Response To: Comment 213-367

See comment response 253-29 (Research and Monitoring Team).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS (p II-39) states that BLM will expand the Research and Monitoring Team (RMT) formed pursuant to the ROD for the Northwest Plan. The Northeast ROD stated: 'Monitoring will be undertaken to determine the status of the various resources in the planning area, to ensure compliance with the enforcement of plan decisions and with stipulations attached to separate land use authorizations, and to measure the effectiveness of protective measures. The Research and Monitoring Team will help guide the monitoring effort in the planning area.' To date, the RMT has focused largely on evaluating research priorities. Little, if any, work has been allocated to

monitoring. We are very concerned that the monitoring program for the Reserve is inadequate and significantly behind schedule. We request that BLM clearly define and clarify the role of monitoring within the Reserve and provide a summary of what has been accomplished to date and a time line for additional monitoring in both the Northeast and Northwest Planning Areas. **(Comment No. 253-374)**

Response To: Comment 253-374

Please see the response to 253-29 (Research and Monitoring Team).

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The Service supports the proposal to expand the mission of the Research and Monitoring Team pursuant to the Record of Decision for the Northeast Planning Area EIS. The Service recognizes that the amount we do not know about the ecology and dynamics of the Alaskan arctic far exceeds what we know. We believe that a collaborative effort to identify and fund the research that is needed is the only logical way to fill the data gaps that exist. We look forward to working with BLM in this effort. **(Comment No. 260-650)**

Response To: Comment 260-650

The Research and Monitoring Team has been replaced with a new organization that BLM is developing with other Federal agencies, the State, the North Slope Borough and others. Please see Section II.F.8. for a description.

47. TOPIC : OUTSIDE OF THE SCOPE OF THE IAP/EIS

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-18 (c), Gravel Requirements. This section needs to include a discussion about the need for inter-community roads. **(Comment No. 251-379)**

Response To: Comment 251-379

This section specifically addressed the assumptions and scenarios for the Alternatives under consideration in this IAP/EIS. Inter-community roads within the Northwest NPR-A Planning Area are mentioned in the cumulative scenario and are considered speculative at this time. The justification and feasibility of inter-community roads in NPR-A is beyond the scope of the present IAP/EIS. The BLM acknowledges that such studies are in progress with State DOT oversight. The final route selection, material requirements, and environmental impacts will undergo thorough NEPA review before ROW permits are approved

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-27-28, Roadless Development. This section needs to be revisited to incorporate recent road development planning in conjunction with the Alpine Satellite Development Project and roads proposed through the Northwest Planning process (see general comments). The economic and environmental assumptions supporting roadless development need to change consistent with changes proposed in the economic landscape

including a new potential for public sector participation in road development in this remote region of Alaska and concerns about the effects of reduced ice road seasons on economic development opportunities in NPR-A. Changing weather patterns, discussed and confirmed in this Draft IAP/EIS, point to a trunk road scenario if major discoveries are made during exploration activities in this region. The Final IAP/EIS should reflect these changes and concerns. 251-381 **(Comment No. 251-381)**

Response To: Comment 251-381

The draft IAP/EIS states that "short gravel roads...could connect nearby fields to allow sharing of infrastructure." The present IAP/EIS considers the character of development in the Northwest NPR-A Planning Area, therefore proposed activities in the Northeast NPR-A are not within the scope of the Alternatives for this IAP/EIS. These proposed roads are addressed as part of the cumulative scenario. The current plan for the Northeast NPR-A Planning Area does not allow permanent roads connecting to outside of the Planning Area. Exception to the current requirement could be made following additional analysis in the Alpine Satellite Development Project EIS. Public sector road development is also in the preliminary stage of analysis, and no final projects have been defined, proposed, approved, or funded. While the possibility exists for a future network of gravel roads in NPR-A, it is not considered reasonably foreseeable in the IAP/EIS for the Northwest Planning Area.

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

The members of the Sierra club are greatly concerned when they look at the full-scale development proposal for the National Petroleum Reserve, the full- scale development for the Beaufort Sea off shore, on the Outer Continental Shelf of Alaska. It seems that the Bureau of Land Management, the Bush administration, and their allies in Congress are open to full-scale development every place, everywhere in Alaska's Northern Slope. **(Comment No. 80082-552)**

Response To: Comment 80082-552

The IAP/EIS for the Northwest National Petroleum Reserve-Alaska addresses potential alternative for an oil and gas leasing program. No development is proposed in the IAP/EIS. Historically, not all tracts offered for lease are actually leased, only a small percentage (less than 10%) of leases have been explored, and development proposed for a small percentage (less than 10%) of the leases explored. Environmental reviews are completed for both exploration plans and development plans. Similar statistics apply for the Beaufort Sea OCS where the MMS has proposed offering tracts for lease. No development has been proposed in the Beaufort Sea OCS.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

Now, I want to point out some issues that haven't been resolved in Prudhoe. There are rightful land owners that have no right over land in Prudhoe area, West Dock (ph), I'm going to point that out because it's with my family. My father and his father, they build a sod house, ice cellar, we lost it, we have no right over it, it's case closed with Native allotment, nothing, zero, zip. And that land rightfully belongs to my family but the Federal government says, no, you have no right over it. Now, what's wrong with that picture' **(Comment No. 80077-933)**

Response To: Comment 80077-933

The Prudhoe Bay area is well outside the Northwest NPR-A Planning Area and the scope of this IAP/EIS; thus this land ownership issue is outside the scope of this project. See also response to comment 80077-942 (Sociocultural Systems).

48. TOPIC : CUMULATIVE IMPACTS AND ANALYSES

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The National Academy of Sciences National Research Council (NRC) March 2003 report Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope documents significant environmental and cultural effects that have accumulated as the result of three decades of oil development on Alaska's North Slope. Based on a review of the NRC report, the Northwest Planning Area DEIS does not adequately determine or describe the potential long-term cumulative effects of oil and gas development on wildlife and ecosystem processes. **(Comment No. 253-24)**

Response To: Comment 253-24

The National Academy of Science's National Research Council (NRC) March 2003 report Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope was released after publication of the draft IAP/EIS. The information and conclusions of the NRC report are considered in the cumulative analyses in the final IAP/EIS. The NRC report does not represent new information on the effects of cumulative oil development on Alaska's North Slope, rather it is a review of current information and an assessment of that information. The NRC report presents some important information and suggestions for areas of future research. The report does not document new "significant" effects on the environment. Projections of effects have been included in the NRC's report as appropriate. Some of the conclusions in the report are not supported by the data presented in the report and BLM and MMS subject-matter-experts do not necessarily concur with all of the conclusions presented in the NRC report. Differences of professional opinion still exist on effects of development activities on some resources including the caribou herds on the North Slope, especially the Central Arctic Herd which has significantly increased in population along with the increase in industry activity. Vegetation is a major focus of the report; effects from past, ongoing, and projected future activities have been evaluated along with projections for habitat recovery.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

In light of the information presented in the NRC Report, BLM should prepare a new DEIS. The Revised DEIS cumulative effects analysis for the Northwest planning Area should address the degree to which development in the planning area will exacerbate impacts associated with existing oil field operations elsewhere on the North Slope. In addition, an analysis of proposed development in the NPRA must include a discussion of potential activities on native corporation lands within NPR-A and adjacent state and private lands, particularly in light of existing oil leases on ASRC lands within NPR-A. There is no field-tested data to demonstrate that NPRA will not evolve into a far greater infrastructure of interconnected roads, pipelines, and drill pads, which could have significant impacts on NPRA's wildlife resources. Cumulative analysis should include all facilities, as well as secondary effects of development such as impoundments, dust shadowing, culvert failures and oil spill sites. This kind of trend analysis would show rates of gravel fill and extraction, rates of construction of roads and pipelines, number of drill pads and production pads, and distance between roads, pipelines, and other facilities within each oil field and between oil fields. The analysis that is contained in the DEIS's subsection on cumulative impacts is superficial and glosses over some serious problems. Some examples of this failure to take a hard look at specific cumulative impacts follows. BLM's prediction that future impacts may be smaller than past and present impacts is irrelevant to the cumulative impacts analysis. The task of the cumulative impacts analysis is to identify the past and present impacts and explain how they will interact and contribute with the future impacts of this project and other similar activities. Given that about 1% of oil facilities have been restored, NRC Report at 144, the DEIS should not dismiss these past developments'many of these developments are continuing to have effects that are accumulating. In analyzing each resource area, the DEIS mainly goes no farther than comparing the impacts

expected from the proposed development to those caused by past development and concluding that the impacts of the current proposal are small in comparison to past environmental impacts. This isn't the question, however. NEPA's cumulative impacts requirement is intended to uncover impacts that may seem relatively small individually, but create a significant impact when considered together. Thus, the question is 'is this the straw that breaks the camel's back.' The response, 'we're only adding one straw to the thousands that are already there,' isn't a useful answer. The DEIS is overly dismissive of the possibility of synergistic impacts. Synergistic environmental effects are commonly recognized and are more than theoretic effects that can only be 'demonstrated in the laboratory (for certain types of chemical reactions, for example) . . ..' DEIS at IV-383. For instance, the DEIS should have considered the interaction of global warming, which may stress polar bears and cause them to spend more time onshore, with increased onshore development. Similarly, global warming may have an effect on insect populations that needs to be considered in combination with the possible displacement of caribou from preferred insect relief habitat. **(Comment No. 253-148)**

Response To: Comment 253-148

The comment "there is no field-tested data to demonstrate that NPR-A will not evolve into a far greater infrastructure of interconnected roads, pipelines, and drill pads, which could have significant impacts on NPR-A's wildlife resources" alludes to the uncertainty of early predictions made for resource potential in an infrastructure-shy frontier area; this is a topic discussed in Appendix C of the NRC report. The NRC report notes that "these estimates work both ways, there tend to be more over-estimates of potential than underestimates." The appendix concludes, "(W)ith the full awareness of this uncertainty, a range of potential and cumulative effects of future oil and gas activities can be addressed. The best approach is to use the knowledge derived from known activity and its effects and project a likely case into the future, with a series of scenarios that vary the future activity within reasonably constrained limits. This approach will still not guarantee when, where, and how much. However, it should provide the most reasonable range of estimates of the overall effects of future activities." This is the approach embodied in the IAP/EIS. As noted in Section I.A of the IAP/EIS, the plan's objective is to encourage "oil and gas leasing in NPR-A while requiring protection of important surface resources and uses." In order to analyze potential effects of management actions in the Northwest NPR-A Planning Area, the IAP/EIS develops scenarios describing the full range of activities expected to occur for oil and gas exploration, initial development, additional future lease sales, and activities other than oil and gas exploration and development. These activities are described in detail in Section IV.A. In order to "rigorously explore and objectively evaluate all reasonable alternatives" as required by NEPA, the IAP/EIS examines an array of alternative packages created by varying the area within the Planning Area that might be offered for oil and gas leasing and the mitigating measures that would be applicable to that leasing. The alternatives (A, B, C, Preferred Alternative, and No Action) adequately cover the range of reasonable alternatives. Synergistic effects are difficult at best to determine in field conditions even with a comparable field control site. The abiotic resources of air and water quality are the best opportunities to identify synergistic effects but even these resources are subject to numerous highly variable parameters that do not readily translate to quantifiable effects. Global warming could be that parameter that on a grand global scale could produce synergistic effects, but the concern would then focus on ecosystem effects with some synergistic interactions suspect, but again probably not quantifiable. The projections for global warming are not a scientific certainty and may not be correct on a larger natural time frame. Global warming on a time scale that includes the ice age was not the result of industrial green house gases. Geologic history clearly shows that Earth's climate is dynamic and ever changing. While carbon dioxide as a constituent of Earth's atmosphere has been increasing since the Industrial Revolution, it has been similarly increasing since the earth started warming 18,000 years ago. Clearly, there are natural forces at work. Some experts claim global warming is more of a political issue than a scientific issue, but all sides agree the subject of climate change is a complex one.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-394 (3) Transportation for 'Roadless' Development. This section needs to be reviewed and revised consistent with recent proposals to construct permanent roads to CD-South and to the Lookout Drillsite within the NW NPR-A. **(Comment No. 251-386)**

Response To: Comment 251-386

The proposed permanent roads to CD-South and Lookout Drillsite are within the Northeast NPR-A, not the Northwest NPR-A.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

Cumulative Impacts. I am concerned about cumulative impacts that creep up on people, it's like a house. Like this week at my house. The mess may start in one room and when it gets to another it might not be alarming but when it spreads to your living room and then to your kitchen, then it becomes unbearable. Our hunting and fishing sites are spread out all around Dease Inlet and the rivers that pour into the inlet. BLM had identified the Dease Inlet area as having high oil and gas potential. My concern is that impacts may happen one well at a time. Before we know it we may be dealing with a much bigger area than was anticipated. How do we avoid that as a community' I don't have the answers, but the way the proposed lease sales are structured to deal with mitigating measures on a case by case basis without any lines being drawn on the map makes me concerned. **(Comment No. 80075-473)**

Response To: Comment 80075-473

Our document indicates that it is true that there will be some long-term cumulative effects on subsistence resources of development across the North Slope and that these effects may significantly impact subsistence and subsistence resources. This will be true whether there is oil and gas development in Northwest NPR-A or not.

Comment From: State of Alaska (Comment Letter No. 251)

It is essential that BLM consider these road proposals. We recommend that potential allseason community roads and mainline/trunk roads for oil and gas exploration and development be included in the alternatives and appropriately analyzed for human and environmental impacts as required by the National Environmental Policy Act. The assumption in the Draft IAP/EIS that private sector financing of roads makes roads unlikely needs to be revised in recognition that the State may finance roads in whole or part. In addition to providing overland transport of vehicles, the road corridors identified through the Northwest Plan may also function as electrical energy, consumer gasline and communications distribution routes. This potential infrastructure should be considered as well. **(Comment No. 251-512)**

Response To: Comment 251-512

Please see the response to comment 213-357 (Transportation).

Comment From: Western Arctic Caribou Herd Working Group (Comment Letter No. 80004)

As planning and development of NPR-A pushes westward, BLM should adequately describe potential transportation infrastructure with the region. Land managers must evaluate these changes and determine how they will be integrated within the entire western Arctic and the North Slope communities. Cumulative impacts from oil and gas development, coal extraction, hard-rock mining, and the associated transportation infrastructure within the NPR-A need to be fully analyzed relative to their potential impacts on Arctic caribou. The Working Group is concerned that the DEIS does not adqequately addreess these long-term cumulative effects. **(Comment No. 80004-530)**

Response To: Comment 80004-530

The cumulative scenario includes reasonably foreseeable expansions to oil and gas infrastructure. The cumulative scenario has been update for the Final IAP/EIS to include information from the recently submitted Alpine Satellite Expansion Project and the State-sponsored permanent road between Nuiqsut and the Dalton Highway. Coal extraction and hard-rock mining are not permitted in the NPR-A at this time or in the foreseeable future (15 to 20 years). Please also see the response to comment 213-358 (Cumulative Scenario).

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

In the cumulative impact area, the DEIS is very insufficient. For one thing, you need to take into account the National Academy of Sciences report on cumulative impact on the North Slope from oil development, and not only to include the data and the information that they lay out in their report, but in fact to find or research the areas where they say there is wholly inadequate data. **(Comment No. 80082-547)**

Response To: Comment 80082-547

Please see the response to 80082-539 and 80082-541 (Impact Evaluation).

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

In addition, development is squeezing the Kuukpikmiut out of portions of our traditional subsistence range, which will force us west into the Northwest NPR-A. There has been substantial evidence, including that set out in our March 6, 2002 comment letter on the first two Alpine satellites ("March 6, 2002 EA Letter: These are impacts that should be considered in the cumulative impacts analysis of this EIS. **(Comment No. 254-613)**

Response To: Comment 254-613

This cumulative scenario and analyses include assumptions regarding proposed and reasonably foreseeable oil and gas activities outside of the Northwest NPR-A Planning Area that may have impacts on the environmental and socioeconomic resources of the Planning Area. The Alpine Plan and initiation of the EIS process occurred after completion of the draft IAP/EIS. The Cumulative scenario and analyses have been revised to update the status of the Alpine development.

Comment From: Michael North (Comment Letter No. 80003)

For one thing, it does not incorporate the latest findings released only this month by the National Academy of Sciences regarding the extent to which cumulative effects of oil and gas development occur and go unmitigated. The findings of that report need to be incorporated into each of the alternatives presented in the draft EIS. **(Comment No. 80003-848)**

Response To: Comment 80003-848

The National Academy of Sciences National Research Council (NRC) March 2003 report "Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope" was released after publication of the draft IAP/EIS. The information and conclusions of the NRC report are considered in the cumulative analyses in the final IAP/EIS. Please also see response to comment 253-24 (Cumulative Impacts and Analyses).

Comment From: The Sierra Club (Comment Letter No. 80014)

The assessment of potential impacts from oil development is inadequate and unrealistic. The recent report, Cumulative Environmental Effects of Oil and Gas Activities on Alaskas North Slope by the National Academy of Sciences National Research Council (March 2003), documents the significant effects of widespread oil development across Americas Arctic. Those effects stretch far beyond the immediate footprint of the industrial complex itself, and are having lasting cumulative impacts on the land, water, people and wildlife of the region.- hi light of this new accumulation of information, BLM should significantly expand their analysis of the likely impacts of oil drilling in the Reserve. **(Comment No. 80014-860)**

Response To: Comment 80014-860

The BLM believes that the analytical method used to develop the exploration and development scenarios is sound, considering the degree of uncertainty about oil and gas resources and future economic conditions. A consistent methodology was used to develop the hypothetical scenario for oil and gas activities under each alternative. The BLM believes that the scope of the cumulative analysis is appropriate for this programmatic IAP/EIS and in accordance with the provisions of NEPA regulations to keep EIS's concise and no longer than absolutely necessary (40 CFR 1502.2(c)) and to evaluate broad actions generally (40 CFR 1502,4(c)(2). Please also see responses to comments 253-24 (Cumulative Impacts and Analyses), 253-146 (NEPA Process)and 253-148 (Cumulative Impacts and Analyses). The BLM believes that the cumulative effects analyses for subsistence-harvest patterns, sociocultural systems, and environmental justice look far past the existing industrial footprint and openly and adequately address the long-term effects on Native people and subsistence resources in the region. A discussion in Section IV.F.8.n., Cumulative Effects on Subsistence-Harvest Patterns, has been added to address the issues and concerns of the effects of global climate change and their impacts on the people and wildlife of the Arctic. The NRC report does not represent new information on the effects of cumulative oil development on Alaska's North Slope, rather it is a review of current information and an assessment of that information. The report does not document "significant" effects on the environment. Some of the conclusions in the report are not supported by the data presented in the report and BLM and MMS subject-matter-experts do not necessarily concur with all of the conclusion presented in the report. Relevant information from the NAS report has been incorporated into the analysis although the concept of lasting cumulative effects has been modified to include recovery times for the affected resources.

49. TOPIC : ECONOMY

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

While the draft IAP/EIS indicates that the population within the planning area is "homogeneous,"the final IAP/EIS should present the source(s) of information that form the basis for such a statement. As presently written, the draft IAP/EIS does not present this information. The draft IAP/EIS also uses 1993 average household income data for the State of Alaska to begin analysis of income, yet provides no discussion of why these data (now 10 years old) are still applicable and appropriate for use in the EJ analysis. The reasoning for use of these data, particularly when 2000 Census data are readily available, should be included in the final IAP/EIS. Income data must also be specific to the communities in the planning area. **(Comment No. 261-404)**

Response To: Comment 261-404

The BLM believes that the discussion in the three preceding paragraphs creates adequate context for the population being characterized as "homogeneous." As for the use of 1993 income data, they are used to indicate trends in the amount that household and per capita incomes have increased from then until 1999. If the commenter had read the entire discussion on income, he/she would have noted that Borough data for 1999 have and 2000 Census data have been cited.

Comment From: State of Alaska (Comment Letter No. 251)

Section III.C.1.a.(2), Page III-77, Social Systems. State Revenues. The Alaska Administrative Code citation '19 AAC 50.050' should be '3 AAC 150.050.' **(Comment No. 251-449)**

Response To: Comment 251-449

The text has been corrected.

Comment From: State of Alaska (Comment Letter No. 251)

Section III.C.1.b.(3), Page III-79, Social Systems, State Unemployment in the North Slope Borough. It is not surprising that '24 percent of the resident labor force worked fewer than 40 weeks in 1998.' This is very typical for Alaska, which has a highly seasonal economy. Many Alaskans earn sufficient income from seasonal employment (tourism, construction, fishing, logging, fire- fighting, trapping, Native crafts, etc.) and have no need to work 52 weeks a year. The EIS implies that this 24 percent of the labor force is also under-employed, and we disagree. **(Comment No. 251-450)**

Response To: Comment 251-450

The sentence states: "...22 percent of the Borough's resident labor force believed they were underemployed, and 24 percent of the resident labor force worked less than 40 week in 1998." These statements on unemployment and perceived underemployment come from the 1998 NSB census. We have used the Borough's definitions of the data and believe the Borough is making an effort to better define unemployment and underemployment.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

Tonight there's been a lot of good comments on this Environmental Draft-EIS, but there's a different area which the BLM has not done and I have stated time and again at previous meetings on the EIS system, and their programs is not -- it has been brought but a couple of times before tonight, is on the health or economic benefits or economic impacts, or social impacts or social benefits on this -- on the residents of the North Slope. And I believe that is a strong approach that needs to be done to revisit the program, on the EIS programs, how they create the EIS. Because that's one of the areas that needs to be revisited is on your process in doing an EIS. But it's mandatory by Federal statute to put this in documents, economic impacts or economic benefits or social impacts, but it's not done yet. And I have made comments in the past about previous EIS' done within the Northeast area, Prudhoe Bay area, is to go back and revisit the EIS on the previous, what the impacts are on the natural resources and that hasn't been done yet. **(Comment No. 80075-496)**

Response To: Comment 80075-496

A description of the economy is in Section III.C.1 and analysis of effects for Alternative A is in Section IV.C.12. Description of the sociocultural systems is in Section III.C.4 and analysis of effect for Alternative A is in Section IV.C.15.

Comment From: The North Slope Borough (Comment Letter No. 80065)

The Borough and our residents have a variety of goals with respect to maximizing the positive effects of oil and gas leasing, exploration, and development within the NPR-A. First, impact funds must come to the Borough in a timely manner to offset ongoing and increasing effects associated with NPR-A leasing and operations, first in the Northeast Planning Area, now in the Northwest planning Area, and likely in the Southern Planning Area in the near future. Second, every effort must be made to provide employment for North Slope residents in conjunction with any industrial operations within the NPR-A. Opportunities for economic participation by local regional and village corporations, businesses, and tribes must be aggressively developed. Agencies and the oil and gas industry must work now in our communities to encourage and train a skilled local workforce to take advantage of employment opportunities in the future. A local employment office staffed by a human resources professional, high school programs, job fairs, facility tours, and mentoring programs all would be a good start toward providing local residents with a sense that they may directly realize some of the potential benefits of expanding development. It is also a goal of the Borough to secure local sources of oil, gas, or electricity from NPR-A development to meet village energy needs. **(Comment No. 80065-577)**

Response To: Comment 80065-577

The NPR-A special revenue fund grants available for local communities are described in Section III.C.1. Fifty percent of lease sale revenues are transferred to the State of Alaska by BLM after each lease sale. The BLM believes the transfer of funds to the State from the two sales held for the Northeast NPR-A has occurred in a timely manner. The BLM believes that the State has passed on funds to potentially affected NPR-A communities in timely manner. The various aspects of employment are discussed in Section III.C.1.b and, in particular, the aspect of North Slope oil-industry employment of North Slope Borough resident Natives is discussed in Section III.C.1.b(4). The BLM cannot promote preferential hiring, but it can urge lessees to vigorously pursue existing local hire programs and encourage the development of new ones. The BLM encourages local and regional Native corporations and tribes to develop their own partnerships with the oil industry.

Comment From: Olgoonik Corporation (Comment Letter No. 169)

We strongly support the local hire from the affected communities. **(Comment No. 169-712)**

Response To: Comment 169-712

The various aspects of employment are discussed in Section III.C.1.b; the North Slope oil-industry employment of North Slope Borough resident Natives is discussed in subsection (4) of that section.

Comment From: City and Native Village of Nuiqsut (Comment Letter No. 80026)

Employment and Training: According to the State of Alaska, thirty-three percent (33%) of adults over the age of 16 are unemployed in our community. The continued lack of opportunity for employment in the oil industry is

distressing to our community. As a mitigation requirement in the Northwest NPR-A Integrated Activity Plan/Environmental Impact Statement we would like to see training to meet the necessary requirements for oil industry employment and employment programs that are effective in assuring community members work in the oil industry. **(Comment No. 80026-1014)**

Response To: Comment 80026-1014

Please see responses to comments 169-712 (Economy), 80065-577 (Economy), 80075-489 (Government to Government), and 80077-924 (Government to Government).

Comment From: Kellie Ward (Comment Letter No. 80023)

Appendix 2 mentions the economic effects in relation to employment, however it does not discuss a broader economic stance. There are important concepts to consider, such as benefits versus costs, especially marginal abatement costs. The proposal lacked projected costs for cleaning up the pollution caused by oil and gas activity. The ambient quality of this area will be greatly affected by such activity. What will the price be to obtain efficient levels of emissions where marginal abatement costs and marginal damage costs are equal' **(Comment No. 80023-835)**

Response To: Comment 80023-835

The BLM is a land management agency with the authority to lease appropriate public lands for oil and gas leasing. We do not fund research into alternative sources of energy or energy conservation. Other agencies are responsible for energy research.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

Kuukpik is blessed to have the land that they own, and they are for our people, and they are there to benefit for our people. And we have to fight so hard for what rightfully belongs to the people. We're left with broken promises by ConocoPhillips Alaska, Inc., especially with that Alpine. They promised us jobs. How many percent of Nuiqsut is working over there, three, four, out of 500 people. We're given promise after promise saying that they will take care of us and nothing, nothing ever comes that way. **(Comment No. 80077-934)**

Response To: Comment 80077-934

See responses to comments 80075-489 (Government to Government) and 80077-924 (Government to Government).

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

Now, you are the key source that they have to overcome in order to go to NPR-A. You have to give them that EIS and you have to give them your blessings. And I don't know how or what or how can you put a clause in there that will benefit the communities that are impacted, directly impacted. We share NPR-A funds with Barrow, Atqasuk and Wainwright. They don't even see a rig. They don't see the first fruits of the oil industry. They haven't felt effects of it. In Nuiqsut you'll see the effects of it. Unemployment is high. Alcohol and drug abuse is high. You have to go a long ways for subsistence. I believe there needs to be some kind of socio-economic clause in there for

this community. Because if you go down to NPR- A then we'll have to go farther. And that 4.15 a gallon, how far do you think will go to hunt for our subsistence. It's an ongoing battle with the oil industry. **(Comment No. 80077-936)**

Response To: Comment 80077-936

See responses to comments 80077-926 (Impact Compensation), 80077-935 (Impact Compensation), and 80077-945 (Government to Government).

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

Secretary of Interior Bruce Babbitt and Governor Knowles had a public hearing in Nuiqsut eight years ago before opening up NPR-A Northeast side. In broad public they stated they will open NPR-A and they promised the village with jobs. At that time we had 90 percent unemployment in the village. We still have about 70 to 80 percent unemployment in this community. When are you guys going to implement the true words from Washington, D.C., words were to this community' **(Comment No. 80077-940)**

Response To: Comment 80077-940

See responses to comments 80077-924 (Government to Government) and 80075-489 Government to Government).

50. TOPIC : REQUIRED PERMITS

Comment From: State of Alaska (Comment Letter No. 251)

Appendix 4-3, Alaska Department of Natural Resources. The water permitting reference should be changed to read - "Issues Temporary Water Use Authorizations and Water Rights under AS 46.15 for water use necessary for exploration, development, construction and operations." **(Comment No. 251-413)**

Response To: Comment 251-413

The text has been revised.

51. TOPIC : SOCIOCULTURAL SYSTEMS

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

EPA recommends that the final IAP/EIS include a separate section that includes native Traditional Knowledge and the process of gathering this information. We believe it is important for DOI/BLM to explain in the final IAP/EIS how Traditional Knowledge is being incorporated into the planning process for the Northwest NPRA, development of reasonable alternatives, and selection of a preferred alternative. **(Comment No. 261-120)**

Response To: Comment 261-120

There is a discussion in Section III.C.5, Environmental Justice, regarding the process for gathering Traditional Knowledge and how Traditional Knowledge has been incorporated into the analysis and studies processes, as well as in the development of mitigating measures. Sources for Traditional Knowledge on all the topics mentioned are not always available. The BLM believes that the Traditional Knowledge incorporated into the affected environment and effects discussions for subsistence-harvest patterns, sociocultural systems, and environmental justice, when taken in aggregate, is a representative view of local knowledge as it relates to the proposed activities in the Northwest NPR-A Planning Area. The BLM notes the suggestion for a separate section for Traditional Knowledge and how it was gathered. We chose to present both the Traditional Knowledge and the Western Scientific discussion in the same section to ensure that a balanced delivery of both sources of information is available to the reader. Local Iñupiat Traditional Knowledge has been considered in the development of the Preferred Alternative, specifically in the 10-year deferral from leasing of important subsistence-resource habitat and harvest areas in the Kasegaluk Lagoon/Dease Inlet area and in the development of mitigation measures offering greater protection for caribou.

Comment From: State of Alaska (Comment Letter No. 251)

Section III.C.4.a., Page III-115, Social Systems, Characteristics of the Population. In 1990, 72.5% of NSB residents reported they were Alaska Native or American Indian. The Census did distinguish between Eskimo, Aleut and Indian (although Inupiat, Yup'ik, Cup'ik and Siberian Yup'ik are grouped together as 'Eskimos.' 'Indians' included numerous Athabascan tribes, Haida, Eyak, and Tsimpsians.) In 1990, 4,241 of the 5,979 residents of NSB were Eskimo. The large majority are Inupiat. In 2000, 73.8% of NSB residents reported they were all or part Alaska Native or American Indian (not 68.38%, which is the number who reported they were wholly Native/Indian.) And although the Census did not differentiate between Eskimo, Aleut and Indian, it asked a more specific question ' the individual's 'Alaska Native or American Indian tribe(s).' In 2000, 5,450 North Slope Borough residents (73.8%) reported they were Section III.C.1.b.(7), Page III-81, Social Systems, Personal Incomes. The Bureau of Economic Analysis is the only annual source of income data, and it is a valid one. BLM should add the U.S. Census income data, just released for Alaska on September 25, 2002. For example, 1999 per capita income for NSB residents was $20,540 (Anchorage $25,287; Fairbanks North Star $21,553). The 1999 median family income for NSB was $63,810 (Anchorage $63,682; Fairbanks North Star $56,478). **(Comment No. 251-451)**

Response To: Comment 251-451

The per capita and median family incomes have been included in the final IAP/EIS. The reason they were not included in the draft IAP/EIS is relative to how we analyzed effects in Section IV.C.12 (page IV-188). We measure changes in aggregate personal income for the various geographic areas. The reason we include U.S. personal income relates to why we cite Federal revenues from all sources. Comments on MMS EIS's have indicated that federal revenues generated by outer continental shelf lease sales are best described in Section III, Description of the Affected Environment. To be consistent, federal revenues from all sources need to be described also. In Section IV Environmental Consequences, the effects of the proposed alternatives are analyzed--specifically in this IAP/EIS, the revenue generated from the proposed alternative compared to federal revenues (see Section IV.C.12.b page IV-188 of the draft IAP/EIS). It is very small, less than a .004 percent change. While this appears to be a non-issue, we have added the data and analysis in response to multiple comments.

Comment From: State of Alaska (Comment Letter No. 251)

Section III.C.4.a., Page III-115, Social Systems, Characteristics of the Population. In 1990, 72.5% of NSB residents reported they were Alaska Native or American Indian. The Census did distinguish between Eskimo, Aleut and Indian (although Inupiat, Yup'ik, Cup'ik and Siberian Yup'ik are grouped together as 'Eskimos.' 'Indians' included numerous Athabascan tribes, Haida, Eyak, and Tsimpsians.) In 1990, 4,241 of the 5,979 residents of NSB were Eskimo. The large majority are Inupiat. In 2000, 73.8% of NSB residents reported they were all or part Alaska Native or American Indian (not 68.38%, which is the number who reported they were wholly Native/Indian.) And although the Census did not differentiate between Eskimo, Aleut and Indian, it asked a more specific question ' the individual's 'Alaska Native or American Indian tribe(s).' In 2000, 5,450 North Slope Borough residents (73.8%) reported they were Alaska Native or American Indian, and based on tribal data, at least 4,594 of the 7,385 NSB residents were Eskimo. [USDOC, Bureau of the Census, 2000 Census, SF1, Table PCT1]. The large majority are Inupiat. **(Comment No. 251-452)**

Response To: Comment 251-452

The text has been revised to indicate the more accurate percentages of Eskimo and Inupiat residents of the North Slope Borough.

Comment From: State of Alaska (Comment Letter No. 251)

Section III.C.4.b.(1), Page III-116, Social Systems, Socioeconomic Conditions in Point Lay. We recommend removal of the word 'traditional' from the last sentence of the first paragraph. The sentence may be misleading as written. Point Lay is the only unincorporated community in the NSB, but not the only 'traditional' village. There are six 'traditional' councils and three 'IRA' councils in the NSB, in addition to City governments. 251-452
(Comment No. 251-453)

Response To: Comment 251-453

The word "traditional" has been deleted from the text in Section III.C.4.b.(1).

Comment From: The North Slope Borough (Comment Letter No. 80065)

This section also seems realistic in considering the effects of 30 years of oil development on the North Slope. There have been rather profound changes to the Inupiat culture and the basic social systems. Some of these changes may be viewed as 'beneficial', including opportunities for steady employment, vastly improved social and community services, housing, education, and health care. Negative changes certainly have also occurred, including an erosion of cultural traditions. Subsistence activities, however, remaincentral to the Inupiat culture and continue to be the single most important factor binding together extended families, communities, and the North Slope as a whole. The critical importance of continued access to subsistence resources and continued subsistence harvest opportunities, both on land and in the ocean, must be fully recognized and addressed in the Final IAP/EIS. It is likely that with development in the Northwest NPR-A Planning Area, disruption of sociocultural systems will be felt more intensely in villages already directly affected by oil and gas activities, and that the disruption will be newly felt in communities experiencing industrialization of their traditional lands for the first time. Key issues in this regard are whether the benefits of oil and gas will outweigh the negative effects, and whether there are effective methods to mitigate anticipated negative effects. **(Comment No. 80065-589)**

Response To: Comment 80065-589

The critical importance of continued access to subsistence resources is discussed in Section IV.F.8.n., Cumulative

Effects on Subsistence-Harvest Patterns.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

They promised us natural gas. Where is it' They promised jobs. Where are they' They tell us we're not qualified. They always find some kind of loophole to make us like third class citizens, and by gosh yesterday I felt like a third class citizen. **(Comment No. 80077-939)**

Response To: Comment 80077-939

For a discussion of oil industry job programs and ongoing issues with the effectiveness of these programs, see the analysis of effects for Alternative A in Section IV.C.15 for Sociocultural Systems and for Environmental Justice in Section IV.C.16. See also the Cumulative analysis section for Sociocultural Systems in Section IV.F.8.o. It is BLM's understanding that ConocoPhillips Alaska, Inc. has completed the natural gas line to Nuiqsut and that the community is waiting for the Kuukpik Corporation and the North Slope Borough to coordinate and release an RFP for the construction of the distribution system within Nuiqsut. See also Responses to comments 254-612 (Subsistence), 80077-926 (Impact Compensation), and 80065-577 (Economy).

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

We have -- I had seen unmarked grave along with an old sod house just recently, that they'd never been there in long time. When you implement your cultural historical site first before you fully develop the area of NPR-A, Northeast and Northwest site. The coastal area in the 1980s -- 1880s or so, the whole coastal area had hundreds of camp sites, where are they, you just marked three of them. But how many more are not -- unmarked yet' **(Comment No. 80077-942)**

Response To: Comment 80077-942

Section 106 of the National Historic Preservation Act requires that the lease holder identify any cultural resource, sites that might be impacted by their operations, and if the site is determined eligible for inclusion on the National Register of Historic Places (NRHP), impacts to the site must be mitigated. The NPR-A lease holders employ consultants and/or contractors who survey all areas (that might be impacted by lease holder operations) looking for cultural resource locales. In all cases, avoidance has been the mitigative procedure for any site regardless of whether it was eligible for inclusion on the NRHP or not. This information has been passed on to the Inupiat History, Language, and Culture Commission of the North Slope Borough.

52. TOPIC : VEGETATION

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

The information in Table III-06. NW NPR-A Land Cover Classifications is useful, but would be better represented as a map to show the abundance, location, and distributions of the major and minor land cover classes in the NW planning area. EPA recommends comparing this type of land classification with the Cowardin et al. System for Classification of Wetlands and Deepwater Habitats used by the National Wetland Inventory (NWI) program of the U.S. Fish and Wildlife Service. **(Comment No. 261-121)**

Response To: Comment 261-121

The land cover classification developed by BLM and Ducks Unlimited has a resolution of 30m pixels. Although there is a general trend from north to south for landcover type to change, most of the 17 cover classes are present at some frequency in most all areas of the NPR-A. A map at this level of resolution would not provide additional support or value to the vegetation analysis and so was not included in the Draft IAP/EIS. However, it is available from BLM and is part of the administrative record. The report detailing the production of the map has been published. The first publication was by Ducks Unlimited. It has recently been republished as a BLM Technical Report and is available from BLM External Affairs in Anchorage: USDOI, BLM and Ducks Unlimited. 2002. National Petroleum Reserve - Alaska Earth Cover Classification. Technical Report 40. BLM, Anchorage, AK.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Northwest NPR-A Land Cover Classification EPA recommends that the information regarding the NW-NPR-A land cover classification (Table III-06) be incorporated as a Map. This would help the public determine the distribution and location of each land cover category. **(Comment No. 261-134)**

Response To: Comment 261-134

Please see the response to comment 261-121(Vegetation).

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

For instance, the recent National Academy of Sciences report on the impacts of oil development on the North Slope finds that nonacidic tundra is vitally important to wildlife, yet the DEIS does not identify areas where nonacidic tundra is present and analyze the 24 likely effect of oil exploration development. **(Comment No. 80082-550)**

Response To: Comment 80082-550

The author of the section of the National Academy of Sciences report to which this comment refers has done, with colleagues, some research on vegetation types across the North Slope of Alaska. That research has resulted in a relatively simple land cover classification system for the entire area that includes only six vegetation categories (Muller, S.V., A.E. Racoviteanu and D.A. Walker. 1999. LandSat MSS-derived land-cover map of northern Alaska: extrapolation methods and a comparison with photo-interpreted and AVHRR-derived maps. Int. J. Remote Sensing. 20:2921-2946). The same research also suggested that vegetation on moist, nonacidic soils, which are broadly distributed across the North Slope, may be important to wildlife. However, that importance has not been studied specifically. Because the BLM has developed a land cover classification specific to the NPR-A that includes 14 vegetation categories, and because the importance to wildlife of vegetation on nonacidic soils has not been studied, we did not include discussion of the above mentioned vegetation classification or the hypothesized importance of nonacidic soils in the DEIS.

Comment From: WesternGeco (Comment Letter No. 215)

6 A study of tundra disturbance by winter seismic surveys on the eastern portions of Alaska's North Slope (Jorgenson et al., 1996) indicated that 1 to 2 years after a survey, the disturbance level to the affected tundra

under seismic lines was little to none for 11 percent of the area, low for 64, percent, medium for 23 percent, and high for 2 percent. After 8 to 9 years, recovery' The reference (Jorgenson et al., 1996) does not exist in the bibliography. This study apparently evaluated the long-term impact to the tundra from of a seismic crew operating in the 1980's. The equipment used during this period was designed in the 1960's and 1970's. Therefore, the calculated levels of disturbance are only accurate if you assume that a seismic survey conducted today would use 30-40 year old technology. Since the latter half of the 1980's, WesternGeco has made substantial advances in reducing the environmental footprint of seismic crews operating in the Arctic. Therefore, WesternGeco contends that the damage assessments are far in excess of what could reasonably be expected. These estimates should be re-calculated using appropriate correction factors that account for the technological advances of the last two decades. **(Comment No. 215-798)**

Response To: Comment 215-798

Perhaps one major difference between the IAP/EIS and the comment is the use and meaning of the words damage and disturbance. A disturbance, or impact, occurs with every movement of a vehicle over snow. However, there may be no negative consequence. The disturbance may be limited to snow compression if the snow rests on ice, in which case no disturbance would be present in the summer. At the next level, the only observable disturbance in summer may be the compression of standing dead vegetation, leaving a visual "green trail for one to a few years. In the studies referenced, this may be measured as the "none to little" level of disturbance. The IAP/EIS seldom uses the word "damage," staying with "disturbance" or "impact" to avoid implication of a negative value judgment. When the total areal extent of impacts is summarized, the total estimated acreage traversed by vehicles is used without reference to the amount in each disturbance level. The text has been revised to indicate the age of the technology used in the 1984-85 seismic exploration of ANWR, and to include data from a study by ABR, Inc. of seismic activities conducted near the Colville Delta in 2001. The BLM does not have data for the NPR-A that are suitable for describing the distribution of initial impacts.

Comment From: WesternGeco (Comment Letter No. 215)

'Because 3-D seismic involves more tight turns by heavy equipment than does 2-D, the potential for vegetation damage is greater. For this reason, the medium and high disturbance levels to tundra may occur in greater proportions from 3-D seismic lines than presented for 2-D' This statement is incorrect. The line spacing for 3-D surveys was much smaller 20-25 years ago than it is today. The vehicles in use at that time were equipped with friction steering that had a tendency to disrupt surface vegetation if they turned too sharply. The receiver line spacing in use today is in excess of 1000 feet and the source line spacing is even greater than this. Since WesternGeco utilizes at least two source lines, a typical turn is on the order of 2640 feet. In addition, most of our vehicles are steered by articulation and not the braking action of one track. To prevent damage to surface vegetation, WesternGeco prohibits 'tight turns' with any vehicle in our operations. The damage due to 'tight turns' is a thing of the past. **(Comment No. 215-800)**

Response To: Comment 215-800

The text has been revised.

Comment From: WesternGeco (Comment Letter No. 215)

'The impacts of oil exploration would include vegetation disturbance on 33,800 to 549,000 acres per year from 2D and 3D seismic surveys over the entire exploration period (10 years). About 25 percent of the disturbance would be at a medium to high level'. See Attachment A. **(Comment No. 215-808)**

Response To: Comment 215-808

The information provided by the commenter is discussing the percentage of a seismic survey area that would be disturbed. The text referred to in the comment is discussing the percentage of the disturbed area assumed to have medium to high impacts for purposes of this analysis. These percentages do not refer to the same areas. No change is needed to the text.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-127, Seismic Activities. In the late 90's, CPAI and its seismic contractors began development of new equipment designs that would result in minimal tundra impacts. New articulated, rubber-tracked, low ground pressure (<1 to 4.5 psi) machinery has been designed, field tested and is now becoming standard equipment for North Slope seismic surveys. As stated previously, to evaluate the potential benefit from these new machines in protecting the tundra, CPAI recently completed a survey of tundra damage from seismic surveys shot in 1999, 2000, and 2001, in the NPRA and Colville River Unit. Overall, this study found that only about 8% of trails were judged to be moderate disturbance, and no areas of high disturbance were found. We point out this new study for two reasons: (1) to provide updated information on the benefits of the new machinery; and (2) to suggest that the large acreage of assumed tundra disturbance presented in this discussion should be updated to more accurately reflect future NPRA seismic impacts. We believe using these new techniques will significantly reduce the amount of disturbed acreage in NPRA. **(Comment No. 255-828)**

Response To: Comment 255-828

The text under the No Action Alternative, where impacts of seismic exploration to vegetation are first analyzed, has been revised to address the issue of more modern equipment and to compare the results of a more recent study of impacts (2001) with those from a 1986 study. The total acreage affected by seismic exploration, as reflected in this analysis, remains a result of the scenario used for estimating annual seismic exploration efforts by the industry. Please see the response to comment 215-798 (Vegetation).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-128, 5th para. This section assumes ponding will occur for 164 feet on all sides of gravel pads, which will impact 1000 acres in Alternative A. For clarification, based on our coperation experience, we do not see ponding on all four sides of gravel pads. When ponding occurs, it typically only occurs along one or two sides of any pad. Drill pads are very seldom built in a 'depression', where local drainage would carry and hold water against all four sides. Typically drainage is away from one or more sides of pads. Hence, disturbed acreage estimates in this discussion seem excessive. **(Comment No. 255-830)**

Response To: Comment 255-830

The author agrees that it is not likely that ponding would occur on both sides of a road or all four sides of a pad. However, the side(s) opposite of ponding may also be affected by drying due to lack of surface flow input. The text has been revised to present this. The total acreage presented for these types of effects over five oilfields (<1,000 acres) is a range, meaning that it is not expected to exceed 1,000 acres. The total acres presented in the summary include all effects (i.e., flooding, drying, dust, snow drifting, etc.) and these different impacts are not necessarily additive in areal extent. The flooding/drying situation has the potential to affect the greatest acreage, so it overshadows the others when discussing total acres of vegetation potentially altered.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-131, Conclusions. The acreage estimates of disturbed tundra resulting from seismic surveys seems excessive and based on equipment now longer used. New articulated, rubber tired, and low psi equipment developed in the past few years cause significantly less damage. See previous comments. This section needs to be updated so EIS reviewers have a more accurate impression of this potential impact. **(Comment No. 255-831)**

Response To: Comment 255-831

Please see the response to comment 255-828 (Vegetation).

53. TOPIC : WETLANDS

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

According to the draft IAP/EIS, approximately 95% of the NW Planning Area would be classified as wetlands. EPA recommends that additional Stipulations and/or ROPs be developed for the NW planning area to minimize potential adverse impacts to important wetland resources and floodplains per Executive Order 11990 (Protection of Wetlands) and Executive Order 11988 (Protection of Floodplains). EPA recommends that additional guidelines be developed to ensure that impacts to wetlands for construction of roads, gravel source sites, well pads, and airstrips comply with the Clean Water Act Section 404(b)(1) Guidelines. The final IAP/EIS should address the potential direct and indirect effects (including cumulative effects), to wetlands resources from these development activities. **(Comment No. 261-123)**

Response To: Comment 261-123

The Lease Stipulation and Required Operating Procedures Package in the Draft EIS as well as the Final EIS were developed with the knowledge that activities would affect wetlands, as has all previous oil development on Alaska's North Slope. All developments would have to include consultation with the U.S. Army Corp of Engineers in compliance with the Clean Water Act, Section 404.

54. TOPIC : GOVERNMENT-TO-GOVERNMENT

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

EPA commends DOI/BLM for engaging the Native Alaskan villages in meaningful public participation during the scoping process by producing scoping documents in the native language of the impacted communities. However, there is no indication that the draft IAP/EIS (or documents summarizing the draft IAP/EIS) was translated into Inupiat for the affected villages. Since comments from the Inupiats on the draft IAP/EIS are desired and should continue to influence decision-making, translation of important materials is also an important part of accomplishing 'meaningful participation' with the Inupiats. The final IAP/EIS should document the efforts taken by DOI/BLM in engaging the affected EJ communities by identifying written materials that have been provided in the Inupiat language as well as meetings held with EJ communities to discuss their concerns. Meetings with Native Alaskan villages may be necessary to explain the proposed alternatives, how these were developed, how Inupiat input from the scoping meetings affected alternative development for the final IAP/EIS,

and to request further input on the development of the IAP. **(Comment No. 261-102)**

Response To: Comment 261-102

The Executive Summary the final IAP/EIS will be available in the indigenous language of Iñupiaq.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

EPA recommends that the draft IAP/EIS for the NW-NPR-A include a separate section that addresses the federal government's (DOI/BLM's) Tribal Trust Responsibilities. The draft IAP/EIS should document the tribal consultation process used by DOI/BLM to formally consult and/or coordinate with interested Alaskan Tribes in the Northwest Planning Area on a Government-to-Government basis. 'Consultation' means the process of seeking, discussing, and considering the views of federally recognized Tribal governments at the earliest time. Typically, consultation means two-way communication that works toward a consensus reflecting the concerns of the affected federally recognized Tribe(s). The draft IAP/EIS indicates that public scoping meetings were held in the North Slope Borough communities of Wainwright, Atqasuk, Barrow, Nuiqsut, Anaktuvuk Pass, and Point Lay. While important, scoping meetings with the general public do not fulfill the tribal consultation responsibilities of the Federal government embodied in E.O. 13175. Formal consultation must take place with the interested tribal governments. The opportunity for effective consultation must be created to allow for meaningful Tribal input. The final IAP/EIS should document the Tribal Government-to-Government consultation process for the Northwest NPR-A. EPA believes that if a federal action is located in or adjacent to an Alaska Native Village, it is likely to be of concern to the Tribe. In addition, if a federal action is in an area where a Tribe may have historically used the area for hunting or subsistence purposes, this too may be of interest to the Tribe. EPA recommends that formal Government-to-Government consultation with interested Alaska Tribes be conducted with Federally Recognized Tribes in the following native governments of the Northwest Planning area of NPR-A: Village of Anaktuvuk Pass Atqasuk Village Native Village of Barrow Inupiat Traditional Government Inupiat Community of the Arctic Slope (ICAS) Kaktovik Village Native Village of Nuiqsut Native Village of Point Lay Village of Wainwright In general, Tribal consultation would commence by sending a written letter requesting formal Government-to-Government consultation to the Tribal governments identified above. EPA realizes that not all of these Tribes will have the interest, time, resources, or for other reasons, to respond to a formal request. However, even if the Tribe has not responded to the consultation letter, efforts should be made to follow up with information which allows Tribes to participate at a later date should they so choose. The development of a Tribal Government-to-Government consultation plan, including a schedule or time line, negotiated collaboratively with the Tribe, can help to ensure that Tribes are aware of the Federal action and the dates for significant involvement and decisions. At this stage of the NEPA process, EPA recommends that DOI/BLM conduct formal consultation with the Tribal Governments identified above regarding the draft IAP/EIS and the proposed alternatives. The Tribal Government-to-Government plan and consultation process should be documented in the final IAP/EIS for the Northwest NPR-A. **(Comment No. 261-119)**

Response To: Comment 261-119

A summary of the Government-to-Government consultation process that occurred with regard to the Northwest NPR-A is included in the Final IAP/EIS (see Section VI.D). Additionally, a brief description of the BLM's Tribal Trust responsibilities has been included separately from the Environmental Justice section.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Section VI. Consultation and Coordination B. Agencies and Organizations Contacted. This section identifies Federal Agencies, State Agencies and Commissions, and Municipal Governments. Presidential Executive Order (E.O.) 13175 - Consultation and Coordination with Indian Tribal Governments (November 6, 2000; FR Vol. 65;

No. 218) refers to federally recognized Tribes as a sovereign government. EPA recommends that a separate heading entitled "Tribal Governments" be included in Section VI (B) and a list of the federally-recognized tribal governments be included. At a minimum, DOI/BLM must conduct Government-to-Government Consultation with the following affected Federally Recognized Tribes in the NW NPR-A planning area, and list them in a separate section under "Tribal Governments": Village of Anaktuvuk Pass Atqasuk Village Native Village of Barrow Inupiat Traditional Government Inupiat Community of the Arctic Slope (ICAS) Kaktovik Village Native Village of Nuiqsut Native Village of Point Lay Village of Wainwright **(Comment No. 261-129)**

Response To: Comment 261-129

The text has been revised to incorporate this comment.

Comment From: Audubon Alaska (Comment Letter No. 213)

Beluga coastal concentration areas should be clearly identified and protected from unnecessary disturbance, particularly from June through August. Other important coastal habitats used by beluga whales, including Kasegaluk Lagoon, should be identified and protected from habitat degradation and contamination. Special consideration must also be given to future Outer Continental Shelf oil and gas exploration and development as well as future port developments and resulting shipping activities. Conservation strategies should be developed in collaboration with Alaska Native villages and the Alaska Beluga Whale Committee. **(Comment No. 213-355)**

Response To: Comment 213-355

Under the Preferred Alternative, the BLM calls for Kasegaluk Lagoon to be designated a special area. This proposed special area would recognize this outstanding example of a barrier island/lagoon complex, as well as its wide variety of fish and wildlife resources, including beluga whales. In other areas, the protection of marine mammals and other species is addressed in Lease Stipulation K-3. With regard to future Outer Continental Shelf development, the Cumulative Case as presented in the Plan did include the analysis of 7 potential offshore discoveries that may be developed in the next 15 to 20 years. The Minerals Management Service manages the offshore waters of the Outer Continental Shelf area--not the BLM; however,if the need for conservation strategies for any resource or species arises, it will be addressed in collaboration with the pertinent entities, agencies, and tribal governments.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

The Eastern Arctic NPR-A Example is another comment I'd like to make. The process for determining a preferred alternative that was eventually adopted by the Federal government was much more inclusive during the Eastern Arctic NPR-A lease sale. Nuiqsut. The village of Nuiqsut worked through a list of areas that they wanted to protect and they were effective representing themselves at all levels of the lease sale including the permitting process. North Slope Borough. When the land near Nuiqsut were being leased for oil and gas activity, there was a lot of opportunity for the village of Nuiqsut to come to consensus on mitigating on measures that were important to them. Representatives from the North Slope Borough Planning Department and Wildlife met with the residents of Nuiqsut to develop the Borough position. State of Alaska. Governor Knowles worked with the North Slope Borough to come to consensus with the local government on areas that should be protected for wildlife resources and for subsistence activities. We agreed to disagree on some issues, but the State of Alaska consulted with the people who would be most directly impacted by development. Again, this process was used to come up with stipulations that enable the local subsistence hunters and the industry to live with each other and it seems to be working as far as I can tell. **(Comment No. 80075-471)**

Response To: Comment 80075-471

A similar process to that used in Northeast NPR-A plan was employed for the Northwest NPR-A planning process. However, because more than one community was potentially affected by the plan, the Bureau extended the comment period, in part to provide more time for the North Slope Borough to coordinate community meetings, develop comments and help the Bureau craft the proposed Preferred Alternative. In addition, members of the North Slope Borough Wildlife Management Department attended a special stipulation workshop in Anchorage and later provided recommended language that was eventually incorporated into the lease stipulations and required operating procedures. Copies of the draft IAP/EIS were mailed directly to appropriate resources/regulatory agencies and their comments were solicited during the public review and comment period. Representatives of BLM, both management and staff specialists, met with various Federal, State, and Borough representatives to discuss their comments and concerns. In addition, as required by Section 7 of the Endangered Species Act, formal consultation was initiated with both the U.S. Fish and Wildlife Service and the NOAA Fisheries. Consistent with the National and State Programmatic Agreements and protocols, BLM also consulted with the State Historic Preservation Officer. In accordance with Executive Order 13175, Government-to-Government Relationships with Native American Tribal Governments, representatives of BLM met with the representative of the potentially affect Native villages of the North Slope to discuss their comments and concerns, as well as to discuss the development of the Preferred Alternative. A list of the agencies with resource protection and/or regulatory/permitting responsibilities is provided in Appendix 4. Interrelationships of various laws and regulatory agencies is discussed in Section II.F. An overview of consultation and coordination for this IAP/EIS is provided in Section 6.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

Finally, it is your job, as a Federal agency to protect our interest and it is only fair to give some leeway for local people who will have to live with the impacts of development on NPR-A. Our local entities need time to work with people like myself who use the land for traditional subsistence activities. We need time to identify important areas and the types of protections that we need to sustain the use of our homeland. I expect our Federal government to take our collective efforts seriously and include them in their preferred alternative before the lease sale is held. What we need are stipulations that will make it tolerable for us to literally live next door to the oil industry. **(Comment No. 80075-474)**

Response To: Comment 80075-474

Pursuant to a formal request from the Mayor of the North Slope Borough to extend the public comment period, the Bureau of Land Management agreed. The rationale for the request was that the North Slope Borough needed additional time to conduct community meetings to solicit concerns from across the North Slope. As a result, the comments from the North Slope Borough were much more reflective of the wider North Slope community. The borough's comments had a major influence on the development of the Preferred Alternative.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

Tonight I'm going to advocate for our membership to implement a plan into the NPR-A Northwest Planning Area to make sure that we get our local people working in these top of the line jobs, like in the seismic activities. Get our people trained properly to run equipment, that way we won't have any grumpy members out there looking for jobs and hurting for jobs. I would encourage the planners for the industry to advocate such a plan for our working people out there in the responsible oil and gas development that is happening here on the NPR-A. If that is not in the plans already, I would encourage you folks to put it into the plan. I'm just saying, let's start training our people out there properly to get them jobs and we just want to get along real good with the oil industry and I'm just here to encourage that. **(Comment No. 80075-489)**

Response To: Comment 80075-489

The BLM has long supported the hiring of local residents for oil and gas and related industry positions. In this regard, we have supported and encouraged the hiring of local subsistence representatives for seismic and ice road construction monitoring both from Barrow and Nuiqsut. We will continue to encourage the hiring of local residents who are knowledgeable of local subsistence concerns

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

Consultation with the Borough and other entities and the potentially affected communities must be made a component of such measures. **(Comment No. 80075-492)**

Response To: Comment 80075-492

The BLM has taken your comments into consideration in developing the Preferred Alternative. Please see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

Because of the importance of the area around Puviaq which is located in the Eastern NPR-A and the Northwest NPR-A Planning Area, for our subsistence hunting,it is very important that the subsistence hunters who utilize this area, whether or not they own allotments in the area be consulted on any planned development related to Puviaq or the Northwest NPR-A Planning Area or any other nearby development that might be planned in the future. A model of this type of consultation exists already in the Open Water Season Conflict Avoidance Agreement. The Conflict Avoidance Agreement should be referenced and a similar type of consultation required by the North Slope Borough, the U.S. Army Corps of Engineers, and any other government agencies involved in permitting oil and gas activities in the vicinity of the Eastern NPR-A and the Northwest NPR-A Planning Area. **(Comment No. 80075-493)**

Response To: Comment 80075-493

Conflict avoidance agreements, among other mechanisms to address potential subsistence conflicts, are specifically mentioned in the General Lease Stipulations and Required Operating Procedures: Subsistence Consultation for Permitted Activities.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

There was a memorandum dated February 4, 2002 from the Council on Environmental Quality Executive Office of the President of the United States urging Federal agencies to actively solicit for participation of State, tribal and local governments as cooperating agencies in implementing the Environmental Impact Statement process of the National Environmental Policy Act, NEPA 40 CFR 1508. Native Village of Barrow has submitted a letter of interest in assuming the responsibilities of becoming a cooperating agency under 40 CFR 1501.6. Currently, Native Village of Barrow is awaiting an answer for the request to become a cooperating agency. **(Comment No. 80075-498)**

Response To: Comment 80075-498

At this time we are not aware of any correspondence with the Native Village of Barrow regarding their request to be a non-federal cooperating agency. If a letter was sent, it was not received by the Northern Field Office in Fairbanks. The North Slope Borough and BLM have entered into an assistance agreement to provide assistance in development the Northwest NPR-A Plan. Given that the Planning Area extends well beyond the boundaries of the area of interest of the Native Village of Barrow, the decision to work directly with the North Slope Borough is deemed appropriate.

Comment From: Arctic Slope Regional Corporation (Comment Letter No. 186)

We support Alternative A, provided that exploration and development follow the consultative process that has successfully worked elsewhere on the North Slope, such as at the Alpine oil field in the Colville River delta. Exploration should be allowed in the area, and then reasonable decisions, through consultation with our local government and communities, can be made regarding development. **(Comment No. 186-558)**

Response To: Comment 186-558

Please see the response to comment 254-638 (Governmen-to-Government).

Comment From: Arctic Slope Regional Corporation (Comment Letter No. 186)

A leasing program for exploration and development in the Planning Area must recognize and account for the close ties that the Iñupiat people retain to their traditional lands. ASRC has observed over time that a consultative process ' both prior to exploration and again prior to any development - between the industry and our residents has been adequate in balancing the cultural and subsistence resources with the need for continued responsible development. **(Comment No. 186-562)**

Response To: Comment 186-562

Please see the response to comment 80065-586 (Subsistence).

Comment From: Arctic Slope Regional Corporation (Comment Letter No. 186)

ASRC wishes the Department of Interior to recognize the special closeness that the Iñupiat people have with the lands of Alaska's North Slope. Our success as a people is dependent upon a continuing respect for the land and its resources. Oil and gas development provides job opportunities for our residents, and improves the quality of life in our villages. The land and its living resources provide a foundation for our culture, nutrition for our bodies, and a home for our spirit. We are confident that the Department of Interior, like our local government, can foster development in the Planning Area in a way that respects the land and all that it means to our people. **(Comment No. 186-566)**

Response To: Comment 186-566

The BLM acknowledges the importance of the land and the living resources it contains to the Inupiat people and believes that the affected environment and effects discussions for subsistence-harvest patterns, sociocultural systems, and environmental justice reflect this recognition.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Conflicts can arise between subsistence and industry when industry's operations are not consistent with subsistence activities or when operations interfere with subsistence activities. In order to avoid such conflicts in the Northwest NPR-A Planning Area, stipulations should require lessees to consult regularly and extensively with affected North Slope communities and the BLM. This kind of consultation is already required in the Northeast NPRA Planning Area, but its application has been less than perfect. Failures in consultation can be traced to two possible root causes: consultation with only the Subsistence Advisory Panel and/or failure to follow the stipulation at all. **(Comment No. 254-638)**

Response To: Comment 254-638

The BLM is in agreement that consultation is the foremost technique in effective conflict avoidance and mitigation. It is for this reason that the General Lease Stipulations and Required Operating Procedures (ROP's) that accompany the Preferred Alternative for the NW NPR-A Final Integrated Activity Plan contain an entire section regarding Subsistence Consultation. The BLM believes the Stipulations and ROP's in the NW Plan are an improvement over those that accompanied the NE Plan in the following ways: The NW Plan Stipulation • Sets the parameters for the types of communication that are considered consultation, and gives guidance to the industry with regard to what constitutes adequate consultation; • Requires documentation by all permit applicants of their consultation efforts be submitted to the BLM with their Plan of Operation; • Identifies the types of information to be included in the Subsistence Plans submitted by the permit applicants; and • Includes a specific Required Operating Procedure for consultation with regard to seismic operations, which contains additional requirements due to the nature of the activity. It is the hope of the BLM that the more exacting language used in the NW Plan Stipulations will aid the industry in understanding and fulfilling the requirement of the stipulation. In addition, specifying what is expected of the permit applicant allows the BLM to more accurately enforce adherence to the stipulation. Stipulation K-7 also establishes buffers along many rivers that are important subsistence areas.

Comment From: Olgoonik Corporation (Comment Letter No. 169)

In couple of the proposed plans where there were some lands identified within the corporate lands. Olgoonik Corporation should be involved before any exploration and development takes place this would also include in any of the multiple ownership lands. **(Comment No. 169-715)**

Response To: Comment 169-715

The Northwest Integrated Activity Plan/Environmental Impact Statement applies only to those lands under the stewardship of the BLM. Map 05 in the NW IAP/EIS shows the breakdowns of lands in the NW Planning Area. For those lands that are split estates (where the surface is owend by a private individual or company, but the subsurface is owned by the federal government) the lands can be leased because the BLM owns the subsurface rights, but Surface Management Agreements would have to be in place before any activity, such as exploration and development, could occur on those lands.

Comment From: City and Native Village of Nuiqsut (Comment Letter No. 80026)

Geographic Response Strategies: Geographic response strategies individually developed for sites deemed critical to subsistence resources by the community and the Kuukpik Subsistence Oversight Panel are imperative as a mitigation measure. As is special consultations for owners of Native Allotments in order that they may understand the impacts at and near their properties. **(Comment No. 80026-1016)**

Response To: Comment 80026-1016

Please see responses to comments 80077-942 (Sociocultural Systems) and 80077-946 (Government to Government). See also the General Lease Stipulations and Required Operating Procedures for the Preferred Alternative, specifically Required Operating Procedure E-12.

Comment From: City and Native Village of Nuiqsut (Comment Letter No. 80026)

Consultation with local communities: Under all alternatives the required amount and character of consultation with local communities will decrease from that required under the NPR-A Northeast ROD. Has the BLM conducted a study among NSB communities to ensure that the community consultation required under the NPR-A Northeast management plan is effective for the communities' Has the Research Monitoring Team, established pursuant to the ROD for the Northeast NPR-A IAP/EIS, met with the Subsistence Advisory Panel to consult and cooperate in designing research efforts, specifically in relation to the effectiveness of stipulations and other mitigative management options' The Preferred Alternative, ROP H-1 should be strengthened by requiring full, not partial, funding of Subsistence Oversight panels in each affected community. These panels cannot be effective if they are not funded to perform duties with which they are charged. Funding would include amounts for a full-time executive director, part-time administrative help and part-time subsistence field observers and could be provided either by BLM or the lessee, or both. Tools and training for field observers are essential to develop the skills necessary for effective subsistence monitoring. **(Comment No. 80026-1022)**

Response To: Comment 80026-1022

Please see responses to comments 254-638 (Government to Government), 261-102 (Government to Government, 261-119 (Government to Government), 80026-1016 (Government to Government), 80075-471 (Government to Government), 80075-474 (Government to Government), 80075-493 (Government to Government), 80077-926 (Impact Compensation), 80077-946 Government to Government), and 80079-989 (Government to Government). See also the General Lease Stipulations and Required Operating Procedures for the Preferred Alternative, specifically Required Operating Procedures H-1 and I-1.

Comment From: Christine Henderson (Comment Letter No. 252)

Several questions remain unanswered with this new plan: Have the Inupiats been able to give their views on this proposal? How will the oil and gas development affect their subsistence living and culture? How will this development change their culture, will the economic benefits outweigh the negative, pathologic consequences? What studies have been done to confirm that the development of countless roads and drill pads will not negatively affect the wildlife and vegetation. What about migratory birds and mammals? How will it affect their traditional travel routes? Have plans been designed for mitigating the harmful effects once drill pads and roads are abandoned? Infrastructure for such development is extremely resistant to natural healing processes. These and other very important and critical factors must be taken into consideration before any exploratory or permanent development takes place. **(Comment No. 252-841)**

Response To: Comment 252-841

The meetings that were held after the release of the Draft IAP/EIS this past spring were two types: 1) Public Meetings, and 2) joint ANILCA 810 Subsistence Hearing/Public Meetings. Every meeting that was held on the North Slope (in the communities of Point Lay, Wainwright, Atqasuk, Anaktuvuk Pass, Nuiqsut, and Barrow) was an ANILCA 810 Subsistence Hearing/Public Meeting. The hearing officer at all of these meetings was Arnold Brower, Jr. (who also provided translation). Flyers, radio announcements, and letters sent to the various communities specified that the meetings were combined ANILCA 810 Subsistence Hearings/Public Meetings. At each hearing/meeting, BLM gave a PowerPoint presentation explaining that the meeting was an ANILCA 810 Subsistence Hearing/Public Meeting. Additionally, and as required by policy, the hearing officer read a statement before he began to take public comments in which it was stated that the purpose of the hearing was in response to the ANILCA 810 evaluation, but if anyone wanted to comment on other aspects of the plan, they could do so. The decision to combine the ANILCA 810 hearings with a joint public meeting was made for several reasons: 1. Most communities on the North Slope have commented that they are experiencing "meeting burnout" in that too many meetings occur, and it is difficult to discern what information is actively being solicited at each. It was felt that if we had two separate meetings, one ANILCA 810 hearing, and one public meeting about the draft NW NPR-A Plan, that the same information, concerns, and issues would be identified at each, and we would be contributing to this burnout. 2. Precedent had been set, in that during the public meetings for the NE NPR-A, the ANILCA 810 hearing occurred simultaneously. Therefore, the decision of the planners to hold a joint Public Meeting/ANILCA 810 hearing was viewed as acceptable, since it had occurred before on the North Slope with no complaint. 3. ANILCA 810 provides that the notice, hearings, and findings required by that statute be presented as part of the EIS.

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

The lease stipulations from the Northwest NPR-A Plan Babbitt Record of Decisions that were dropped in Northwestern Plan Draft-EIS in 2003, which we're looking at, Northwest and the Northwest Plan Lease Stipulations or ROP, Required Operating Practices. That will be left up to the discretions of the Bureau of Land Management bureaucrats in charge. That has no significant approach, neither addresses it, government to government, consultation policy, which falls under the Executive Order 13-175, which is the coordination with the tribal governments and the Department of Interior during the proposed changes made. I don't think when they made these stipulations that they did not follow up with government to government relations. **(Comment No. 80074-885)**

Response To: Comment 80074-885

We have taken your comments into consideration in developing the Preferred Alternative. Please see the responses to comments 249-524 (Stipulations, Required Operating Procedures and Mitigations) and 251-136 (Management).

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

MR. AIKEN: Yeah, when I was down in the Alaska Forum on the Environment and as I was listening to ConocoPhillips Alaska, Inc., they made a comment, they said, we consult with the tribal governments, tribal people, which is the North Slope Borough, he said, and I didn't -- I kind of didn't like his phrase when he mentioned North Slope Borough as the tribal government. It's not a tribal government. So somebody should tell ConocoPhillips Alaska, Inc. not to say that kind of a phrase again. They should consult with the tribal governments, tribal members and they should never, never, again, mention North Slope Borough as a tribal government. **(Comment No. 80074-896)**

Response To: Comment 80074-896

The BLM has forwarded your comment to ConocoPhillips Alaska, Inc..

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

In 2002, ConocoPhillips Alaska, Inc. partnered with Arctic Slope Regional in offering training programs for North Slope residents interested in oil field maintenance and heavy equipment maintenance. This year 20 North Slope residents spent their summer working and training in these areas. ConocoPhillips Alaska, Inc.' employees are also volunteer mentors for the Nuiqsut High School students participating in the Alpine Career Quest Internship Program. In 2002, seven Trapper School students completed the winter Career Quest Program at the Alpine Oil Field, and about 12 students were involved in the summer program based in Nuiqsut. These programs will continue in 2003. **(Comment No. 80077-924)**

Response To: Comment 80077-924

This statement has been incorporated into the discussion on industry programs to employ local workers in Section IV.C.15, Sociocultural Systems, as well as in Section III.C.1.b(4), North Slope Oil-Industry Employment of North Slope Borough Resident Natives.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

HEARING OFFICER BROWER: She's stating that she supports Eli and Bernice's comments. The pipeline is already -- because the pipeline has already crossed the Kukpuk River, it seemed like that was sufficient for the industry to provide from the comments because they did allow that to come across and since then they have neglected the community of Nuiqsut. And for that reason, these people need to get back in communication with the village of Nuiqsut to meet those concerns and mitigated items that were done for the community of Nuiqsut because she, right now, hardly has enough cash to pay for her fuel, heating fuel. **(Comment No. 80077-943)**

Response To: Comment 80077-943

See Responses to comments 80077-945 (Government to Government) and 80077-946 (Government to Government).

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

You know, I, along with them are frustrated. So if the industry and the State agencies and the Federal agencies would keep up their work and considering all the protection rights for lands and seas and animal life, they should also very closely look at the people, you know, because what affects the land, what affects the wildlife, ultimately affects the people. **(Comment No. 80077-945)**

Response To: Comment 80077-945

The BLM acknowledges that there are potential economic, social, and subsistence effects, and has evaluated these potential impacts for each alternative under the resource topics of Economics, Subsistence-Harvest Patterns, Sociocultural Systems, and Environmental Justice.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

And so I agree with what Bernice had said earlier with the economy. Something needs to be said now and some collaboration needs to be put together between the people, the industry, the State and the Federal level on figuring these out. And I'm pretty sure it's going to take some cooperation on all parts. **(Comment No. 80077-946)**

Response To: Comment 80077-946

The BLM has taken your comments into consideration in developing the Preferred Alternative. Please see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures. See Section VI for additional discussion on subsistence resources and harvests. See Section II.F.8 for a discussion of local governmental participation in the developing North Slope Science Strategy and the North Slope Management Oversight Group. This group would be instrumental in initiating subsistence resource inventories, monitoring, and research.

Comment From: Paul Hugo (Comment Letter No. 187)

All activities within the NPR-A will follow guidelines set by the NSB Planning Commission. **(Comment No. 187-965)**

Response To: Comment 187-965

The BLM has worked closely with the North Slope Borough in developing the Preferred Alternative. Furthermore, permittees must observe all Federal, State and local laws and regulations applicable to the area.

Comment From: Paul Hugo (Comment Letter No. 187)

All activities are done in a timely manner with assistance from local observers. **(Comment No. 187-968)**

Response To: Comment 187-968

Several measures to minimize impact on caribou movement are included in the Preferred Alternative. However, these measures are focused on the Teshekpuk Lake Caribou Herd, not the Western Arctic Herd (WAH). Impacts to the WAH from oil and gas activities in the Planning Area are not specifically addressed because the winter range, calving area, primary migratory area, and most of the summer range of the WAH are outside of the Planning Area.

Comment From: Public Meeting on DEIS - Wainwright, Alaska (Comment Letter No. 80079)

HEARING OFFICER BROWER: Yeah, Enoch, we could allow that I guess since we're still in Wainwright. MR. OKTOLLIK: What I forgot to include is we have no choice. Like I picked that no action. But if we have no choice we want to make sure they're going to do studies that we have local observers. Also if there's development, also, that local observers are included in the development. **(Comment No. 80079-989)**

Response To: Comment 80079-989

Please see the response to 253-29 (Research and Monitoring Team).

55. TOPIC : GEOLOGY

Comment From: State of Alaska (Comment Letter No. 251)

Section III, Page III-4, Last Paragraph. The discovery date of the Alpine Field is the winter of 1994-95, not 1988. Also, the stated Alpine recoverable reserves of 500 Mmbo seem excessive when compared with the public disclosures by the operator which are in the range of 430 Mmbo. An economically recoverable reserve of 500 Mmbo is repeated throughout the Draft. IAP/EIS and should be corrected throughout. Section III.A.1.a(3), Oil and Gas Resource Assessment. See Appendix 7 comments. **(Comment No. 251-415)**

Response To: Comment 251-415

The 1988 reference for Alpine discovery in sentence 4 is incorrect and is contradicted by the 2nd sentence. The 1988 reference has been deleted. Sentence 3 in the subject paragraph has been re-written. For some years, Alpine field has been reported as having 429 MMbbl in oil reserves. More recently, company announcements about "debottlenecking" efforts to raise Alpine production from the originally planned 70,000 bpd to 120,000 bpd (150,000 bpd with satellites added) (Petroleum News, 2002, 7/39) suggest higher ultimate reserves. In December 2001, Dean Gingrich, lead ConocoPhillips Alaska, Inc. geophysicist for Alpine field, cited 500 MMbbl for Alpine field in a luncheon presentation to the Geophysical Society of Alaska. The 500 MMbbl estimate is the most recent public disclosure by an official representative of the operating company.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment; a. Geology; (1) Mineral Potential; (d) Coal Resources; paragraph 3: "While the North Slope coal bed methane resources are strictly speculative at this time, the Alaska Division of Geological and Geophysical Survey estimates there are up to 700 trillion cubic feet (Tcf) of North Slope coal bed methane, based on simple basin calculations determining coal volumetrics and conservative estimates of gas yield." This statement should specify that the estimate is for in-place resources and that the volume recoverable is unknown. "This estimate dwarfs the 33 Tcf of booked natural gas reserves and 64 Tcf of estimated onshore conventional gas resources currently cited by the USGS (U.S. Geological Suvey, 2002)." This statement needs to be rewritten as follows: "This estimate dwarfs the 33 Tcf of booked natural gas reserves and 64 Tcf of estimated onshore undiscovered conventional gas resources currently cited by the USGS (U.S. Geological Suvey, 2002)." **(Comment No. 164-867)**

Response To: Comment 164-867

The text has been revised.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment; a. Geology; (2) Petroleum Geology; paragraph 1: The statement, "'proven commercial oil reserves exceeding 17.8 Bbbl'," might be interpreted as indicating that there is still that much oil in "reserve." In fact, more than 13 Bbbl of the 17.8 Bbbl have already been produced so that, according to the State figures cited, current oil reserves are less than 5 Bbbl. **(Comment No. 164-868)**

Response To: Comment 164-868

The text has been revised for clarification.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment; a. Geology; (2) Petroleum Geology; (a) Petroleum Activities in Northern Alaska; 1) Past Exploration Efforts; paragraph 3: "State lease sales in 1964 and 1965 were followed by the discovery of the super-giant Prudhoe Bay field in 1968. With 12.8 Bbbl of oil, Prudhoe Bay is the largest oil field ever found in North America." 3 The number cited here (12.8 Bbbl) is cumulative production and does not include remaining reserves. A clarification is needed. **(Comment No. 164-869)**

Response To: Comment 164-869

The oil reserve figure for Prudhoe Bay field is a few years old and can be updated. The 2002 summary published by the State of Alaska Division of Oil and Gas shows cumulative production of 10,634 MMbbl of oil and NGL (tbl. III.3) and forecasts 3,024 MMbbl in remaining oil reserves (tbl. III.1), for a new total estimate of original reserves of 13,658 MMbbl oil. The text has been amended and Figure III-01 and Map 101 have been updated accordingly.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment; a. Geology; (2) Petroleum Geology; (a) Petroleum Activities in Northern Alaska; 1) Past Exploration Efforts; paragraph 4: Resumed exploration of the NPR-A in 1973 was initially conducted by the U.S. Navy. The USGS did not "coordinate" this exploration activity until 1976 when management of the petroleum reserve was transferred from the Navy to the Department of the Interior. **(Comment No. 164-870)**

Response To: Comment 164-870

The text has been corrected.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment; a. Geology; (2) Petroleum Geology; (a) Petroleum Activities in Northern Alaska; 1) Past Exploration Efforts; paragraph 7, Figure III-01: Figure III-01 shows the Nanuq accumulation in the Upper

Jurassic, at the same stratigraphic horizon as the Alpine accumulation. Nanuq actually is in the Lower Cretaceous Torok Formation. **(Comment No. 164-871)**

Response To: Comment 164-871

Figure III-01 has been revised to associate the Nanuq field with the turbidites at the base of the Torok Formation. However, there is also production associated with a Kuparuk C sandstone (P/I Dwight's Plus Drilling Wire, 2001, 47/31, p. 1), which is why the Nanuq was posted next to the Beaufortian sequence.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment ; a. Geology; (2) Petroleum Geology; (b) Geologic History and Stratigraphy; Map 27: In the legend of Map 27, the arrows point the wrong way on the arch symbol. **(Comment No. 164-872)**

Response To: Comment 164-872

The map symbol has been corrected.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment; a. Geology; (2) Petroleum Geology; (c) Petroleum Potential ; 2) Future Petroleum Exploration: Considering the focus on the Mukluk well in the first two paragraphs of this section, it would be helpful to identify the well on at least one map and to refer to that map in this section. **(Comment No. 164-873)**

Response To: Comment 164-873

The Mukluk well has been added to Maps 26, 99, 100, 101, 102, 103, and 104.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment; a. Geology; (2) Petroleum Geology; (c) Petroleum Potential ; 2) Future Petroleum Exploration; paragraph 5: "The Alpine facilities in the Colville delta, and the sales-oil pipeline under the Colville River connected to the Kuparuk River unit, have pioneered the infrastructure on the eastern border of the NPR-A." The underlined phrase in not clear and the sentence needs to be rewritten. It is unclear if this is a typographic error or if there is a missing section. **(Comment No. 164-874)**

Response To: Comment 164-874

We are unsure about the point of confusion but offer a revised sentence structure that clarifies the meaning to note that two pieces of new infrastructure, 1) the Alpine facilities and 2) the pipeline passing under Colville River, are pioneering westward extensions of North Slope infrastructure

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment; a. Geology; (3) Oil and Gas Resource Assessment; (b) Summary of Assessment Results; paragraph 1 and 2: The first paragraph, which summarizes estimates for conventionally recoverable resources, should specify the area to which these estimates apply. Based on context, one initially assumes these estimates are for the Northwest Planning Area; however, the second paragraph summarizes estimates of economically recoverable resources for the combined Northeast and Northwest planning areas. Clarification is needed. **(Comment No. 164-875)**

Response To: Comment 164-875

The text has been revised to clarify that the estimates for conventionally recoverable resources pertain to the combined Northeast and Northwest NPR-A Planning Areas.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment; a. Geology; (3) Oil and Gas Resource Assessment; (b) Summary of Assessment Results; paragraph 3: "The resource potential is not uniformly distributed throughout the assessment areas, and only a few plays hold a majority of the undiscovered resource potential. The highest geologic and economic potential lies in the northern third of the coastal plain associated with the subsurface Barrow Arch. This structural feature has been a focal point for regional oil and gas migration, and all currently producing fields on the North Slope are located on or near the Barrow Arch. The high oil potential of the northern coastal plain in the NPR-A is generally recognized in this assessment as well as all previous petroleum assessments." The 2002 USGS assessment of NPR-A (see References) does not place particularly high resource potential in these rocks. **(Comment No. 164-876)**

Response To: Comment 164-876

The comment indicates that a new assessment by the USGS (2002) "does not place particularly high resource potential in these rocks." The commenter is evidently referring to the limited resource potential of Ellesmerian rocks along the Barrow arch (1% of overall USGS oil assessment for NPR-A). However, the three plays with the largest oil resources in the 2002 USGS assessment (collectively 79% of the overall NPR-A endowment) overlie or flank the Barrow arch. These plays have high oil potential, enjoy discovered reserves, and are the targets of active exploration precisely because of hydrocarbon migration updip toward the crest of the Barrow arch. The MMS-BLM and USGS assessments disagree in some detail about the resource potential of Ellesmerian rocks. However, the key point of the paragraph is the critical role of the Barrow arch in gathering migrating petroleum into traps along the arch. On this point, both the MMS-BLM and USGS assessments are in full agreement. The text has been revised to clarify that the high oil potential is associated with the Barrow arch. A comparison of the MMS-BLM and USGS assessments has been added to Appendix 7.F.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

Appendix 7. Oil and Gas Resource Assessment; B. Geologic Assessment; paragraph 1: A reference to the new USGS oil and gas assessment of the entire NPR-A should be updated to indicate that the results were released in May 2002 in USGS Fact Sheet 045- 02 authored by Bird and Houseknecht (see References). **(Comment No.**

164-880)

Response To: Comment 164-880

The USGS 2002 assessment was made public two months after completion of the initial draft of Appendix 7. Since the announcement of the results of the USGS assessment in May 2002, several publications related to the assessment were available only at USGS websites. We were unable to view these publications because of court actions related to the Corbell vs. Norton lawsuit between American Native interests and the U.S. Department of the Interior. Since April 2003, access to the USGS websites has been restored. A comparison of the MMS-BLM and USGS assessments is appended as a new in section Appendix 7.F.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

Appendix 7. Oil and Gas Resource Assessment; B. Geologic Assessment; 1. Summary of Plays; paragraph 8: "Along the Beaufort Sea coast, the westernmost occurrence of pooled oil is in the Simpson field and overlying surface oil seeps (Map 26). In the south, the westernmost occurrence of pooled oil is in the Umiat Oil field. This statement should be rewritten as follows: "Along the Beaufort Sea coast, the westernmost known occurrence of pooled oil is in the Simpson field and overlying surface oil seeps (Map 26). In the south, the westernmost known occurrence of pooled oil is in the Umiat Oil field." "This province evidently endowed more with natural gas than oil, lies west of the Umiat and Simpson oil pools." It is not clear which province is being discussed here. 6 Appendix 7. Oil and Gas Resource Assessment; B. Geologic Assessment; 2. Description of Plays; Play 23. Fortress Mountain Formation-Deep Detached Foldbelt (UBW A2300); paragraph 11, first sentence: This is the first mention of "Cobblestone unit" and no definition is included in the discussion. A short description of the unit would be helpful here. **(Comment No. 164-882)**

Response To: Comment 164-882

The text has been revised. The commenter is correct; Appendix 7 uses the undefined term "Cobblestone unit." This is a relict of earlier drafts of the description for play 23 in which "Cobblestone unit" was used to refer to the turbiditic sandstones in the lower Torok Formation as an extension of the terminology used by Kelley, 1988 (USGS OF88-42) for some outcrop exposures of sandstones within the Torok Formation in the Chandler Lake quadrangle. Although we have abandoned use of the term "Cobblestone unit" for the sake of simplicity, we remain convinced that the Torok turbidites flooring the Colville foredeep are different from the conglomeratic rocks of the Fortress Mountain Formation (sensu strictu) exposed in the foothills north of the Brooks Range. In keeping with other parts of the discussion of play 23, we have replaced "Cobblestone unit" with "Fortress Mountain Formation."

56. TOPIC : CUMULATIVE SCENARIO

Comment From: Audubon Alaska (Comment Letter No. 213)

Cumulative Effects : Based on a review of the DEIS and the recent NRC (2003) report on cumulative effects on the North Slope, Audubon does not believe that BLM has adequately determined or described the potential long-term cumulative effects of oil and gas development on wildlife populations and ecosystem processes within the planning area. **(Comment No. 213-206)**

Response To: Comment 213-206

The BLM believes that the scope of the cumulative analysis is appropriate for this IAP/EIS and in accordance with the provisions of NEPA regulations to keep EIS's concise and no longer than absolutely necessary (40 CFR 1502.2(c)), to evaluate broad actions generally (40 CFR 1502,4(c)(2)), and to use tiering to focus on the actual issues ripe for decision at each stage(40 CFR 1502.20). The National Academy of Sciences National Research Council (NRC) March 2003 report Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope was released after publication of the draft IAP/EIS. The information and conclusions of the NRC report are considered in the cumulative analyses in the final IAP/EIS. Please also see the responses to comments 253-24 (Cumulative Impacts and Analyses) and 253-146 (NEPA Process).

Comment From: Audubon Alaska (Comment Letter No. 213)

Cumulative impacts from oil and gas development and the associated transportation infrastructure within the western Arctic and NPR-A need to be fully analyzed relative to their potential impacts on Arctic caribou and other wildlife. The DEIS is inadequate in this regard. **(Comment No. 213-358)**

Response To: Comment 213-358

Infrastructure assessments have been made for past, present, and future activities. To the best of our knowledge, these projections are correct at this time. Certainly as future activities are formally proposed, the projections will become more accurate and have more site-specific detail. Future EIS's on specific proposed development activities will address these issues. Caribou interaction and effects have been extensively analyzed in this and previous documents. Fortunately caribou herds have increased to the greatest degree in areas of industry activity and infrastructure.

Comment From: Audubon Alaska (Comment Letter No. 213)

At a minimum, the cumulative effects analysis for the northwestern planning area of NPR-A should address the degree to which development in the planning area will exacerbate impacts associated with existing oil field operations elsewhere on the North Slope. In addition, an analysis of proposed development in the NPRA must include a discussion of potential activities on Native corporation lands within NPR-A and adjacent state and private lands, particularly in light of existing oil leases on ASRC lands within the NPRA. **(Comment No. 213-359)**

Response To: Comment 213-359

The environmental resources described in Chapter III and the impacting factors identified in Chapter IV that carry over into a cumulative context are addressed in Chapter IV.F. Other perturbations from both the past, ongoing, and future have been addressed to best define the layering of potential effects with time. The contribution of the activities in the Northwest NPR-A to overall effects is addressed as an incremental contribution to the cumulative effects on each of the designated resources, and overall effects are also assessed (Section IV.F.9).

Comment From: Audubon Alaska (Comment Letter No. 213)

Based on a review of the DEIS and the recent NRC (2003) report on cumulative effects on the North Slope, Audubon does not believe that BLM has adequately determined or described the potential long-term cumulative effects of development on wildlife and ecosystem processes within the planning area. **(Comment No. 213-362)**

Response To: Comment 213-362

There is more information available regarding the effects on a resource for the current leasing alternatives because the future is measured in a few years, not decades. Projections of activities and effects decades into the future are understandably less detailed and by necessity less precise. However, possible general trends in activities and effects for a given resource are probably good indicators of what could occur in the future. It is important to remember that future projections of impacts also must consider recovery over time or countervailing effects. The BLM believes that the scope of the cumulative analysis is appropriate for this IAP/EIS and in accordance with the provisions of NEPA regulations to keep EIS's concise and no longer than absolutely necessary (40 CFR 1502.2(c)), to evaluate broad actions generally (40 CFR 1502,4(c)(2)), and to use tiering to focus on the actual issues ripe for decision (40 CFR 1502.20). Please also see the response to comment 213-359 (`Cumulative Scenario`).

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.F, Effects of the Cumulative Case. The "Alpine Satellite Development Program" NEPA review has been initiated since publication of the Draft IAP/EIS. Preliminary information in that study should be incorporated in the Final IAP/EIS to better define and constrain effects of the cumulative case. With the exception of Point Thomson (and possibly Liberty) the probability that many of those fields expected to be developed in out-years 15-20 is very low. ExxonMobil has announced that up to 75,000 b/d of condensate might be produced from the Point Thomson field by the end of 2006. Hence it should not be included in the 15 to 20-year category. Those facts should be emphasized and the incremental reserves and impacts re-evaluated appropriately. **(Comment No. 251-419)**

Response To: Comment 251-419

Regarding the development of the Alpine Satellite fields of Lookout, Spark, and Alpine West, information on the developmental timelines and reserve estimates of these fields is not publicly available . Accordingly, these fields will remain in the category of reasonably foreseeable future development. Exxon/Mobil is in the process of re-evaluating the development timeline for the Point Thompson field. The developmental final EIS for the field may be published in 2005. The permitting process would occur afterward. As yet, there are no timelines established for development, no infrastructure estimates, and no production profiles available. Until this information is available and the project has assumed a more definitive condition, the Point Thomson field remains in the category of reasonably foreseeable future development.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-385, Fifth Paragraph. The next-to-last sentence regarding the exploration well success ratio on the North Slope is inaccurate. Since 1995, at least 52% of the exploration wells drilled onshore on the North Slope (including the NE NPR-A) have been described by operators as discoveries, and at least 32% have been classified as commercial. This represents a significant improvement over earlier exploration drilling results and is largely attributable to the use of 3-D seismic as a pre-drilling exploration tool and to advances in directional drilling technology. **(Comment No. 251-426)**

Response To: Comment 251-426

The commenter does not cite a reference for the exploration success statistics, and the status of all wells drilled recently on State North Slope land is not publicly available. However, the recent drilling results in the Northeast

NPR-A (based almost entirely on mapping from 3-D seismic surveys) could be used to evaluate future success ratios for wildcat wells. Thirteen wells were drilled since 1999 and six encountered oil or gas. Therefore the discovery ratio is 46 percent. Only two of these prospects are being considered for commercial development (Lookout and Spark, as satellites to Alpine). Therefore the commercial success ratio is 15 percent (consistent with the estimates of 10 to 20 percent in this IAP/EIS). However, if we consider the success rate for the discovery of new standalone fields found using 3-D seismic surveys, the results to date are zero. We acknowledge that 3-D seismic data and interactive workstations have made a significant contribution to petroleum exploration and that success rates are likely to be higher than using older 2-D data. However, we disagree that future commercial discovery rates in NPR-A are likely to replicate more mature areas on the North Slope (with success rates of 30 to 50 percent).

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-386, Sixth Bullet. The Yukon Gold well is onshore, not offshore. **(Comment No. 251-427)**

Response To: Comment 251-427

The text has been corrected.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-387, Fourth Paragraph. Alpine reserves are listed here as 429 Mmbo. This is a more accurate figure, but does not agree with the reserves listed in the geology and assessment sections. **(Comment No. 251-428)**

Response To: Comment 251-428

The text has been corrected.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-388, Second Paragraph. Point Thomson Gas Cycling Project should be listed in this category. The plan is under development, the tentative schedule has been set, and the project is currently undergoing NEPA review. This project should be included in Table IV-10 as well. **(Comment No. 251-429)**

Response To: Comment 251-429

The Point Thomson Gas Cycling Project has been included in Table IV-10 and the text has been revised to include the information provided in the comment.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-389, Last Paragraph. The statement that the order of prospects listed in Table III-01 is indicative of the probabilities and sequence of development is misleading. Development and timing are often

controlled more by proximity to and availability of facilities than by potential field size. Also see previous comments regarding Point Thomson production schedule. **(Comment No. 251-430)**

Response To: Comment 251-430

The discoveries listed in Table III-01 are in chronological order and do not imply probabilities for future development. However, Table IV-12 does list these discoveries according to our opinions on the sequential order of future development. Table IV-12 criteria were primarily field size, proximity to existing infrastructure, and per-barrel cost.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-391, Second Paragraph. The order of fields listed is correct on the basis of total historic production. However, the use of the term 'producibility' might imply to some that those are the leading fields on the basis of current production rates. In January 2003, the four leading North Slope fields in terms of current rates were Prudhoe Bay, Kuparuk, Alpine and Milne Point. **(Comment No. 251-431)**

Response To: Comment 251-431

We do not use the term "producibility," rather we use the term "productivity" (or total reserves produced). The fields are correctly listed according to this definition. If we use a definition of current production rates, the proper order of listing would be Prudhoe Bay, Kuparuk, Alpine, and Milne Point, (as noted by the commenting organization.)

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-392, Third Paragraph. The exploration success ratio addressed in this paragraph might be reasonably accurate when viewed in the context of the entire history of North Slope exploration. More on point, however, is the significantly increased exploration success in recent years (see Page IV-385, fifth paragraph comments above). **(Comment No. 251-432)**

Response To: Comment 251-432

Please see the response to comment 251-426 above. It remains to be seen whether 3-D seismic data can produce the same commercial success ratios in untested areas where initial development requires very large, standalone oil fields. Recent results have shown that 3-D data is a much better predictor of natural gas or gas/condensate in reservoirs than of crude oil. Unfortunately, at the present time there is no market for natural gas on the North Slope. A general comment will be added to state that 3-D seismic surveys could contribute to exploration success rates and more efficient field development through better well placement.

Comment From: ConocoPhillips Alaska, Inc. Alaska, Inc (Comment Letter No. 255)

Page IV-380, General Comment - Effects of the Cumulative Case. No scale of size is presented to help readers understand the magnitude of these issues. In fact, as we read these sections there is an implied assumption in these sections that the problems are extensive and can be a large component of the affected area. We believe it is necessary to give the readers some perspective of how large an area is likely to be at risk from these impacts. For

example, in the discussion on page IV-401, without quantification and scale this section reads as if all streams are at risk for blockage, and all lakes and streams are at risk for shoreline and bank erosion, and that all miles of gravel road will block natural drainage patterns. With only 1400 acres of gravel fill in Alternative A, placed across the entire planning 8.8 million acre area, we believe these discussions must present some quantification of these potential impacts, and also needs to reference current design standards used to eliminate these problems. **(Comment No. 255-833)**

Response To: Comment 255-833

The text has been revised to include this information.

57. TOPIC : WATER QUALITY

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.C.4.b.(2), Paragraph 8, Page IV-107. This section discusses potential effects from spills to freshwater quality, but the paragraph refers to Alaskan marine water quality criteria. The appropriate freshwater water quality criteria should be used in this discussion instead. **(Comment No. 251-192)**

Response To: Comment 251-192

The text has been revised.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Figure III-25 depicts many of the fish species found in the arctic environment. The draft IAP/EIS describes the life histories of the freshwater (e.g., lake trout, arctic grayling, blackfish, northern pike, stickleback, etc.), anadromous and amphidromous (e.g., pink and chum salmon, arctic cisco, least cisco, rainbow smelt, humpback whitefish, etc.), and marine (arctic cod, saffron cod, arctic flounder, etc.) fish species in the NW Planning Area. Both the public and decision makers would benefit from maps identifying fish species and their distribution, summer and overwintering habitat, and spawning areas be included in the final IAP/EIS. In particular, some of the water bodies important for the migration, rearing, and spawning of anadromous fish may be available by the Alaska Department of Fish and Game (ADFG) in their anadromous stream catalogue. In addition, EPA recommends strengthening existing stipulations and ROPs to minimize potential adverse impacts to sensitive fish species and their habitat areas. Sampling of NPR-A lakes revealed that lakes or ponds deeper than 6-ft, with suitable spawning substrate, appeared to support the largest and most diverse populations of arctic fish (p. III-43). Map 11 and Map 89 identify the locations and depths of lakes and ponds in the NW NPR-A. Deep water lakes and ponds deeper than 6- ft, which provide for overwintering habitat should be managed under special considerations, such as appropriate and effective buffers, no water withdrawals, no gravel extraction, etc. EPA recommends that additional stipulations and ROPs, set backs and other measures be developed to manage deep water lakes and ponds based on best available information. **(Comment No. 261-421)**

Response To: Comment 261-421

The stipulations for setback (buffer) strips (II.C.5) have been increased to 0.25 mi. for deep-water lakes. This would prohibit gravel removal from the beaches of these lakes, without special authorization. Waterbodies used

by anadromous species as listed in the Alaska Department of Fish and Game (ADF&G) Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes have been added to the EIS on Map 86.

58. TOPIC : GRAVEL

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Development - Gravel requirements. The DEIS fails to show sites of any potential gravel sources that may be developed in the Plan Area; therefore the potential effects cannot be analyzed. While it states that gravel could be 'extracted from river drainages within the NW NPR-A Planning Area,' (DEIS P.IV-19) it does not show these locations. The Draft NW Plan presents a circular argument regarding either the economic cost, or the environmental impact from this operation and never addresses the issue. The plan states, 'BLM has not studied the economic feasibility of gravel transportation in the NPR-A. It is premature to evaluate the possibilities without knowing the location or scale of future gravel- use activities' (DEIS p.IV-19). Yet, gravel use is essential for any oil field development, and the effects of gravel mining can permanently alter the nature of the habitat in river floodplains. (Walker J.D.1996). Furthermore, it recognizes 'gravel sources could be a major problem for inland sites in the southern part of the Northwest NPR-A Planning Area.' (DEIS p. IV-19). Further information on gravel is needed to assess the environmental effects of oil development in the NW Plan Area, as well as to accurately estimate the potential for economical oil development. **(Comment No. 253-98)**

Response To: Comment 253-98

Gravel resources are an important aspect of development and the impacts of gravel extraction are considered in the IAP/EIS. The amount of gravel needed is dependent on the location and amount of hydrocarbon resources discovered as well as on the technology proposed to exploit those resources. Rivers are noted as one possible source of gravel materials, but certainly not the only, preferred, closest, or least expensive source.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

The draft IAP/EIS indicates that development activities could include construction of gravel pads for wellheads, production and support facilities, infield roads and airstrips (p. IV-18). Future NPR-A developments for gravel requirements could range up to 5 million cubic yards (IV-19). However, there is no information regarding potential sources of gravel borrow source sites for the NW Planning Area. In order to evaluate potential direct and indirect effects (including cumulative effects) to wetlands, floodplains, lakes, ponds, and/or riverine pools from gravel borrow sites, the final IAP/EIS should identify the location of existing, and potential future gravel sources on a Map for the NW Planning Area. A Table should include estimates of the quantities (cubic yards) of gravel that would be required for each type of development activity. The DOI/BLM should develop management measures and stipulations for the siting and development of gravel borrow source sites in the NW NPR-A. EPA recommends that lakes and ponds deeper than 6-ft and used by fish for overwintering habitat be excluded from gravel source sites. Furthermore, we recommend that DOI/BLM make the commitment to require that decommissioned gravel source sites be rehabilitated or restored for fish and/or wildlife habitat. **(Comment No. 261-127)**

Response To: Comment 261-127

The stipulations for gravel removal will require site-specific environmental analysis for each proposed pit location and a rehabilitation plan (Section II.C.6). These will be evaluated using performance-based best management practices. Reconnaissance level maps of sources of surficial materials, including gravel borrow sites, have been

produced by the USGS and are available for the Planning Area. The BLM is developing an agreement with USGS to update mapping of the more important regions. The presence of gravel may not be as important as has been suggested simply because of the impact of technology change in industry. Significant changes have been made in all aspects of industrial development in the Arctic from size of pads to type materials needed. There are simply too many unknowns and too many variables to make a detailed analysis of gravel use meaningful at this stage. Additional NEPA analysis at the permitting stages would examine alternate material sites and pad designs.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Introduction, Gravel Requirements, Page IV-19. The fourth paragraph on this page discusses alternate types of gravel pads that could be used to reduce gravel requirements and references Map 107 for examples. The referenced location probably should be Figure IV-02, which shows gravel pad construction designs. One of the pads depicted is termed the 'all- season pad' which contains 2 to 3 ft. of polystyrene insulation. The use of foam within or beneath gravel pads creates problems when the pad is rehabilitated. The foam will break into small pieces that can be carried offsite by wind if the material of the pad is required to be removed because of site contamination remediation or material reuse at site closure. Inclusion of foam in reuse gravel will likely make this material unsuitable for other uses. **(Comment No. 251-154)**

Response To: Comment 251-154

The proposed design of a pad goes through an engineering and environmental review during the site-specific plan and permitting phase. If mitigation is needed for potential problems of the types mentioned in the comment, appropriate measures would be identified at that time. The graphic reference has been corrected.>

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Introduction, Gravel Requirements, Page IV-19. The fourth paragraph on this page discusses alternate types of gravel pads that could be used to reduce gravel requirements and references Map 107 for examples. The referenced location probably should be Figure IV-02, which shows gravel pad construction designs. One of the pads depicted is termed the 'all- season pad' which contains 2 to 3 ft. of polystyrene insulation. The use of foam within or beneath gravel pads creates problems when the pad is rehabilitated. The foam will break into small pieces that can be carried offsite by wind if the material of the pad is required to be removed because of site contamination remediation or material reuse at site closure. Inclusion of foam in reuse gravel will likely make this material unsuitable for other uses. **(Comment No. 251-156)**

Response To: Comment 251-156

The graphic reference has been corrected. The proposed design of a pad goes through an engineering and environmental review during the site-specific plan and permitting phase. If mitigation is needed for potential problems of the types mentioned in the comment, appropriate measures would be identified at that time.

Comment From: ConocoPhillips Alaska, Inc. Alaska, Inc (Comment Letter No. 255)

Page IV-18, last paragraph. The discussion on gravel mining from rivers implies that significant environmental damage would occur from this activity, then goes on to recommend alternatives. While these negative impacts could occur without proper design and careful construction practices, CPAI believes that existing guidance issued by the U.S. Fish and Wildlife Service and Alaska Department of Fish and Game provides for development of floodplain gravel mines that will not only provide over wintering fish habitat but will also result in the

production of diverse wildlife habitat for waterbirds. If floodplain gravel mining occurs in the Northwest Planning Area, using the design guidelines in these manuals, these actions can prevent negative impacts from occurring (McLean, 1993). **(Comment No. 255-815)**

Response To: Comment 255-815

The BLM has established guidelines designed to substantially reduce the negative impacts of removing gravel materials from rivers. Recent development projects have attempted to avoid removing gravel materials from rivers. Use of gravel from rivers is a valid use of these resources.

59. TOPIC : NEPA PROCESS

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The evaluation of potential impacts from oil development activities in the DEIS is based upon a series of proposed development scenarios that are incomplete and unrealistic when evaluated in the context of existing development in the region. As a result, the nature and extent of potential direct, indirect and cumulative impacts are significantly understated. While BLM has acknowledged the proposed actions for the Northwest Planning Area are of a level of significance to warrant a full NEPA review, BLM has failed to address the NEPA requirements for such an analysis in this document. A generic discussion of resources and potential impacts like that contained in the DEIS cannot suffice as the required site-specific analysis. **(Comment No. 253-22)**

Response To: Comment 253-22

The BLM believes that the analytical method used to develop the exploration and development scenarios is sound, considering the degree of uncertainty about oil and gas resources and future economic conditions. A consistent methodology was used to develop the hypothetical scenario for oil and gas activities under each alternative. The methodologies used for the geologic and economic assessments are discussed in Appendix 7. Impact levels may tend to be overstated in this IAP/EIS. The scenarios used for the analyses are optimistic (higher levels of exploration and development are based on $30/bbl oil in 2002) in projecting the types and levels of activities that could occur. In addition, the impact analyses for the Alternatives assume the maximum projected level of leasing, exploration, development, production, and support activities would occur. The analysis in this IAP/EIS is intended to support a planning decision on potential oil and gas leasing in the Northwest National Petroleum Reserve-Alaska. It is appropriate that the analysis in the IAP/EIS is broad in scope because the decisions on the leasing program and mitigation measures will be broad in scope. The subsequent NEPA analyses for proposed exploration and development activities would be prepared at the time that these actions are ripe for decision. This "tiered" approach to NEPA compliance and decision making is encouraged by the NEPA regulations (see 40 CFR 1502.20 and 1508.28).

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Section IV. Environmental Consequences describe the different types and levels of activities that are projected to occur in the NW Planning Area and the potential effects on important physical, biological, and social resources from activities for each of the four Alternatives. EPA's review found the information in the analysis of effects insufficient for an adequate comparison between alternatives. No quantitative data for the potential direct and indirect effects (including cumulative effects) was found in the draft IAP/EIS. The analysis of effects is weak. We recommend that the final IAP/EIS clearly define and/or explain effects in detail and in the context of environmental consequences with additional supporting information. The Council of Environmental Quality

(CEQ) regulations require that an EIS shall include discussions of the direct and indirect effects and their significance on physical, biological, and human social resources [40 CFR 1502.16]. The analysis of effects for the NW NPR-A draft IAP/EIS does not fully discuss the 'significance' of the effects on each of the resources identified. The final IAP/EIS should include an effects analysis that identifies the significance of the impacts on the resources considering such factors as the nature of the impact, the spatial and temporal extent of the effects, expected or known recovery times, and the effectiveness of mitigation from the proposed stipulations. The use of significance thresholds may be appropriate for assessing the significance of the expected effects from the alternative management approaches being evaluated in the final IAP/EIS. The MMS has recently incorporated '"significance thresholds" into their analyses of effects. In so doing, MMS defined significance thresholds for each resource category as the level of effect that equals or exceeds the adverse changes indicated in certain impact situations (refer to the final EIS for the Beaufort Sea Planning Area, Oil and Gas Leasing Sales 186, 195, and 202). EPA recommends that the effects analysis for the final IAP/EIS include a characterization of the significance of predicted effects, consistent with the NEPA regulations. The use of quantitative significance thresholds based on the best available data is encouraged. **(Comment No. 261-128)**

Response To: Comment 261-128

The BLM believes that the analytical approach taken in the effects analyses for physical, biological, and human social resources, such as subsistence-harvest patterns, sociocultural systems, and environmental justice, thoroughly identifies the significance of impacts on resources, including the nature of the impact, the spatial and temporal extent of the effects, recovery times, and the effectiveness of mitigation. The potential impacts of the alternatives are compared in Section II.D. The incremental contribution of the alternatives to cumulative impacts is compared in Section IV.F. A comparison of the effectiveness of the mitigation measures under the Alternatives is presented in Appendix 12. Existing quantitative information is presented in sections where appropriate; analyses attempted to avoid unnecessary repetition in discussing alternatives.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS does not contain a full cumulative impacts analysis as required by NEPA. Although the DEIS contains a section titled 'effects of the cumulative case,' this section fails to ask the right questions and answers the questions it does address with cursory generalized analysis that is far from adequate. **(Comment No. 253-146)**

Response To: Comment 253-146

The BLM believes that the scope of the cumulative analysis is appropriate for this IAP/EIS and in accordance with the provisions of NEPA regulations to keep EIS's concise and no longer than absolutely necessary (40 CFR 1502.2(c)), to evaluate broad actions generally (40 CFR 1502,4(c)(2)), and to use tiering to focus on the actual issues ripe for decision (40 CFR 1502.20). Please also see the response to comment 253-24 (Cumulative Impacts and Analysis).

Comment From: State of Alaska (Comment Letter No. 251)

Map 20 depicting deep lakes in Lake Zone III is missing from the map section of Volume II of the Draft IAP/EIS. **(Comment No. 251-147)**

Response To: Comment 251-147

The text has been corrected.

Comment From: Audubon Alaska (Comment Letter No. 213)

The cumulative effects analysis of incremental development on wildlife within Northwest Planning Area are inadequate. **(Comment No. 213-205)**

Response To: Comment 213-205

The environmental resources described in Chapter III and the impacting factors identified in Chapter IV that carry over into a cumulative context are addressed in Chapter IV.F. Other perturbations from both the past, ongoing, and future have been addressed to best define the layering of potential effects with time. The contribution of the activities in the Northwest NPR-A to overall effects is addressed as an incremental contribution to the cumulative effects on each of the designated resources (Section IV.F.9). The major contribution to potential cumulative effects on TLH would be from ongoing and potential future development on State lands east of NPR-A. The additional cumulative impact from activities in the Northwest NPR-A would be limited to a potential off-site pipeline to either Kuparuk or TAPS and would not constitute a significant addition to cumulative effects. An analysis of the incremental contribution of activities that are projected from the Preferred Alternative has been added to the cumulative analysis.

Comment From: Audubon Alaska (Comment Letter No. 213)

In the absence of a comprehensive cumulative effects analysis and strategic planning on a landscape scale, we anticipate further piecemeal development across Alaska's Arctic landscape. We are concerned that such development could result in significant and unplanned environmental impacts and foreclose future conservation options. Therefore, future development in the Northwest Planning Area and elsewhere in NPR-A must be undertaken only under a comprehensive plan that minimizes cumulative environmental impacts. A comprehensive plan should include a protected areas network encompassing key areas of biological importance. **(Comment No. 213-209)**

Response To: Comment 213-209

We can only plan for public lands that we control. See response 261-87 (Planning) for a discussion of how we are trying to ensure the consistency of all our plans within NPR-A.

Comment From: Audubon Alaska (Comment Letter No. 213)

Audubon's western Arctic synthesis suggests that four additional sites within the Northwest Planning Area also merit special management. We request that these habitat conservation recommendations be considered as alternatives for the final environmental impact statement. **(Comment No. 213-210)**

Response To: Comment 213-210

Please see response 213-202 (Special Designation Areas).

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

HEARING OFFICER BROWER: Thank you, Nate. In summary, Nate's comments are that the book that was -- the documents that we received are pretty thick documents and cannot be quickly digested in such a short period of time that you've given us and perhaps, he's suggesting an extension of these comments and give us more time. Because in view of the 600-some allotments, applications not counting the Alaska Native Veteran allotees, my allotment, and those things, and his comments are not coming from the ICAS Board but are his own comments. And he feels the inadequacy of his comments are because of the voluminous presentation that you've given us in this short period of time. **(Comment No. 80075-494)**

Response To: Comment 80075-494

In response to public requests, the close of the public review and comment period on the draft IAP/EIS was extended from March 18, 2003, to April 2, 2003.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

And one more comment that we -- even though the deadline is March 18th for the public comment, we should unite and call our representative or legislators to extend this comment period by at least six months. That's what we ought to do, is extend the draft comment period on this EIS until we have a clear understanding with a town meeting throughout the North Slope. **(Comment No. 80075-497)**

Response To: Comment 80075-497

In response to public requests, the close of the public review and comment period on the draft IAP/EIS was extended from March 18, 2003, to April 2, 2003.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

During the discussions that were happening there it has been evident how the plan, this MMS [sic] plan has been in our hands for a very short period of time. We have not been given adequate time to review how it will impact us economically, subsistencely [sic], and we have heard time and time again this evening, from our leaders, how we need to come together to meet and review this proposed plan that BLM has proposed to us. **(Comment No. 80075-501)**

Response To: Comment 80075-501

In response to public requests, the close of the public review and comment period on the draft IAP/EIS was extended from March 18, 2003, to April 2, 2003.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

BLM has known since 2002 that this was going to be happening and yet it's just, what, like 17, 18, 19 days before they have to make a decision and they start having public meetings, that's not fair. Come on, you guys get real. Have some village meetings like that have been suggested. Postpone the deadline for March 18 and maybe make it to June, where it will be more appropriate for everybody to have input instead of this rush, rush stuff on

everything that's going on today. **(Comment No. 80075-510)**

Response To: Comment 80075-510

As requested at the Barrow Hearing, a Barrow community workshop was held on March 7, 2003. The meeting was organized jointly by the North Slope Borough, City of Barrow, Native Village of Barrow, and the Inupiat Community of the Arctic Slope. Staff from the Bureau of Land Management attended the meeting and provided a briefing for participants. Staff also made themselves available as the meeting progressed to answer questions or provide clarification when questions arose. In response to public requests, the close of the public review and comment period on the draft IAP/EIS was extended from March 18, 2003, to April 2, 2003.

Comment From: American Society of Mammologists (Comment Letter No. 249)

The first comment that has to be made concerning the draft EIS document regards the comment submission process and comment period. We feel very strongly that a 60-day comment period with a 14-day extension is grossly insufficient for thorough review and commentary on a document that exceeds 1000 pages in length. The actions proposed in this document are too important and potentially consequential to receive such a short deadline; instead, a comment period of 90- to 120-days is warranted, consistent with comment periods for other draft EISs (some much shorter than this one). May we suggest a 90-day comment period for what we sincerely hope will be a revised version of this **(Comment No. 249-514)**

Response To: Comment 249-514

In response to public requests, the close of the public review and comment period on the draft IAP/EIS was extendedfrom March 18, 2003, to April 2, 2003.

Comment From: American Society of Mammologists (Comment Letter No. 249)

Two extremely important recent publications (National Audubon Society 2002; Orians et al. 2003), both with tremendous relevance for oil and gas exploration and development in the NW NPR-A, were not used or cited anywhere in this document. Orians et al. (2003) is particularly important as it identifies a number of significant cumulative environmental effects of oil and gas activities on Alaska's North Slope, something that this draft EIS fails to consider or acknowledge. NPR-A Planning Team, from A.S.M. **(Comment No. 249-517)**

Response To: Comment 249-517

The Audubon (2002) Alaska's Western Arctic: A Summary and Synthesis of Resources was published after the draft IAP/EIS was at the printer. Orians et al. (2003) was released after publication of the draft IAP/EIS. The information in these reports is considered in the cumulative analyses in the final IAP/EIS. Please also see the responses to comments 253-24 (Cumulative impacts and Analyses) and 253-25 (Alternatives General).

Comment From: American Society of Mammologists (Comment Letter No. 249)

We are particularly concerned with the preponderance of 'gray' literature and paucity of peer-reviewed literature cited throughout the document. As you are probably aware, gray literature generally is not peer-reviewed and reliance on non-peer-reviewed documents can unduly weaken an otherwise workable. We strongly recommend

undertaking a serious review of the peer-reviewed literature germane to this EIS and citing it wherever possible in a revised draft EIS. **(Comment No. 249-525)**

Response To: Comment 249-525

The Department of the Interior retains a highly qualified staff of scientists and other professionally trained resource evaluation team members. Every individual that is responsible for analyzing the various resources potentially affected by a proposed action is obliged to research and investigate hundreds of pieces of documentation that include both peer and non-peer reviewed literature references. Many non-peer reviewed or "gray" references are products of Federal Government efforts to gather as much information as possible, which is then used in preparing documents that describe and evaluate the consequences of various proposed actions. As part of a government deliverable, in many cases, the preparer/contractor is required to publish the results of the project in appropriate science publications within a relatively short time frame. While taking your comment into consideration, we are confident the information included in this document is valid scientifically and supports the evaluation of the consequences of the pending land use decision.

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

Additionally, we believe the DEIS fails to fulfill requirements under NEPA, inadequately addresses sociocultural impacts of potential drilling on the Native culture in the NPRA, fails to address cumulative impacts of full-scale drilling, and falls short in its consideration of wilderness and wild and scenic designations, and in the interests of time, I will highlight our NEPA concerns and our recommendations for permanent protections. From a process perspective, the DEIS we feel does not fulfill requirements under NEPA to address all reasonable alternatives. NEPA states that an EIS -- and I'm quoting here -- shall serve as a means of assessing 4 environmental impacts of proposed agency actions rather than justifying decisions already made. Given BLM's statement in the DEIS executive summary that the potential uses of the area for oil development is a major focus of the DEIS, we can hardly view the alternatives presented as unbiased and not skewed to support a predetermined action. **(Comment No. 80082-543)**

Response To: Comment 80082-543

You are correct that the DEIS summary identifies the potential uses of the area for oil and gas development as a major focus of the document. There is nothing in this statement that supports your assertion that we have made a prior decision regarding oil and gas leasing of the area. The EIS identifies many uses of the Planning Area, with oil and gas leasing and possible development being important ones.

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

Furthermore, NEPA directs Federal agencies to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment. Alternatives A and B open up 100 percent and 96 percent of the Western Arctic to drilling respectively. These are hardly reasonable proposals, and they leave the DEIS without a middle ground alternative for the public to consider. **(Comment No. 80082-544)**

Response To: Comment 80082-544

Your comment ignores the existence of Alternative C which makes 47 percent of the area available. You also ignore the fact that we do not identify a Preferred Alternative and indicate in Chapter 2 that our final Preferred

Alternative may cut and paste from the existing ones or be entirely new. We also believe that it is important to judge an alternative not only by how much land is made available for leasing, but also by the stipulations and ROP's that provide protection for the natural and cultural resources of the Planning Area. The Preferred Alternative that we present here includes an 18-million-acre deferred area, Special Area status for Kasegaluk Lagoon and a strong package of setbacks and other restrictions that will provide protection to resources of concern.

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

First, I would like to thank you for having this hearing today. I would like to say I was pleased to hear that the public comment period has been extended. However, much like several other people have testified today, I am a bit disappointed to know that this is the only hearing taking place outside of Alaska. **(Comment No. 80082-553)**

Response To: Comment 80082-553

The decision on the number and locations of public meetings is a balance between opportunities for public input and cost-effective use of public funds. The public meetings on this IAP/EIS were held in communities that would be potentially most affected by oil and gas leasing and other ground-impacting management actions in the Northwest NPR-A. Other stakeholders and interested parties were provided full opportunity to comment via mail, e-mail, fax, and website. The method of submission makes no difference in how comments are considered in development of the final IAP/EIS. All comments, regardless of method of submission, become part of the official administrative record.

Comment From: Olgoonik Corporation (Comment Letter No. 169)

The consensus of the group was that the time for the comment period be extended to April 18, 2003. **(Comment No. 169-695)**

Response To: Comment 169-695

In response to public requests, the close of the public review and comment period on the draft IAP/EIS was extended from March 18, 2003, to April 2, 2003.

Comment From: Wainwright Tribal Council (Comment Letter No. 80012)

The comment period should be extended to April 18, 2003, instead of March 18 of this year. The hearings should be a day of meeting instead of having two meeatings in two separate villages in one day. This would give people more time to express their concerns on the issues that oil entities have come to collect informaiton. **(Comment No. 80012-1028)**

Response To: Comment 80012-1028

Please see responses 80075-494 (NEPA Process), and 80082-553 (NEPA Process) concerning extending the comment period. For BLM's meeting and consultation protocol see comments 254-638 (Government to Government), 261-102 (Government to Government), 261-119 (Government to Government), 80026-1016 (Government to Government), 80075-471 (Government to Government), 80075-474 (Government to

Government), 80075-493 (Government to Government), 80077-926 (Impact Compensation), 80077-946 (Government to Government), and 80079-989 (Government to Government). See also the General Lease Stipulations and Required Operating Procedures for the Preferred Alternative, specifically Required Operating Procedures H-1 and I-1.

Comment From: Terry Woods (Comment Letter No. 80021)

First let me say that although this letter may be similar to others you receive, the ideas and views expressed are either my own or are consistent with mine. I recently read that an agency of the current Administration ignored 170,000 comments (out of 175,000) because they were considered "form" letters. How arrogant and disingenuous! That same agency uses "form" letters, as does Congress and the White House. If you disagree or feel obligated to go along with the payback of lOUs by the President then say so. Dont act like the "slick, fast-talking" trial lawyers the President is always deriding. Now that Ive gotten that off my chest, please consider my comments. **(Comment No. 80021-842)**

Response To: Comment 80021-842

The BLM received almost 100,000 letters, postcards, e-mails, faxes, and web-based comments on the draft IAP/EIS. Every comment submission was reviewed by BLM or MMS staff. Every e-mail was opened. No comments were ignored. Many, many of the comments received are form letters. Although duplicate letters are not reproduced in the final IAP/EIS and individual responses are not provided for every form letter, the opinions expressed in the form letters were considered in revising the draft IAP/EIS and in developing the Preferred Alternative. The comments that appeared in form letters or were expressed multiple times in multiple ways have been either summarized and responded to or addressed as a response to an example letter.

Comment From: Alaska Coalition (Comment Letter No. 80016)

BLM must analyze the full environmental effects of the indirect and cumulative effects of projected oil development, not just eh direct 'footprint.' BLM has a responsibility under NEPA to the communities and to the public to analyze the full environmental effects of the maximum development scenario. Do not repeat the mistakes of the Alpine where the agencies failed to look at the reasonable future.' **(Comment No. 80016-856)**

Response To: Comment 80016-856

The effects of the indirect and cumulative effects are analyzed in the alternative analyses and cumulative analyses, respectively. The analyses of the Alternative assume the maximum level of exploration and development activities projected for each Alternative. The analyses also consider supporting activities and infrastructure. The Alpine field development provided the model for the scenario for the Alternatives in this IAP/EIS. The actual configuration of supporting infrastructure and level of activities associated with any future development would depend on several factors. Location, reservoir characteristics, existing infrastructure, new technologies, and mitigation measures developed during site-specific environmental review are just a few of those factors. Reasonable foreseeable cumulative activities are discussed in Section IV.F.7 Major Factors Considered in the Cumulative Effects Analysis. Reasonably foreseeable activities are considered in the cumulative analyses.

Comment From: David van den Berg (Comment Letter No. 189)

The flaw with NEPA's steps is that correspondence is essentially one way. The public has an abiding interest, and at either of our two opportunities, we may not suggest the right measures, say exactly the right words. It is too

easy, then, for the BLM to categorize input and sweep it away. For the most part, there is not face-to-face contact in which the public can build and refine the terms of the negotiation to protect the Colville. (An example: Public says: 'please protect Colville to maximum extent.' Agency: 'I wish they'd be more specific. Put that one in category 6c. Tell them that we are protecting the Colville already.' A better way might be for BLM to be able to ask for clarifications, refinements on the idea.) **(Comment No. 189-1037)**

Response To: Comment 189-1037

The NEPA process provides specifically for two public input opportunities – scoping and public meeting on the draft EIS. The 45-day scoping period of the Northwest NPR-A IAP/EIS was formally initiated with publication of the Notice of Intent to Prepare an Integrated Activity Plan/Environmental Impact Statement and Call for Information and Comments in the Federal Register November 14, 2001. Scoping is specifically intended to give stakeholders and the public an opportunity to have input on the issues, alternatives, and mitigation measures of the EIS. Scoping comments can be as lengthy and detailed as necessary. In a sense, the draft EIS is the "reply" to the scoping comments. The issues, alternatives, and mitigation measures in the draft EIS are prepared with consideration of the scoping comments. The public review and comment period on the draft EIS provides stakeholders and the public another opportunity to comment on the issues, alternatives and mitigation measures as well as on the information and analyses in the EIS. If scoping comments were not understood or were not considered in the draft EIS, the public comment period is a opportunity to clarify or repeat a concern. The comment period on the draft Northwest NPR-A IAP/EIS was initially 60 days and was then extended an additional two weeks. Comments on the draft document were accepted through a variety of means – mail, fax, e-mail, website, and public meetings. The comments could be as lengthy and detailed as needed to fully convey concerns. Multiple comment letters can be submitted during the comment to provide additional detail as it occurs to the commenter. In addition to the formal public comment period and public meetings, the BLM has met with various individual and groups of stakeholders and interested parties – from State of Alaska representatives to for the Greater Fairbanks Chamber of Commerce.

Comment From: Public Meeting on DEIS - Wainwright, Alaska (Comment Letter No. 80079)

But then I see the huge expanse 8.8 million acres of land, including Wainwright and areas to the west of here and I'm realizing that we're asked to make decisions now that are of historic proportions. What we decide here is going to affect our families for the next 50 to 100 years and I'm feeling a little overwhelmed by what we're being asked to comment on in the short period of time that we're being asked to comment. Although, right now, for the record I am pro-development. I'm an engineer for petroleum development and I'm also environmentalist in nature supporting the subsistence and cultural aspects of my family, my Native family. Hard for me to decide what to do here and I don't feel I should be asked to decide at this time for this area around Wainwright which I consider home. Because of this, I support a no action alternative at this time. That's all. **(Comment No. 80079-986)**

Response To: Comment 80079-986

In response to public requests, the close of the public review and comment period on the draft IAP/EIS was extended from March 18, 2003, to April 2, 2003.

Comment From: Public Meeting on DEIS - Wainwright, Alaska (Comment Letter No. 80079)

By the time we digest what's really going on, the time period is over for comments. And I would recommend that they make it at least 90 days, you know, because a lot of the small communities have people who wear many different hats, not just me but there is a lot of people who need to digest what information that's given and think about it and talk to the people in the community. As you can see there's hardly anybody here. The room should

have been packed full of all the hunters, people who have allotments, who have concerns and they're not here. **(Comment No. 80079-988)**

Response To: Comment 80079-988

In response to public requests, the close of the public review and comment period on the draft IAP/EIS was extended from March 18, 2003, to April 2, 2003.

60. TOPIC : SPILL-PREVENTION AND RESPONSE

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.2, Paragraph 4, Page IV-35. This section states that "The State of Alaska....requires an oil spill to be cleaned up except under certain specified conditions. The Final IAP/EIS should detail those conditions, namely: The Department, in consultation with the U.S. Coast Guard or the U.S.Environmental Protection Agency, as appropriate, determines that containment or cleanup is not technically feasible; or Containment or cleanup activities would result in greater environmental damage than the spill itself. **(Comment No. 251-178)**

Response To: Comment 251-178

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.2, Paragraph 4, Page IV-35. The following statement is unclear and should be revised: 'In cases where an oil spill may reach open water, a facility operator must be prepared to contain and control a volume of oil appropriate to the type of activity that may occur within 72 hours '.' **(Comment No. 251-179)**

Response To: Comment 251-179

The text has been revised to conform to language in AS 46.04.030(k).

Comment From: State of Alaska (Comment Letter No. 251)

Except for a discharge permitted by the State for scientific purposes, any discharge of oil to land or water in Alaska is illegal under State law. Under State law, a person causing or permitting an oil spill is responsible for its immediate containment and cleanup. Certain facilities (which include oil exploration and production facilities, crude oil transmission pipelines, oil terminals, and noncrude oil tank vessels and barges among the proposed activities envisioned in the Draft IAP/EIS must have an oil discharge prevention and contingency plan approved by the Alaska Department of Environmental Conservation (ADEC). These facilities must demonstrate in their contingency plans how they will: · Except for noncrude oil vessels and barges, contain or control and clean up the portion of an oil spill of specified size that enters open waters within 72 hours; · Except for noncrude oil vessels and barges, contain or control within 72 hours, and clean up within the shortest possible time consistent with minimizing environmental damage, that portion of the oil spill of specified size that enters

the environment other than open water; · For noncrude oil vessels and barges, contain or control within 48 hours, and clean up within the shortest possible time consistent with minimizing environmental damage, that portion of an oil spill of specified size that enters open water; and · For noncrude oil vessels and barges, contain or control and clean up within the shortest possible time consistent with minimizing environmental damage, that portion of an oil spill of specified size that enters the environment other than open water. **(Comment No. 251-180)**

Response To: Comment 251-180

The BLM acknowledges that oil and gas operators would be required to obtain an oil discharge prevention and contingency plan approval from the Alaska Department of Environmental Conservation in Section II.F.6, Section IV.A.4, and Appendix 4.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.4, Paragraph 1, Page IV-44. Two corrections are needed. In the next to last sentence, the word 'prove' should be 'provide.' In the last sentence, the citation of '18 ACC75' should be '18 AAC 75.' **(Comment No. 251-183)**

Response To: Comment 251-183

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.4, Paragraph 1, Page IV-44. In addition to providing ADEC with the authority to prevent and respond to oil pollution, A.S. 46.03 and 46.04 also provide the Department with civil, criminal, and administrative enforcement authorities. **(Comment No. 251-184)**

Response To: Comment 251-184

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.4, Paragraph 1, Page IV-44. The Final IAP/EIS should acknowledge that U.S. Coast Guard regulations also may apply to the transportation and transfer of oil to or from barges or vessels. **(Comment No. 251-185)**

Response To: Comment 251-185

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.4, Paragraph 5, Page IV-45. The Final IAP/EIS should also note that the U.S. Environmental Protection Agency (EPA) serves as on-scene coordinator for spills that reach inland waters. **(Comment No. 251-186)**

Response To: Comment 251-186

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.4, Paragraph 6, Page IV-45. The second sentence should be reworded as follows: 'The ADEC also requires operators of facilities that must have an approved contingency plan and operators who drill for shallow natural gas (3,000 ft. below ground surface or less) to provide acceptable proof of financial responsibility for the cleanup of oil spills.' **(Comment No. 251-187)**

Response To: Comment 251-187

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.4, Paragraph 6, Page IV-45. The second-to-last sentence should be rewritten to more accurately state Alaska's oil spill control and cleanup requirements, as described above. **(Comment No. 251-188)**

Response To: Comment 251-188

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.4, Paragraph 6, Page IV-45. The Final IAP/EIS should state that the State also has oil and hazardous substance spill reporting requirements. Those requirements are found in 18 AAC 75.300. **(Comment No. 251-189)**

Response To: Comment 251-189

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.B.6.b, Paragraph 6, Page IV-53. This section refers to a description of air emission sources associated with oil and gas exploration, development, and production in the report Air Quality Impact of Proposed OCS Lease Sale No. 95. The Final IAP/EIS should indicate that the descriptions in this report also are accurate for operations that would occur within the planning area rather than offshore waters. This same comment applies to Section IV.C.6.b. **(Comment No. 251-190)**

Response To: Comment 251-190

The text has been revised to add to Sections IV.B.6.b and IV.C.6.b the following text: "Information from that report is still relevant even for operations that would occur within the Northwest NPR-A Planning Area. Certain emission sources discussed therein obviously do not apply for operations occurring on land, but the report does include a fairly comprehensive analysis of activities and emission sources that do occur during oil and gas exploration, development, and production, regardless of the specific locations in which they may occur."

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.C.5.b.(2), Paragraph 1, Page IV-114. This section should state that ADEC approval of oil prevent ion and discharge contingency plans also is required for oil barge and offshore exploration and production facilities in the planning area. State oil spill prevention requirements located in 18 AAC 75, Article 1 also would apply to these activities. **(Comment No. 251-193)**

Response To: Comment 251-193

Section IV.C.6.b.(3) states that ADEC requires that all oil spill prevention and contingency plans rely on the control, containment, and cleanup of spills as the primary response tools. Additional information on oil-spill response tools has been added to Section IV.A.4 Spill-Prevention and Response.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.C.6.b.(2), Page IV-121. The section states that 'In addition, in situ burning is a preferred technique for cleanup and disposal of spilled oil in oil-spill-contingency plans.' The State recommends that the discussion indicate that an ADEC-approved contingency plan would require an exploration or production facility operator to include plans for the control and containment of oil spills, including blowouts. While in-situ burning is a spill response technique that would be considered and may be used in appropriate circumstances, ADEC requires that all oil spill prevention and contingency plans rely on the control, containment, and cleanup of spills as the primary response tools. **(Comment No. 251-195)**

Response To: Comment 251-195

The 1999 U.S. Coast Guard Caps Review recognizes in situ burning as "the only effective countermeasure for broken ice conditions. Recovery on broken ice is possible, but again in situ burning is preferred." The BLM believes that in situ burning is an important response tool for coastal spills, regardless of whether broken ice conditions exist. As pointed out in response 251-194 (Air Quality), ADEC requires that all oil spill prevention and contingency plans rely on the control, containment, and cleanup of spills as the primary response tools. Recognizing that in situ burning of spilled oil is a viable, but not the primary tool under ADEC requirements, BLM has evaluated potential effects to resources that they believe would be potentially affected. .

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.C.6.b.(3), Paragraph 1, Page IV-122. This section discusses well blowouts on the U.S. Outer Continental Shelf. The Final IAP/EIS should provide a brief explanation of why information concerning blowouts on the Outer Continental Shelf is relevant here. 251-196 **(Comment No. 251-196)**

Response To: Comment 251-196

The State of Alaska does not maintain a blowout database that can be used to calculate a quantitative blowout rate. The OCS blowout rate is used as a proxy rate for Northwest NPR-A until better information becomes available. Similar regulations and standards cover drilling and production operations in both Northwest NPR-A and the OCS. We consider blowouts to be unlikely events. Blowout events are often equated with catastrophic spills; however, in reality very few blowout events have resulted in spilled oil, and the volumes spilled are often small. For blowouts in the outer continental shelf database, all five of the blowout events >1,000 barrels occurred between 1964-1970. Following the Santa Barbara blowout in 1969, amendments to the Outer Continental Shelf Lands Act and implementing regulations significantly strengthened safety and pollution prevention requirements for offshore activities. Well control training, redundant pollution prevention equipment, and subsurface safety devices are among the provisions that have been adopted in the regulatory program. From 1971 to 2000, 199 blowouts occurred on the OCS while drilling approximately 29,000 wells and producing 11.4 Bbbl of oil. Twenty eight of those 199 blowouts resulted in oil spills of crude or condensate with the amount of oil spilled ranging from <1 bbl to 200 bbl. The total volume spilled from those 28 blowouts is approximately 1,200 barrels. The volume spilled from blowouts was approximately 0.00001 percent of the volume produced. There are no spills > 1,000 bbl from blowouts in the last 30 years on the OCS. The record for Alaska North Slope blowouts is not validated, but is presented as the best available information. Well control training, redundant pollution prevention equipment, and subsurface safety devices are among the provisions that have been adopted in the regulatory program nationwide. The State of Alaska record generally parallels the OCS record where blowouts in the early days were more common. There are two written reports regarding blowouts on the Alaska North Slope, Mallory (1998) and Fairweather (2000). Fairweather (2000) found 10 blowouts, 6 that Mallory had identified and 4 prior to 1974. Of the 10 blowouts, 9 were gas and 1 was oil. The blowout of oil in 1950 was unspectacular and could not have been avoided, as there were no casings of blowout preventors available (Fairweather, 2000). These drilling practices from 1950 would not be relevant today. A third study confirmed that no crude oil spills greater than or equal to 100 barrels from blowouts occurred from 1985-1999 (Hart Crowser, Inc., 2000). In Cook Inlet, a minimum, and perhaps a maximum, of three natural gas blowouts have occurred: 1. The Pan American blowout occurred during drilling on August 1962 from the Cook Inlet State No. 1 well. The well encountered natural gas and blew gas from August 23, 1962, to October 23, 1963. Pan American Petroleum Corporation drilled a relief well, No. 1-A, to stop the blowout. 2. A short-term natural gas blowout occurred at the Grayling Platform in May 1985. Union Oil Company was drilling well G-10RD into the McArthur River Field when the blowout occurred. The event lasted from May 23 to May 26. The platform was evacuated, and observers noted a plume of gas, water, and mud reaching a height of 600 feet above sea level. Union prepared to drill a relief well, but the blowout stopped on its own because of bridging. Bridging seals off the escaping fluids and gases when part of the formation around the well bore collapses into the well bore and naturally closes it. The operator regained permanent well control by pumping cement through the drill pipe in G-10RD. There was no fire or injuries, and personnel shut in all oil wells prior to evacuating the platform. 3. A blowout occurred at the Steelhead Platform from well M-26 on December 20, 1987. Marathon Oil Company was drilling into the McArthur River Field. The gas blowout lasted from December 20, 1987, until December 28, 1987. A relief well was started, but the blowout bridged before the relief well was completed. The well blew out natural gas, water, coal, and rocks. The escaping gas caught fire, which damaged the deck of the platform.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.J.2, Page IV-493. We recommend that the discussion on blowout assumptions discuss the basis for using 15 days as a likely duration for a potential well blowout. Recent DEC decisions on the approval of North

Slope contingency plans have been hallenged administratively and in a civil complaint, in part, because a 15-day duration assumption was used in well blowout spill scenarios. It also should be noted that ADEC requires that contingency plans plan for a realistic maximum oil discharge, not a worst case discharge. **(Comment No. 251-198)**

Response To: Comment 251-198

The time period was chosen based on the analysis of typical oil-industry oil-spill-discharge prevention and contingency plans submitted to the State of Alaska. Operators in Alaska's North Slope and Cook Inlet areas typically use 15 days as their response-planning standard, and the standard is codified in the Alaska Clean Seas manuals. We have included this information in the text of the EIS. The wording "worst case discharge" is not used. The words "greatest possible discharge" are taken from 18 AAC 75.430(a): Response planning standards. Notwithstanding the response planning standards set out in 18 AAC 75.430 - 18 AAC 75.442, the plan must demonstrate the general procedures to clean up a discharge of any size, including the greatest possible discharge that could occur, subject to the provisions of AS 46.04.020 and AS 46.09.020.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.J.5.l, Page IV-507. The discussion on the potential effects of a very large oil spill needs to be expanded to include the potential effects on all subsistence resources. The section discusses potential effects on caribou herds within the planning area, but does not discuss potential effects on other subsistence resources, most notably marine mammals, birds, and fish. **(Comment No. 251-199)**

Response To: Comment 251-199

A discussion of impacts on marine mammals, birds, and fish has been included in Section IV.J.5.l., Effects of a Very Large Oil Spill on Subsistence-Harvest Patterns.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-44, Spill-Prevention and Response. In paragraph 1, reference is made to the size of the reserve pit. It is doubtful that an excavated reserve pit will be authorized for drilling operations in the planning area. Also, the AOGCC is responsible for H2S planning for drilling operations. We recommend that the first sentence in paragraph 3 be changed to read - 'Regulations administered by the AOGCC and BLM require the operator to maintain well control at all times during drilling and production. **(Comment No. 251-447)**

Response To: Comment 251-447

The text has been revised.

Comment From: NOAA (Comment Letter No. 209)

Pg. IV-114 Estuarine Water Quality ' Effects of Spills The final EIS should include further description or studies on the successfulness of oil spill recovery under the ice or in broken ice situations. The 'under the ice' and 'in broken ice' oil spills seem difficult to address with current recovery techniques. As oil becomes immobilized in the ice, it has the potential to be released over long periods of time and could affect the local habitat for years.

(Comment No. 209-911)

Response To: Comment 209-911

Oil spill prevention and response, including effectiveness of spill response, is discussed in Section IV.A.4 of the IAP/EIS.

61. TOPIC : COASTAL ZONE MANAGEMENT

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.C.17, Alternative A, Coastal Zone Management, Page IV-238. Parts of the description of the statewide Habitats standard in the first paragraph of this section is not technically correct. Minor proposed changes such as those incorporated in the following paragraph would improve the statement. Part (a) of the statewide Habitats standard lists 8 types of habitat that are subject to the ACMP including offshore areas, estuaries, wetlands and tideflats, rocky islands and seacliffs, barrier islands and lagoons, exposed high-energy coasts, rivers, streams and lakes and important upland habitat. Part (b) of the standard requires that these 8 habitats be managed to maintain or enhance the biological, physical and chemical characteristics of habitat. Part (c) provides management guidance for the first 7 of the habitats. Part (d) includes a provision to allow uses and activities to occur that do not conform to parts (b) and (c) of standard if: 1) there is significant public need, 2) there are no feasible and prudent alternatives, and 3) all feasible and prudent steps to maximize conformance with the standard have been taken. The second to last sentence in the second paragraph of the discussion of the Habitats standard on page IV-238 states that there are no conflicts with the Habitats standard under Alternative A. This statement may not be correct. Until specific proposals are submitted and reviewed, it would be premature to assume that there will not be conflicts with this standard. 251-469 **(Comment No. 251-998)**

Response To: Comment 251-998

The suggested changes to the description of the Habitat standard have been made. The second to the last sentence has not been modified. This statement is correct for an oil and gas lease sale. The last sentence, as is exists, clearly states that as specific proposals are brought forward a more focused analysis may identify site-specific concerns.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.C.17, Alternative A, Coastal Zone Management, Page IV-241. The discussion of effects of spills in the third paragraph on page IV-241 appears to imply that because a large spill is unlikely, it is not reasonably foreseeable. The discussion on large spills on page IV-36, however, supports the contention that a large spill is reasonably foreseeable. Under Alternative A with the price of oil at $30/bbl, the probability of a spill is 38 percent. AK-117 **(Comment No. 251-999)**

Response To: Comment 251-999

Section IV.A.2.a addresses the potential for large oil spills. The discussion states that for Alternatives A and B, with the price of oil at $30/bbl, the percent probability for an oil spill is 38 and 33 percent, respectively, over the lifetime of the project. The conclusion, however, states that the most likely number of large spills for all

alternatives is zero. Oil spills are accidental events and a large spill is not likely. This analysis supports the conclusion that a large spill is not a reasonably foreseeable event.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV. D. 17. Alternative B, Coastal Zone Management, Page IV-309. Under the discussion of effects of spills, the last sentence states that a large spill would be unlikely. The analysis on page IV-36, however, states that the probability of a spill under Alternative B at $30/bbl is 33 percent. **(Comment No. 251-1000)**

Response To: Comment 251-1000

Please see the response to comment 251-999 (CZM).

Comment From: State of Alaska (Comment Letter No. 251)

In general, the Draft IAP/EIS discussions on coastal zone management need to state more clearly when Alaska Coastal Management Program (ACMP) reviews are required for activities proposed in the NPR-A. Specifically, for a federal activity, such as an oil and gas lease sale, an ACMP review is required because there are reasonably foreseeable effects to coastal uses and resources. A consistency determination prepared by the Bureau of Land Management initiates the state's review for each lease sale. For federally permitted activities in the coastal area of NPR-A, projects must undergo an ACMP review if they require a listed federal authorization (15 CFR 930.53(a)(1)). Projects in NPR-A located outside of the coastal area may undergo an ACMP review if the state demonstrates, and the federal Office of Coastal and Resource Management agrees, that there are reasonably foreseeable effects to coastal resources or uses. The state consistency review of projects requiring a listed federal authorization begins when the state receives a consistency certification and necessary data and information. **(Comment No. 251-454)**

Response To: Comment 251-454

The text has been revised to more clearly state when Alaska's Coastal Management Program reviews are required. Throughout the section, the text has been changed to clearly identify the "consistent to the maximum extent practicable" standard applied to federal activities and the requirement that certain federally permitted activities must be consistent.

Comment From: State of Alaska (Comment Letter No. 251)

Section III.C.6(b)(1), Page III-128. The statement in the second sentence of the last paragraph should be reworded to reflect that the purpose of enforceable policies is to ensure that reasonably foreseeable effects on any coastal use or resource are consistent with the state's coastal management program. The statement is incorrect because it implies that the Coastal Zone Management Act (CZMA) only considers development and use of lands and resources within the coastal zone. Enforceable policies include the statewide standards in 6 AAC 80 and the enforceable policies in an approved coastal district program. 251-454 **(Comment No. 251-455)**

Response To: Comment 251-455

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section III.C.6(b)(1), Page III-129. The third sentence of the second paragraph should remove the words 'to the maximum extent practicable' or limit the discussion to only federal activities. While federal activities must be consistent to the maximum extent practicable with enforceable policies of the ACMP (15 CFR 930.32), federally permitted activities must be 'conducted in a manner consistent with approved management programs' (15 CFR 930.50). **(Comment No. 251-456)**

Response To: Comment 251-456

The text has been changed to remove the phrase "maximum extent practicable." No changes were made to the text to further clarify that both statewide standards and coastal district policies are enforceable. That language already exists in the last sentence of the paragraph.

Comment From: State of Alaska (Comment Letter No. 251)

The discussion in the second paragraph should be expanded to include requirements of 15 CFR 930. For example, in addition to spillover effects, an ACMP review is required when an activity requires a listed federal authorization and occurs within the coastal area of federal land (15 CFR 930.53(a)(1)). (The coastal area of the NPR-A is depicted on maps within the Coastal Zone Boundaries of Alaska publication.) 251-456 **(Comment No. 251-457)**

Response To: Comment 251-457

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section III.C.6.b.1, Page III-129-130. The discussion about the statewide ACMP standards needs to be rewritten to reflect the statewide standards more accurately. The standards are listed under two sections in the state regulations: Resources and Habitats and Uses and Activities (6 AAC 80). **(Comment No. 251-458)**

Response To: Comment 251-458

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

On page III-129 under the 'Coastal Habitats' heading, it should be clarified that there is only one statewide Habitats standard (6 AAC 80.130). This standard addresses 8 types of habitats and includes specific management principles for 7 of these habitats. The last paragraph under the Coastal Habitats section is correct as written. **(Comment No. 251-460)**

Response To: Comment 251-460

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Under the heading 'Uses and Activities' on page III-130, the sentence after the 9 standards limits the policies that are relevant to 5 policies. Two additional policies could be relevant to ACMP reviews in the NPR-A: Geophysical Hazard Areas (6 AAC 80.050) and Mining and Mineral Processing (6 AAC 80.110). **(Comment No. 251-461)**

Response To: Comment 251-461

The text has been revised to remove the phrase "maximum extent practicable." No changes were made to the text to further clarify that both statewide standards and coastal district policies are enforceable. This language already exists in the last sentence of the paragraph.

Comment From: State of Alaska (Comment Letter No. 251)

Section III.C.6(b)(1), Page III-131. The discussion regarding enforceable policies that minimize negative impacts should be rewritten to indicate that policies in this section apply to all applicable development. The current language implies that only certain types of activities. **(Comment No. 251-462)**

Response To: Comment 251-462

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.B.17, No Action Alternative, Coastal Zone Management, Page IV-84-85. The last sentence of the first paragraph should be rewritten as follows: '. . . must be consistent with the enforceable policies of the Alaska Coastal Management Program (ACMP) including the statewide standards in state regulation (6 AAC 80) and the enforceable policies of the affected coastal management program.' The proposed language removes the term 'maximum extent practicable' because this standard only applies to federal activities, not federally permitted activities. Also, the new language clarifies that both the statewide standards and the coastal district policies are enforceable policies. **(Comment No. 251-463)**

Response To: Comment 251-463

The text has been revised to remove the phrase "maximum extent practicable." No changes were made to the text to further clarify that both statewide standards and coastal district policies are enforceable. This language already exists in the last sentence of the paragraph.

Comment From: State of Alaska (Comment Letter No. 251)

The last paragraph on page IV-84 that continues to the next page should move the discussion on seismic activities to the next section since seismic surveys are an oil and gas-related activity. The last sentence of the first paragraph on page IV-85 should be reworded. It is possible that some non-oil and gas activities could have effects described in the definition of 'a use of direct and significant impact' in A.S. 46.40.210. **(Comment No. 251-464)**

Response To: Comment 251-464

Seismic surveys are included in this discussion because they may occur whether or not an oil and gas lease sale is held.

Comment From: State of Alaska (Comment Letter No. 251)

The last paragraph on page IV-85 should be rewritten. Again, because activities could have effects described in the definition of a 'use of direct and significant impact,' it would be premature to assume otherwise without doing a consistency review. Also, the term 'maximum extent practicable' in the second sentence only applies to federal activities. This standard does not apply to federally permitted activities. **(Comment No. 251-465)**

Response To: Comment 251-465

The text has been revised to remove the phrase "maximum extent practicable." The conclusion that no direct and significant impacts are anticipated has not been changed. It is anticipated that activities described in this section can proceed given the protections provided by existing regulatory structure, including consistency processes, and the oversight and permitting authorities of BLM.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.C.17, Alternative A, Coastal Zone Management, Page IV-234-235. The last paragraph that continues to page IV-235 should be rewritten to clarify the applicability of enforceable policies. Any project located in the coastal portion of the NPR-A requiring a listed license or permit would be subject to the ACMP enforceable policies including the statewide standards and the NSB enforceable policies (15 CFR 930.53(1)). **(Comment No. 251-466)**

Response To: Comment 251-466

Text has been added to clarify that projects requiring a listed license or permit will be subject to Alaska's Coastal Management Program review. The existing text states that both the statewide standards and the Borough district policies apply. No change was made.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.K.3.P, Possible but Unlikely Permanent Roads, Page IV-529. The discussion regarding applicability of ACMP reviews should be rewritten to clarify that if a project in the coastal area of NPR-A requires a listed federal authorization, an ACMP review would be required (15 CFR 930.53(a)(1)). AK-119 **(Comment No.**

251-1001)

Response To: Comment 251-1001

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

On page IV-235, the second to the last sentence of the discussion of the Coastal Development standard should reference the Coastal Zone Management Act (CZMA) rather than NEPA. The CZMA regulations, located at 15 CFR 930, provide guidance for determining whether an enforceable policy is relevant to a review. **(Comment No. 251-1002)**

Response To: Comment 251-1002

It is through the NEPA analysis that a determination is made whether or not there may be reasonably foreseeable effects. We have retained the NEPA reference and added a reference to the Coastal Zone Management Act.

62. TOPIC : KASEGALUK LAGOON

Comment From: State of Alaska (Comment Letter No. 251)

Kasegaluk Lagoon. Little information regarding the biological resources of Kasegaluk Lagoon is presented in this document. Birds make extensive use of Kasegaluk Lagoon during the open water season. Brant use the northeastern section of Kasegaluk Lagoon in mid August through early September for feeding prior to or during their southward migration. The y are the most numerous bird species using the lagoon, followed by shorebirds. Molting male long-tailed ducks also use the lagoon. Shorebirds use the mudflat and marsh habitats extensively during August and early September. Belugas are present from late June to late July, with an estimated population of 2,000 to 3,500 animals traveling through the area. Significant numbers of spotted seal use the spits and shoals within Kasegaluk Lagoon and Avak Inlet from July through October. It is estimated that from 1,000 to 3,000 seals use the area. **(Comment No. 251-144)**

Response To: Comment 251-144

The use of Kasegaluk Lagoon by several waterbird species, brant in particular, has been described in Section III of the IAP/EIS. Kasegaluk Lagoon has been highlighted as an area of high species diversity in late summer and fall.

Comment From: State of Alaska (Comment Letter No. 251)

As a result of the presence of significant concentrations of biological resources, notably brant, beluga, and spotted seal, which make Kasegaluk Lagoon different from any other arctic Alaska lagoon system, the State of Alaska recommends restricting permanent facilities in the lagoon and surrounding onshore areas. The specific boundaries of the area should be identified by a working group of federal, state and local regulatory and

resource agencies and incorporated in the Final IAP/EIS. This will provide the necessary measures of protection for these biological resources. Refer to the following reference for information on bird and mammal use of Kasegaluk Lagoon: LGL Alaska Research Assoc., Inc. and Alaska Department of Fish and Game. 1992. Use of Kasegaluk Lagoon, Chukchi Sea, Alaska, by marine birds and mammals. OCS Study MMS 92-0028. Unpubl. Rept. for U.S. Minerals Management Service, Herndon, VA. 627 pp. **(Comment No. 251-145)**

Response To: Comment 251-145

Please see the responses to comments 251-135 (Management), 251-144 (Kasegaluk Lagoon).

63. TOPIC : PIPELINE CONSTRUCTION

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Introduction, Pipeline Construction, Page IV-26. This section provides assumptions regarding pipeline design and construction that are the basis for analyses in the rest of the document. It states that wide, shallow rivers could be crossed by trenching and burying insulated pipelines in the riverbed. This section should be modified to note that fewer impacts would occur to the stream, streambanks, riparian habitat, and aquatic resources if a properly designed elevated pipeline crossings were used. Potential problems associated with maintenance, corrosion, and abandonment also would be less with an elevated crossing versus a buried crossing. **(Comment No. 251-159)**

Response To: Comment 251-159

The scenarios discuss a wide range of construction situations and current technologies, therefore analysts evaluating potential environmental impacts consider a variety of conditions. This section of the IAP/EIS is not intended to dictate approved construction methods. Regarding the advantages of elevated pipeline crossings for wide, shallow rivers, there are also disadvantages, including changes to flow characteristics of the braided channel, scour problems around mid-channel supports, visual impacts, and higher project costs. Future project designs will be based on site specific conditions and the tradeoffs between project economics and mitigation measures.

Comment From: City and Native Village of Nuiqsut (Comment Letter No. 80026)

Aboveground Pipeline Elevation: Required Operating Procedure (ROP) E-5 stipulates aboveground pipeline height of at least 5 ft under Alternative C, but specifies no minimum height for Alternatives A and B. The Preferred Alternative should stipulate aboveground pipeline height at a minimum of 10 feet, as measured from the ground to the bottom of the pipe, except where the pipeline intersects a road, pad or a ramp installed to facilitate wildlife passage and subsistence passage and access. Pipeline heights of 5 feet are not adequate to allow caribou and other game free passage under the pipelines, especially taking snowfall levels into account. Additionally, we recommend more crossings and more vertical expansion. **(Comment No. 80026-1021)**

Response To: Comment 80026-1021

Please see responses to comments 251-159 (Pipeline Construction) and 80065-571 ((Subsistence). See also the General Lease Stipulations and Required Operating Procedures for the Preferred Alternative, specifically

Required Operating Procedures E-7 and K-5 and Stipulation K-6.

64. TOPIC : WATER RESOURCES

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Alternative A, Water Resources, Gravel Removal, Page IV-100. The text notes that because of scarce gravel resources, composite pads made of a mixture of gravel, sand and silt, layered with styrofoam and geotextiles would reduce gravel requirements significantly. While this may be true, as mentioned earlier, the use of foam within or beneath gravel pads creates problems when the pad is rehabilitated. **(Comment No. 251-161)**

Response To: Comment 251-161

The use of foam underlayment for insulating gravel roads, work pads, etc. when encountering ice-rich permafrost is widespread throughout Alaska. The Alaska Department of Transportation, as well as oil and gas operators, utilizes this in gravel road and pad construction. Not using foam would require a much thicker gravel layer, which has negative impacts in terms of much greater gravel requirements, increasing the size and number of pits, in addition to widening the footprint to accommodate the side slopes required by the increased depth of fill. The foam also greatly reduces thermokarst, which is responsible for much of the increased sedimentation and flow diversions associated with road and pad construction in the arctic.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-97 2(b)(1) CPAI would like to point out that the water withdrawal limit cited by BLM of 15% of under-ice volume is preferred by the Alaska Dept of Fish and Game for fishbearing lakes. There are no water withdrawal limits for those lakes determined to be devoid of fish. CPAI typically collects information on fish presence/absence in lakes targeted for potential winter water withdrawal. According to numerous lake recharge studies conducted by CPAI consultants, removal of water from lakes rarely approaches 15% of the available amount of water under 7- feet of ice, and the amount of recharge during summer breakup typically meets or exceeds the amount of water used during winter exploration activities (Michael Baker, Jr., 2002). **(Comment No. 255-823)**

Response To: Comment 255-823

Please see the response to comment 253-363 (Fish).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-100, 2nd para. The discussion of potential pad and road induced drainage problems refers primarily to gravel fill techniques used in the 1980s and 1990s. Impoundment problems created from these designs are largely the problem of older oilfields (e.g. Prudhoe Bay). Current engineering standards and new BMP manuals used to locate and install cross-pad drainage structures, including larger and more frequently deeply buried culverts and more use of small bridges, have significantly reduced impoundment and thermokarsting issues. **(Comment No. 255-825)**

Response To: Comment 255-825

Impacts were determined as a range of consequences from the development scenarios (Section IV.A.1.b(4)), the stipulations that would govern these development activities (Section II.C.5), and the potential adverse impacts as referenced in the literature. The alternatives with fewer and more limited stipulations (Alternatives A and B) would have greater impacts than would Alternative C, with a greater number and more encompassing stipulations. These impacts would indeed be lessened by the construction methods noted in the comment, however, we did not assume these best management practices to be in place for analysis purposes.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-100, oil pipeline paragraph. It is not clear what is meant by the reference to impoundments along pipelines. Oil pipelines are elevated and impoundments typically do not occur along these alignments. Ice roads used to construct pipelines typically melt only a few days later that the adjacent tundra, hence impoundments along the ice road also are not usual features associated with this activity. **(Comment No. 255-826)**

Response To: Comment 255-826

The impoundments were assumed to occur during and/or immediately after elevated pipeline construction when work pads, ice roads, or equipment activities might create berms, dikes, ditches, or depressions that could impede or divert surface water. After all pipeline work is completed, few impoundments or diversions would be expected. If all work on the pipelines was done during winter, these impacts would be greatly reduced, but this is not a requirement of the scenarios (Section IV.A.1.b(6)).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-101, "Conclusions." This section concludes that the impoundment problems associated with roads, pads, and pipelines in oilfields built in the 80's and early 90's will still be a serious component of new fields and lead to significant habitat loss. CPAI has put considerable engineering effort into correcting these problems in the last few years and believes new Engineering Cross-pad Drainage Manuals and BMP's will substantially reduce these losses. New techniques allow correctly buried culverts that are properly sized for break-up flow events with more frequent placement to prevent sheet-flow impoundments. Also more frequent use of small bridges and larger culverts reduce gravel washouts. Using these new techniques, impoundments and thermokarsting should not result in the habitat loss that occurred in older fields. We believe the discussion and conclusion for this issue should be updated to reflect these new designs. Assumptions that disturbed acreage from impoundments and thermokarsting would be double the actual gravel footprint are no longer accurate. **(Comment No. 255-827)**

Response To: Comment 255-827

A study of the impacts of oil-field activities in Prudhoe Bay (Walker 1987) found that 15 years after construction began, the areas adjacent to the road system still showed an increase in thermokarst growth and that flooding from impoundments and diversions was more than double that of the primary impact of gravel placement. Please see the response to comment 255-825 (Water Resources).

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-401. Water Resources. In all chapters throughout the document, the discussions of impacts to water

resources have been excessively descriptive of serious negative impacts to water resources resulting from "implied" extensive amounts of soil erosion, melting of permafrost, blockages of natural channels and floodplains, stream bank and lake bank erosion, sedimentation, and drainage of lakes and river pools for ice road construction. While hypothetically these impacts can occur with poor design, in reality, standard engineering design and operation of newer oilfields have basically eliminated these impacts. Even in the older Prudhoe Bay Unit and Kuparuk River Unit oilfields, built with engineering standards of the 1970s and 1980s, when these impacts did occur, they were relatively minor on the scale of the total landscape. **(Comment No. 255-951)**

Response To: Comment 255-951

The Water Resources Section analyzes the range of impacts that can occur within each scenario, given a specific set of stipulations. Though the conclusions may differ, this same type of analysis was used for the Northeast National Petroleum Reserve-Alaska IAP/EIA (USDOI, BLM and MMS, 1998), and it is very similar to that used in the Alpine Development Project Environmental Evaluation Document (Parametrix, Inc. 1996) submitted by Arco and Anadarko to the U.S. Army COE, for their oil and gas development project. The former concluded that the alternative that opened all of the Planning Area for leasing and development would result in the greatest "long-term impacts (melting of permafrost and disrupting drainage patterns)" of all the alternatives (USDOI, BLM and MMS, 1998:Section IV-F-3). The latter document states that "The proposed in-field facilities are expected to cause minor or negligible impacts from increased sedimentation resulting from drainage impedance during large flood events;" then concludes in the same paragraph that "Wash outs of portions of the in-field facility access roads could occur during large floods" (Parametrix 1996, 4-16). This represents a local, but substantial, impact. The primary purpose of an environmental impact statement is to "provide a full and fair discussion of significant environmental impacts and shall inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts" (40CFR1502.1). The discussion in the environmental consequences section "will include the environmental impacts of the alternatives including the proposed action, any adverse environmental effects which cannot be avoided should the proposal be implemented" (40CFR1502.16), and that these "environmental effects must be expressed in the context of locality" (40CFR 1508.27). While localized impacts may seem "relatively minor on the scale of the total landscape" (ConocoPhillips Alaska, Inc., 2003), the long term and cumulative impacts may not be minor when viewed locally. If the methods used to mitigate impacts are not required in the stipulations, they cannot be assumed to be in place when assessing the impacts of the alternative.

65. TOPIC : ESTUARINE WATER QUALITY

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Alternative A, Estuarine Water Quality, Effectiveness of Stipulations and Required Operating Procedures, Page IV-115. This section states Stipulation D-1 would prohibit exploratory drilling that might cause more than minimal impacts to hydrologic conditions. However, Stipulation D-1 refers to exploratory drilling in freshwater systems including shallow lakes, streams, lake beds, and active floodplains. Activities in these locations may have limited or no effects to estuarine conditions. The description of Alternative A does not appear to include mitigation measures designed specifically to protect estuarine water quality. **(Comment No. 251-162)**

Response To: Comment 251-162

The text has been revised to explain that Stipulation D-1 would have an indirect benefit on estuarine waters. The stipulation would reduce the likelihood of spills that might drain into streams and relatively quickly into estuarine waters.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Estuarine Water Quality, Docks, Page IV-113. The text states East Dock within Prudhoe Bay is one mile long. In reality, its length is closer to 1000 **(Comment No. 251-163)**

Response To: Comment 251-163

The text has been revised to indicate that East Dock is approximately 1300 feet long.

Comment From: NOAA (Comment Letter No. 209)

Pg. IV-113 Estuarine Water Quality - Docks The DIAP/EIS is unclear as to whether any consideration has been given to utilizing existing docking and staging facilities in Barrow or the construction of centralized facilities at Ikiak or Cape Simpson. This would reduce the likelihood of oil and fuel spills in the undeveloped pristine estuaries and bays. **(Comment No. 209-910)**

Response To: Comment 209-910

Utilizing previously constructed facilities would be preferable to constructing new facilities in pristine areas. This would reduce potential impacts to undisturbed coastal settings, and it could be more cost effective from an industry standpoint. The location of possible staging areas is given on Map 107. Past exploration programs in Northwest NPR-A have utilized coastal staging facilities, primarily at Barrow or Camp Lonely. Cape Simpson is centrally located in the high petroleum potential area, and therefore, would be a good site for a new staging facility to support future activities in Northwest NPR-A. The first petroleum activities on the North Slope occurred on Cape Simpson in the early 20th century. Two phases of government exploration between the 1940's and early 1980's conducted operations in this area. With its natural oil seeps and long history of oil-related activities, the Cape Simpson area could be considered the least pristine, though undeveloped, coastline in northwestern Alaska. Please see specifically the provisions for using existing sites included in Stipulation K-6.

66. TOPIC : EFFECTS OF SPILLS

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Alternative A, Mammals, Effects of Spills, Page IV-163. This section describes the potential direct effects of oil, natural gas, or seawater spills on wildlife and vegetation. Although some direct effects of these substances on mammals may occur, a greater impact would be the disturbance associated with recovery, cleanup, and rehabilitation of a large spill area. A greater emphasis should be placed on the disturbance effects to mammals in this discussion. **(Comment No. 251-169)**

Response To: Comment 251-169

The BLM recognizes that in the case of terrestrial mammals, impacts from oil spill response may occur. These impacts would range from temporary displacement and disturbance of larger more mobile animals to possible mortality of smaller, less mobile animals. Additional analysis has been added to Sections IV.F.8.j., IV.C.10.A.,

and IV.J.5.h.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.K.3. The State recommends that this section be supplemented with additional discussion on potential effects from transportation-related spills of oil and other substances. Small oil spills of up to 10,000 gallons could occur as the result of bulk fuel tanker accidents. These and other types of spilled substances could have local, temporary effects on soils, vegetation, water quality, and perhaps other resources. **(Comment No. 251-200)**

Response To: Comment 251-200

The potential effects of small spills on environmental resources in the Planning Area are discussed in the Alternative analyses. The scenario for these spills includes spills from both oil and gas activities and non-oil and gas activities. The cumulative oil spill scenario also includes spills from both oil and gas and non-oil and gas activities.

67. TOPIC : BASIC ASSUMPTIONS/SCENARIO

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Finally, the DEIS also states that oil exploration and development in the Reserve is necessary to meet the country's future need for petroleum and to reduce our dependence on foreign sources of oil. Nonetheless, the DEIS contemplates overseas sales of the oil extracted. Indeed, it goes so far as to provide a schematic of the proposed tanker routes to the Far East (DEIS Map 97.) **(Comment No. 253-48)**

Response To: Comment 253-48

In a free market, oil and gas are sold for the highest netback value possible. Netback value is the market price minus the transportation cost. During various times of the year, usually winter, the netback value is higher in Asia than the U.S. West Coast, and some tankers are redirected to this temporary market. This does not cause a shortage on the West Coast because lower cost oil is available from other sources (generally Indonesia). The increase in domestic demand is a slow, long-term condition driven by population and economic growth. New sources of energy from Alaska will help to fill this demand, as the North Slope has supplied up to 25% of domestic production since 1977. As the commenter noted, even when exports to Asia were occurring they amounted to only 5% of total North Slope production. As of 2001, Alaska supplied 1.0 million barrels per day of a total domestic production of 7.7 million barrels per day (15%). Meanwhile, net oil imports totaled 10.9 million barrels per day to balance domestic demand of 18.6 million barrels per day. If 5% of Alaska production (or 50,000 barrels per day) was again redirected to Asia, it would amount to 0.27% (0.00268) of total domestic demand—hardly a reason for concern, particularly when it is replaced by lower cost oil from other sources. There is no stipulation that oil from NPRA must be sold and consumed in domestic markets. It is in the country's best interest (from both a consumer and economic growth perspective) that the lowest cost energy is available. A free market system is usually very efficient in doing just that. Occasional exports of minor volumes of oil to foreign markets will not upset the balance. In any case, Congressional legislation regarding the potential export of oil from NPRA is beyond the scope of this document.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS estimates that 'the mean undiscovered economically recoverable oil and gas volumes for the Northwest Planning Area range from zero at the $18/bbl of oil and $2.56/Mcf of gas price levels to 2.1 billion barrels (Bbbl) and 7.3 trillion cubic feet (Tcf) at the $30 bbl and $4.27/Mcf of gas price levels. These estimates are further based on the assumption that the entire area is open to leasing with unrestricted exploration and development.' (Emphasis added). These assumptions appear to unrealistic and require reassessment, especially given the available resources from the United States Geological Survey and the Energy Information Administration which contradict the assumptions made on forecast petroleum prices and economically recoverable reserves. **(Comment No. 253-50)**

Response To: Comment 253-50

An independent petroleum assessment was completed by MMS/BLM prior to the release of the 2002 USGS assessment. Our assessment covers a different area, uses different computer models, and is based on different data. As discussed in Appendix 7, our assessment of the conventionally recoverable resources is followed by an assessment of the economically recoverable resources. At the initial stage of the analysis, it is premature to factor in possible area closures or restrictions that could preclude successful discovery and development. These considerations are incorporated as reductions in the economic petroleum potential for the Alternatives (see Table IV-06). Thus, a full spectrum is provided between the total development potential (without regulatory restrictions) and full protection of the area (no leasing or development). With regard to the USGS assessment of National Petroleum Reserve-Alaska, meetings were held with the two groups to generally coordinate the fundamental assumptions common to both assessments. However, there are clear differences between the methodologies used by two groups. The USGS does not have access to all available data (proprietary well and seismic data) or mapping technology (interactive computer workstations). The USGS computer models also require somewhat different input parameters, and the assessment area was larger (entire NPR-A). Despite these differences, the results generated by the two groups are very consistent (see Appendix 7, Section F). The fundamental point we stress is that technically recoverable resource assessments are made without economic considerations of cost and profitability, not "regardless of cost" as stated by the reviewer. At very high commodity prices, economically recoverable resource volumes would approach technically recoverable (or conventionally recoverable) resource volumes. The bracketing prices assumed in the MMS/BLM assessment ($18 and $30) compare well with 2000 Environmental Information Administration forecasts for future prices ($18.71 for the low-price scenario, adjusted to 2002$; and $31.84 for the high-price scenario, adjusted to 2002$). Given the volatility of oil prices, these differences are inconsequential.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS does not appear to factor in the anticipated higher production costs in the Northwest and throughout the Reserve for that matter. According to the Energy Information Administration, 'oil exploration and production is expected to be about 30 percent more expensive than is typical for the North Slope of Alaska.' Energy Information Administration, Annual Energy Outlook 2003 DOE/EIA-383 (2003) p. 82. The DEIS is accurate recognizing that '[t]he lower price level would not support economically viable development of oil or gas in the Northwest NPR-A Planning Are.' However, the lower price range may actually be to high given the USGS analysis and EIA price forecast summaries, calling into question whether any economically recoverable quantities of oil or gas can be recovered within the area. **(Comment No. 253-51)**

Response To: Comment 253-51

The resource assessment reported in the Draft EIS/IAP does include cost adjustments for exploration, development, and production operations. General "remoteness" factors range from 0.25% to 0.50% per mile (depending on the operation) and are scaled from the nearest road-connected facility (Kuparuk's Central Processing Facility-2). The EIA's cost adjustment of 30% would be applicable to operations in Northeast NPR-A

(distances of 60-120 miles), but would underestimate the cost differential for more remote operations in the Northwest Planning Area. Again, our economic models included cost adjustments for location and types of operations. As discussed in the response to comment 253-50, there are differences between the scope, assumptions, and computer models used by the MMS and USGS. Figure App-04 shows that there are no economically recoverable oil resources (for the mean case) below a price of $18 per barrel. The USGS assessment concluded that economic resources are not recoverable (at the mean case) below a price of $21 per barrel. This is a minor difference considering the methodologies followed by the two groups. At $30 per barrel, the USGS reported that 5.6 billion barrels are economically recoverable at the mean case. The MMS/BLM assessment reported that 5.7 billion barrels are economically recoverable. Considering that the assessment area for the MMS/BLM work is smaller (northern 2/3 of NPR-A) than the USGS work (entire NPRA), one could conclude that the MMS/BLM was also more optimistic at high-end prices. These differences should not prompt revisions to the development scenarios, given that both agencies are estimating undiscovered oil and gas resources and the scenarios are speculative. At prices averaging $25 per barrel (OPEC's target price), both USGS and MMS/BLM estimate large volumes of economic resources in NPR-A (USGS 3.7 billion barrels; MMS/BLM 4.2 billion barrels). Government assessments and recent industry activities confirm the attractiveness of the NPR-A for future exploration and development

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS's impacts analysis flounders out of the starting gate. To provide a useful analysis of impacts, the analysis must be based upon a realistic development scenario. The DEIS, however, is based upon a series of proposed development scenarios that are incomplete and unrealistic when evaluated in the context of existing development in the region. As a result, the nature and extent of potential impacts are significantly understated. The DEIS fails to describe adequately potential scenarios for oil field exploration and production activities and infrastructure. The requisite site-specific analysis necessary to authorize exploration and development leases is not provided. Indeed, BLM concedes that development is described 'only in a general sense.' (DEIS at IV-7.)
(Comment No. 253-70)

Response To: Comment 253-70

As stated in the draft IAP/EIS (Section IV.A), the environmental analysis is based on hypothetical scenarios that are conceptual views of possible future activities. It is difficult to accurately predict events decades into the future. Most competent analysts accept (and deal with) the uncertainties associated with incomplete information. The commenter is correct in that scenarios are largely built on projections of existing technology and trends, and the BLM believes that is a logical basis for analysis. It is difficult to quantify the effects of technology or new trends that no one can currently define. This would raise speculation of future events to another level that is entirely unsupported by facts. In the same light, no one can predict exactly where new commercial oil discoveries would be made in a largely untested area. Thus, this analysis of the activities and potential impacts is based on reasonable scenarios which are in turn based on current information on oil and gas potential. When commercial discoveries are identified, additional NEPA analysis to mitigate the effects of a specific development will be conducted at that time.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS's impacts analysis flounders out of the starting gate. To provide a useful analysis of impacts, the analysis must be based upon a realistic development scenario. The DEIS, however, is based upon a series of proposed development scenarios that are incomplete and unrealistic when evaluated in the context of existing development in the region. As a result, the nature and extent of potential impacts are significantly understated. The DEIS fails to describe adequately potential scenarios for oil field exploration and production activities and infrastructure. The requisite site-specific analysis necessary to authorize exploration and development leases is not provided. Indeed, BLM concedes that development is described only in a general sense. (DEIS at IV-7.)
(Comment No. 253-71)

Response To: Comment 253-71

As clearly stated in the draft IAP/EIS (Section IV.A), the environmental analysis is based on hypothetical scenarios that are only conceptual views of possible future activities. Other scenarios are plausible if based on sound professional judgment. It is difficult, if not impossible, to accurately predict events decades into the future. Most competent analysts accept (and deal with) the uncertainties associated with incomplete information. The commenter is correct in that scenarios are largely built on projections of existing technology and trends. We believe that is a logical basis for analysis. How can we quantify the effects of technology or new trends that no one can define today' This would raise speculation of future events to another level that is entirely unsupported by facts. In the same light, no one can predict where new commercial oil discoveries would be made in a largely untested area. Thus, only a general analysis of the activities and potential impacts is realistic at this early stage of exploration. When commercial discoveries are identified, site-specific analysis to mitigate the effects of development would be more accurate and meaningful.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Resource estimates. Better documentation of the resource estimates is needed because this is a fundamental basis of both the oil potential that could meet the national needed, as well as for the assumptions of environmental impact. The DEIS gives biased information on petroleum resources because 'these estimates are further based on the assumption that the entire area is open to leasing with unrestricted exploration and development.' (DEIS p. IV-8.) In doing so, the DEIS fails to provide an analysis of the impacts of potential environmental restrictions. It is necessary to understand what factors have the biggest economic effect regarding the amount of economically recoverable oil that might be expected if the agency is going to presume that mitigation measures or leasing deletions, deferrals, or other mitigation measures cannot be done. Furthermore, the BLM has failed to address how development and production in the Northeast Planning area of the Reserve would influence the subsequent economics of the Northwest Planning area, despite the fact that these are integrally related. **(Comment No. 253-72)**

Response To: Comment 253-72

The resource assessment methodology is discussed in detail in both Section III.A.1.a(2) and Appendix 7. As stated in the response to comment 253-50, the first part of the assessment evaluates the entire recoverable petroleum endowment without reductions for cost, profitability, regulatory restrictions, or environmental consequences. The economic phase of the assessment considers only the timing, cost, and logistics of producing new discoveries in relation to changing commodity prices. The economic assessment provides a full development model that can be scaled back as mitigation and area closures reduce the potential for petroleum production. Reductions in the potential for petroleum production to account for the cost of required mitigation for environmental effects are treated under the Alternatives for leasing. The factors considered when making the reductions for "mitigation costs" are largely related to area and access issues. Area closures and seasonal restrictions reduce the likelihood that discoveries would be made. Access to exploration and development sites is a key factor in designing a viable commercial project. These general principles are recognized by government and industry, and they are discussed in qualitative terms in "Differences in Activity Levels for Leasing Alternatives" (Section IV.A.1.b.(7)(c)). Development activities in the Northeast Planning Area are important, but perhaps not vital, to new commercial developments in the Northwest Planning Area. Shorter distances for pipeline or road construction, access to closer staging areas or processing facilities, and experience with operations in a similar area would all contribute to lowering the cost of development in the Northwest Planning Area. The resource assessment included assumptions for developmental synergy among plays in the same general area (which could span both the Northeast and Northwest Planning areas). We assumed that many of the resource-poor plays (likely to be uneconomic as standalone projects) would share infrastructure with the resource-rich plays (more likely to have large, standalone pools). Because the engineering assumptions were simulated over thousands of trials, it is difficult to separate the economic impact of individual components of the analysis.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Petroleum Operations ' Past experience. This section (DEIS P. IV-10) is extremely cursory and needs to be updated with the latest science from the National Academy of Sciences NRC Study (2003), and U.S. Geological Survey Study (2002). It also fails to document the on-going impacts of past exploration in the National Petroleum Reserve- Alaska, such as 110 wells that still need to be properly capped and serious contamination at Umiat and at locations within the Northwest Planning Area (AK Journal of Commerce Aug 18. 2002). **(Comment No. 253-74)**

Response To: Comment 253-74

The section titled "Petroleum Operations in Arctic Conditions" provides a brief overview of activities in Alaska and Canada, highlighting the key projects in their historical context. A more lengthy description of past petroleum activities is given in Section III.2.a.1. The NRC report also provides an excellent summary of past activities in NPR-A, but it falls short in discussing petroleum activities in other Arctic areas (Canada and Russia, among others). The NRC report also fails to discuss the 110 wells (most of which were not properly abandoned by government-sponsored drilling programs—not industry); nor does it discuss in detail the location and status of the "abandoned and orphan wells" on State lands on the North Slope. Readers of the IAP/EIS will note the statement "no attempt is made to cite all literature relevant to the NPR-A," but key references are offered. The NRC report has been added to the references relied upon in the EIS Analysis of the cumulative impacts of past operations in NPR-A is discussed in the EIS/IAP in Section IV.F.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Petroleum Operations ' Technology Advancement. This section claims that a number of operations will have less environmental impact, yet does not provide references for this information. None of these technologies are any different than what had been described in the Northeast Plan in 1998. Therefore, these cannot be used as justification for deviating from the environmental stipulations contained in the Northeast FEIS and leases. Instead of just touting the benefits of technological advances, the DEIS should also acknowledge their limitations. For instance, the NRC reported noted the limits to reducing footprint size by placing wells more close together: In the current design, which is used for pads at the Alpine oil fields, wells at 43c (109f) are spaced only 3m (10 ft) apart (Hazen 1999). Accommodating such a concentration of heat in permafrost requires sophisticated design with extensive refrigeration by passive heat pipes (or thermo-siphons) and insulation. Hazen (1999) calculated that, without refrigeration the thaw chimneys would coalesce at all depths, and all the permafrost'about 300 m (1,000 ft) thick'under the row of wells would thaw. Then, the natural surface, gravel pad, and well houses would settle nonuniformly from 2 to 6 m (6.5 to 20 ft). With refrigeration to a depth of 15 m (50 ft) and insulated conductor pipe to 24 m (80 ft), Hazen (1999) estimated that all of the permafrost except for the top 12 m (40 ft) will thaw. NRC at 109. **(Comment No. 253-76)**

Response To: Comment 253-76

The environmental benefits of the newer technologies are briefly summarized and generally self-evident (e.g., a smaller footprint produces lower impact). With a few exceptions these are the same technologies that were listed in the previous EIS/IAP for the Northeast Planning Area. With less than five years between these documents, there has not been much in the way of public literature released with case studies. However, listing these current technologies was not intended to provide justification for revising the environmental regulations. The primary justification for this revision in policy was to convert to performance-based regulations based on site-specific conditions, rather than relying on simple exclusionary mechanisms. In regards to possible subsidence problems related to oil wells through permafrost, industry has 35 years of experience on the North Slope and has developed

successful methods to mitigate the problems. Closely spaced wellheads have been used for over a decade in several fields without catastrophic subsidence occurring. Obviously, realizing that a problem exists is the first step to mitigating it. The commenter erroneously assumes that proven mitigation strategies would not be followed by future operations. This is not realistic.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Petroleum Operations ' Timing. This section should provide timelines showing what activities are expected during development and production throughout each month of the year, so that the environmental effects on wildlife and human communities and subsistence can be more clearly understood. The DEIS should make clear that oil production activities on the North Slope take place throughout the year, particularly air and road transportation access to the oil fields, and the production of oil. **(Comment No. 253-92)**

Response To: Comment 253-92

The scenarios offered in this document are reasonable views of the future, but have varying degrees of uncertainty given the set of assumptions for each scenario. Trying to predict the exact timing of future activities is highly speculative because of changing economic conditions that influence industry actions. A general timetable for a typical development project similar to the Alpine field is given in Table IV-02, but a variety of factors could change this example by many years. A schedule given at a monthly scale would be ridiculous and misleading. Typical schedules for exploration, development, and production activities are discussed on a seasonal level in Section IV.A.1.a. Exploration is expected to, for the most part, occur during winter months (December to May) at sites scattered throughout the area. Development (construction) activities are also expected to occur in winter because of transportation feasibility. Production operations (including well drilling and oil production) would occur year round for perhaps decades. Table IV-03 provides a general life-span timetable for typical petroleum activities in northern Alaska.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Exploration ' Seasonal roads and drilling pads . This section needs to describe the constraints to ice road use for parts of the Northwest Plan area where there are few lakes (the southern part); the full water needs for gravel pads, ice road networks, and ice airstrips should be described here. Furthermore, if the entire Northwest Planning Area is located more than 50 miles from existing oil field road networks, and the 'maximum practical length of overland ice roads is less than 50 miles, considering permitting requirements, opening dates for tundra travel, ice road construction time, and the seasonal window for winter drilling,' (DEIS p. IV-13) then the DEIS needs to explain the degree to which ice roads will be used. The DEIS is not clear at all about how much reliance there will be on ice roads, compared with driving directly on the tundra ('rolligon trails' or 'off- road travel') or construction of permanent roads. If indeed, access is more likely to be done by driving directly onto the tundra, with hundreds of trips with very heavy loads needed for moving drillrigs, etc., this needs to be explained as one of the assumptions and the impacts of the likely transportation modes need to be discussed fully. **(Comment No. 253-94)**

Response To: Comment 253-94

A variety of transportation options are available to move supplies and equipment to the Northwest Planning Area. These could include: ice roads, packed-snow roads, rolligon trails, gravel roads, air lifts to temporary ice landing strips or permanent gravel strips, and marine barging. It is likely that a combination of these methods would be used, depending on the activity and site. Some logical explanations can be offered. Inland sites would probably rely more on air transport than sites closer to the coast (access by marine barges) or sites near existing infrastructure (access by ice roads). Other strategies could include reducing the drilling rig size to facilitate

transport as lighter modules (for rolligons and aircraft) and constructing multi-year staging sites closer to operations in the Northwest Planning Area. These options are discussed in general terms in the DEIS document because the location of exploration and development sites is not established at the present time.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Development- Field layout. The DEIS presents a muddled picture regarding whether ice roads will be used at all for access for development, given that 'for practical and economic reasons, winter ice roads are likely to be limited to 50 to 100 mi in overall length,' (p. IV-17), a distance far exceeding the distance away from existing gravel road network. Therefore, the DEIS needs to assess the environmental impact of construction of permanent gravel roads in the Northeast Planning area, or in the Northwest Planning area, or both. The DEIS states that a permanent road connecting this area to the coast or to the Northeast Planning Area is unlikely (DEIS p. IV-34), yet it also provides the data that shows ice roads are infeasible. Analysis of the effects of permanent roads, both within oil fields, connecting to satellites, and connecting outside the planning area should be done since there are no prohibitions of this infrastructure. **(Comment No. 253-96)**

Response To: Comment 253-96

The practical distance for seasonal ice roads construction is commonly assumed to be approximately 50 miles on land and 100 miles on near-shore grounded ice. Because the Northwest Planning Area is located beyond this distance from existing Prudhoe-Kuparuk infrastructure, the commenter incorrectly assumes that ice roads would not be feasible. However, there is no requirement that all ice roads emanate from existing infrastructure on State lands. Ice roads would connect remote sites to other staging areas (e.g., Barrow, a new coastal base, inland gravel airstrips, or new production facilities) in the Northwest Planning Area. Potential staging sites are shown on Map 107. Regarding permanent gravel roads, it is important to distinguish the types and use of the roads. It is likely that gravel roads would connect drilling/production pads (a few miles apart) within individual oil fields. It is possible that some gravel roads would connect outlying satellite fields (within 20 miles or so) to central processing facilities. It is less likely that long gravel roads would be constructed across NPR-A to connect oil field infrastructure or villages in the area. Several factors (construction cost, availability of gravel, cost-benefit, and environmental effects) would limit the feasibility of long gravel roads across NPR-A. The IAP/EIS evaluates the impacts of gravel roads in Section V.II. Economics would largely dictate character of new infrastructure (including gravel roads) in NPR-A.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Development and Production- Well Drilling. The assumptions given for extendedreach wells document a number of limitations that cast into doubt the likelihood that the best available technology will actually be used for field development. The DEIS states that 'extended-reach drilling methods are rarely employed for exploration wells, because they are far more costly than vertical wells'alternative field designs must consider the cost tradeoffs between fewer pads with more extended-reach wells as opposed to more pads containing conventional wells. In most instances, it is more practical and cost effective to drill conventional wells from an optimum site, [than] it would be to drill ERD wells from an existing drill site.' (P. IV-20, IV-21). As well, the DEIS has dropped an important stipulation from the NE Plan related to this issue, Stip 32. Lessees shall use maximum economically feasible extended-reach drilling for production drilling to minimize the number of pads and the network of roads between pads. **(Comment No. 253-100)**

Response To: Comment 253-100

The utility of extended-reach drilling (ERD) is discussed in the document (Section IV.A.1.b.(4)(d)). For exploration wells, there are a number of issues other than cost that limit the usefulness of ERD wells. For

production drilling, project designs attempt to balance the higher costs for ERD wells with the cost of additional pads and connecting roads. Basic economics dictate that companies would try to lower the development costs as much as possible. For example, if part of an oil field extended under a large river, it probably would be cheaper to drill ERD wells than it would be to construct a pad and connecting road, bridge, and pipeline across the river. Economic forces have a greater effect than the stipulation contained in the Northeast NPR-A Plan.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Development and Production ' Water Demand. This section only addresses water used for drilling and camp use, but ignores water needed for ice roads in the event that production sites are not located on a road network. If ice roads are not needed during the production phase because roads will be built, this should be clearly stated. **(Comment No. 253-103)**

Response To: Comment 253-103

Water requirements are discussed under several sub-headings in Section IV. Section IV.A 1.b.(3)(a) discusses water demand for seasonal ice roads (1.0-1.5 million gallons per mile). Section IV.A 1.b.(3)(d) discusses water demand associated with exploration drilling and camps. Section IV.A 1.b.(4)(f) discusses water demand for construction and development drilling. Section IV.A 1.b.(5)(c) discusses water demand for waterflooding operations during production.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Many of these new developments will connect to the Alpine field facilities. Accordingly, if BLM is going to use Alpine as a model scenario, then it is necessary to include the entire picture of what facilities may result. Tables IV-10 (Known fields) and IV-11 (proposed infrastructure and development) is inaccurate as they do not include the known NPR-A fields, Liberty, Pt. Thomson, and other fields for which NEPA review is concurrent. **(Comment No. 253-111)**

Response To: Comment 253-111

Alpine is used as an example of a typical standalone field in order to judge environmental impacts of similar-sized fields (if discovered) in Northwestern NPR-A. ConocoPhillips Alaska, Inc. postulates that from 5-15 additional fields near Alpine might someday share the Alpine infrastructure, but they have located only 5 of these satellite fields by discovery wells. Tables IV-10 and IV-11 will be updated to reflect current proposals for development in the Alpine and Point Thomson areas.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Current activities are also ignored. A map of hypothetical pipeline routes (map 106) does not show the current proposal for 19 miles of pipelines in the NE area that will connect to Alpine. Is it expected that this current proposal located north of the one that is shown going into the NW Plan area, so that multiple sprawling networks of pipelines, roads, and airstrips (if no connecting roads) are built' No staging areas are show to be located along the northern pipeline route. Wouldn't another one be needed' **(Comment No. 253-113)**

Response To: Comment 253-113

The Draft IAP/EIS for Northwest NPR-A Planning Area was published prior to the announcement of the ConocoPhillips Alaska, Inc. plan to expand the Alpine development into the Northeast NPR-A Planning Area. Proposed pipeline routes for satellite fields in the Northeast Planning Area are shown as dashed lines on Map 25. When they are actually constructed, they will be shown as solid lines. The hypothetical pipeline corridors shown on Map 106 are large-diameter oil and gas trunklines that could carry large production volumes from numerous fields in Northwest and Northeast NPR-A to the existing pipeline system connected to TAPS. It is unlikely that smaller flowlines from the proposed Alpine satellites or the Alpine sales oil line would have sufficient capacity to handle additional production streams from large new fields. The location of the northern hypothetical trunkline is uncertain because new fields have not been identified in areas farther west. It is unlikely that a permanent staging area would be required to construct the new trunkline. However, one or more pump stations might be required along the corridor depending on pipeline design. It is impossible to specify the location of pump stations when we can't accurately define the route of the pipeline itself.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

General scenarios. It is unclear whether the most recent U.S. Geological Survey Assessments of oil potential in the NPR-A were incorporated into the oil and gas resource information described in the DEIS. The USGS information should be compared with the BLM/ MMS assessment results, as they may provide different bases for the assumptions of potential development. **(Comment No. 253-114)**

Response To: Comment 253-114

The USGS assessment of NPR-A was released as a summary announcement in May 2002, two months after the completion of the Draft IAP/EIS. A comparison of the MMS/BLM and USGS assessments has been added as new section Appendix 7. Please also see the response to comment 164-880 (Geology).

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The DEIS assumes at least one commercial oil field (Alpine-equivalent plan) in the northern part of the planning area, (DEIS p. IV-9) but it fails to describe exactly what this scenario means. Later it said ' the first field' would anchor development'[and] allow the economic development of number of surrounding satellite fields. It is assumed that satellite fields would be located within 20 mi of the main field. No attempt was made to include satellite developments in the representative activity schedule for the first large field.' (DEIS pp. IV-30-31). Yet, there would be environmental impact from the subsequent development. This document evaluates only a segment of the environmental impacts of the field development by ignoring the later, piecemeal additions. To consider the complete environmental impact, these subsequent fields connected to the main field need to be included, as they can involve considerable aircraft traffic or road transportation, further fragmentation of the landscape, need for gravel mines, pipelines, etc. For example, the entire Alpine scenario actually includes up to 15 eventual satellites now described by ConocoPhillips Alaska, Inc., and all of the road and airport transportation requirements associated with it.i **(Comment No. 253-116)**

Response To: Comment 253-116

For purposes of environmental analysis, we have assumed that at least one large oil pool, similar to Alpine, would be discovered and developed in the northern part of the Northwest Planning Area. Geologic analysis has indicated that the Alpine-equivalent play is present in this part of the Planning Area (Beaufortian Play 8, see Map 102), and it could contain pools large enough to support a standalone field (see Figure App-03). However, we cannot speculate about the size, number, and location of unidentified satellite pools that may be in the proximity to the example Alpine-like pool. Estimating the timing of discovery and development of satellite pools could be highly

inaccurate. Estimates of the total scope of development associated with the various leasing Alternatives are given in Table IV-07. For example, under Alternative A at high ($30) oil prices, we estimated that 16 production pads would ultimately be installed in the Northwest Planning Area. How many of these would be associated with Alpine-size developments (2 pads), satellite expansions (5-15 additional pads tied to the main field), or other standalone fields (2 or more pads) cannot be accurately predicted. The materials requirements and environmental impact analyses are based on the totals given in Table IV-07 without assumptions as to which fields would be connected together.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

Furthermore, the DEIS assumes a large natural gas field in the southern part of the Planning Area (DEIS p.IV-11), but fails to describe the potential corridors and locations for road, airport, and pipelines and the activity levels and their ecological effects. Why is a large gas field assumed to be located here, when Map 106 shows this a 'low' potential area' **(Comment No. 253-118)**

Response To: Comment 253-118

For purposes of environmental analysis, a large gas field is assumed to occur in the southern part of the Northwest NPR-A Planning Area. As this hypothetical field has not been identified, we cannot accurately define the location of pads, roads, airports, and pipelines. However, a possible main gasline corridor is shown on Map 108 to illustrate that gas production in NPR-A would probably be gathered back to a central processing facility and future pipeline head in the Prudhoe Bay area. The southern area is labeled as "low potential" largely on the basis of oil prospects and the economics of development. The southern area is considered to be "gas prone" and large oil pools could be rare. However, oil discoveries made in Northwest NPR-A could be transported to market through the existing TAPS system. On the other hand, there is no gas transportation system from the North Slope to handle gas production, and all gas discoveries would be stranded until a system is built. Although many proposals are being discussed for a North Slope gas pipeline, the completion of this line could be a decade or more in the future (or not at all). Therefore, the development potential for the southern (gas-prone) area is labeled as low.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Introduction, Pipeline Construction, Page IV-26. This section provides assumptions regarding pipeline design and construction that are the basis for analyses in the rest of the document. It states that wide, shallow rivers could be crossed by trenching and burying insulated pipelines in the riverbed. This section should be modified to note that fewer impacts would occur to the stream, streambanks, riparian habitat, and aquatic resources if a properly designed elevated pipeline crossings were used. Potential problems associated with maintenance, corrosion, and abandonment also would be less with an elevated crossing versus a buried crossing. **(Comment No. 251-157)**

Response To: Comment 251-157

The scenarios discuss a wide range of construction situations and current technologies, therefore, analysts evaluating potential environmental impacts consider a variety of conditions. This section of the IAP/EIS is not intended to dictate approved construction methods. Regarding the advantages of elevated pipeline crossings for wide, shallow rivers, there are also disadvantages, including changes to flow characteristics of the braided channel, scour problems around mid-channel supports, visual impacts, and higher project costs. Future project designs will be based on site specific conditions and the tradeoffs between project economics and mitigation measures.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Buried Gas Line. At a number of locations within the document, including Page IV-9, buried natural gas lines are discussed. These buried natural gas lines are assumed to be constructed in trenches 5 ft. deep along the same route as the oil line. The text also states permafrost is a good material in which to install overland high pressure gas pipelines. However, no discussion is presented describing the potential problems associated with construction, operation, maintenance, and abandonment of long distance chilled buried gas pipelines. Some of these potential problems include: pipeline thaw settlement; subsidence or erosion of backfill material; ditch integrity and stability; interception and channelization of water along the buried pipeline ditch; unintentional drainage of wetlands or lakes; ponding over the pipeline; pipeline exposure; corrosion protection; leak detection; and summer access, repair, and rehabilitation of the backfilled ditch. Buried gas line trenching trials conducted in winter 2002 in the Prudhoe Bay area produced substantial site thermokarsting, permafrost thawing, backfill subsidence, and backfill erosion during the following summer. **(Comment No. 251-176)**

Response To: Comment 251-176

The impacts to vegetation that are likely to happen as a result of the issues in this comment are discussed in the final IAP/EIS. Please see Section V.II.7 under the Preferred Alternative.

Comment From: State of Alaska (Comment Letter No. 251)

A thorough assessment of both buried and elevated gas pipeline alternatives should be included in the document for those subsections that discuss impacts of pipelines on various phys ical and biological resources. **(Comment No. 251-177)**

Response To: Comment 251-177

Please see the response to comment 251-176 above.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

The final IAP/EIS should establish and identify the available minimum amount of public lands necessary to carry out a successful leasing program at normal price levels ($18 per barrel or $30 per barrel, etc.) while still excluding or restricting oil and gas leasing or surface activities in the areas most critical for subsistence and cultural uses, environmental resources, fish and wildlife habitat, and historic or scenic values. Other criteria and standards that should be considered include, but should not be limited to, the following: (1) economics of operations in remote areas; (2) distances and costs from existing infrastructure; (3) accessibility to oil and gas reserves; (4) future variations in oil prices that must be anticipated; (5) restrictions imposed on surface activities and facilities which increase environmental and subsistence protections, but also increases the costs to industry; (6) environmental sensitivity of the area; and (7) subsistence resources. **(Comment No. 261-329)**

Response To: Comment 261-329

It is a difficult, if not impossible, task to establish the minimum land area required for a successful leasing program. Very little of the proposed Northwest plan area is covered by seismic surveys and the few exploration wells there are decades old. The newer geologic plays are entirely stratigraphic and require state-of-the-art, 3-D

seismic surveys to identify potential drilling targets. Many of the prime targets in Northeast NPR-A failed to hold commercial amounts of oil when they were actually drilled. Using all available geologic information (public and proprietary), we have a reasonable working concept of the area of highest potential for commercial oil discoveries. However, no one can define today exactly where commercial-size fields will be located. Offering larger areas for leasing and exploration will increase the chance that commercial fields will eventually be discovered and developed. After discoveries are made, site-specific measures can be taken to minimize environmental impacts. The development scenarios analyzed in the EIS/IAP are based on a petroleum resource assessment that includes many of the factors listed in this comment, such as economics of remote operations (time tables and logistic costs), distance from infrastructure (transportation costs), variations in future oil prices (bracketed by $18 and $30 average prices), regulatory restrictions (costs and delays for mitigation measures), and surface restrictions (increased development costs). However, our resource assessment models are designed to evaluate petroleum volumes and do not include societal costs related to environmental sensitivity or subsistence values. It is difficult to place a monetary value on these variables, so a non-quantitative approach is used to reach decisions to balance the concerns of stakeholders.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

When the oil industry was promoting Alpine they sold it as a small footprint. It was an improvement over past practices because they could drill in many directions from one pad, so the amount of tundra that was covered by gravel was greatly reduced. They said that the development would be roadless and it would have little impact on the area. However, since that time, they started the process of adding on satellite fields. These fields will be connected to Alpine by pipelines, roads and bridges. Instead of having a small footprint, the entire project will be a spider web of production facilities, roads and pipelines and encompass a very large area. There's already a huge area to the east of Nuiqsut that they don't use for hunting because it is tied up in oil production and this will tie up another large section of their hunting area. Most of the oil finds in NPR-A will probably be relatively small, so it is likely that the development here will follow the Alpine pattern. It will be compromised of many drill sites all connected by pipelines and sometimes roads. Instead of small footprints, we'll most likely have a spider web of development here, too. This will tie up large sections of land which will probably not be used by local residents for hunting, fishing and camping. **(Comment No. 80075-408)**

Response To: Comment 80075-408

The purpose of conducting lease sales and exploring for oil is to find as many commercial-size fields as possible. No one can accurately predict when or where these fields will be discovered. Alpine was discovered in the winter of 1994 (5 years before the NE NPR-A sale was held in 1999). When Alpine was developed, the companies had no knowledge (or leases) of additional fields in NPR-A. Later leasing and exploration resulted in discoveries that could become commercial fields if they were tied into the existing Alpine infrastructure. The nature of oilfield development is that it spreads from a central (or core) area. It remains to be seen if infrastructure will continue to spread to the west into NPR-A. This will depend on successful leasing and exploration drilling. However, it is unlikely that the scale of roads, pipelines, and facilities present in the Prudhoe-Kuparuk complex will be replicated in NPR-A because the fields are likely to be much smaller.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.A.1.b(4)(a), Page IV-17, Development, Field Layout. The author states that, "To be economically feasible, the first field developed in the NW NPR-A would need to be at least an Alpine-size field." This statement is not backed by any economic or other analysis. The possibility of an independent oil company discovering a smaller field, and partnering with other independents exists, and could allow smaller developments. **(Comment No. 251-416)**

Response To: Comment 251-416

The commenter is correct and the statement will be clarified. Economic analysis as part of our petroleum assessment has shown that a minimum reserve of approximately 400 to 500 MMbbl would be required for a new standalone project in the NPR-A Northwest Planning Area. This minimum oil volume (equivalent to an "Alpine-size" field) is needed to supply a central processing facility and a long overland pipeline. The existing text will be revised to clarify that the minimum reserve volume does not necessarily have to be located in a single pool. Several smaller pools within a radius of 20 miles owned by different operators could share the costs of new infrastructure. Gathering several satellite fields into a central facility and oil pipeline could make the combined, multi-owner development economically viable.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV. Page IV-11, Technology Advancement. The modular portable drilling/production platform now being tested on the North Slope by the Anadarko Petroleum Corporation for the "Hot Ice" project should be mentioned in this section. **(Comment No. 251-420)**

Response To: Comment 251-420

A short description of Anadarko's new modular drilling system has been added to Section IV.A.1.b(2)(b).

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-13. In the second paragraph, the term "geophysical" is misused. "Hydrological" might be preferable. **(Comment No. 251-423)**

Response To: Comment 251-423

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-25, First Paragraph. Although the practice is no longer prohibited, North Slope oil is not currently shipped to foreign markets, it all goes to domestic refineries. Several years ago British Petroleum shipped several tanker loads to Pacific Rim markets, but has since discontinued the practice. **(Comment No. 251-424)**

Response To: Comment 251-424

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-25. The assumption articulated in the last paragraph that NPR-A oil and liquids will not be

transported through the Alpine facilities might burden the economic analysis unnecessarily. Additional and more recent information regarding the disposition of NPR-A production might be made available in the Colville Delta EIS process and should be incorporated here. **(Comment No. 251-425)**

Response To: Comment 251-425

The assumptions regarding the use of the Alpine facility and oil pipeline for new production from Northwest NPR-A are clearly stated in the text. The primary reason is that there may not be capacity in Alpine infrastructure to handle the high production volumes expected from the first large fields in the Northwest Planning Area (please also see the response to comment 251-416). We believe production from a number of known satellites (5) and postulated fields (up to 15) tied into the Alpine facility will fill its capacity for the next decade. Capacity would have to double to handle the additional production from Northwest NPR-A fields. Not being able to use Alpine infrastructure would have a minor effect on the economics of projects in the Northwest NPR-A. Processing and gas handling could occur at a hypothetical new central facility in the Northwest NPR-A, but a second Colville River crossing and 35 miles of pipeline to reach the Kuparuk River Unit would be required. As the Alpine Satellite Development EIS is in preparation at this time, it is inappropriate to cite any of its conclusions in this IAP/EIS.

Comment From: State of Alaska (Comment Letter No. 251)

Appendix 7, Oil and Gas Assessment. The assessments of conventionally and economically recoverable oil and gas reserves are very well done, as are the descriptions of the methods employed. Play descriptions, their distribution and potential are consistent with current understanding of North Slope petroleum systems and with the most recent methodologies employed by the USGS and the MMS. However, all published reserve estimates appear to be for the combined NW and NE NPR-A Planning Areas with no breakdown for each area. Reserve estimates should be published for only the planning area in this IAP/EIS. This is particularly true because, as correctly stated in the assessment, reserves are not evenly distributed across the NPR-A. We recommend that reserve estimates for the NE NPR-A area be incorporated in only the cumulative effects section. **(Comment No. 251-433)**

Response To: Comment 251-433

A revised table (App 7-02) provides a breakdown for economic play resources in the Northwest NPR-A Planning Area. Readers should note that these estimates are for undiscovered resources, not proven reserves. The commenter is correct in observing that the resources are not uniformly distributed between the two areas. For example, at a price of $30 per barrel, only 2.1 Bbbl (37%) of the total economic resources in the combined assessment area (5.7 Bbbl) is present in the Planning Area. Considering that the Northwest NPR-A Planning Area is twice the size of the Northeast NPR-A Planning Area, the richness on a per-acre basis is far lower.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-11, Third Bullet. The comment mentions that reserve pits have been replaced by bladder tanks. This is not correct. The rigs presently used on the North Slope have steel pits within the rig structure to contain the active mud. Drilling wastes may be contained within ice-bermed areas during winter exploration (as permitted by ADEC). During thawed periods within the developed fields, drilling wastes are initially moved to a holding tank outside the rig where 'super suckers' and vac trucks pick up the waste and haul it to the processing plant. Some rigs may have their own processing equipment that can prepare the waste for disposal. **(Comment No. 251-437)**

Response To: Comment 251-437

The text has been revised.

Comment From: State of Alaska (Comment Letter No. 251)

State of Alaska NW NPR-A Comments Page 30 Section IV, Page IV-20, Development and Production Well Drilling. The authors provide a good discussion with regard to using directional drilling to reduce surface impacts. The record departure well in Alaska, NK-11, is specifically mentioned and reference is made to the current world record departure (BP's Wytch Farm'). While these references show what can be achieved, it may be more appropriate to provide information on some of the more routine departures drilled in the presently developed fields on the North Slope. An important factor for this discussion is the ratio of the departure (distance) and the true vertical depth (TVD) where the productive horizon occurs. For while NK-11 may hold the departure record, 3 of the selected wells from Milne Point have departure/depth ratios greater than 2. Following is some selected information from historic drilling activities among the various operators on the North Slope. Operator Pool Well Name TVD Departure Departure TVD Year Drilled Phillips West Sak 1C-104 3688 5914 1.60 2002 Phillips Kuparuk 2K-19 6579 7733 1.17 1989 Phillips Meltwater 2P-427 5853 7800 1.33 2002 Phillips Kuparuk 1D-34 6646 8112 1.22 2000 BP Schrader Bluff MPU S-29 4314 9201 2.13 2002 Phillips Tarn 2N-315 5373 9273 1.73 1998 ARCO Pt. McIntyre Pt. Mac 12 9288 10845 1.17 1991 BP Schrader Bluff MPU E-24 6563 11058 1.68 1998 Phillips Alpine CD1-09 6898 11631 1.69 1999 Phillips Kuparuk 2M-35 6478 12411 1.92 1996 BP PBU/Aurora S-107 6824 13170 1.93 2001 BP PBU/Niakuk NK-17 9395 14050 1.49 1997 BP Milne Point/Kuparuk MPU F-92 7746 16667 2.15 1998 BP Milne Point/Kuparuk MPU F-34 7653 18140 2.37 1997 BP PBU/Niakuk NK-11 9392 18219 1.94 1998 Elsewhere in the text, the reduced surface impact of the Alpine development is discussed. The development pad surface area and total field area are given in acres, about 100 and 40,000 respectively. It may be more appropriate to give these areas or at least the field area in square miles. Making that reference change may make the concept easier to grasp. In this case the Alpine field area is about 62.5 square miles and is being developed from two drill sites that occupy 0.16 square mile. Neglecting the pipeline corridor, the occupied surface area is 0.25 % (1/4 %) of the field area. Since the field is roughly rectangular and each drill site develops about half of the field area, each drill site at Alpine is developing the oil resource in some 31 square miles. The advance of technology is very evident when the Alpine developed area per pad is compared with the area per pad for the main development in Kuparuk. The majority of Kuparuk pads developed 4 square miles of reservoir. On a per pad basis, Alpine is developing nearly 8 times as much reservoir from a single surface site. **(Comment No. 251-441)**

Response To: Comment 251-441

The text has been revised to note the historical drilling on the North Slope as provided by the State of Alaska in this comment. It is also important to distinguish what has been achieved on the North Slope compared to extended reach drilling in other parts of the world. Geologic, environmental, and economic conditions are often unique in each operating region and dictate the feasibility of drilling operations. At this time, a lateral reach of 4 miles (21,120 ft) or departure ratio of 2.5 could be considered the maximum feasible limit for drilling on the North Slope.

Comment From: State of Alaska (Comment Letter No. 251)

Elsewhere in the text, the reduced surface impact of the Alpine development is discussed. The development pad surface area and total field area are given in acres, about 100 and 40,000 respectively. It may be more appropriate to give these areas or at least the field area in square miles. Making that reference change may make the concept easier to grasp. In this case the Alpine field area is about 62.5 square miles and is being developed from two drill sites that occupy 0.16 square mile. Neglecting the pipeline corridor, the occupied surface area is 0.25 % (1/4 %) of the field area. Since the field is roughly rectangular and each drill site develops about half of

the field area, each drill site at Alpine is developing the oil resource in some 31 square miles. The advance of technology is very evident when the Alpine developed area per pad is compared with the area per pad for the main development in Kuparuk. The majority of Kuparuk pads developed 4 square miles of reservoir. On a per pad basis, Alpine is developing nearly 8 times as much reservoir from a single surface site. 251-442 **(Comment No. 251-442)**

Response To: Comment 251-442

Although the overall size of the Alpine pool is frequently given as 40,000 acres, the "core area" currently undergoing development drilling is probably smaller. Evaluating the number of wells and drainage area of each well leads us to believe that the core area is approximately half as large as the total pool area. The well lengths given for Alpine also would support the concept of a smaller "core area". The suggested conversion from acres to square miles may not be appropriate to others who typically use the metric system (square kilometers). By either set of reckoning, the gravel footprint (100 acres) represents less than 0.5 percent of the subsurface pool area. The environmental effects (for example, noise, visual disturbance, air emissions, among others) could extend beyond the surface footprint of the gravel pads and roads

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-21, Drilling Mud and Rock Cuttings. Reference is made to Figures IV-03 and IV-04 regarding mud processing and disposal. Figure IV-04 shows annular waste disposal that is one of two methods available. Class I or Class II injection can be illustrated by reversing the 'deep' arrows on the drawing and moving them from the pay zone. **(Comment No. 251-443)**

Response To: Comment 251-443

Figure IV-04 does show only one of two methods for subsurface disposal; however, the suggested revisions would unduly complicate this simple illustration. It is not materially important whether waste products are injected in the well annulus (in producing wells) or through downhole tubing (in disposal wells). The main point is that wastes can be injected into non-pay zones in the subsurface. The text has been revised to make this point.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-22, Second Paragraph. The language in this paragraph should be reworded to state: 'Wastewater, spent fluids, chemicals, drilling solids and drilling mud may be disposed in Class I disposal wells approved by the EPA or Class II wells administered by the AOGCC. Disposition of fluids and solids into Class I or Class II wells depends on their source, makeup and applicable regulatory requirements. Solid wastes " **(Comment No. 251-445)**

Response To: Comment 251-445

The text has been revised.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

The first one would be on the corridor, where is it and who will be designating a corridor for pipelines' I don't

see any notation of corridor anywhere on these maps. **(Comment No. 80075-483)**

Response To: Comment 80075-483

Potential future pipeline routes are given on Map 108. These routes are speculative because fields have not been discovered in these areas. The location of the routes shown on Map 108 is based on our concepts of where commercial discoveries are more likely to be made in the future. An accurate location of pipeline corridors will be possible only after leasing, exploration drilling, and permitting studies are completed. The description of the economy is in Section III.C.1 and analysis of effects for Alternative A is in Section IV.C.12. The description of the sociocultural systems is in Section III.C.4 and analysis of effect for Alternative A is in Section IV.C.15.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

And I would very much like to see some sort of -- some kind of a corridor system instead of this pipeline sprawl because it displaces calving areas. **(Comment No. 80075-503)**

Response To: Comment 80075-503

It would serve everyone's purpose to minimize the number of pipelines across NPR-A. Industry would benefit because their development costs would be lower. Government would benefit because fewer pipelines would be easier to monitor. The residents of the North Slope would benefit by having less restrictions caused by pipelines. When enough fields are discovered in NPR-A, it is likely that some coordinated effort will be made to minimize the construction projects required to produce the oil. Designated pipeline corridors could be established sometime in the future, but it is impossible to do so now when no one knows where the commercial discoveries will be made.

Comment From: American Society of Mammologists (Comment Letter No. 249)

It appears that the evaluation of potential impacts from oil and gas development activities in the draft EIS is based upon a series of development scenarios that are incomplete and unrealistic in the context of existing oil and gas development activities in the region. As a result, the nature and extent of potential direct, indirect, and cumulative impacts are significantly understated in the draft EIS. Further, while the BLM has stated that these proposed actions warrant a full NEPA review, it has failed to address the NEPA requirements for such an analysis in this draft EIS. The generic discussion of resources and potential impacts given in the draft EIS fall far short of the required site-specific analysis required by NEPA. (**(Comment No. 249-518)**

Response To: Comment 249-518

At the leasing stage, scenarios are general in nature because no one can accurately foresee development exactly before exploration has even occurred. The current IAP/EIS does provide site specific information necessary for the leasing decision to be well informed. All subsequent exploration and development activities will require additional NEPA analysis and permits with special consideration given to site-specific conditions in the area of operations. A major new field development will undoubtedly require a NEPA review. The analysis in this Integrated Activity Plan/Environmental Impact Statement is intended to support a programmatic-level planning decision on the potential oil and gas leasing program in the Northwest National Petroleum Reserve-Alaska. It is appropriate that the analysis in the IAP/EIS is broad in scope because the decisions on the leasing program and mitigation measures will be broad in scope. The site-specific NEPA analyses for proposed exploration and development activities would be prepared at the time that these actions are ripe for decision. This "tiered"

approach to NEPA compliance and decision making is encouraged by the NEPA regulations (see 40 CFR 1502.20 and 1508.28). Please also see the responses to comments 253-22 (NEPA Process), 253-70 (Basic Assumptions/Scenario), and 253-92 (Basic Assumptions/Scenario).

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

And I have read a lot of these environmental impact statements over the years, and what I always see is systematic minimization of what the impacts might be, and if you're not going to put in roads, people talk about ice roads, then you're going to have airports, so Alpine has an airport. They predicted there would be 13 flights a month in the summer. They talked about minimizing the impacts to geese in the summer. How many did they have' In the year of construction in 2000, or 2001, 1,900 flights in and out in 45 days. **(Comment No. 80082-535)**

Response To: Comment 80082-535

Please see the response to 80082-532 (Roads).

Comment From: Tacoma-Pierce County Chamber (Comment Letter No. 168)

For Alternative B, we understand that it would not allow access for development on the most prospective area, located within 25 miles of the shoreline, where every commercial hydrocarbon discovery on Alaska's North Slope has been made. This is in seeming contradiction to the summary's statement that Alternative B would make available 100% of the area of high oil and gas potential available. **(Comment No. 168-568)**

Response To: Comment 168-568

Under Alternative B, a one-half mile set back inland from the shoreline would be required (Table II-02, Stipulation E-1.v). Alternative B includes a No Surface Occupancy Stipulation for permanent facilities in coastal waters (bays, inlets, and lagoons); these areas would be made available to leasing but any development would be through extended reach drilling. If the draft IAP/EIS specified no development access within 25 miles of the shoreline, then it was an error and the text will be corrected if found.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

The Draft EIS/IAP heightens this concern because it depicts three possible pipeline corridors between the Northwest NPR-A Planning Area and the Trans Alaska Pipeline. One corridor follows the existing Alpine Sales Oil pipeline right of way. One parallels the Alpine Sales Oil pipeline, but just to the south of Nuiqsut. The third passes from Umiat to Trans Alaska Pipeline Pump Station #2.42 These latter two possible pipelines, especially the possible pipeline running just south of Nuiqsut concern us greatly. We would like the BLM to mandate that only one elevated pipeline corridor may leave the Northwest NPR-A planning area and that such a corridor must join and follow the Alpine Oil Sales pipeline right-of-way unless it is shown that following the Alpine Oil Sales pipeline route is not environmentally preferable. **(Comment No. 254-631)**

Response To: Comment 254-631

Fewer infrastructures do not always equate to less impact, but may equate to different impacts and, in some cases, more of some types of impacts. For example, a smaller storage pad would have a smaller footprint, may require

less sand and gravel, have direct impact on a smaller area of vegetation, be less visible to recreationists, and be a smaller apparent obstruction to caribou. A smaller storage pad may also mean significantly more frequent restocking trips by aircraft, watercraft, and/or off-highway vehicles. The balance between infrastructure and various factors is also considered during the subsequent environmental review for individual permits.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

To further minimize the impact of infrastructure, stipulations on the use of airstrips and roads in the Northwest NPR-A should be adopted by the BLM. In the March 6, 2002 EA Letter, the main local organizations in Nuiqsut highlighted how aircraft traffic at the Alpine development exceeded what we, and the U.S. Army Corps of Engineers, were told to expect. The Draft EIS/IAP seems to accept that the excessive number of flights that were actually observed at Alpine can be expected during the construction of all future roadless developments. We don' t think that' s an acceptable response to project creep. This concerns us because of the disruption and impact on wildlife, including caribou, of such heavy air traffic. Aircraft destined for roadless developments in the NPR-A will likely fly over the Colville River Delta, too, increasing the level of noise. No one should accept the air traffic at Alpine as the future norm for the construction and development of roadless facilities. Simply put, future roadless development should require fewer flights than what was needed at Alpine. BLM should adopt a stipulation to achieve this end instead of institutionalizing the Alpine experience. One response is to re-examine the tradeoff between an extra acre or two of pad size at a roadless facility and the impact of extensive air traffic. In efforts such as Alpine and in proposals for ANWR, the oil industry has made a mantra of reducing pad size. So much so that there is a real danger of more harm being caused to land and resources from the consequences of constructing a pad using underestimations of on-pad storage needs than would have been done by a slightly larger pad. We think that most people in Nuiqsut would have traded an extra couple of acres in pad size at Alpine for a reduction in overflights and takeoff and landing traffic. A corollary, though, is that the operator has to use the right equipment. In our March 6, 2002 EA Letter, we complained that the amount of air traffic at Alpine had far exceeded the projections on which the Alpine Record of Decision had been based (by a factor of 10). Phillips claimed in response that the increase in flights had been a result of complaints made by Nuiqsut residents about large aircraft, 737s and DC-6s. Not so. We had complained about 737s, but DC-6s are perfectly acceptable. Whereas the CASA owned by Phillips has a cargo capacity of 8,000 to 11,500 pounds, a DC-6 has a cargo capacity of about 50,000 pounds, versus about 66,000 pounds for a 737. A single DC-6 will carry the load of between 4 and 6 or more CASA flights. If Phillips had contracted for DC-6s (better still, a Herc) instead of using its own CASA, the offending flights would have been greatly reduced. The point is, however, that BLM shouldn' t simply roll over and accept an increase of ten times the projected level of a harmful activity without scrutiny of the procedures that led to estimates that were so far off. Moreover, without substantial solid investigation of alternatives to reduce such levels of harmful activity, BLM shouldn' t be accepting similar increased levels of air traffic for other, future roadless projects. That kind of response does not give the Native community and us in particular a great deal of confidence in the federal government' s follow through and policing of the requirements that are intended to protect us and our subsistence resources. That type of problem can' t be cured with a new stipulation, as a term of the lease or as a ROP. Such problems have to be cured with inspections and follow through. We' re open to suggestions as to how to address that type of problem in the EIS, but it clearly can' t be simply ignored or it means that all of the cumulative impact analysis is understated and inaccurate. **(Comment No. 254-632)**

Response To: Comment 254-632

The BLM has dealt with this issue by drafting proposed Required Operating Procedure F-1 that will govern air traffic for permitted activities over key habitat and subsistence-use areas of the Northwest NPR-A. Required Operating Procedure F-1 calls for aircraft operations to be conducted in such a manner so that effects to wildlife and birds will be minimized.

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

Audubon's Wildlife Habitat Alternative also provides significantly more industry access to areas of high oil and gas potential than BLM's Alternative C. **(Comment No. 80073-1004)**

Response To: Comment 80073-1004

The commenter is correct in stating that the Audubon proposal provides more area for leasing in the high potential part of Northwest NPR-A, as compared to BLM's Alternative C (which provides only 2% of the identified high potential area for leasing). However, the statement is misleading with regards to access. Although in the Audubon proposal much of the high potential area is open for leasing, all post-lease activities will be encumbered by regulatory restrictions that will largely prevent open access for exploration and development. Area and seasonal restrictions will to some extent inhibit leasing, reduce the level of exploration drilling, and could preclude economic development of some discoveries burdened by added costs for impact mitigation. The Audubon proposal will result in significantly lower development potential compared to BLM's Alternatives A and B with fewer area and regulatory restrictions.

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

All the producing fields on the North Slope are located within this 25 mile coast as well as all pending developments. Eliminating any acreage within this belt as recommended in Alternatives B and C would be a significant mistake. If similar restrictions had been in place prior to leasing in the Central North Slope, the discovery of Prudhoe Bay and Kuparuk would have been jeopardized. **(Comment No. 80073-1007)**

Response To: Comment 80073-1007

The commenter is correct that all producing fields on the North Slope are located within 25 miles of the coast (see Map 25). Geologic conditions that formed these fields are expected to trend westward into NPR-A. As revealed by the petroleum assessment conducted for the Northwest Plan EIS/IAP, the highest potential area is also located on the northern coastal plain (see Maps 101, 102, and 105). Reducing the area offered for leasing and development within the recognized high potential area will reduce the opportunities for industry to make discoveries leading to commercial oil development.

Comment From: Public Meeting on DEIS - Anchorage, Alaska (Comment Letter No. 80073)

Discovery and development of new oil fields is also important for the nation's future energy and economic security. American oil production is at its lowest level in four decades and more than half of the oil now used in the United States is imported. According to the Department of Energy, U.S. oil reserves have fallen 30 percent since 1977 and production has declined more than 25 percent since 1986. The Energy Department estimates imports may account for as much as 68 percent of U.S. oil supplies by 2015. Oil from the Petroleum Reserve can help change this trend. **(Comment No. 80073-1008)**

Response To: Comment 80073-1008

The commenter is generally correct that domestic crude oil reserves and production have dropped dramatically in the last few decades, and increasing amounts of imports will be needed to supply U.S. markets in the future. As the commenter did not supply references for his information, our review of the DOE literature found slightly different numbers (which did not change the basic conclusion). Domestic oil production peaked in 1970 at about 9.4 MMbbl per day and as of 2000 was about 6 MMbbl per day (for a 36% reduction). Projecting the trend to present (2003) indicates a production decline over the last three decades of approximately 40%. Oil production

declines in the Lower 48 have been partly offset by supplies from Alaska, which peaked in 1988 at 2 MMbbl per day and are now also in decline (currently at about 1 MMbbl per day). Oil production from NPR-A or other new development areas in northern Alaska could help to flatten the production decline trend and reduce the need for oil imports from overseas.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

The final IAP/EIS should establish and identify the available minimum amount of public lands necessary to carry out a successful leasing program at normal price levels ($18 per barrel or $30 per barrel, etc.) while still excluding or restricting oil and gas leasing or surface activities in the areas most critical for subsistence and cultural uses, environmental resources, fish and wildlife habitat, and historic or scenic values. Other criteria and standards that should be considered include, but should not be limited to, the following: (1) economics of operations in remote areas; (2) distances and costs from existing infrastructure; (3) accessibility to oil and gas reserves; (4) future variations in oil prices that must be anticipated; (5) restrictions imposed on surface activities and facilities which increase environmental and subsistence protections, but also increases the costs to industry; (6) environmental sensitivity of the area; and (7) subsistence resources. **(Comment No. 261-33)**

Response To: Comment 261-33

It is a difficult, if not impossible, task to establish the minimum land area required for a successful leasing program. Very little of the proposed Northwest plan area is covered by seismic surveys and the few exploration wells there are decades old. The newer geologic plays are entirely stratigraphic and require state-of-the-art, 3-D seismic surveys to identify potential drilling targets. Many of the prime targets in Northeast NPR-A failed to hold commercial amounts of oil when they were actually drilled. Using all available geologic information (public and proprietary), we have a reasonable working concept of the area of highest potential for commercial oil discoveries. However, no one can define today exactly where commercial-size fields will be located. Offering larger areas for leasing and exploration will increase the chance that commercial fields will eventually be discovered and developed. After discoveries area made, site-specific measures can be taken to minimize environmental impacts. The development scenarios analyzed in the EIS/IAP are based on a petroleum resource assessment that includes many of the factors listed in this comment, such as economics of remote operations (time tables and logistic costs), distance from infrastructure (transportation costs), variations in future oil prices (bracketed by $18 and $30 average prices), regulatory restrictions (costs and delays for mitigation measures), and surface restrictions (increased development costs). However, our resource assessment models are designed to evaluate petroleum volumes and do not include societal costs related to environmental sensitivity or subsistence values. It is difficult to place a monetary value on these variables, so a non-quantitative approach is used to reach decisions to balance the concerns of stakeholders.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Alternative C is supposedly the most restrictive of the Alternatives offered by the DEIS. The DEIS states that, under this scenario, up to 53 percent of the land in the Northwest Planning Area (98 percent of the highest oil and gas potential) would be unavailable for oil and gas leasing. The unavailable areas are outlined on Map 19, however, there is no text in the DEIS which corresponds to the map or that specifically identifies these areas as off-limits to oil leasing or development. **(Comment No. 260-716)**

Response To: Comment 260-716

Map 19, NW NPR-A Alternative C Areas of Availability for Oil and Gas Leasing is referenced in Section II.C.4, which is the description of Alternative C. A description of the lands that would be withheld from leasing under Alternative C are described in the text (Section II.C.4) and outlined on Map 19 (the light gray areas on Map 19

are specifically identified as "Unavailable for Leasing for Oil and Gas"). Oil and gas exploration drilling and development can occur only on leased lands.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

The DEIS also states that oil and gas development is unlikely under Alternative C, unless modifications and/or exceptions are made to the Stipulations and ROPs. In Section II of the DEIS, which outlines the Stipulations and ROPs for each Alternative, there are no Stipulations or ROPs which would restrict this much land from development. In fact, the only area specifically identified as a 'no-lease' area in the Stipulations and ROPs for Alternative C is Kasegaluk Lagoon. Most of the land restrictions for Alternative C occur in Stipulation E-1 (a-v) and would require set-backs of one-half mile from designated rivers, waterbodies, and high-density waterfowl and raptor nesting areas. The coastal areas of lagoons and bays also would have one-half mile restrictions. These Stipulations are the same under Alternative B, except that the setbacks are stated as maximums (up to one-half mile). It is unclear how, if the maximum set-backs are applied under Alternative B, any less land (especially that of the highest oil and gas potential) would be available for leasing under Alternative C than under Alternative B. Map 19 depicts areas which would be unavailable for leasing for oil and gas under Alternative C. Map 84 however, shows sensitive biological and natural areas under Alternative C, which may require one-half mile setbacks around nests and brood-rearing colonies. All of the areas depicted in Map 84 are included in the 'no-lease' areas shown in Map 19. It is unclear, therefore, whether these areas are actually off-limits to oil and gas leasing and development, or may be developed with one-half mile set-backs. Clarification is needed regarding the locations and extent of the areas that would be unavailable for development under Alternative B versus Alternative C, and which Stipulations and ROPs would determine the restrictions which would be implemented under these two Alternatives. **(Comment No. 260-717)**

Response To: Comment 260-717

Alternative C is considered the most restrictive alternative (besides the No Action Alternative) because, as the commenter noted, 98 percent of the area with the highest potential for the occurrence of oil and gas resources would not be made available for oil and gas leasing. Map 19 shows that most of the northern coastal plain and the southern foothills would be "unavailable for leasing" under Alternative C. Stipulations and Required Operating Procedures represent restrictions on exploration and development activities within the areas that would be offered for leasing. Although commercial (economically viable) discoveries are not expected in low potential areas that would be offered for lease under Alternative C, the additional restrictions would likely preclude commercial development even if sizeable discoveries are made. If tracts are not leased (not made available for lease or else offered and not purchased by industry), then no one owns the rights to develop oil/gas under the lease. Exploration activities (e.g., seismic surveys) might occur on non-leased tracts, but development would only be permitted on active leases. Possible setbacks around rivers or waterfowl colonies are a moot issue in areas "unavailable for leasing" as shown on Map 19 because no development activities would be allowed.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-92, 1c Pipelines. It is unclear if the discussion in paragraph 2 on buried pipelines is applicable only to gas lines. The sentence that reads 'Buried pipeline, a common construction method for gas pipelines, would cause a dramatic shift for disturbed soils' leads the reader to believe that the discussion is only about buried gas pipelines. While this is consistent with the discussion beginning on page IV-25, it needs to be clarified in this section. If this section is intended to discuss buried oil lines or three-phase pipelines then it needs to be drastically expanded to discuss the serious technical and economic limitation of such lines. **(Comment No. 255-818)**

Response To: Comment 255-818

At this stage in the planning and environmental analysis process, we assume that only long-distance, chilled, high-pressure gas pipelines will be buried. Warm oil pipelines and three-phase lines are assumed to be installed on VSM's. Gas flowlines over short distances (within fields or between a satellite field and a processing facility) will also be installed on VSM's. A number of technical problems have been encountered for oil pipelines buried in permafrost regions, and burial of oil lines is generally not proposed for new projects. In contrast, for safety and technical reasons most new projects involving large-diameter, high-pressure gas pipelines call for buried lines. Cold ground temperatures tend to minimize flow problems with volatile natural gas liquids and can increase the distance between compression stations.

Comment From: David Pray (Comment Letter No. 80002)

For the various alternatives you quote percentages for the amount of high oil and gas potential that would be made available for oil and gas leasing. While you did a pretty good job making the GIS data for the plan available to the public, the layers used to produce these calculations (also in maps 105 and 106) was not provided. In an attempt to obtain these GIS layers I was told that they no longer exist. I was provided with an early version of map 105 which included boundaries between the various levels of oil and gas potential. I was able to georeference this map and digitize the boundaries myself. However, this data I received and the data used in the report are not the same. I was quoted from BLM staff that the high oil and gas potential unavailable in Alternative C to be 1,728,000 acres. My analysis determined 1,036,000 acres for this same area based on the data BLM made available to me. How can I trust any of the figures for oil and gas potential when the data I am given obviously is not the same used in the document' Good science should be reproducible. Apparently, one is not able to recreate your oil and gas analysis. **(Comment No. 80002-1041)**

Response To: Comment 80002-1041

The data layers for general oil and gas potential do still exist. We apologize that you were given incorrect information. Omission of data layers from Maps 105 and 106 in the draft IAP/EIS was an unfortunate oversight. It's unclear where you obtained the draft version of Map 105. This would have been a working map and would not necessarily be identical to the final version published in the draft IAP/EIS. It's also unclear which BLM staff quoted you a number of acres unavailable under Alternative C. No such number is stated in the Draft IAP/EIS. Good science should be reproducible. The fact that an acreage number that was not published in the document could not be reproduced by using draft data sets from unspecified sources is not surprising and has no relevance to the content of the Draft IAP/EIS.

68. TOPIC : SOILS

Comment From: State of Alaska (Comment Letter No. 251)

Section IV.C.1.b.(1)(b), Page IV-92. The State suggests that BLM review the acreage disturbance associated with material sites. The Draft IAP/EIS estimates that each material site would disturb 20 to 50 acres. Currently, the proposed development at Point Thomson estimates the disturbance from a material site at more than 76 acres, including about 46.5 acres for the mine, 18.8 acres for overburden storage, and 11.2 acres for gravel storage. Any changes to the analysis of acreage disturbance caused by material sites would need to be incorporated throughout Section IV. **(Comment No. 251-191)**

Response To: Comment 251-191

The BLM believes that the acreage range for a material site is appropriate and sufficient for this analysis. The actual acreage of disturbance for any particular site would depend on many factors including the topography of the site, the depth of the overburden, the thickness of the gravel or sand deposit, and the total volume of gravel or sand needed. Any proposed material site would go through a permitting process and additional environmental review.

Comment From: WesternGeco (Comment Letter No. 215)

"The footprint would be unlikely to destroy more than 1500 acres of soil or'.' Soil is not destroyed it is displaced. Replace the word 'destroy'. **(Comment No. 215-785)**

Response To: Comment 215-785

The text has been revised.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-93 (d), 2nd para. Winter exploration is conducted off ice pads, which results in minimal impact or disturbance to soils. The disturbance is much less than 1 acre and in most cases is less than 0.01 acres. The sentence also needs to be revised to read "disturbance from well cellars (collars).' **(Comment No. 255-819)**

Response To: Comment 255-819

The text has been revised.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-93 (d), 3rd para. Revise 3rd sentence. "of these impacts to soils would be permanent.' North slope researchers have been evaluating methods for growing vegetation on gravel pads, thus there is the potential for creating wildlife habitat at the completion of the field life. **(Comment No. 255-820)**

Response To: Comment 255-820

Although research has progressed toward the reuse of gravel pads and the recovery of soils, current trends are more toward reduction in size of pads and improved design as tools to reduce soil impacts.

69. TOPIC : SEISMIC SURVEY ACTIVITY

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Summary; Summary of Impacts, paragraph 2. The first sentence states 'Seismic activities, overland moves, and exploratory drilling, all occur during the winter.' This is not always the case because offshore seismic surveys

often occur in the area during the summer months. **(Comment No. 260-718)**

Response To: Comment 260-718

Seismic surveying in the NPR-A occurs in the winter. Waters seaward of the barrier islands are outside of the NPR-A.

Comment From: WesternGeco (Comment Letter No. 215)

After careful review and analysis by leading professionals, we have concluded that the estimates of the potential acreage impacted by seismic operations are incorrect. It appears that the impact estimates contained in the IAP/EIS are based on decades old technology and methodologies of the 1980's. The reader should keep in mind that, over the last decade, WesternGeco has significantly reduced the environmental impact of Arctic seismic operations. **(Comment No. 215-774)**

Response To: Comment 215-774

WesternGeco and its heritage companies have indeed conducted a great deal of geophysical data collection in the NPR-A. Today, there are three companies performing similar data collection efforts in the NPR-A. While WesternGeco may speak for itself and its record, not every company continuously works to the same standard. We believe that the acreage figure of 10 acres of disturbance used in the Northeast IAP/EIS is an appropriate generalization for all geophysical permits programs in the NPR-A. When this acreage figure was carried forward to the Northwest IAP/EIS, it suggested an additive condition where the same level of disturbance would occur in each Planning Area. To clarify, the area of disturbance figure covers all programs over the entire NPR-A. As the concentration of geophysical activities shifts from one year to the next, the area of disturbance shifts, some years more to the east, while in other years, more to the west.

Comment From: WesternGeco (Comment Letter No. 215)

"Individual fish, mammals, and birds would probably die or" This statement is speculative and conveys a bias against responsible development. The sentence should be removed or reworded. **(Comment No. 215-783)**

Response To: Comment 215-783

The statement is presented out of context. The statement that individual animals would probably die or be displaced as a result of oil and gas development within their habitat is supported by the analyses in this IAP/EIS.

Comment From: WesternGeco (Comment Letter No. 215)

'Seismic vehicles would be a combination of tracked vehicles from small Nodwell 110's for surveyor travel to Caterpillar tractors for pulling seismic camp trains. Buggy style vehicles such as rolligons and Deltas are possible (Rice, 1997). Except for a new buggy design that may lessen the need to have a lead snowplow in deeper snow, most of the seismic vehicles in use are types that have been used on the North Slope for one to three decades... Most of the information contained in this paragraph is outdated and incorrect. For example, Nodwells are no longer present on any of our seismic crews. Most of the Vehicles that were in use 10 to 30 years ago had steel tracks. All modern seismic units are equipped with low ground pressure rubber tracks or large floatation

tires. This greatly reduces the potential impact to the vegetative cover. WesternGeco believes the entire paragraph is misleading and should be rewritten or eliminated. **(Comment No. 215-786)**

Response To: Comment 215-786

The discussion on equipment has been deleted and reference made to the seismic scenario in Section IV.A.1.b(3)(b).

Comment From: WesternGeco (Comment Letter No. 215)

'Carefully regulated seismic operations conducted in ANWR from 1984 to 1986 resulted in damage to vegetation in some tussock tundra and moist sedge-shrub tundra, but not to lower, moist sedge and wet tundra (Felix et al., 1989)' There was no seismic activity in ANWR at any time during 1986. The author cites a report that claims there was damage on 29 percent of the seismic trails. Stating damage in this manner is highly misleading. Most of the seismic lines were several miles long but tundra damage occurred a few feet at a time. What the author fails to mention is that during the 1984 season, there was very little snow in ANWR and on many of the elevated areas there was no snow cover at all. Normally, seismic operations would not take place under these conditions. However, the USFW was under extreme political pressure to complete the Congressional mandated exploration program. Most of the tundra damage occurred during camp moves and not on the actual seismic lines. Inexperienced government monitors chose the actual camp-move routes and, in many cases, the camp was pulled over large areas of exposed tundra. We find it interesting that the author cites a 19 year old 'worst case' example from ANWR but does not cite an example from the thousands of miles of seismic lines obtained in NPR-A. The IAP/EIS deals with NPR-A and not ANWR. **(Comment No. 215-788)**

Response To: Comment 215-788

The dates have been changed and text has been revised. While the depth of snow cover does mitigate some of the impacts of seismic activities, disturbance has been documented even where the snow depth exceeded two feet (Felix and Raynolds 1989). The study cited (Felix and Raynolds 1989) represents the only long-term study of such impacts.

Comment From: WesternGeco (Comment Letter No. 215)

'Persistent high damage has been estimated to occur on 13 acres per seismic survey' The author provides no reference for the high damage estimates. We know from years of records that the '13 acres' is not even remotely accurate. It is too high by several orders of magnitude. The author goes on to state that thermokarst erosion due to seismic operations has never been observed. In spite of this, he makes estimates of the total area that will be affected by themokarst erosion and down- flow water quality. We believe that this entire paragraph contains incorrect information and unfounded speculation. It should be deleted from the EIS. **(Comment No. 215-790)**

Response To: Comment 215-790

The text has been revised.

Comment From: WesternGeco (Comment Letter No. 215)

Long-term impacts, such as diversions of shallow water tracks and limited ponding, are estimated at 2 acres affected by a 2-D seismic operation and about 8 acres by a 3-D seismic operation' Again, the estimates are much too high. It is clear that these estimates are based on decades old technology and methodologies that no longer exists. As an example, WesternGeco currently reports all disturbed surface impacts to the North Slope Borough. Last year alone we filed over 600 incidents from our seismic crew operating in the NPRA. The average disturbance affected an area of approximately 4 square inches. This yields a total of 17 square feet of minor surface damage over a survey area of 800 square miles (22,302,720,000 square feet). In other words, this represents a percentage of 0.00000007.6 % (negligible). WesternGeco had a total of 8 tundra contacts that were considered 'other than minor'. In each case an on site Environmental Observer (a resident of the North Slope Borough) investigates the incident. A GPS reading of the location is taken and a '24 hour reportable' form is filed with the Borough. Each incident is revisited the next summer to determine possible long-term impacts. In all cases, a finding of no significant impact (FONSI) was determined. It should be pointed out that the environmental observers are highly respected and knowledgeable residents of the North Slope Borough. **(Comment No. 215-796)**

Response To: Comment 215-796

The text has been revised.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-15, second paragraph. The DEIS states that a typical 3-D program consists of 50 to 80 people and can collect from 2 to 4 square miles of data per day. The crew size on current 3-D seismic operations range from 70 to 110 people and will collect 3 to 6 square miles of data per day. This general statement applies to several sections in the DEIS and should be correct in each. **(Comment No. 255-810)**

Response To: Comment 255-810

The text has been revised.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-15, third paragraph. The DEIS states that seismic camps are re-supplied using both ground vehicles and light fixed-wing aircraft. We do not believe the term 'light fixedwing' applies to the type of aircraft used to deliver fuel and suggest deleting the word 'light' from the last sentence of this paragraph. This general statement applies to several sections of the DEIS and should be corrected in each. **(Comment No. 255-811)**

Response To: Comment 255-811

The text has been revised.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-15, fourth paragraph. The DEIS states a train would consist of 10 to 15 vehicles. This could be updated to 17 vehicles for 3-D seismic operations. This general statement applies to several sections of the DEIS and should be corrected in each. **(Comment No. 255-812)**

Response To: Comment 255-812

The text has been revised.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-48, 3.b Effects of Oil and Gas Activities. The discussion on 3-D seismic impacts needs to be updated. Current 3-D seismic operations do not require tighter turns and therefore the estimates of impacts are overstated. **(Comment No. 255-816)**

Response To: Comment 255-816

Surveying techniques have never required maneuvers that cause undue disturbance on the tundra. It has been a matter of custom, attitude, or poor management control that has allowed for the lack of care that brought the issue of impacts from vehicle maneuvering to light some years ago. The BLM agrees that it is no longer an issue that needs to be in the discussion of seismic surveying. The issue is better addressed in terms of general driving or terrain negotiating skills in a discussion of overland travel methods.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-50, 4.b Effects of Oil and Gas Activities. CPAI believes the second paragraph fails to recognize the significant improvements made in recent years to much of the equipment used in seismic operations. This paragraph states that 'most of the seismic vehicles in use are types that have been used on the North Slope for one to three decades.' CPAI seismic operations in recent years have been conducted almost entirely with new, rubber tracked or rubber wheeled low ground pressure vehicles. Use of 'steel tracked' tractors is minimized. **(Comment No. 255-817)**

Response To: Comment 255-817

The aspect of seismic operations that could cause the greatest disturbances to the land surface is the camp. Camp design has not changed significantly in the last one to three decades. Steel-tracked vehicles are needed to move the camps. Alternative lower-ground-pressure vehicles are used for all other activities where possible.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Pg IV-97 3(b)(1) Paragraph 1. Reference is made to the potential impacts from seismic activities from 'tighter turns by seismic equipment required by closer spaced grid patterns.' Since the late 1990s the seismic industry has been evaluating seismic equipment and developing equipment that exerts minimal ground pressure (in many cases <3psi) on the underlying tundra. Additionally, conducting tight turns during seismic work has been discontinued following activities in the late 1990s where CPAI determined that the Cross Line Swath pattern, a wider spaced pattern would alleviate the problems exhibited by earlier activities where tight turns were the norm. CPAI requests that this evolution in seismic technology be acknowledged in this document. **(Comment No. 255-822)**

Response To: Comment 255-822

The text has been revised based on the information provided. Also, please see comment response 255-816 (Seismic Survey Activity).

Comment From: Wainwright Tribal Council (Comment Letter No. 80012)

Reports of the seismic activities/oil development should be reported to the Wainwright City Council, Olgoonik Corporation and Wainwright Tribal Council. **(Comment No. 80012-1031)**

Response To: Comment 80012-1031

For BLM's meeting and consultation protocol see comments 254-638 (Government to Government), 261-102 (Government to Government), 261-119 (Government to Government), 80026-1016 (Government to Government), 80075-471 (Government to Government), 80075-474 (Government to Government), 80075-493 (Government to Government), 80077-926 (Impact Compensation), 80077-946 Government to Government), and 80079-989 (Government to Government). See also the General Lease Stipulations and Required Operating Procedures for the Preferred Alternative, specifically Required Operating Procedures H-1 and I-1. We recommend that the Wainwright City Council, Olgoonik Corporation, and Wainwright Tribal Council contact BLM concerning their participation in BLM's developing North Slope Science Strategy and the North Slope Management Oversight Group. This body could appropriately address local concerns about the timely reporting of seismic activities and oil development and the sharing of this information with the community.

70. TOPIC : ROADS

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

First, none of the development alternatives prohibit the construction of permanent roads (DEIS pp. IV-34-35, IV-511-12), and Alternatives A and B permit construction of a permanent road connecting the Northwest to areas outside the Planning Area, (id. at 512-14.) Moreover, Alternatives A, B, and C permit permanent facilities in the Colville River Special Area. An alternative in which that area is closed to permanent construction should be considered. **(Comment No. 253-63)**

Response To: Comment 253-63

None of the alternatives, including the Preferred Alternative, preclude or support a possible road connecting the Planning Area to outside of the Planning Area. We do consider the possible impacts of a State-sponsored road between the Dalton Highway Road and Nuiqsut in the cumulative effects section of the Final IAP/EIS. A decision on a proposed road would not be made until a NEPA analysis is completed. The BLM believes it will be at least 10 years before any proposal comes forward. The Preferred Alternative includes a one-mile setback from the Colville River for permanent development.

Comment From: State of Alaska (Comment Letter No. 251)

State of Alaska NW NPR-A Comments Page 23 Section III, Page III-150, Road Systems. This section should be modified to incorporate the general comments noted earlier regarding the Northwest Planning process and

identification of road proposals supported by the State, NSB, and North Slope villages. Section IV, Page IV-3, Introduction and Basic Assumptions Ground-Impacting Management Activities. This section needs to include a discussion of community roads between Barrow-Atqasuk-Wainwright. **(Comment No. 251-376)**

Response To: Comment 251-376

Please see the responses to comments 251-373 (Transportation) and 315 (Right of Way), and 213-357 (Transportation).

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-3, Introduction and Basic Assumptions Ground-Impacting Management Activities. This section needs to include a discussion of community roads between Barrow-Atqasuk-Wainwright. 251-378
(Comment No. 251-378)

Response To: Comment 251-378

Construction of a Barrow-Atqasuk-Wainwright road during the life of this plan is not considered likely. A discussion of permanent roads is found in Section IV.A.1. A permanent road between the Dalton Highway and Nuiqsut has been added to the cumulative scenario. Permanent roads are also considered in Section IV.K. Please see the response to 251-315 (Right of Way).

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-34-35 (8) (c), Possible But Unlikely Activities, Permanent Roads. This section, specifically the prohibition on road connection to the outside road network, needs to be reviewed and revised consistent with the proposed Barrow-Atqasuk- Wainwright transportation corridors and the potential for a permanent road into NE NPRA that could in time form the mainline or trunk road for production operations in NW NPR-A.
(Comment No. 251-384)

Response To: Comment 251-384

At this time, roads proposed in the easternmost part of the Northeast NPR-A Planning Area have not been approved or constructed. Construction of the proposed roads would not materially affect operations in the Northwest Planning Area. The regulations for the Northwest Planning Area do not preclude construction of permanent roads, and studies are underway for the feasibility of inter-connecting roads between villages in western NPR-A. A permanent road between the Dalton Highway and Nuiqsut has been added to the cumulative scenario. Please also see the responses to comments 251-373 (Transportation), 251-380 (Roadless Areas and Development), 251-381 (Outside Scope of Plan), and 351-382 (Transportation).

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-512, Bullet 7. The statement in this section that "the road system east of Nuiqsut would be partially funded with State of Alaska or Federal funds and open to the public" should be modified consistent with Section 118 (e) of the Transportation Enhancement Act 21 (TEA-21). TEA-21 authorizes the expenditure of federal funds for resource development road construction projects without regard to the traditional public funds

equals public access caveat. It allows industrial use designation of these roads that precludes or limits public access eventhough state or federal funds are used. ADOTPF is now investigating the full implications of this statute on the North Slope roads development program currently underway. Section IV, Page IV-512, Bullet 8. The State recommends that the language in this section regarding the funding and construction of a road system west of Nuiqsut by the lessees and closed to general public use be modified in recognition that ADOTPF funding from state and federal sources may be used to develop roads west of Nuiqsut into NPR-A. **(Comment No. 251-402)**

Response To: Comment 251-402

The State-advocated road between the Dalton Highway and Nuiqsut has been incorporated as a reasonably foreseeable activity under the cumulative scenario. This text has therefore been moved. Text has been added in the cumulative scenario to present the information on TEA-21 provided in the comment. The assumption in Bullet 7 has not been changed. In consideration of the history of the Dalton Highway relevant to the question of "public funds equals public access," the BLM believes that the assumption that a federally funded road between the Dalton Highway and Nuiqsut would be open to public use is a reasonable assumption.

Comment From: State of Alaska (Comment Letter No. 251)

Section IV, Page IV-512, Bullet 8. The State recommends that the language in this section regarding the funding and construction of a road system west of Nuiqsut by the lessees and closed to general public use be modified in recognition that ADOTPF funding from state and federal sources may be used to develop roads west of Nuiqsut into NPR-A. **(Comment No. 251-405)**

Response To: Comment 251-405

The text has been revised to indicate that this assumption is meant to apply to oil and gas-related roads and is not intended to mean inter-community roads.

Comment From: State of Alaska (Comment Letter No. 251)

It is essential that BLM consider these road proposals. We recommend that potential allseason community roads and mainline/trunk roads for oil and gas exploration and development be included in the alternatives and appropriately analyzed for human and environmental impacts as required by the National Environmental Policy Act. The assumption in the Draft IAP/EIS that private sector financing of roads makes roads unlikely needs to be revised in recognition that the State may finance roads in whole or part. In addition to providing overland transport of vehicles, the road corridors identified through the Northwest Plan may also function as electrical energy, consumer gasline and communications distribution routes. This potential infrastructure should be considered as well. **(Comment No. 251-513)**

Response To: Comment 251-513

Please see the response to comment 213-357 (Transportation).

Comment From: Public Meeting on DEIS - Washington, DC (Comment Letter No. 80082)

Getting a little more specific about this plan, you hear a lot about the, quote, new technology. Well, how are they proposing to develop in NPRA' It is gravel roads, the same old gravel roads you would have in the Prudhoe Bay Oilfield, the Kuparik oilfield. From the Alpine oilfield there is proposed 19 miles into NPRA. This is the Northeast corner of the first sale area, but it was, quote, the model. There was going to be two gravel pads. That's what they focus on. Now, Alpine, the first oilfield just on the border of NPRA, now moving in with three gravel pads in the petroleum reserve will be up to 15 pads, roads, an airport here and there. It is a lot of activity. **(Comment No. 80082-532)**

Response To: Comment 80082-532

The purpose of conducting lease sales and exploring for oil is to find as many commercial-size fields as possible. No one can accurately predict when or where these fields will be discovered. Alpine was discovered in the winter of 1994 (5 years before the NE NPR-A sale was held in 1999). When Alpine was developed, the companies had no knowledge (or leases) of additional fields in NPR-A. Later leasing and exploration resulted in discoveries that could become commercial fields if they were tied into the existing Alpine infrastructure. The nature of oilfield development is that it spreads from a central (or core) area. It remains to be seen if infrastructure will continue to spread to the west into NPR-A. This will depend on successful leasing and exploration drilling. However, it is unlikely that the scale of roads, pipelines, and facilities present in the Prudhoe-Kuparuk complex will be replicated in NPR-A because the fields are likely to be much smaller.

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

BLM should require that all future development in the Northwest NPRA planning area be roadless unless this is not environmentally preferable. **(Comment No. 254-626)**

Response To: Comment 254-626

It is unrealistic to make final decisions now about what roads will be allowed for future development. Decisions as to whether there will be roads associated with future development will be made on a case-by-case basis depending on the nature of the development, and assessments of the impacts on the resources present. Compliance with NEPA will also be required at that time. Please see Section II.C.6 for a description of Required Operating Procedure E-1.

Comment From: Gordon Brower (Comment Letter No. 48)

This make it clear that we must plan these lease sales to incorporate new and positive designs, with the help of the State industrial roads program to spark a renewed interest in working together, this will reduce the cost of development that industry has always said was not feasable and prudent. **(Comment No. 48-975)**

Response To: Comment 48-975

Once oil and gas fields are discovered and delineated, it is both economically and environmentally prudent to minimize construction of supporting infrastructure. The BLM would encourage planning infrastructure to be able to support anticipated future needs.

Comment From: Gordon Brower (Comment Letter No. 48)

The State Industrial Roads program to build a road cooridor that would be multi use, The road may be used to hold within it a flowline eliminating a mayor portion of elevated pipelines. The road may end up near the coal fields in the heart of NW NPR-A, which would spur the development of coal exports, a section of road may connect to Barrow, which may become to port of development of the area, and the road would provide for refined oil from a nearby field to help displaced subsistence hunters to hunt other location by providing a less cost fuel supply, current moter gas in Barrow is $3.25 a gallon, with a nearby limited fuel refinery on slope the fuel cost may drop subtancially, mayby $1.25 a gallon. This would help keep our ocean clean and would stop mayor fuel haul barges, which travel in ice infected arctic waters, the impact would lessen. Furthermore, the industrial road would bring the cost of living down, goods for sale may now be shipped over land by truck, residents may enjoy the benifits. This is the type of control that would promote a proper industrialization to NPR-A, one that would benifit all. **(Comment No. 48-976)**

Response To: Comment 48-976

Decisions about roads are beyond the scope of this plan.

Comment From: Hearing -Anaktuvuk Pass (Comment Letter No. 80072)

Then my other concern is that if they find the gas and oil over Western NPR-A, then if they build a road that's going to change our subsistence again like pipeline. Pipeline has really changed our caribou hunting because Porcupine Herd used to cross the river, cross the road this way and come out to our Anaktuvuk and Anaktuvuk Valley from east, it doesn't happen no more. Once they build a road up here from -- from Alpine area to -- all the way across to NPR-A, once they build a road it's going to change the subsistence just like every one of those coastal villages, if they build a road that's going to change their subsistence.
(Comment No. 80072-980)

Response To: Comment 80072-980

Please see the response to comment 80072-979 (Caribou).

71. TOPIC : RIGHT OF WAY

Comment From: State of Alaska (Comment Letter No. 251)

Section II'Alternatives. The scope of the current alternatives, which is primarily oil and gas activities, should be expanded to include the Barrow-Atqasuk-Wainwright roads/transmission line projects that will proceed as funding allows. Alternatives should also include an analysis of the need for oil and gas mainline roads in light of reduced ice road seasons. **(Comment No. 251-311)**

Response To: Comment 251-311

Construction of a Right of Way (ROW)for the Barrow – Atqasuk – Wainwright transmission line is an externally generated ROW proposal that does not need to be considered as part of the Northwest IAP alternatives. The plan does not preclude such a development and it is allowed under the authority of FLPMA and the NPRPA. If the Borough should decide to proceed with the ROW, variations on the route can be considered at the time through

the required environmental analysis. As to including alternatives that consider other oil and gas mainline roads to support oil and gas development, it is felt that until there is a discovery this exercise would be highly speculative and of little value. Prior to development, additional environmental analysis will be required, which will consider the impacts of mainline roads.

Comment From: State of Alaska (Comment Letter No. 251)

Map 17, Potential Right of Way Sites. This map should be modified to incorporate transportation/utility transmission corridors to support community roads between Barrow-Atqasuk-Wainwright as identified by ADOTPF, the NSB, and the affected villages in the Northwest Plan. **(Comment No. 251-315)**

Response To: Comment 251-315

A designated Right-of-Way (ROW) corridor is not required to grant a transmission line or road ROW across the NPR-A. A corridor designation is usually used to identify preferred locations for future ROWs. There is not sufficient information available at present to make such a determination. However, an application for the Barrow-Atqasuk-Wainwright road/transmission line ROW was received in 1981. The BLM has received no other ROW applications for community roads. The road/transmission line ROW was not shown on any map because it has been on file for over 20 years and BLM felt that when the proposal went forward it could be modified based on 20 years of new information, technology, and other circumstances. Nevertheless, we have added the route of proposed road/transmission line ROW to Map 20.

72. TOPIC : IMPACT COMPENSATION

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

And if our natural habitat is touched, we can't go out -- we can't get what we want to hunt, what is your compensation going to be' I know beef is not what my stomach wants, but the Native food that we eat is what my stomach is going to hunger for. And I don't think beef would be something that is a natural habitat for the Natives up in the north. So there's a consideration that you guys should think about, **(Comment No. 80075-487)**

Response To: Comment 80075-487

Federal law requires that the State, in allocating its 50 percent share of sales, rentals, and bonus royalties from any leasing in the NPR-A, give "priority to use by subdivisions of the State most directly or severely impacted by development of oil and gas" in the Reserve (P.L. 96-514). Under the law (AS 37.05.530), funds the State receives from leasing on the NPR-A are placed in the NPR-A Special Revenue Fund. These impact funds are distributed to communities through a grant program (19 AAC 50) administered by the Department of Community and Economic Development. If a community feels that the State has violated the Federal law, its remedy is to bring suit against the State in the courts. The BLM believes that these grants are the type of compensatory assistance that could enable local communities to upgrade local medical, public safety, and municipal services.

Comment From: Public Meeting on DEIS - Barrow, Alaska (Comment Letter No. 80075)

As production begins and if production begins, there should be a percentage of royalties set aside to offset the economic disturbances that the oil industries enterprises will generate. And this should be considered very

carefully. And it should be designed to benefit and create innovative opportunities through innovative programs to benefit North Slope residents in socio-economic opportunities not related to oil industrial development, not related to lease sale development. It should be a sustainable program for the long-term benefit and sustenance of the North Slope residents. We are most affected by oil development in attending public meetings such as this, looking at the different plans and we are disturbed by oil development in our subsistence way of life. We have a conflict here, oil development and Inupiat culture. United States government and oil development versus Inupiat culture. Let's face the fact of it, this is the bottom line. Everything that has been said of protecting this area, protecting this area, and protecting that area has dealt with animals that Inuit depend on and that is the subsistence way of life that's the base of our culture, and this is being eroded to a degree and has been eroded to a degree that you do not see a single Inupiat in here wearing fur clothing, which was traditional. We're speaking a different language which is not traditional. We enjoy all these modern conveniences but that's part of our American Dream. But as a country, when you deprive the people of their resources and of their culture and their economic opportunities outside of oil and gas industry, there's something wrong. And I hope you will take this time to consider correcting that opportunity. **(Comment No. 80075-509)**

Response To: Comment 80075-509

In allocating monies from the State's share from any leasing in the NPR-A, Federal law requires that the State give priority to subdivisions of the State most directly or severely impacted by development of oil and gas. The BLM believes that these grants are the type of compensatory assistance that could enable local communities to upgrade local medical, public safety, and municipal services. Please also see the response to comment 80075-487 (Impact Compensation).

Comment From: Arctic Slope Regional Corporation (Comment Letter No. 186)

First, our Iñupiat institutions and our local government must derive benefit from and actively participate in the terms and conditions that regulate development of these resources. **(Comment No. 186-555)**

Response To: Comment 186-555

Please see responses to comments 80074-893 (Impact Compensation), 80075-509 (Impact Compensation), 80077-926 (Impact Compensation), 80077-935 (Impact Compensation), 80077-939 (Sociocultural Systems), and 80077-945 (Government to Government).

Comment From: Olgoonik Corporation (Comment Letter No. 169)

We would also like to see that there are monies set aside in the event that there is an oil spill, tundra damage or any corrective measure that needs to be done as well as any displacement of the subsistence resources. **(Comment No. 169-714)**

Response To: Comment 169-714

Federal law requires that the State, in allocating its 50 percent share of sales, rentals, and bonus royalties from any leasing in the NPR-A, give "priority to use by subdivisions of the State most directly or severely impacted by development of oil and gas" in the Reserve (P.L. 96-514). Under the law (AS 37.05.530), funds the State receives from leasing on the NPR-A are placed in the NPR-A Special Revenue Fund. These impact funds are distributed to communities through a grant program (19 AAC 50) administered by the Department of Community and Regional Affairs. Please see comment response 254-612 (Subsistence) for mitigating measures and processes to prevent

losses of subsistence resources.

Comment From: City and Native Village of Nuiqsut (Comment Letter No. 80026)

Financial support: As a mitigation measure, our community deserves financial support, in the form of user fees paid to the City, for the increased demand NPR-A oil exploration and development creates for additional services such as health and public safety, and infrastructure, and the general disruption created by the overwhelming amount of activity in or near our small arctic community. **(Comment No. 80026-1013)**

Response To: Comment 80026-1013

Please see responses to comments 80074-893 (Impact Compensation), 80075-509 (Impact Compensation), 80077-926 (Impact Compensation), 80077-935 (Impact Compensation), 80077-939 (Sociocultural Systems), and 80077-945 (Government to Government).

Comment From: City and Native Village of Nuiqsut (Comment Letter No. 80026)

NPR-A Federal Mitigation Funds ' These funds should go directly from the federal government to NPR-A development impacted communities. Now these funds are funneled through the State of Alaska and communities are subject to competing against one another for grant funds, with the State as the authority, and grant funds are not always fairly distributed based on impacts to specific communities. **(Comment No. 80026-1023)**

Response To: Comment 80026-1023

Please see response to comments 80077-926 (Impact Compensation) and 80026-1013 (Impact Compensation).

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

I am in agreement to Alternative C until such time we have adequate environmental studies to cover archeological fishing measures and lastly to make the NPR-A Impact Funds made available in direct to Inupiat Community of the Arctic Slope rather than being controlled by the state government. **(Comment No. 80074-893)**

Response To: Comment 80074-893

Federal law requires that the State, in allocating its 50 percent share of sales, rentals, and bonus royalties from any leasing in the NPR-A, give "priority to use by subdivisions of the State most directly or severely impacted by development of oil and gas" in the Reserve (P.L. 96-514). Under the law (AS 37.05.530), funds the State receives from leasing on the NPR-A are placed in the NPR-A Special Revenue Fund. These impact funds are distributed to communities through a grant program (19 AAC 50) administered by the Department of Community and Economic Development. If a community is dissatisfied after discussing allocations with the State, the law provides recourse through litigation.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

You cause a lot of social ills to our community. And that's the things that are devastating to our young people. The obstructions to try to meet the requirements to obtain employment prevent us from being able to come out to the fields and work. There are increased efforts with our corporation working very hard to try to obtain some of these things, but you're still having limited number of slots available to get our people certified to get out there and work. There's no way we can get all of the requirements -- you have how many different requirements even for your basic employments. Those are things that are not readily accessible in our community, yet it's a requirement for us to step in our backyard to go to work. All of these problems are causing us a lot of issues. All of our public services are hit heavily by these influx of activities related to development activities. Our clinic gets used. Our public safety gets used. Our municipal services get used, but yet there's no assistance to our municipal services to provide these extended needed services. **(Comment No. 80077-926)**

Response To: Comment 80077-926

Federal law requires that the State, in allocating its 50 percent share of sales, rentals, and bonus royalties from any leasing in the NPR-A, give "priority to use by subdivisions of the State most directly or severely impacted by development of oil and gas" in the Reserve (P.L. 96-514). Under the law (AS 37.05.530), funds the State receives from leasing on the NPR-A are placed in the NPR-A Special Revenue Fund. These impact funds are distributed to communities through a grant program (19 AAC 50) administered by the Department of Community and Economic Development. If a community feels that the State has violated the Federal law, its remedy is to bring suit against the State in the courts. The BLM believes that these grants are the type of compensatory assistance that could enable Nuiqsut to upgrade local medical, public safety, and municipal services. Nuiqsut has received State approval for eight grants totaling $8,896,200 from monies made available from proceeds from Northeast NPR-A lease sales. Please see comment responses 254-612 (Subsistence) for mitigating measures and processes to prevent losses of subsistence resources and 80077-924 (Government to Government) for industry employment initiatives.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

I felt like a third world citizen yesterday when I went to KOC. You know we go use the restroom and I ask, well, can we buy dinner, no, you just get yours to go and you have to go. We're third world citizens with the oil industry, they don't treat us like people. And as for opening this NPR-A, I want to oppose until Nuiqsut gets what rightfully belongs to them. I'm glad that we have that NPR-A Impact Fund, that's not enough. What kind of revenue comes to this community' And they trample all over our land. Only time we see money coming into this community is by the royalty and it's just a fraction. It's just a fraction compared to what they make, and, yet, we are the ones that are impacted. **(Comment No. 80077-935)**

Response To: Comment 80077-935

Section III.C.1 describes the way the State of Alaska administers the NPR-A Special Revenue Fund grants under the NPR-A Impact Program. If there are inequities in the distribution of these funds among local communities, this should be taken up with the Alaska Department of Community and Economic Development and/or the State legislature. Please also see the response to comment 186-555 (Impact Compensation), 80077-926 (Impact Compensation), and 80077-945 (Government to Government). Section III.C.4 describes the socioeconomic and sociocultural conditions in Nuiqsut and other potentially affected communities as mentioned in the comment.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

If you're going to open this I want to see some kind of clause in this EIS declaring Nuiqsut some kind of economic impact fund for this community to keep it viable. **(Comment No. 80077-937)**

Response To: Comment 80077-937

See response to comment 80077-926 (Impact Compensation).

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

And as for subsistence, I like to fish. I like to fish and I like to hunt caribou. And you heard what I said about driving out that way. You drive out there, you look. You see if there's caribou. Drive out that way and see if you see anything. Then you ask one of these guys to drive you that way where there's nothing yet, see if you'll see a caribou and right now you're not going to see a caribou that way. And if it's going to be opened we're going to lose some of our subsistence and I want to make sure this community gets due rightfully what is their's by way of impact funds or I don't know, you know, there's got to be a way. **(Comment No. 80077-938)**

Response To: Comment 80077-938

See responses to comments 80077-926 (Impact Compensation) and 80077-945 (Government to Government).

Comment From: Paul Hugo (Comment Letter No. 187)

As we know that Federal Funds are given to the villages in the NPR-A Region, not as penny is given to our village from this fund, and still, majority of our resident's will be affected by activities in the NPR-A with the high employment rate and high cost of store goods, fuel, electricity, housing, the caribou herd migration becomes more and more important to us, to get us by for the year. **(Comment No. 187-964)**

Response To: Comment 187-964

Please see responses to comments 80074-893 (Impact Compensation), 80075-509 (Impact Compensation), 80077-926 (Impact Compensation), 80077-935 (Impact Compensation), 80077-939 (Sociocultural Systems), and 80077-945 (Government to Government).

Comment From: Paul Hugo (Comment Letter No. 187)

Funds should be available for our community if there is a impact by activities in the NPR-A . **(Comment No. 187-967)**

Response To: Comment 187-967

See response to comment 187-964 (Impact Compensation).

73. TOPIC : STIPS SPECIFIC

Comment From: The North Slope Borough (Comment Letter No. 80065)

Stipulation A-3, Page II-18. This stipulation prohibits refueling of equipment within 500 feet of any fishbearing waterbody and 100 feet from non-fish-bearing waterbodies for Alternatives A and B. Under Alternative C, the setback is 500 feet from any waterbody. We recommend the stipulation language used in Alternatives A and B, with setbacks of 100 feet from non-fish-bearing waterbodies and 500 feet from fishbearing waterbodies, be used for all alternatives. ROPs A-1 through A-8, Pages II-18 and II-19. These mitigation measures pertaining to waste prevention, handling, disposal, and spills all should be converted to stipulations. They pertain to major issues. Potential lessees and the public must know what is expected in these subject areas as early as possible in the planning process. The qualifying phrase 'except as specifically provided" in ROP A-3 must be explained or deleted. In ROP A-6, notification of government entities should be 'as required by law or permit'. Stipulation B-1, Page II-20. This stipulation discusses winter water withdrawal within the planning area. For Alternatives A and B, the stipulation states the AO may authorize winter water withdrawal from lakes, creeks, or rivers. The Borough supports the approach taken in Alternative C prohibiting winter water withdrawal from rivers and streams, and recommends it be adopted for all proposed alternatives. The stipulation should be modified to limit water withdrawal in fish-bearing lakes to 15% of the under-ice volume for those lakes with depths less than 7 feet. Stipulation B-2, Page II-20. This Alternative C stipulation prohibiting compaction of snow cover or snow removal from ice over fish-bearing waterbodies except at approved ice road crossings and lake water pumping stations, should be applied to all alternatives. Stipulation C-1, Page II-20. Consultation in C-1a should include the Borough and potentially affected communities. In C-1b, the exact dates for the opening of ground operations should be 'determined annually by the AO'. ROP C-1a-g, Page II-21. ROPs C-1a-e should be made stipulations, and applied to all alternatives. ROP C-1g regarding refueling of equipment near waterbodies should be eliminated as redundant of Stipulation A- 3, which should be applied to all alternatives. Stipulation C-2-a, Page II-21. This stipulation regarding use of motorized ground vehicles near raptor nest sites should be applied to all alternatives. The stipulation should be modified to prohibit motorized ground vehicle use within ½ mile of known or observed active raptor nesting sites. Stipulation D-1, Page II-22. This stipulation restricts exploratory drilling in certain waterbodies. The stipulation should be written to prohibit exploratory drilling in rivers, streams, and lakebeds, as determined by the active floodplain, and applied to all alternatives. Stipulation D-2, Page II-22. This stipulation prohibits the construction of certain permanent facilities during the exploration phase of oil and gas development, should be expanded to include gravel drilling pads, and should be applied to all alternatives. Stipulation E-1, Page II-22. This stipulation presents setbacks for permanent oil and gas facilities, including roads, airstrips, and pipelines from specified waterbodies and other resources. To say the least, this Henri Bisson April 2, 2003 Page 7 stipulation as presented is confusing. Under Alternative B, it is unclear when the 'specific investigation' would be conducted to determine whether significant resources occur within a particular land area. It is unclear who would conduct the investigation. It is unclear what 'NEPA analysis' would be required to minimize impacts, and what would trigger such analysis. All setbacks of 'up to' a specified distance from the physical feature or biological resource identified for protection do not provide any certain measure of protection for these resources. All must be made certain. The stipulation under Alternative C provides the necessary certainty, and should be applied to all alternatives with the following modifications: Stipulation E-1) Road crossings of the Colville River within the setback areas defined in E-1s may be allowed on a case-by-case basis in consultation with appropriate federal, state, and North Slope Borough regulatory and resource agencies where no other suitable sites are available. b, d, h, i, j, and l: ½-mile setback increased to ¾-mile. u: Identification of waterfowl nesting and brood-rearing areas requiring the ½-mile setback must be accomplished in a multi-agency workshop mapping effort in consultation with local communities. v: ½-mile setback from Dease Inlet, Elson Lagoon, Peard Bay, and Kasegaluk Lagoon increased to ¾- mile, and ½-mile setback from Kuk River increased to 3 miles. In addition, the ¾-mile setback should be applied along the entire coastal area west of Point Barrow, up to and including Kasegaluk Lagoon to provide protection for caribou insect relief habitat and the spring lead system along the Chukchi Sea coastline that is used by, and is vital to, bowhead whales, beluga whales, seals, seaducks, and the subsistence users who depend on the harvest of these resources. Stipulation E-2, Page II-26. The term 'independent remote oil fields' must be defined to mean single projects targeting a single reservoir. If not, an expansive network of roads could result. The currently proposed Alpine Satellite Development Project, for instance, envisions at least five widely dispersed drillsites, and it is unclear whether if constructed the five together would be considered a single 'independent remote oilfield'. Roads are not proposed to connect all of these sites, but this example should highlight that the goal of this stipulation should be to prohibit a road network. It should be worded accordingly. ROP E-1-4, Page II-27. Each of these should be made a stipulation, with the modification of E-2 to specify that lessees must also consolidate facilities within and between projects or must bear the burden of demonstrating why consolidation is not feasible. ROP E-5, Page II-27. The two versions of this

ROP should be combined, made a stipulation, and specify that burial of pipelines is encouraged and required at locations of concentrated caribou movement and subsistence user travel routes as identified through consultation with affected communities. The elevation of pipelines where above ground should be raised to 7 feet, and it should be required that they be finished with a dull non-reflective surface. Stipulation E-5, Page II-28. This stipulation under Alternative C regarding causeways, docks, artificial gravel islands and bottom-founded structures should be applied to all alternatives. ROP F-1, Page II-29. This ROP under Alternative C defines altitudes and distances for raptor nest site avoidance should be applied to all alternatives and should be made a stipulation. Stipulation H-1, Subsistence, Page II-30. This stipulation should be modified to include setbacks of 1 mile from established subsistence cabins and camps. ROP H-1, Page II-30. This ROP regarding subsistence consultation should be made a stipulation. Henri Bisson April 2, 2003 Page 8 ROP I-1, Page II-31. This ROP regarding environmental orientation and conflict avoidance should be made stipulation. Stipulation J-2, Page II-32. This stipulation under Alternative C prohibiting petroleum exploration and production activities within ½ mile of occupied grizzly bear dens should be applied to all alternatives. ROP J-1, Page II-32. This ROP requiring bear interaction plans should be made a stipulation. **(Comment No. 80065-583)**

Response To: Comment 80065-583

We have taken your recommendations into consideration in developing the Preferred Alternative.

74. TOPIC : LAND OWNERSHIP AND USES

Comment From: The North Slope Borough (Comment Letter No. 80065)

It is also stated with respect to development that 'because the land likely to be disturbed is a very small percentage of the 8.8 million surface acres BLM manages in the Planning Area, impacts to soil, vegetation, water, and paleontological and cultural resources will almost certainly be very minor.' It must be recognized that even a small area of physical disturbance can result in significant effects to the resources mentioned. There are key areas that must be protected from even the small footprint of present day industrial facilities and their associated effects. The vastness of the region does not justify loss of key wildlife habitat and subsistence use areas that are not duplicated across the North Slope. **(Comment No. 80065-585)**

Response To: Comment 80065-585

The BLM recognizes that regionally minor impacts can be locally or even regionally significant. The text has been revised to clarify the meaning.

75. TOPIC : WATER WITHDRAWAL

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

The draft IAP/EIS indicates that on the North Slope, the oil industry uses about one billion gallons of water annually (p IV-395). Freshwater is used for drilling operations, construction maintenance, ice roads, pads, camp use, water flooding, and other purposes. In order to evaluate the potential direct and indirect effects (including cumulative effects) from water withdrawals, the final IAP/EIS should identify the location of existing and potential future water source sites on a map for the NW Planning Area. Estimates of water need for each type of development activity should be summarized in a Table. In addition, we recommend that DOI/BLM should develop

management measures and stipulations for the siting of water withdrawal areas in the NW NPR-A. EPA recommends that lakes and ponds deeper than 6- ft and which provides overwintering habitat for arctic fish be exempt from water withdrawal. Additional stipulations and/or ROPs may be required to ensure adequate protection. **(Comment No. 261-126)**

Response To: Comment 261-126

Preliminary monitoring studies done by both BP and ConocoPhillips Alaska, Inc. indicate that there are no measurable effects when less than 15 percent of the under-ice water volume is removed. There currently are no data available that would demonstrate that limited water withdrawals from deep-water lakes are harmful to over-wintering fish. Exact locations of future exploration and development are unknown. Water withdrawal impacts are assessed for the Planning Area as a whole.

Comment From: U. S. Evironmental Protection Agency (Comment Letter No. 261)

Water Withdrawal Areas EPA recommends that the final IAP/EIS incorporate a map that identifies the locations of potential water withdrawal areas and sources. **(Comment No. 261-141)**

Response To: Comment 261-141

A subsequent environmental analysis would be necessary for any ice road or pad construction; this would require the locations of water-source lakes. It is not possible to determine the exact location of potential water-source lakes prior to any exploration plans being proposed. ConocoPhillips Alaska, Inc. has released a report (MJM Research, 2002) on deep-water lakes between the Ikpikpuk River and Barrow that could be used as water-source selected lakes.

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

While the Northeast ROD prohibited removal of winter water from rivers and streams, the Northwest DEIS does not. The Northwest DEIS solely addresses fish resources, and has no restrictions on water withdrawals from shallow lakes or large lakes that do not contain 'fish'. The standard for setting unacceptable water withd rawals is very low, and fish habitat could be damaged, or many fish killed, so long as the 'population' is not 'endangered.' This is the entire regional population, and it is unclear if it has to be listed endangered under the definition of the Endangered Species Act' Further, it is unclear what is meant by 'resident' fish species; does this include anadromous species that are not in the area all year. The Northwest DEIS has no voluntary guidelines seeking new, less damaging procedures. **(Comment No. 253-364)**

Response To: Comment 253-364

The stipulations for water withdrawals (Section II.C.5) have been revised in the Preferred Alternative to be in agreement with State DNR and Alaska Department of Fish and Game, as to the restrictions applied to water usage where overwintering fish are present. No pumpage from rivers would be permitted. In this document, the term "resident" fish refers to species that spend most or all of their life in freshwater

Comment From: The Wilderness Society, et al. (Comment Letter No. 253)

The NRC (2003) concluded that there was inadequate information on water withdrawals to accurately assess the impacts on fish and aquatic ecosystems and that 'because of a lack of information it is not possible to determine whether biota associated with North Slope lakes are protected by regulations that cap water withdrawal from lakes' (p. 210). Therefore, such studies are necessary prior to completion of this draft NW Plan. **(Comment No. 253-366)**

Response To: Comment 253-366

Preliminary monitoring studies done by both BP and ConocoPhillips Alaska, Inc. indicates that there are no measurable effects when less than 15% of the under-ice water volume is removed. There currently is no data available that would demonstrate that limited water withdrawals from deep-water lakes is harmful to overwintering fish

Comment From: City and Native Village of Nuiqsut (Comment Letter No. 80026)

Water withdrawal for Ice Roads: Stipulations for drawing water from lakes, streams and rivers for ice roads should be the same as the Northeast IAP/EIS, again for our subsistence resources and environmental protection. **(Comment No. 80026-1020)**

Response To: Comment 80026-1020

Please see responses to comments 261-126 (Water Withdrawals) and 80026-1017 (Stipulations, Required Operating Procedures, and Mitigations). See also the General Lease Stipulations and Required Operating Procedures for the Preferred Alternative, specifically Required Operating Procedure C-4 and Stipulations D-1 and K-2.

76. TOPIC : VISUAL RESOURCE MANAGEMENT

Comment From: WesternGeco (Comment Letter No. 215)

The classification system proposed for visual resource management (VRM) is subjective and poorly defined (Appendix 3). There are no clear examples listed for any of the 4 classes. For instance, a 4 wheeler driving across the tundra would leave some sort of visual mark. What class would this fall under' As defined, the VRM classification is subject to perceptive interpretation. **(Comment No. 215-776)**

Response To: Comment 215-776

The BLM's Visual Resource Management manual recognizes that the VRM classification process is subjective. The 8400 manual states: "Assigning values to visual resources is a subjective process. The phrase, "beauty is in the eye of the beholder," is often quoted to emphasize the subjectivity in determining scenic values. Yet, researchers have found consistent levels of agreement among individuals asked to evaluate visual quality. Designers have used the basic design elements of form, line, color, and texture to describe and evaluate landscapes for hundreds of years. Modifications in a landscape which repeat the landscape's basic elements are said to be in harmony with their surroundings. Modifications which do not harmonize often look out of place and are said to contrast or stand out in unpleasing ways. These basic design elements and concepts have been incorporated into the VRM system to lend objectivity, integrity, and consistency to the process. The VRM system

is designed to separate the existing landscape and the proposed project into their features and elements and to compare each part against the other in order to identify those parts which are not in harmony. Then ways are sought to bring them back into harmony." There are no clear-cut criteria for the classes assigned in the VRM process. The VRM process is a tool to classify different landscape values based on landform characteristics, sensitivity and distance zones, arriving at objectives. The process then identifies impacts to those values. The VRM process is used by the Field Manager as a basis for deciding the amount of visual change that is acceptable for a given area.

Comment From: WesternGeco (Comment Letter No. 215)

Under Alternative A, it states that OHV use is allowed throughout the planning area. Does this imply VRM classified areas do not restrict OHV use' **(Comment No. 215-778)**

Response To: Comment 215-778

Assigning VRM Classes to areas does not preclude any activities in and of itself, what VRM does is provide guidance of how activities are best designed to limit impacts to the visual qualities of each area. The Visual Resource Management (8400) manual states: "Public lands have a variety of visual values. These different values warrant different levels of management. . . .Visual values are identified. . . and are considered with other resource values in the. . . [planning] process. The VRM process establishes management objectives.

Comment From: WesternGeco (Comment Letter No. 215)

'Approximately two hundred miles of green trails from overland moves and seismic surveys also would be visible during summer months for 2 to 5 years. The number of miles of 'green trails' does not conform to the number of miles that are stated in Section IV.B.20.b.1, "Approximately 100 mi of intermittent green trails from seismic activities would be visible from the air during any summer season'. The concept of Visual Resource Management (VRM) may be applicable to National Parks but it makes little sense to apply these restrictions to the National Petroleum Reserve. This is especially true when considering the fact that green trails "are difficult to recognize from the ground' (Sec. IV.B.20.b.1). Under the Federal Land Policy and Management Act (FLPMA) the Secretary of the Interior has authority to regulate use, occupancy, and development of public lands and to take whatever action is required to prevent unnecessary or undue degradation of public lands (43 U.S.C.§ 1732). We feel that 'green trails' do not constitute undue degradation of public lands. VRM policy simply creates another level of unnecessary regulation that will substantially reduce seismic data quality if implemented. We further maintain that VRM directly conflicts with the President's energy policy to 'consider additional environmentally responsible oil and gas development, based on sound science and the best available technology, through further lease sales in the National Petroleum Reserve- Alaska' (Sec. I.A.1). The National Petroleum Reserves Production Act (NPRPA) stipulates that the Secretary 'shall assume all responsibilities'for any activities related to the protection of environmental, fish and wildlife, and historical or scenic values' (42 U.S.C. § 6503(b)). Since green trails are usually difficult to recognize from the ground (Sec. IV.B.20.b.1), we do not believe the intent of the 'historical or scenic va lues' phrase in (42 U.S.C. § 6503(b)) applies to views from airborne craft. **(Comment No. 215-807)**

Response To: Comment 215-807

Section IV.B.20.a in the IAP/EIS identifies 100 miles of green trails associated with overland moves related to non-oil and gas activities. Section IV.B.20.b identifies 100 miles of green trails associated with seismic operations for oil and gas activities. Section IV.B.20.d identifies the sum of green trails from both non-oil and gas activities and oil- and gas-associated activities, thus the total of 200 miles of green trails.

77. TOPIC : EDITORIAL

Comment From: State of Alaska (Comment Letter No. 251)

Section III, Page III-21, Oil and Gas Exploration Activities. Reference is made to table III-02 and the list of abandoned wells. It is important to note that a number of the wells listed in table III-02 are not plugged. **(Comment No. 251-435)**

Response To: Comment 251-435

As the title of the table indicates, these are wells that have been abandoned. This table does not differentiate whether or not the wells have been plugged. The downhole condition of the well and plugging status do not constitute factors in determination of a potential hazardous materials site as defined under the Comprehensive Environmental Compensation and Liability Act (CERCLA).

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III. B. 4. paragraph 3. The last sentence of the paragraph requires two citations: one after the description of trends in recent decades (Suydam et al. 2000) and one after the description of recent trends in Alaska (Larned et al. 2001). Please update reference of Larned et al. 2001 to Larned et al. 2003. **(Comment No. 260-720)**

Response To: Comment 260-720

References have been added or updated as appropriate.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 4. c. (1). (f). 4). Update citation of Dau and Anderson (2001) to Dau and Anderson (2002). **(Comment No. 260-730)**

Response To: Comment 260-730

The Dau and Anderson citation has been updated.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section III B. 5 b (5) paragraph 1. Please change 'Lentifer' to 'Lentfer' here and throughout the document. **(Comment No. 260-740)**

Response To: Comment 260-740

The text has been revised.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV. J. 5. g. The outline structure is scrambled. IV. J. 5. g. is used for vegetation and again for birds; IV. J. 5. g. is used for fish resources and again for mammals. **(Comment No. 260-759)**

Response To: Comment 260-759

The text headings have been corrected.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV. J. 5. g. (1) paragraph 1, sentence 2. 'Beaufort Sea terrestrial habitats' is a mistake in nomenclature. Change terrestrial habitats to 'coastal habitats.' **(Comment No. 260-762)**

Response To: Comment 260-762

The intent of the statement was to indicate terrestrial habitats; however, coastal habitats also are terrestrial; thus, coastal will be added to increase the inclusiveness of the statement.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV. J. 5. g. (1). Citation in the second sentence of the first paragraph is misspelled. Change 'Fisher' to 'Fischer.' **(Comment No. 260-764)**

Response To: Comment 260-764

The citation has been corrected.

Comment From: U.S. Fish and Wildlife Service (Comment Letter No. 260)

Section IV. J. 5. i. (2). (a). The authors incorrectly reference Fischer et al. (2002) and Fisher misspelled (2002). Both of these reports cite male spectacled eiders in offshore waters in late July. **(Comment No. 260-767)**

Response To: Comment 260-767

The statement has been amended to include offshore spectacled eider males in late July.

Comment From: WesternGeco (Comment Letter No. 215)

Under Alternative A, seismic activities probably would increase relative to that expected under the No Action Alternative (Sec.IV.A.1.c)' Several references are made to (Sec.IV.A.1.c). This section does not exist in the draft EIS. **(Comment No. 215-791)**

Response To: Comment 215-791

The text has been corrected.

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Pg I-4, subsection A-2, para 1. delete 'dash' between Conoco-Phillips Alaska, Inc. **(Comment No. 255-792)**

Response To: Comment 255-792

The text has been revised as requested.

Comment From: WesternGeco (Comment Letter No. 215)

Sec. IV.B.8.a.2.a is not listed in the index (Page 59 not included). **(Comment No. 215-802)**

Response To: Comment 215-802

The index for the draft IAP/EIS did not go down to this level of subheadings. The index for the final IAP/EIS will be expanded.

Comment From: WesternGeco (Comment Letter No. 215)

'In an effort to quantify pressure wave action, Nyland (unpublished data, 2002) conducted a field test on an unnamed fish bearing lake' The paper referred to was published in August 2002. The reference is: Nyland, D.L., 2002, Water column pressures induced by vibrators operating on floating ice. Journal: The Leading Edge, 21, 751-760 **(Comment No. 215-804)**

Response To: Comment 215-804

The suggested reference related to seismic operations (vibroseis) has been added.

Comment From: WesternGeco (Comment Letter No. 215)

'A longer lasting impact from overland moves would be from 'green trails' which are discussed under Visual Resources (Section IV.B.21). Reference is made to the Visual Resources Section (Section IV.B.21). However, the correct reference is Section IV.B.20. **(Comment No. 215-806)**

Response To: Comment 215-806

The text has been corrected.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

Appendix 7. Oil and Gas Resource Assessment; B. Geologic Assessment; 1. Summary of Plays; paragraph 7: "The Arctic platform and Barrow Arch play groups are further separated into those areas lying east or west of Meade Arch, which passes south from Point Barrow (Map 64)." Map 64 is the wrong map number. **(Comment No. 164-881)**

Response To: Comment 164-881

The text has been corrected to show Map 27 as the correct reference.

78. TOPIC : PALEONTOLOGICAL RESOURCES

Comment From: ConocoPhillips Alaska, Inc (Comment Letter No. 255)

Page IV-94, Paleontological Resources. CPAI expends significant resources before any exploration or development activity to assess the potential for paleontological resources to be present in an area of interest. The IHLC in Barrow and ADNR's SHPO office in Anchorage are advised of any proposed activity and the results of our field clearance work. Activities are rerouted to avoid disturbance to any resource. **(Comment No. 255-821)**

Response To: Comment 255-821

This is generally correct. As noted in the draft IAP/EIS, lessees are required by law (Sec. 106 NHPA and the Antiquities Act of 1906) to assess the potential for paleontological resources. There are other mitigation methods in addition to avoidance. During the exploration phase, avoidance is the easiest and simplest method. In the development and production phase, this is not always the case.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment; e. Paleontological Resources; paragraph 1: It is not clear from the discussion if the paleontologic resources discussed are limited to those occurring on the surface or both surface and subsurface resources. Presumably, microfossils are not included in this discussion, although in one of the lists of fossils, ostracodes, a type of microfossil, are included. Regarding the oldest fossils reported in the NPR-A, those would probably be the Early to Middle Devonian plant fossils from a core in the Topagoruk well. Even older microfossils (Ordovician and Silurian) are present in cores from some of the Barrow wells. **(Comment No. 164-877)**

Response To: Comment 164-877

All fossils reside in some type of a stratigraphic deposit. If a given deposit is exposed on surface, then the fossil material it contains is on surface; if the strata is buried, then the fossils contained therein are also buried. Depending on the context, fossils in the same deposit can be both on surface and buried. This situation is discussed quite clearly in the Draft IAP/EIS on Page IV – 400 in the third paragraph. The commenter is correct in identifying ostracodes as a microfossil. The list has been revised accordingly. Also, as requested, the text has been revised to be more specific.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment; e. Paleontological Resources; paragraph 2: The statement about terrestrial plant fossils originating in the middle Jurassic is incorrect: A Late Silurian age (about 415 Ma) for the first land plants in the geologic record would be correct. It is doubtful that there are any middle Jurassic plant fossils anywhere in northern Alaska. **(Comment No. 164-878)**

Response To: Comment 164-878

The text has been revised.

Comment From: U.S. Geological Survey (Comment Letter No. 164)

III: DESCRIPTION OF AFFECTED ENVIRONMENT; A. PHYSICAL CHARACTERISTICS; 1. Terrestrial Environment; e. Paleontological Resources; paragraph 4: The reference Gangloff et al., 2002, is not in the bibliography. **(Comment No. 164-879)**

Response To: Comment 164-879

The text has been corrected.

79. TOPIC : TRADITIONAL LAND USE SITES

Comment From: Public Meeting on DEIS - Atqasuk, Alaska (Comment Letter No. 80074)

Another thing that is really disturbing, too is traditional land use sites. (In Inupiaq) There's a lot of our sites, especially in Ikpikpuk area, Meade River area, (In Inupiaq) the people from the Barrow area goes up there now with our fast snowmachines to go hunt wolves, whatever, these traditional land use sites will be entered in. So I'd like for the people to listen to some of these things, these traditional land use sites. And I'm glad that we've got North Slope Borough Inupiat History Cultural Commission to recommend some of these, which I think we all would have to work together with the North Slope Borough and our village corporations. **(Comment No. 80074-884)**

Response To: Comment 80074-884

Please see response to comment 80065-586 (Subsistence).

80. TOPIC : POTENTIAL IMPACTS

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

We've done it how many seasons, after seasons, after seasons, we go without. We don't have the number of fish we used to get. We don't have the number of caribou, even though they're all out there, during our modes of transportation when we can get them, we can't get them because there's so many flight activities happening around us. So these kind of things need to be addressed with this activity. They're going to develop regardless of what we say at these meetings, but we need to align out what the answers are to try to address the problems before they get started out there. **(Comment No. 80077-927)**

Response To: Comment 80077-927

We have taken your comments into consideration in developing and analyzing the Preferred Alternative; please see Section H "Subsistence Consultation for Permitted Activities" of the General Lease Stipulations and Required Operating Procedures and Stipulations K-1, K-3, K-6, and K-8. Also, please see response to 254-612 (Subsistence) for mitigating measures and processes to prevent losses of subsistence resources.

81. TOPIC : STUDIES

Comment From: City and Native Village of Nuiqsut (Comment Letter No. 80026)

Studies: Wildlife, subsistence and socio-cultural studies are being conducted currently and not shared with our community. We recommend requiring presentation of such studies to communities affected by NPR-A development affected communities be a stipulation of the Northwest NPR-A IAP/EIS. **(Comment No. 80026-1024)**

Response To: Comment 80026-1024

We have taken your comments into consideration in developing the Preferred Alternative. Please see responses to comments 80077-930 (Studies) and 80077-946 (Government-to-Government). We recommend that the City of Nuiqsut and the Native Village of Nuiqsut contact BLM concerning their participation in BLM's developing North Slope Science Strategy and the North Slope Management Oversight Group. This body could appropriately address local concerns about the sharing of results of current scientific research with the community.

Comment From: Public Meeting on DEIS - Nuiqsut, Alaska (Comment Letter No. 80077)

I happen to hear one of these guys saying that he has been here a number of years but I don't think there is enough adequate studies, fish studies and stuff like that of knowing all the lands and impactments that they're going to do to the rivers and the lakes that are connected to the rivers. And then the high flood zones of the rivers and stuff like that, that they're going to be facing and stuff. So I'd like to see a lot more study being done to the environment before they end up getting permanently damaged or somewhat, some way like all our fish, because

we've already experienced that with our whitefish here in Nuiqsut. **(Comment No. 80077-930)**

Response To: Comment 80077-930

The BLM agrees that there is always more to be learned about the natural resources of the National Petroleum Reserve-Alaska and the North Slope. We also believe there is adequate data, collected over at least several decades, to make responsible management decisions. It is important to recognize that prior to the authorization of any potentially ground-disturbing activity, BLM reviews the proposal and conducts additional site-specific analysis. From this review and analysis, additional mitigation would be developed if needed.

82. TOPIC : TUNDRA TRAVEL

Comment From: The Kuukpik Corporation (Comment Letter No. 254)

Of course, winter exploration is not perfect and some traces are left behind. Some of these traces, such as greener tundra where ice roads were built or where seismic and rolligon trails once existed cannot be prevented. To ensure that these telltale traces do not become more evident, the same location should not be used for such acivities for more than one season. **(Comment No. 254-1010)**

Response To: Comment 254-1010

We have tried to address this concern through Required Operating Procedure C-2, however, no long-term documentation exists to help determine which action has the least overall impact: (a) offsetting routes to reduce the impact on each route but increase the total area affected over the years, vs. (b) using the same route year after year, perhaps increasing the effect on that route, but keeping at a minimum the total area affected.

83. TOPIC : PERMITTING

Comment From: State of Alaska (Comment Letter No. 251)

Section II, Page II-37, Future Interrelationships. Reference is made to Appendix 4 for a listing of the various other state and federal agencies with permitting authority in NPR-A. A bullet list of permits of ADEC is included on page II-38. The AOGCC is not mentioned in this section or Appendix 4. See general comments. Suggested additions for this section and Appendix 4 are: 'The Alaska Oil and Gas Conservation Commission (AOGCC) is responsible for issuing drilling permits, production, injection and disposal plan approvals during exploration and development on lands within the State of Alaska. Regulatory requirements are contained in 20 AAC 25 including but not limited to: 20 AAC 25.05 Permit to Drill 20 AAC 25.080 Annular Disposal of Drilling Waste 20 AAC 25.105 - .172 Plugging, Abandonment and Location Clearance 20 AAC 25.200 - .245 Production Practices 20 AAC 25.252 Class II Waste Disposal and Storage 20 AAC 25.280 Workover Operations 20 AAC 25.300 - .320 Reports 20 AAC 25.402 - .460 Enhanced Recovery' **(Comment No. 251-434)**

Response To: Comment 251-434

The information has been added to Appendix 4.

Comment From: State of Alaska (Comment Letter No. 251)

Section II.F.6, Future Interrelationships, Page II-37. This section discusses some permits that would be required by various agencies during exploration or development activities. Other required permits are listed in Appendix 4. For ease of reference, the state recommends that this section be expanded to include all permits and agencies currently listed in Appendix 4. AK-B **(Comment No. 251-997)**

Response To: Comment 251-997

The BLM believes this type of detailed support is more appropriately presented in an appendix. The list of specific permits in Section II.F.6 has been moved to Appendix 4.

Bibliography

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