OCS EIS/EA
BOEM 2014-1004

Proposed Rule for Oil and Gas Exploration Drilling Activities on the Arctic Outer Continental Shelf for 30 CFR Parts 250, 254, and 550

Draft Environmental Assessment

U.S. Department of the Interior
Bureau of Ocean Energy Management
Bureau of Safety and Environmental Enforcement
Herndon, VA

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Acronyms and Abbreviations

AAQS	Ambient Air Quality Standards
APD	Application for Permit to Drill
APM	Application for Permit to Modify
bbl	barrel(s)
BOEM	Bureau of Ocean Energy Management
BOP	Blowout Preventer
BSEE	Bureau of Safety and Environmental Enforcement
CFR	Code of Federal Regulations
EA	Environmental Assessment
EFH	Essential Fish Habitat
EP	Exploration Plan
ESA	Endangered Species Act of 1973
IOP	Integrated Operations Plan
km	kilometer(s)
mi	mile(s)
NAA	No Action Alternative
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NMFS	National Marine Fisheries Service
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
MODU	Mobile Offshore Drilling Unit
OCS	Outer Continental Shelf
PAA	Proposed Action Alternative
PEIS	Programmatic Environmental Impact Statement
SCCE	Source Control and Containment Equipment
Secretary	Secretary of the United States Department of the Interior
SEMS	Safety and Environmental Management System
USDOI	United States Department of the Interior
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

1.0 Introduction

Pursuant to the National Environmental Policy Act of 1969 (NEPA), this environmental assessment (EA) was prepared to determine if the proposed promulgation of a rule for oil and gas exploration drilling activities on the Arctic Outer Continental Shelf (OCS) would have a significant effect on the human environment.

1.1 Background and Overview

The Outer Continental Shelf Lands Act (OCSLA) directs the Secretary of the U.S. Department of the Interior (Secretary, USDOI) to manage the orderly leasing, exploration, development, and production of mineral resources on the OCS. The Secretary has delegated to the Bureau of Ocean Energy Management (BOEM) the responsibility for overseeing certain aspects of the OCS oil and gas program, including, among other things, management of the leasing program, administration of exploration and development plans, environmental studies and analyses under NEPA, resource evaluation, and economic analyses. The Secretary has delegated to the Bureau of Safety and Environmental Enforcement (BSEE) the responsibility for the development, oversight, and enforcement of safety and environmental standards for offshore energy and mineral operations. BSEE's activities include issuance and monitoring of permits related to drilling, well workover activities, production, development and measurement operations, pipelines, the inspection of offshore structures and facilities, monitoring of environmental hazards, and the mitigation of safety and environmental risks. BOEM and BSEE discharge their responsibilities within the context of several relevant statutory and regulatory regimes, as well as executive orders and other policy guidance. Of particular note here, BOEM and BSEE have promulgated extensive regulations governing oil and gas exploration activities on the OCS at Title 30 Code of Federal Regulations (CFR) Parts 250, 254, and 550.

The proposed rule is informed by the measures required by BOEM and BSEE of Royal Dutch Shell [Shell] during exploration drilling of the Burger and Sivulliq/Torpedo prospects in the Chukchi and Beaufort Seas in 2012, USDOI's subsequent review of Shell's 2012 operations (USDOI, BOEM, and BSEE, 2013), engagement with Arctic partners and stakeholders, and consideration of the development of potential domestic energy resources from the Arctic OCS.

The proposed rule is designed to enhance BSEE's and BOEM's abilities to fulfill their regulatory responsibility on the Arctic OCS, consistent with the added challenges associated with exploratory drilling activities in that environment. The proposed rule would amend and add new provisions for exploratory drilling on the Arctic OCS designed to: (a) prevent pollution; (b) reduce the chance of oil spills occurring; (c) reduce the size and duration of any spills that do occur; (d) enhance the effectiveness of spill response; (e) improve operational planning; and, (f) enhance overall operational safety. In addition, this proposed rule would also help protect the Arctic ecosystems as well as the subsistence needs, culture and traditions of Alaska Native communities, while achieving the National Arctic Strategy goal of reducing reliance on imported

oil and strengthening National energy security.

1.2 Purpose and Need

The purpose of this proposed action is to improve safety, operator performance, environmental safeguards, and protection of Alaska Native subsistence activities, cultural traditions, and the Arctic ecosystem during exploratory drilling operations on the Arctic OCS (e.g., the Beaufort Sea and Chukchi Sea Planning Areas).

The proposed action is needed to address the operational challenges, safety concerns, and environmental and sociocultural risks unique to Arctic OCS exploration drilling, ecosystem, and subsistence practices. The Arctic OCS is known for its challenging environmental conditions, geographic remoteness, and relative lack of existing infrastructure. BOEM and BSEE have undertaken an extensive environmental and safety review of potential oil and gas operations in the Arctic region (USDOI, BOEM, and BSEE, 2013). Arctic OCS operations can be complex, and there are substantial challenges and operational risks throughout every phase of an exploratory drilling program. Accordingly, BOEM and BSEE have concluded that new and enhanced regulations, providing greater clarity and specificity, are necessary and appropriate for Arctic OCS operators who propose to conduct exploratory drilling activities in this unique environment.

2.0 Proposed Action and Alternatives

This section presents and compares alternatives analyzed and also provides the rationale for why another alternative was considered, but not analyzed by BOEM and BSEE.

2.1 Alternative A – Proposed Action Alternative (PAA)

The Proposed Action Alternative (PAA) is to promulgate new regulations applicable to exploration drilling activities on the Arctic OCS. BOEM and BSEE are proposing a rule that revises and creates additional regulatory provisions, specifically tailored to exploratory drilling under Arctic OCS conditions. These new regulations are intended to enhance safety and to reduce the environmental and sociocultural impacts of these activities. Under this alternative, the provisions outlined in the proposed rule (Appendix A) would be promulgated in a final rule. The proposed rule would modify the regulations under 30 CFR Parts 250, 254, and 550, to include new and revised sections that clarify existing requirements and incorporate new and improved planning, drilling, and safety requirements. Section 5.1 and Appendix A provide more detailed descriptions of the proposed rule. The proposed rule would apply only to exploratory drilling activities on the Arctic OCS.

2.2 Alternative B – Proposed Rulemaking Excluding the Requirement for More Frequent Blowout Preventer Testing

Alternative B is the same as the PAA, except that it would only require a Blowout Preventer (BOP) pressure test for exploratory drilling operations every 14 days, as currently required by the existing regulations (30 CFR 250.447), rather than every 7 days as proposed under the PAA. All other provisions of the PAA would be proposed under Alternative B.

2.3 Alternative C – No Action Alternative (NAA)

Under the No Action Alternative (NAA), the proposed rule would not be implemented. The existing rules at 30 CFR Parts 250, 254, and 550 would remain in place, unaltered.

2.4 Alternative Considered But Not Analyzed

BOEM and BSEE also considered another alternative that would eliminate the following provisions of the proposed rulemaking.

§ 250.300 Pollution prevention.
§ 250.471 What are the requirements for Arctic OCS source control and containment?
§ 250.472 What are the relief rig requirements for the Arctic OCS?

Exclusion of those provisions would avoid the possible modest environmental impacts from the additional vessels and equipment that would be required for compliance with the proposed provisions. Exclusion of those provisions also would result in potential cost savings for OCS operators compared to the cost of compliance with the same provisions. However, such an alternative would fall far short of meeting the purpose and need of the proposed rule. Absent the precautionary provisions to reduce pollution potential, reacquire control of and contain a loss of well control, and reduce the time necessary to mobilize and drill a relief well, the proposed rule would not yield the targeted degree of enhancements compared to the NAA. Therefore, BOEM and BSEE did not undertake a more detailed analysis of this alternative.

3.0 Geographic Areas

The proposed rule applies to exploration drilling activities in the Chukchi Sea and Beaufort Sea Planning Areas of the Arctic OCS (see Figure 1). Before an OCS operator may propose exploratory drilling, an operator first needs a valid lease or leases. Thereafter, exploration drilling may occur only under an approved exploration plan (EP) and application for permit to drill (APD). As of December 2014, there were 607 active leases in the Chukchi Sea and Beaufort Sea Planning Areas.

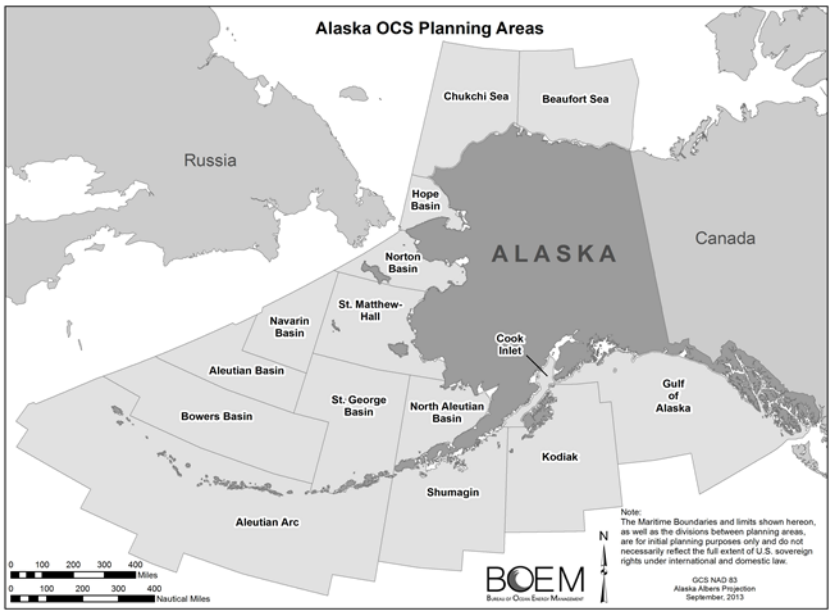

Figure 1. Alaska OCS Planning Areas

Every five years, BOEM releases a schedule of oil and gas lease sales indicating the size, timing, and location of proposed leasing activity that the Secretary determines will best meet national energy needs for the five-year period following its approval. Only the Chukchi Sea, Beaufort Sea, and Cook Inlet Planning Areas are included in the 2012-2017 Outer Continental Shelf Oil & Gas Leasing Program (Five Year Program). Currently, there are no active Alaska OCS leases outside of the Beaufort Sea and Chukchi Sea Planning Areas.

The current Five Year Program does have a lease sale scheduled for the Cook Inlet Planning Area. The proposed rule, however, does not apply to activities in the Cook Inlet Planning Area, because the Cook Inlet OCS typically does not have the same degree of harsh, cold, frozen, and ice conditions as the Arctic OCS. These conditions in the Arctic make exploration operations more difficult and prone to certain types of accidents, which the proposed rule is specifically designed to prevent or minimize. Furthermore, the Arctic OCS is more remote from infrastructure, ports, and facilities needed in case of emergencies, and these factors necessitate the stringent requirements in the proposed rule.

4.0 Affected Environment

The environmental and sociocultural resources present in the Beaufort Sea and Chukchi Sea Planning Areas are briefly described below. This EA incorporates by reference and summarizes relevant information from the *Outer Continental Shelf Oil & Gas Leasing Program: 2012-2017, Final Programmatic Environmental Impact Statement [Five Year PEIS]* (USDOI, BOEM, 2012). Page numbers from this principal reference are provided in parentheses.

4.1 Air Quality

There are few industrial emission sources in Alaska, and (outside of Anchorage and Fairbanks) no sizable population centers. Barrow – with a year 2010 population of about 4,200 – is the largest community in North Slope Borough, which borders the Beaufort Sea and Chukchi Sea Planning Areas. The existing air quality in Alaska is considered to be relatively pristine, with pollutant concentrations in most areas well within the National Ambient Air Quality Standards (NAAQS). The primary industrial emissions in Alaska are associated with oil and gas production, power generation, small refineries, paper mills, and mining.

The Arctic region experiences air pollution problems due to long-range transport of air pollutants from industrial northern Eurasia and North America, including Arctic haze followed by acidic depositions, tropospheric ozone, and buildup of toxic substances such as mercury or persistent organic compounds. Local shipping emissions and summertime boreal forest fires also may be important pollution sources in the Arctic. In addition, large haze events in the Arctic can be caused by Asian dust originating from the Gobi and Taklamakan Deserts in Mongolia and northern China in springtime (pp. 3-66, 3-67, and 3-388).

Over most of the onshore areas bordering the Chukchi Sea and Beaufort Sea Planning Areas, there are only a few small, widely scattered emission sources. The only major local sources of industrial emissions are in the Prudhoe Bay-Kuparuk-Endicott-Alpine oil production complex. With few industrial emission sources, the region is well within the NAAQS and State of Alaska Ambient Air Quality Standards (AAQS). This demonstrates ambient pollution concentrations are within both national and State standards, including areas subject to relatively higher emissions.

4.2 Water Quality

In Alaska there are several seasonal or occasional natural events that contribute to water quality and to which natural systems are adapted. Examples of these events include hydrocarbons from natural oil seeps, sediment from natural coastal erosion, sediment derived from glacial-fed rivers, natural levels of nutrients from river flooding, metals from river sediments, volcanic eruptions, and rock erosion (p. 3-42).

Water quality on the Alaska OCS has received relatively little contribution from the more common land-based and marine anthropogenic pollution found in the lower 48 States. The rivers that originate in Alaska and flow into coastal marine waters remain fairly unpolluted by human activities. Industrial and shipping impacts on water quality have been and are relatively low at this time, with some notable exceptions such as the *Exxon Valdez* oil spill in 1989. There are, however, several sources of anthropogenic contaminants in the Alaska marine environment. They enter the Arctic marine ecosystem through atmospheric deposition, discharges to the sea, drifting sea ice, or directly from accidental or intentional dumping of pollutants (p. 3-42).

In both the Chukchi and Beaufort Seas, water quality is relatively pristine. One of the contributing factors is the limited municipal and industrial activity proximate to these seas.

Degradation of water quality, where it occurs in the Arctic, is related largely to aerosol deposition and localized anthropogenic pollution from, for example, mining facilities and former military facilities (p. 3-45).

Background hydrocarbon concentrations in Beaufort Sea waters appear to be biogenic and on the order of less than 1 part per billion. No seafloor oil seeps have been identified in the Beaufort Sea; however, naturally occurring oil seeps have been identified onshore above the low-tide line along the coast of the Beaufort Sea. Recent studies of sediments in Beaufort Lagoon, located in the eastern portion of the Arctic coast, have indicated that no anthropogenic hydrocarbon or metals contamination exists. These sediment data will serve as a baseline against which to evaluate impacts to nearshore sediments from anthropogenic activities. Hydrocarbon concentrations in sediments of the Beaufort Sea are relatively high compared with other nonpolluted marine areas; however, examination of sediment cores gives little indication that oil and gas activities in the area have measurably contaminated the sediments (pp. 3-47 and 3-48).

Considering the limited sources of anthropogenic input to the area, concentrations of hydrocarbons in the Chukchi Sea are expected to be at background levels. As with the Beaufort Sea, no seafloor oil seeps have been identified in the Chukchi Sea (pp. 3-47 and 3-48).

4.3 Marine Benthic and Pelagic Habitats

Most of the seafloor of the Beaufort Sea and the Chukchi Sea shelves consists of a soft-bottom plain composed of silt, clay, and sand. Deposits of flocculated particles from plankton blooms, epontic organisms, and ice algae from ice retreat all contribute to the bottom sediments in these regions. Disturbance from sea-ice scour is a dominant process affecting the seafloor of the Beaufort Sea and the Chukchi Sea shelves. Deep keels of icebergs moving across the shelf scour sediments, causing chronic disturbance to benthic communities. Strudel (drainage of large volumes of freshwater through the ice at holes and cracks) scours the seafloor and occurs near the mouths of rivers during spring flood periods. Few species inhabit the seafloor in waters shallower than 2 meters (6.6 feet) deep because of the bottom-fast ice, which prohibits overwintering of most organisms.

This nearshore benthic area is recolonized each summer, mainly by mobile, opportunistic, epifaunal crustaceans (e.g., amphipods, mysids, cumaceans, and isopods), which are fed on primarily by waterfowl and fishes. In slightly deeper water, the gouging of the seafloor by ice keels creates a habitat for opportunistic infauna (e.g., small clams and other invertebrates), which are fed on by seabirds, fishes, and walrus. Surveys on the Chukchi Shelf revealed that tunicates, echinoderms, jellies, crabs, polychaetes, and sponges make up most of the benthic biomass. Common fish on soft sediments included Arctic cod (*Boreogadus saida*), Pacific herring (*Clupea pallasii*), sculpins, and pollock (*Theragra chalcogramma*). Sections 3.8.4.3 and 3.8.5.3 of the Five Year PEIS provide further descriptions of fish and invertebrate communities (p. 3-134).

Pelagic habitat in the Beaufort/Chukchi Shelf Marine Ecoregion consists of ice-free open water and high-productivity areas of open water surrounded by sea ice (i.e., polynyas). Productivity in the water column is primarily controlled by temperature, nutrients, light, and the amount of sea

ice in a given year. Phytoplankton productivity is highest in the summer when temperatures are highest and when nutrient and solar irradiance are most conducive to productivity. Phytoplankton productivity gradually decreases from the southwestern Chukchi Sea to the east to the Beaufort Sea (especially east of Point Barrow) and from inshore to offshore areas, although there are isolated mid-shelf upwelling regions where productivity is higher than it is in the surrounding water (p. 3-144).

4.4 Invertebrates and Lower Trophic Levels

At the lowest invertebrate trophic levels, microbes such as bacteria and protists are known to be important in Arctic waters for breaking down and recycling nutrients and organic matter. Cilliates and dinoflagellates dominate the microzooplankton biomass in the Chukchi Sea, but their role in the Beaufort and Chukchi Seas is not well studied. The most common water column macroinvertebrates in the Arctic are the copepods (typically *Pseudocalanus*). In the Chukchi Sea, much of the copepod biomass originates in the Bering Sea, while true Arctic species are most common in the Beaufort Sea. Riverine inputs also create an estuarine zone with a distinct zooplankton assemblage. Other common zooplankton include larvaceans, jellies, euphausiid shrimp, amphipods, pteropod mollusks, and arrow worms. In the Beaufort and Chukchi Seas, invertebrate zooplankton productivity is highly seasonal as a result of the extremely cold winter temperatures. Many invertebrates (e.g., copepods) have adapted by storing lipids for the winter and undergoing a winter dormant period during which they rest in the sediment or lower water column (p. 3-291).

4.5 Essential Fish Habitat (EFH) and Fish

The Arctic Fisheries Management Plan has designated essential fish habitat (EFH) for three species:

- Arctic cod *(Boreogadus saida)*: Insufficient information is available to determine EFH for eggs, larvae, and early juveniles. However, this species has been reported to spawn under ice during winter.
- Saffron cod *(Eleginus gracilis)*: Insufficient information is available to determine EFH for eggs, larvae, and early juveniles. For late juveniles and adults, EFH includes coastal pelagic and epipelagic Arctic waters and wherever there are sand and gravel substrates.
- Snow crab *(Chionoecetes opilio)*: Insufficient information is available to determine EFH for larvae and early juvenile life stages. EFH for eggs, late juveniles, and adult snow crabs consists of bottom habitats along the inner and middle shelves in Arctic waters south of Cape Lisburne, wherever there are substrates consisting mainly of mud.

Arctic aquatic systems undergo extended seasonal periods of frigid and harsh environmental conditions. Important environmental factors that Arctic fishes must contend with include reduced light, seasonal darkness, prolonged low temperatures and ice cover, and low seasonal productivity. The lack of sunlight and the extensive ice cover in Arctic latitudes during winter

months affect primary and secondary productivity, making food resources very scarce during this time, so most of a fish's yearly food supply must be acquired during the brief Arctic summer. In addition, most fish species inhabiting the frigid polar waters are thought to grow slowly relative to individuals or species inhabiting boreal, temperate, or tropical systems. Because of the harsh conditions, many species found in the Beaufort and Chukchi Seas are at the northern limits of their range. Arctic fishes may use one or more aquatic habitats to carry out their respective life cycles. Such habitats may include bays, ice, reefs, and nearshore, coastal, continental shelf, oceanic, and bathypelagic waters and/or substrates (p. 3-279). The Beaufort and Chukchi Seas support at least 98 fish species from 23 families. The greatest number of species is found in the Chukchi Sea (p. 3-279).

Common diadromous fishes found in the Beaufort and Chukchi Seas are salmonids and include Arctic cisco (*Coregonus autumnalis*), least cisco (*Coregonus sardinella*), humpback whitefish (*Coregonus pidschian*), broad whitefish (*Coregonus nasus*), and Dolly Varden (*Salvelinus malma*). Although present in Arctic waters, all five Pacific salmon species significantly decrease in abundance north of the Bering Strait and from west to east along the Beaufort and Chukchi Seas. Pink salmon and chum salmon are the most common Pacific salmon in Arctic waters. Warming of waters in the Beaufort, Chukchi, and Bering Seas has resulted in species of salmon migrating further northward; this trend is expected to continue as the water temperature continues to increase. The amount of change is not well documented at this time. The National Marine Fisheries Service (NMFS) does not allow commercial fishing for salmon in the Chukchi and Beaufort Seas in the U.S. Exclusive Economic Zone (pp. 3-154 and 3-155).

Common pelagic fish in the Beaufort Sea and Chukchi Sea include Pacific sand lance (*Ammodytes hexapterus*), Pacific herring (*Clupea pallasii*), Arctic cod (*Boreogadus saida*), capelin (*Mallotus villosus*), snailfish (*Liparidae*), and lanternfish (*Benthosema glaciale*) (p. 3-280). Most fish in the Beaufort and Chukchi Seas are demersal species, often migratory, living on or near the bottom. Species occurring in the Chukchi Sea include Arctic staghorn sculpin (*Gymnocanthus tricuspis*), shorthorn sculpin (*Myoxocephalus scorpius*), Bering flounder, and Arctic cod. The most abundant demersal fish occurring in the Chukchi Sea are cod (family Gadidae), poachers (family Agonidae), Bering flounder (*Hippoglossoides robustus*), and sculpins (family Cottidae). Greenlings (family Hexagrammidae), eelpouts (family Zoarcidae), smelts (family Osmeridae), wolfish (family Anarhichadidae), and snailfish (*Lycodes* spp.) are also present in Arctic waters. In the Beaufort Sea, Arctic cod, eelpouts, and walleye pollock (*Theragra chalcogramma*) comprised the majority of the catch in recent benthic trawl surveys (pp. 3-280 and 3-281).

4.6 Marine and Coastal Birds

Because of the limited seasonal nature of open water and snow-free conditions, the Beaufort and Chukchi Seas support a smaller number of avian species than onshore. About 180 species have been reported from the Arctic National Wildlife Refuge, whereas a 1999-2001 summer survey of birds in the western Beaufort Sea detected 30 species (primarily waterfowl). Most birds occurring in the Beaufort and Chukchi Seas and their adjacent coastal habitats are migratory, being present for all or part of the period between May and early November (p. 3-248).

Two species that are listed as threatened under the Endangered Species Act (ESA) occur in the Beaufort and Chukchi Sea Planning Areas. These species are the spectacled eider (*Somatria fischeri*) and the Alaska breeding population of the Steller's eider. Spectacled eiders use important molting and staging areas including the Ledyard Bay Critical Habitat Unit located in the Chukchi Sea. On the Arctic North Slope or Arctic Coastal Plain, an average of 6,841 spectacled eiders, representing about 2 percent of the world's population, are present each summer. In addition, Kittlitz's murrelet and the yellow-billed loon, both Federal candidate species, occur in the coastal and inland waters adjacent to the Chukchi Sea Planning Area (pp. 3-251 through 3-253).

4.7 Marine Mammals

Fifteen species of marine mammals have been identified in the Beaufort and Chukchi Sea Planning Areas (Table 1). Four of these species are listed as threatened or endangered under the ESA, one is a candidate species, and two are proposed for listing as threatened species. See pp. 3-194 to 3-217 of the Five Year PEIS for a complete description of life history and attributes. One species is under review for delisting, and one is delisted under the ESA.

Table 1. Arctic Marine Mammals

Species	Status
ORDER CETACEA	
Suborder Mysticeti (baleen whales)	
Balaenoptera acutorostrata (minke whale)	–
Balaenoptera mysticetus (bowhead whale)	E/D
Balaenoptera physalus (fin whale)	E/D
Eschrichtius robustus (gray whale)	DL/D
Megaptera novaeangliae (humpback whale)	URD(a)
Suborder Odontoceti (toothed whales and dolphins)	
Delphinapterus leucas (beluga whale)	–
Monodon monoceros (narwhal)	–
Orcinus orca (killer whale)	D
Phocoena phocoena (harbor porpoise)	–
ORDER CARNIVORA	
Suborder Pinnipedia (seals, sea lions, and walrus)	
Erignathus barbatus (bearded seal)	PT
Odobenus rosmarus divergens (Pacific walrus)	C
Phoca fasciata (ribbon seal)	–
Phoca hispida (ringed seal)	PT
Phoca largha (spotted seal)	DL(b)
Suborder Fissipedia (polar bears)	
Ursus maritimus (polar bear)	T/D
Status: E = endangered under the ESA; T = threatened under the ESA; C = candidate for listing under the ESA; DL = delisted under the ESA; D = depleted under the Marine	

Mammal Protection Act (for the killer whale, it only applies to the AT1 group of eastern North Pacific transient killer whales); PT = proposed for listing as threatened under the ESA; – = not listed (pp. 3-194 to 3-195).
(a) Status: URD = under review for delisting, 2013
http://www.nmfs.noaa.gov/pr/species/esa/delisted.htm
(b) Status: DL = delisted, 2013
http://alaskafisheries.noaa.gov/protectedresources/seals/ice.htm

This EA focuses on species of critical importance to either subsistence practices or trophic function of the Arctic food web. For descriptions of fin whales, humpback whales, gray whales, minke whales, narwhals, and harbor porpoises, the reader is referred to pp. 3-199, 3-205, 3-206, and 3-207 of the Five Year PEIS, respectively.

Bowhead Whale

The endangered bowhead whale occurs in seasonally ice-covered waters of the Arctic and near-Arctic, in the Western Arctic Basin. Bowhead whales generally migrate from winter breeding areas (November to March) in the northern Bering Sea, through the Chukchi Sea in the spring (March through June) where most calving occurs, and into the Canadian Beaufort Sea where they spend much of the summer (mid-May through September).

In the fall (September through November), bowheads were historically presumed to return along this general route, closer to shore across the Beaufort Sea and through the middle of the Chukchi Sea and closer to shore, to the Bering Sea to overwinter in polynyas and along edges of the pack ice.

The main fall migration begins in late August. The first whales are typically the larger ones, which establish the migration route in the Beaufort Sea. Migration through the eastern Alaskan portion of the Beaufort Sea continues through September and into October. In contrast to the presumed route that the paragraph above describes, a recent study shows the fall migration from Amundsen Gulf to Barrow, including some whales that traveled inshore and others that traveled offshore (p. 3-196). From Barrow to the Bering Sea, bowheads occurred throughout much of the Chukchi Sea. All of the tagged whales traveled through the Chukchi Sea Planning Area during the fall migration, but only one whale did so during the spring migration. Most whales traversed the planning area in less than one week; however, one whale remained in the area for 30 days. In addition, during the fall migration, several whales passed Barrow, and then returned to Barrow for a period of time before completing their migration to the Bering Sea.

Another study notes that, during fall, many bowheads use the area near Barrow and the northern half of the Chukchi Sea Planning Area (p. 3-196). The study also indicates that bowheads use the eastern Chukchi Sea, especially nearshore from Wainwright to the Bering Sea, less often than previously presumed. Further, the study shows that bowheads use the western Chukchi Sea, including nearshore areas along the Russian Chukchi Peninsula north of the Bering Strait, extensively during the fall. The best estimate of the abundance of the Western Arctic bowhead whale stock is 10,545 with a minimum population estimate of 9,472 (pp. 3-194 through 3-198).

Bearded Seal

Most of the bearded seals offshore Alaska occur over the continental shelf of the Bering, Chukchi, and Beaufort Seas. Their densities are greatest during the summer and lowest during the winter. They migrate north through the Bering Strait in April and May to summer ice on the edge of the Chukchi Sea. Others remain in the open waters of the Chukchi Sea. During spring, they prefer areas that contain 70 to 90 percent sea-ice cover and are most abundant 32 to 161 kilometers (km) (20 to 100 miles [mi]) from shore. NMFS estimates that 3,150 bearded seals occur in the Beaufort Sea in the June timeframe, and 27,000 bearded seals in the Chukchi Sea in the May to June timeframe (p. 3-200).

Ringed Seal

The ringed seal, the most abundant seal in the Arctic, occurs throughout the Beaufort and Chukchi Seas. They live on and under extensive, largely unbroken, shorefast ice. Ice cover strongly influences ringed seal movements. They continue to use sea ice as resting platforms during the summer and fall, and some occur during ice-free periods in the Chukchi Sea. A reliable population estimate for the Alaska stock is not available, but it is assumed to be over 249,000 and possibly as high as 1 million individuals (p. 3-201). In December 2014, NMFS proposed critical habitat for the Arctic ringed seal in the northern Bering, Chukchi, and Beaufort Seas.

Pacific Walrus

The Pacific walrus ranges through the shallow continental shelf waters of the Chukchi Sea where its distribution is closely linked with the seasonal distribution of the pack ice. While they occasionally move into the western Beaufort Sea during summer, most of the population is found in the Chukchi Sea during the summer months. Pacific walrus occupy two large Arctic areas during summer: (1) from the Bering Strait west to Wrangell Island, and (2) along the northwest coast of Alaska from about Point Hope to north of Point Barrow. Within this area, summer and fall haul-outs include Cape Lisburne, Corwin Bluff, Point Lay Barrier Islands, Icy Cape, Wainwright, Naokok, Asiniak Point, and Peard Bay. The majority of the population occurs north and west of Barrow, with the highest seasonal abundance along the pack-ice front. Walrus forage in most areas they occupy, and areas of concentrated foraging generally correspond to regions of high benthic biomass, such as in the northeastern (Hanna Shoal) and southwestern Chukchi Sea (Jay et al., 2012, pp. 1-13). With the southern advance of the pack ice in the Chukchi Sea during the fall (October to December), most of the Pacific walrus population migrates south of the Bering Strait. The population of the Pacific walrus has been declining, mainly due to major stressors such as subsistence harvest and loss of sea ice. Between 1975 and 1990, there were approximately 201,039 to 234,020 individuals; this number declined to approximately 129,000 in 2006 (pp. 3-201 and 3-202).

Polar Bear

Polar bears occur in the Chukchi and Beaufort Seas, from the Bering Strait to the Canadian border. In 2010, the U.S. Fish and Wildlife Service designated the following critical habitat for

the polar bear: barrier islands, sea ice in both the U.S. Chukchi and Beaufort Seas, and terrestrial denning habitat. Seasonal movements of polar bears reflect changing ice conditions and breeding behavior. In spring, polar bears in the Beaufort Sea overwhelmingly prefer regions with ice concentrations greater than 90 percent and composed of ice floes 2 to 10 km (1.2 to 6.2 mi) in diameter. Mature males range offshore in early spring, but move closer to shore during the spring breeding season. With the breakup of the ice during spring and early summer, polar bears move northward, where they select habitats with a high proportion of old ice. To reach this ice, polar bears may migrate as much as 1,000 km (620 mi). As ice re-forms in the fall, the bears move southward, and by late fall are distributed seaward of the Chukchi and Beaufort Sea coasts. During winter, polar bears prefer the lead ice system at the shear zone between the shorefast ice and the active offshore ice.

In the fall, polar bears aggregate along the Beaufort Sea coastline in areas where Alaska Natives harvest and butcher marine mammals, primarily bowhead whales. Polar bears are attracted to these areas because they feed off the carcasses. Specific aggregation areas include Point Barrow, Cross Island, and Kaktovik. Polar bear concentrations also occur during the winter in areas of open water, such as leads and polynyas, and areas where beach-cast marine mammal carcasses occur.

A reliable estimate for the Chukchi and Bering Seas polar bear stock does not exist, but the best information available provides a minimum population estimate of 2,000 individuals. The best population estimate for the southern Beaufort Sea stock is between 1,397 and 1,526 individuals. This stock is experiencing a population decline due to loss of sea ice (partly due to climate change), potential overharvest, and human activities (including industrial activities) in nearshore and offshore environments (pp. 3-202 through 3-204).

Beluga Whale

Beluga whales occur in coastal waters of the Chukchi and Beaufort Seas in summer and fall. Ice cover, tidal conditions, access to prey, temperature, and human interactions affect the seasonal distribution of beluga whales. Some beluga whales migrate more than 2,700 km (1,500 mi) between the Bering Sea and the Mackenzie River estuary in Canada, sometimes moving more than 180 km (100 mi) per day. They will ascend large rivers and are apparently unaffected by salinity changes. The best population estimate for the Beaufort Sea stock is 39,258, with a minimum estimate of 32,453 individuals, while the best population estimate for the Chukchi Sea stock is 3,710 individuals (pp. 3-205 and 3-206).

Killer Whale

The killer whale occurs along the entire Arctic coast within the Chukchi Sea and other waters to the south (p. 3-207).

Ribbon and Spotted Seals

The ribbon seal inhabits the Chukchi and western Beaufort Seas. They occur in the open sea, generally in the summer; on the pack ice, generally in winter; and only rarely on shorefast ice.

The ribbon seal rarely occurs on land. Many ribbon seals migrate from the Bering Sea into the Chukchi Sea for the summer. Reliable population estimates and trends for the Alaska stock of the ribbon seal are not available, although there is a provisional estimate of 49,000 ribbon seals in the eastern and central Bering Sea based on aerial surveys done in 2003, 2007, and 2008 (p. 3-207).

A distinct population segment of the spotted seal occurs in the Beaufort and Chukchi Seas in the summer. Terrestrial haul-out sites are generally located on isolated mud, sand, or gravel beaches or on rocks close to shore. Spotted seals frequently enter estuaries and sometimes ascend rivers, presumably to feed on anadromous fishes. Spotted seals migrate out of the Arctic region in the fall (September to mid-October) as the shorefast ice re-forms and the pack ice advances southward. A reliable population estimate for the Alaska stock is not available, but preliminary results provide a population estimate of over 59,000 individuals (pp. 3-207 and 3-208).

4.8 Subsistence

Traditionally, Alaska Natives hunted, fished, and lived off the land out of necessity. Alaska Natives view subsistence hunting and gathering as a core value of their traditional cultures. Since contact with Western ways of life, they have gradually made the transition to a mixture of subsistence and cash-based economies, varying in degrees from community to community. The first major contact with those from Western civilization was with commercial whalers starting in the 1850's. Alaska Natives would sell goods to the whalers, including carved walrus tusks with scrimshaw, often in the form of cribbage boards that the whalers liked and bought or bartered. Most subsistence activities are group activities that further core values of community, kinship, cooperation, and reciprocity (pp. 3-376 and 3-378). Current Federal regulations define subsistence use as "the customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter or sharing for personal or family consumption; and for customary trade" (16 U.S.C. § 3113). *See also* 36 CFR 13.420, 36 CFR 242.4, 50 CFR 36.2, and 50 CFR 100.4.

The subsistence harvest plays an important role in the predominantly Alaska Native communities adjacent to the Chukchi and Beaufort Sea Planning Areas. The communities bordering the Chukchi and Beaufort Seas are Point Lay, Point Hope, Wainwright, Barrow, and Kaktovik. They are part of the Arctic's North Slope Borough, which has been described as "the most organized, strongest, and best-funded subsistence economy in Alaska." The Alaska Natives living in these communities are primarily Iñupiat Eskimo, whose traditional culture is based on cooperation, kinship ties, and subsistence hunting and gathering. Whaling, particularly for the bowhead and the beluga whales, is at the core of their traditional culture. Hunters in the communities along the Beaufort Sea also hunt for bearded and ringed seals and walrus. This includes the inland community of Nuiqsut on the Colville River delta. An example of trade, bartering, and kinship sharing of marine mammal subsistence foods between coastal communities and inland communities is Anaktuvuk Pass, an inland community in the North Slope Borough about 250 miles southeast of Barrow (pp. 3-386 and 3-389).

While many of the most important subsistence resources are found in or near the sea, Alaska Natives also rely on freshwater and terrestrial subsistence resources. However, even in communities where terrestrial resources such as caribou or freshwater and saltwater fish supply more meat, marine mammals still are culturally most important (p. 3-396). Various types of subsistence resources utilized by the communities adjacent to the Chukchi and Beaufort Sea Planning Areas are:

- 8 marine mammal species,
- 13 terrestrial mammal species,
- 17 fish species,
- 19 bird species, and
- 12 other resources (including berries, bird eggs, clams, etc.) (pp. 3-398, 3-399, and 3-400).

4.9 Sociocultural Resources

The Chukchi and Beaufort Sea Planning Areas lie off the northern coast of the North Slope Borough, which is located largely in the North Slope region of Alaska. The population of the North Slope Borough in 2010 was 9,430, almost 54 percent of which were Alaska Natives (p. 3-386).

Chukchi Sea communities include Barrow, Wainwright, Point Hope, and Point Lay along the coast, while Atqasuk lies somewhat inland. Barrow is the largest permanent community on the North Slope and serves as the region's administrative and commercial hub. It is a traditional Iñupiat settlement with 61 percent Alaska Natives. Subsistence whaling, hunting, and fishing are important to the economy, and many residents with full- or part-time employment continue to hunt and fish for food. The other, smaller communities are comprised of over 86 percent Alaska Natives that also rely heavily on subsistence harvesting. As of 2010, the population of Barrow was approximately 4,200; Point Hope, 670; Point Lay, 290; and Wainwright, 560 (pp. 3-386 and 3-388).

Beaufort Sea communities are Nuiqsut and Kaktovik. Deadhorse is a workers' enclave that houses as many as 5,000 transient workers from the nearby Prudhoe Bay oil fields. Workers at Deadhorse live and work separately from the nearest communities of Nuiqsut and Kaktovik. Alaska Natives account for 87 percent and 89 percent of the population in Nuiqsut and Kaktovik, respectively. As of 2010, the population of Nuiqsut was 402 and of Kaktovik, 239. Both communities are subsistence based (pp. 3-386, 3-388, and 3-389).

Western influence in the region has increased over the years due to strengthened military presence and industrialization. Alaska Natives successfully have incorporated modern technology into their subsistence way of life. Rifles and whale bombs have replaced spears and harpoons; aluminum skiffs are employed along with seal-skin boats (umiak); whaling crews use electronic global positioning and communication devices; and snow machines and all-terrain vehicles have replaced dog teams and sleds (p. 3-390). Adoption of modern technology further

reflects shifting from a purely hunting and gathering subsistence economy to a mixture of subsistence and cash-based economies.

4.10 Health Status of Alaska Natives in the North Slope Borough

Alaska Native health has undergone profound changes since 1950, and the changes in health status among the Iñupiat residents of the North Slope mirrors State-wide trends in Alaska Native health status in many respects. Since 1950, infant mortality, overall mortality, and life expectancy have improved significantly. However, over the same time period, cancer, chronic diseases (such as diabetes, cardiovascular disease, cardiopulmonary disease, hypertension, and asthma), and social pathology have increased. Alcohol and drug problems, associated accidental and intentional injury, depression, anxiety, assault, and domestic violence are now highly prevalent and cause disproportionate health impacts and mortality for these communities. Suicide, especially among youth, exceeds the U.S. rate by numerous orders of magnitude (pp. 3-415, 3-416, and 3-417).

4.11 Environmental Justice

A large number of minority and low-income individuals are located in the Arctic region. The number of minority individuals in the region exceeds 50 percent of the regional population. The number of minority individuals exceeds the State average by 20 percentage points (p. 3-413).

5.0 Environmental Consequences

5.1 Alternative A – Proposed Action Alternative (PAA)

Under the Proposed Action Alternative (PAA), BOEM and BSEE would promulgate the proposed rule, and any future oil and gas exploration drilling on the Arctic OCS would be governed by the new and revised requirements. In order to assess the potential environmental impacts associated with the PAA (Appendix B), it is first necessary to understand the *type* of activities that first would be affected by the rules.

The effects of the proposed rule must be considered in the context of Arctic EPs and the exploration activities typical of the Chukchi and Beaufort Sea Planning Areas. Recent EPs and three recent BOEM documents were used to help inform and prepare this analysis (USDOI, BOEM, Alaska OCS Region, 2011-a; USDOI, BOEM, Alaska OCS Region, 2011-c; and USDOI, BOEM, 2012). All three environmental documents are incorporated by reference (including citations) to help differentiate the potential effects of exploration activities under the proposed rule (relative to existing standards) and to ensure the context, intensity, scope, timing, and general location are representative of recent and foreseeable exploration drilling operations on the Arctic OCS.

In a typical Arctic EP, exploration wells would be drilled during the open-water season in the Arctic OCS, which generally runs from July, as soon as ice and weather conditions allow, through October. The drilling would continue as necessary during subsequent open-water

seasons until all wells are completed. Drilling operations would be conducted from a Mobile Offshore Drilling Unit (MODU), which would be supported by additional vessels for ice management, anchor handling, crew and supplies transport, waste storage and transport, and spill response. The handling of all drill cuttings, muds, and other discharges would comply with the requirements of the relevant U.S. Environmental Protection Agency (USEPA) Region 10 National Pollutant Discharge Elimination System (NPDES) permit. The number of wells may vary depending on the EP. The number of wells drilled in a given season would depend upon, among other things, ice conditions, length of time that each drilling site is accessible, and conditions of plan approval (USDOI, BOEM, Alaska OCS Region, 2011-c). Exploratory drilling activities would occur an average of 30 to 45 days at each drill site in the Chukchi Sea and 34 to 44 days in the Beaufort Sea. During such operations, accidental spills are possible. For the purposes of analysis, the EA assumes a large oil spill would be ≥1,000 bbl, and a catastrophic spill, although not expected to occur, could approach 2.1 million bbl of crude oil in the Chukchi Sea Planning Area and 3.9 million bbl of crude oil in the Beaufort Sea Planning Area (USDOI, BOEM, Alaska OCS Region, 2011-b, Appendix D; USDOI, BOEM, 2012, p. 4-167).

The environmental effects of provisions of the proposed rule that would modify exploration planning and operations are described below.

5.1.1 Provisions That Would Not Cause Environmental Impacts

BOEM and BSEE have determined that the following provisions of the proposed rule are purely informational or administrative in nature and would not cause environmental impacts. While globally designed to enhance the safety and careful planning of operations, they do not prescribe or modify any actions or operations that would themselves impact the environment. Instead, they are proposed to enhance general planning and reporting to improve and/or document the overall management and effectiveness of operations. Therefore, further environmental analysis of these provisions is not necessary.

§ 250.105	Definitions.
§ 250.188	What incidents must I report to BSEE and when must I report them?
§ 250.198	Documents incorporated by reference.
§ 250.418	What additional information must I submit with my APD [application for a permit to drill]?
§ 250.470	What additional information must I submit with my APD for Arctic OCS exploratory drilling operations?
§ 250.1920	What are the auditing requirements for my Safety and Environmental Management System (SEMS) program?
§ 254.6	Definitions.
§ 254.52	Format of response plan.
§ 254.55	Spill response plans for facilities located in Alaska State waters seaward of the coast line in the Chukchi and Beaufort Seas.
§ 254.65	Purpose.
§ 254.70	What are the additional requirements for facilities conducting exploratory drilling from a MODU on the Arctic OCS?

§ 254.80	What additional information must I include in the "Emergency response action plan" section for facilities conducting exploratory drilling from a MODU on the Arctic OCS?
§ 254.90(b)	What are the additional requirements for exercises of your response personnel and equipment for facilities conducting exploratory drilling from a MODU on the Arctic OCS? (Notification of Regional Supervisor 60 days before handling, storing, or transporting oil)
§ 550.105	Definitions.
§ 550.200	Definitions.
§ 550.204	When must I submit my IOP for proposed Arctic exploratory drilling operations and what must the IOP include?
§ 550.220	If I propose activities in the Alaska OCS Region, what planning information must accompany the EP?

5.1.2 Operational Provisions Analyzed

This EA analyzes the direct, indirect, and cumulative effects of operational provisions of the proposed rule. The effects analysis is organized into three themes:

- The **pollution prevention** provision proposed at § 250.300, which clarifies existing requirements for the capture of petroleum-based drilling mud and associated cuttings, as well as BSEE's existing discretionary authority to require capture of water-based drilling mud and associated cuttings under certain circumstances, is intended to prevent discharge of oil into the marine environment and to minimize other effects of mud and cuttings on water quality, subsistence activities, and marine fauna.

- Provisions intended to **reduce the likelihood of a spill occurring**:

§ 250.402(c)	When and how must I secure a well?
§ 250.447	When must I pressure test the BOP system?
§ 250.452	What are the real-time monitoring requirements for Arctic OCS exploratory drilling operations?
§ 250.473	What must I do to protect health, safety, property, and the environment while operating on the Arctic OCS?

- Provisions intended to **reduce the size and/or duration of an oil spill** and therefore its environmental effects:

§ 250.471	What are the requirements for Arctic OCS source control and containment equipment (SCCE)?
§ 250.472	What are the relief rig requirements for the Arctic OCS?
§ 254.90(a) & (c)	What are the additional requirements for exercises for your response personnel and equipment for facilities conducting exploratory drilling from a MODU on the Arctic OCS?

There is an explanatory summary for each provision presented in the preamble of the proposed rulemaking (USDOI, BSEE, and BOEM, 2014). The complete text of the operational provisions is provided in Appendix A. The proposed rulemaking, if implemented, would largely contribute to the avoidance or reduction of potential adverse environmental effects that may otherwise occur absent the rulemaking. However, in some cases, specific provisions of the PAA could trigger certain additional activities that could cause additive, adverse effects. For that reason, effects are further organized by beneficial (i.e., avoided) and adverse effects.

5.1.3 Environmental Analysis of Operational Provisions

Pollution Prevention: Summary Description of Proposed § 250.300(b)

Proposed § 250.300(b) would clarify BSEE's pollution prevention regulation as it pertains to spent mud and cuttings generated during Arctic OCS exploratory drilling operations. Operators can use drilling fluids (i.e., mud) that are water-based or that contain petroleum (i.e., oil). Cuttings generated using the latter would be contaminated with oil, and discharge of such mud or cuttings into the marine environment also would discharge the associated oil. Currently, under 30 CFR 250.300, no petroleum-based substances can be added to the drilling mud system without prior approval of the District Manager, who must also approve the method of disposal of drilling mud and cuttings. Additionally, USEPA National Pollutant Discharge Elimination System general permits for discharges from oil and gas exploration facilities on the Arctic OCS, which became effective on November 28, 2012, effectively prohibit discharge of oil-based mud and cuttings and authorize the discharge of only water-based drilling fluids and associated cuttings, and only within certain parameters (USEPA, 2014). Operators can choose to use oil-based or synthetic-based fluids during exploration activities, but those drilling fluids and associated cuttings may not be discharged into the marine environment. These permits currently are scheduled to expire on November 27, 2017.

Proposed § 250.300(b) would require operators to capture all petroleum-based mud from Arctic OCS exploratory drilling operations, and cuttings from operations that utilize petroleum-based mud, to prevent their discharge into the marine environment. Proposed § 250.300(b) also takes into consideration the variation in marine mammal migrations and subsistence hunting patterns in different areas of the Arctic OCS region and at different times of the year by clarifying the Regional Supervisor's (BSEE) discretionary authority to require the capture of water-based mud and associated cuttings where location- and season-specific circumstances warrant such restrictions. This discretion would be exercised based on factors including, but not limited to:

(a) the proximity of the exploratory drilling operations to subsistence hunting activities;

(b) the extent to which discharged mud or cuttings may cause marine mammals to alter their migratory patterns in a manner that interferes with subsistence activities; or,

(c) the extent to which discharged mud or cuttings may adversely affect marine mammals, fish, or their habitat.

Pollution Prevention: Environmental Analysis of Proposed § 250.300

This proposed section of the PAA is designed to reduce the likelihood of adverse environmental and sociocultural effects from the discharge of drilling mud and cuttings into the marine environment.

Partners and stakeholders, primarily Alaska Natives, have expressed concern that mud and cuttings from exploratory drilling operations could adversely affect marine species (e.g., whales and fish) and their habitat, and compromise the effectiveness of subsistence hunting activities. The release of mud and cuttings could result in increased turbidity and concentrations of total suspended solids in the water column, which could displace marine mammals, if present, from the drill sites and could adversely affect habitat and prey within and around the drill site (USDOI, BOEM, Alaska OCS Region, 2011-c). Subsistence hunters similarly have expressed concern that whales are capable of detecting the odors from mud and cuttings and will avoid areas where these discharges occur, potentially impacting subsistence harvest activities. While this is considered traditional ecological knowledge and has not been substantiated by the scientific community, there is little doubt that mysticetes have a more highly developed olfactory ability than microsmatic mammals like humans (Thewissen et al., 2011). Thewissen et al. (2011) hypothesize that bowhead whales use olfaction to detect conspecific mates and/or, more likely, clouds of the plankton on which they feed. Displacement of marine mammals could force subsistence hunting farther away from shore, which in turn can increase transit time, reduce the likelihood of successful harvest, increase exposure to adverse weather and dangerous sea states, and increase safety concerns for subsistence hunters. Finally, the farther away whales are harvested from a community, the greater the length of towing time necessary to bring the animals back to shore for processing. This increased tow time could negatively affect the viability of the meat and blubber because of spoilage.

Pollution Prevention: Direct and Indirect Effects

By reducing discharges of petroleum-based mud and, in certain circumstances, water-based mud and associated cuttings into the marine environment, this section of the PAA would help avoid potential adverse environmental impacts in the exploration drilling site areas in the Chukchi and Beaufort Seas:

- Suspended sediment, solids, and turbidity in the water column around the vicinity of drill sites would decrease, which would result in increased light transmissivity and visibility. Exposure in the lower water column would be reduced for some fish species, such as sculpin species, yellow fin sole, Bering flounder, starry flounder, and sand lance. This would increase visibility (and, therefore, their feeding ability), cause less interruption to their reproductive behaviors, and reduce the potential for smothering of the fish themselves and their benthic prey (USDOI, BOEM, Alaska OCS Region, 2011-a, p. 78; USDOI, BOEM, Alaska OCS Region, 2011-c, p. 80). Certain impacts would be avoided for weak swimming or non-swimming developmental life stages of larvae, fry, smolt, or eggs of fishes in the vicinity of the drill sites, such as epipelagic Arctic cod eggs and larvae and capelin juveniles, or demersal fish life stages with strong affinities to benthic habitats, such as sculpins, flounder, snailfish, saffron cod eggs, capelin eggs, and Arctic

cod juveniles and adults (USDOI, BOEM, Alaska OCS Region, 2011-a, p. 79). Additionally, decreased suspended solids would reduce localized and temporary losses of some benthic and pelagic organisms. Decreasing turbidity and concentrations of total suspended solids in the water column may lessen displacement of marine mammals from the drill sites and improve habitat and prey within and around the drill site. For example, walrus foraging habitat, which can be affected by accumulation of sediments on the sea floor, would be less affected (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 96).

- Hydrocarbon concentrations, including polycyclic aromatic hydrocarbons and some metals, would be reduced in the lower water column and seafloor sediments around the drill sites. Decreased concentrations of hydrocarbons and metals in the lower water column and seafloor sediments would reduce the potential for physiological and toxicological effects on fish adults, eggs, and larvae in the vicinity of the drill sites (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 80). Some marine mammals, such as the bowhead whale and the Pacific walrus, would also benefit, as their prey would be exposed to lower concentrations of hydrocarbons and metals (USDOI, BOEM, Alaska OCS Region, 2011-a, pp. 90 and 99). For example, Pacific walrus, which feed primarily on benthic invertebrates, some of which are known to concentrate contaminants, would ingest lower levels of hydrocarbons and/or metals (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 96).

- Whales and other species that may be capable of detecting the odors from mud and cuttings would be less likely to avoid the areas around the drill sites. This is considered traditional ecological knowledge and has not been substantiated by scientific study. However, there is little doubt that mysticetes have a more highly developed olfactory ability than microsmatic mammals like humans (Thewissen et al., 2011). Thewissen et al. (2011) hypothesize that bowhead whales use olfaction to detect conspecific mates and/or, more likely, clouds of the plankton on which they feed. If certain species of whales are in fact avoiding the areas around drill sites due to their detection of odors from mud and cuttings, this provision of the PAA could have a positive impact on marine mammals and subsistence activities in the areas surrounding the drill sites.

- The potential health effects of oil spills can disproportionately impact Alaska Natives, other minority population groups, and low-income communities. Effects that could be avoided or reduced include those related to worker safety, toxicology in workers and community members, and mental health emanating from social and economic disruption. Such effects may otherwise disproportionately affect low-income persons in the North Slope Borough (USDOI, BOEM, 2012, p. 3-413).

While the PAA can be expected to reduce or avoid the potential adverse environmental and sociocultural effects from the discharge of drilling mud and cuttings into the marine environment, proposed § 250.300(b) also could contribute to incremental or additive, adverse effects. Activities associated with this requirement that could contribute to adverse effects include the prolonged use of equipment, particularly vessels, already on-site, or the use of additional equipment to capture mud and associated cuttings. The source document for the analysis below is the *Chukchi Sea Planning Area, Chukchi Lease Sale 193, Shell Revised*

Chukchi Sea Exploration Plan, Environmental Assessment (USDOI, BOEM, 2011-c). Additive, adverse effects could include the following:

- Air quality could be adversely affected by the introduction of additional emissions from vessels during any increased operational time, or from the use of additional vessels (needed to capture mud and cuttings) (pp. 65-71). However, any effects related to vessel and support equipment emissions would be localized and temporary. Based on these factors and the short duration of the potential increased operational time, these activities would have a minor effect.

- Water quality could be adversely affected by prolonged use of vessels or the use of additional vessels during any increased operational time (pp. 72-73). However, any effects related to vessel discharges would be localized and temporary. Based on these factors and the short duration of the potential increased operational time, these activities would have a minor effect.

- Marine and coastal birds could be adversely impacted from vessel noise during any increased operational time or from the use of additional vessels. Routine vessel traffic has limited potential to disturb birds, and could temporarily move them a short distance to another location (p. 84). Several species of birds, such as the spectacled and Steller's eiders, also could be subject to vessel collisions during this time because they fly low and fast over the ocean and often do not or cannot react in time to avoid vessels (p. 85). These effects would be localized and temporary. Based on these factors and the short duration of the potential increased operational time, these activities would have a minor effect.

- Fish could be adversely impacted from vessel noise during any increased operational time or from the use of additional vessels. Fish also could be indirectly affected by water quality degradation (pp. 89-108). These effects would be localized and temporary. Based on these factors and the short duration of the potential increased operational time, these activities would have a minor effect.

- Marine mammals could be impacted adversely from vessel noise during any increased operational time or from the use of additional vessels. Vessel noise may contribute to an incremental increase in communication masking and limited behavioral disturbance related to noise exposure (pp. 90-91, 96-97, 99, and 101). Some species of marine mammals also could be subject to vessel collisions during this time. Additionally, marine mammals could be affected indirectly by water quality degradation and impacts to prey species (pp. 89-108). These effects would be localized and temporary. Based on these factors and the short duration of the potential increased operational time, these activities would have a minor effect.

- Increased use of vessels, use of additional vessels, or prolonged use of vessels on the OCS attributable to the requirements of § 250.300(b) of the PAA may increase the risk of non-permitted vessel discharges, collisions, allisions, vessel groundings, equipment failures, etc. The types of small spills most likely to result from such events would be

localized and temporary, and would have minor effects on the marine environment.

Pollution Prevention: Cumulative Effects

The Arctic Ocean ecosystem as a whole is rapidly changing, with melting sea ice and increasing sediment input from numerous regional river systems. Open-water seasons are longer than in past years, and there has been a reduction in multi-year ice. As the ice cover is reduced, the number of cargo, tourism, and research vessels in the region is expected to continue increasing (USDOI, BOEM, Alaska OCS Region, 2011-a, p. 74). Other events that are currently ongoing in the U.S. Arctic region, or that may occur in the foreseeable future, and that may affect water quality include: increased air traffic, fuel and petroleum spills, permitted and non-permitted discharges, long-distance aerosol-transported pollutants, the discharge of other pollutants, warming temperatures, ocean acidification, and risk of invasive species from ship hulls and equipment deployed (USDOI, BOEM, Alaska OCS Region, 2011-a, p. 67). This provision of the PAA would not necessitate any operations that would meaningfully further exacerbate the degradation of the marine water quality or pelagic or benthic habitat (USDOI, BOEM, Alaska OCS Region, 2011-a, pp. 75-76). By reducing discharges of petroleum- and, in certain circumstances, water-based mud and associated cuttings into the marine environment, promulgation of this provision of the PAA potentially would decrease incremental cumulative impacts to fish, marine mammals, and subsistence harvests in the Chukchi and Beaufort Seas. Any reduction of cumulative impacts from this provision of the PAA likely would be limited to the immediate areas surrounding the drill sites. Any potential cumulative adverse effects would be temporary, localized, and minor.

Reducing the Likelihood of an Oil Spill Occurring

Summary Description:

§ 250.402(c)	When and how must I secure a well?
§ 250.447(b)	When must I pressure test the BOP syste?
§ 250.452	What are the real-time monitoring requirements for Arctic OCS exploratory drilling operations?
§ 250.473	What must I do to protect health, safety, property, and the environment on the Arctic OCS?

Proposed **§ 250.402(c)** would require operators to ensure that any equipment left on or in a temporarily abandoned well that has penetrated below the surface casing be secured in a manner that prevents or minimizes the likelihood of the equipment being damaged or the integrity of the well and equipment being compromised. The primary concern is for ice that could sever, dislodge, or drag any exploration-related equipment, obstructions, or protrusions left on the well or the adjacent seafloor. If ice were to contact equipment left on or in a well that had penetrated hydrocarbons, the impact could damage the well and potentially compromise the cement, casing, or safety valves and plugs inside the well and could result in the discharge of hydrocarbons.

Proposed **§ 250.447(b)** would require a BOP pressure-test frequency of 7 days for Arctic OCS exploratory drilling operations (instead of every 14 days under the existing rules). This provision reflects concern regarding the potential for extreme weather conditions to compromise

the integrity or functionality of a BOP, particularly one that is maintained on a surface vessel or facility such as a jackup rig under Arctic OCS conditions. Ensuring the proper functioning of a BOP, which is a primary line of defense against a loss of well control, is critical to Arctic OCS exploratory drilling operations.

Proposed **§ 250.452** would require real-time data gathering on the BOP control system, the fluid handling systems on the rig, and the well's downhole conditions. In addition, this provision would require operators to immediately transmit the data during operations to an onshore location where it must be stored and monitored by personnel who are capable of interpreting the data. The onshore monitoring personnel would be required to have the authority, in consultation with rig personnel, to initiate any necessary action in response to anomalous data or events. Such personnel also must have the capability for continuous and reliable contact with rig personnel to ensure the ability to communicate information or instructions between the rig and onshore facility in real time, while operations are underway. This section also would require that real-time monitoring data be available to BSEE upon request to enable BSEE to perform its oversight role and to monitor responses to events as they unfold. This provision would increase the level of oversight of well conditions during operations, ensuring that onshore personnel are in a position to review data, help rig personnel conduct operations in a safe manner, and be able to assist the rig crew in identifying and evaluating unusual conditions that may arise during operations.

Proposed **§ 250.473** would require that all equipment and materials proposed for use in Arctic OCS exploration drilling operations be rated or de-rated for service under conditions that can be reasonably expected during operations. Because of the extreme cold temperatures and potential ice loading anticipated at drill sites, operators must ensure that the equipment and materials proposed for use can operate safely and effectively in such conditions. For example, cranes must be designed to withstand ice loads, and operational limitations of components under extreme cold temperatures (e.g., reduced tensile strength) must be understood and accounted for. Also, capping and containment equipment must be specifically designed to withstand the demands of Arctic conditions. This provision also would require operators to employ measures to address human factors such as safety of the workforce, health, and decision-making in the context of weather conditions that can be reasonably expected during operations.

Environmental Analysis:

§ 250.402(c)	When and how must I secure a well?
§ 250.447	When must I pressure test the BOP system?
§ 250.452	What are the real-time monitoring requirements for Arctic OCS exploratory drilling operations?
§ 250.473	What must I do to protect health, safety, property, and the environment on the Arctic OCS?

These provisions are designed to lessen the probability of oil spills from Arctic OCS exploratory drilling operations, thus reducing the possibility that an oil spill would impact environmental resources. However, implementation of proposed §§ 250.402(c) and 250.447 also may cause some potential adverse environmental effects, given the fact that additional operational

requirements and/or time on the Arctic OCS may be necessary to comply with these two provisions. Specifically, additional equipment or prolonged use of the equipment already on-site, such as aircraft and vessels, may be necessary to implement the provisions of the rule and to handle additional crew and supply requirements, to conduct any required marine mammal and ice observations, etc. No potential adverse environmental effects are associated with the other two sections, proposed §§ 250.452 and 250.473.

Reducing the Likelihood of an Oil Spill Occurring: Direct and Indirect Effects

These four provisions are designed to lessen the possibility of oil spills from Arctic OCS exploratory drilling operations, thus reducing the potential that an oil spill could impact environmental resources in the Chukchi Sea and Beaufort Sea Planning Areas. The following summarizes the potential adverse environmental impacts associated with oil spills that could be reduced or avoided through implementation of these four provisions of the PAA.

Reducing the Likelihood of an Oil Spill Occurring: Effects That Could Be Reduced or Avoided with Promulgation of These Provisions of the Rule

- Assuming an incrementally greater risk absent the proposed rule, a small oil spill would cause an increase in concentrations of gaseous hydrocarbons, which could affect onshore air quality. Effects would be localized and temporary. Eventually, the continuing decrease in surface oil, lessening use of clean-up equipment, and the effect of Arctic winds would be expected to decrease any onshore air quality impacts to minor levels of effects (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 70). The effects of a large oil spill or a catastrophic oil spill on air quality would be moderate to major during the initial event and during the response and cleanup process. The impacts at a given location would depend on the size, location, and duration of the spill and meteorological conditions. Effects would diminish with time because most of the surface oil would evaporate before reaching the shoreline (where effects would be minor) (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 70).

- Assuming an incrementally greater risk absent the proposed rule, a small oil spill would introduce hydrocarbons and temporary toxicity to the surface water around the vicinity of the spill site. The effects would be localized and short-term (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 73). A large spill affecting coastal waters could result in longer term impacts on water quality, but cleanup efforts would reduce the likelihood of long-term impairment. A large spill in marine waters would be expected to have temporary impacts on water quality; however, cleanup efforts and evaporation, dilution, and dispersion would minimize long-term impacts. Overall, impacts on water quality from large spills are expected to be minor to major, depending on the location, timing, magnitude of the event, and the effectiveness of containment and cleanup activities (USDOI, BOEM, 2012, p. 4-193). Sustained degradation of water quality would be unlikely (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 73). The impacts to water quality from a catastrophic oil spill would be moderate to major, depending on the location, timing, and magnitude of the event, as well as the effectiveness of spill containment and cleanup activities. Sustained degradation of water quality could result from hydrocarbon contamination that exceeds State and Federal water and sediment

quality criteria (USDOI, BOEM, 2012, p. 4-193).

Impacts on coastal habitats could range from negligible to moderate for small spills and moderate to major for large spills, if recovery from the effects of a spill does not occur and exposure results in habitat loss. Oil or other spilled materials might be transported to barrier island beaches, coastal beaches, or lagoon beaches by currents or tides. Direct mortality of biota could result on affected beach habitat. Oil could become stranded on beaches and penetrate into subsurface layers or be carried to higher elevations by storm waves and tides and affect vegetation behind beaches. Impacts on wetlands from oil spills could result in extensive injury to or mortality of vegetation and invertebrates in or on the substrate of coastal and estuarine habitats. Spills may impact a variety of species differently, which could result in changes in flora and fauna community structure and direct loss of habitat (USDOI, BOEM, 2012, p. 4-261). A catastrophic oil spill would potentially result in heavy or widespread deposits of oil and would have a greater likelihood for extensive areas of shoreline being affected and heavy deposits of oil in multiple locations. The degree of effects and length of recovery depend on a number of factors such as: the type and amount of oil, extent of biota exposure, substrate type, degree of sediment contamination, time of year, temperature, and species sensitivity. Impacts to coastal habitat from a catastrophic oil spill could have moderate effects if recovery of habitats occurs, and major effects if recovery does not occur and exposure results in habitat loss (USDOI, BOEM, 2012, p. 4-262).

- The impacts of oil spills on pelagic habitat would range from negligible to minor for small spills and from minor to moderate for large spills. Large spills would temporarily reduce the quality of large areas of pelagic habitat. Most released oil would float above the seafloor, so exposures would be expected for zooplankton, which lack the mobility to avoid the oil. However, the oil would be broken down by natural processes, and pelagic habitat would recover. A catastrophic oil spill could result in minor to moderate impacts to pelagic habitat. Pelagic organisms could be exposed to lethal or sublethal concentrations of hydrocarbons or mixtures of hydrocarbons and dispersants, if used during cleanup operations. However, over time, hydrocarbons in the water column would be diluted and broken down by natural processes, and pelagic habitat would recover (USDOI, BOEM, 2012, p. 4-304).

- A small oil spill is not likely to result in the degradation of benthic marine habitat, because hydrocarbons associated with small spills would be diluted to low concentrations as they moved through the water. Assuming an incrementally greater risk absent the proposed rule, a large spill would cause minor to moderate impacts, depending on various factors such as the size, duration, timing, and location of the spill, and the nature of the benthic habitat contacted by the oil (USDOI, BOEM, 2012, pp. 4-289 and 4-290). Impacts from a catastrophic oil spill would also depend on these factors. Hydrocarbons could persist at sublethal concentrations in sediments for decades, and sensitive benthic habitats damaged by a spill would likely recover slowly and could suffer long-term loss of ecological function. Major impacts to hard-bottom kelp habitat could occur if these areas were heavily oiled and high mortality occurs. However, hydrocarbons would be broken down by natural processes and most benthic habitats would likely recover

(USDOI, BOEM, 2012, p. 4-290).

- Impacts on invertebrates from a small oil spill would range from negligible to minor, since a small surface or subsurface hydrocarbon spill would be rapidly diluted and would likely result in only small localized, sublethal impacts to invertebrates. Assuming an incrementally greater risk absent the proposed rule, the impact magnitude of large oil spills on invertebrates would be primarily a function of the invertebrate species and habitat affected. Impacts would be greatest if a large spill occurred during a reproductive period or contacted a location important for spawning or growth such as intertidal and nearshore subtidal habitats. Overall, impacts from large spills are expected to be temporary as oil is diluted and broken down by natural chemical and microbial processes (USDOI, BOEM, 2012, p. 4-476). Local populations of intertidal organisms affected by a catastrophic oil spill would be measurably depressed for several years, and oil could persist in shoreline sediments for decades. However, benthic and pelagic invertebrates typically have short generation times and should recover. Overall, impacts to invertebrates from a catastrophic oil spill could range up to moderate (USDOI, BOEM, 2012, p. 4-478).

- Assuming an incrementally greater risk absent the proposed rule, a small oil spill could introduce hydrocarbons and effects with respect to toxicity to the surface water. Pelagic fish adults, juveniles, eggs and larvae could be exposed. Acute and chronic effects could occur to the various life stages of the fish species in the area (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 81). Overall, impacts from small oil spills on fish would range from negligible to minor, as these spills would be localized and are unlikely to affect a substantial number of fish before dilution and weathering would reduce concentrations of toxic fractions to nontoxic levels (USDOI, BOEM, 2012, p. 4-437). Large spills and catastrophic oil spills would affect a wider area, and the magnitude of effects would depend on: the location, timing, and volume of spills, distribution and ecology of affected fish species, and other environmental factors. Most adult fish are highly mobile and would likely avoid lethal hydrocarbon exposures, although they may be subjected to sublethal concentrations. Smaller species and egg and larval life stages are more likely to suffer lethal or sublethal exposures from oil contact because of their relative lack of mobility. Overall, impacts on fish would range from minor to moderate for large spills and catastrophic oil spills (USDOI, BOEM, 2012, p. 4-437).

- In EFH areas, small obligate benthic species, eggs, larvae, and some managed species and their prey could experience lethal and sublethal effects from contact with hydrocarbons. Therefore, assuming an incrementally greater risk absent the proposed rule, impacts to EFH from a small spill would range from negligible to minor, and from minor to moderate for large spills (USDOI, BOEM, 2012, p. 4-318). In the event of a catastrophic oil spill, managed species that suffer large losses of early life stages or long-term sublethal impacts could experience moderate to major population-level effects. Overall, a catastrophic oil spill could result in moderate to major impacts on EFH depending on: the size of the spill, its location, environmental factors, and the uniqueness of the affected EFH (USDOI, BOEM, 2012, p. 4-318). EFH could be impacted from vessel and aircraft noise associated with spill response. These activities would have a

minor effect (USDOI, BOEM, Alaska OCS Region, 2011-c, pp. 89-108).

- A small spill would not persist in the environment very long, resulting in few opportunities to contact threatened and endangered birds. Since small spills would have only the potential to impact limited areas of habitat and few individuals, they would have minor impacts on marine and coastal birds. Assuming an incrementally greater risk absent the proposed rule, large spills have the potential for sublethal or lethal effects to marine and coastal birds contacted by spilled oil, especially those spills that enter coastal lagoons and delta areas where the oil may impact birds using those habitats for molting and staging. Therefore, effects on marine and coastal birds are expected to be moderate to major for a large spill. Similarly, a catastrophic oil spill could have moderate to major impacts on marine and coastal birds were spilled oil to reach important habitat areas (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 86). For example, the Beaufort Sea Planning Area contains important nesting, molting, and stopover habitat for many species of coastal and marine birds; therefore, a catastrophic oil spill has the potential to affect large numbers of birds that are already at the edge of their geographic range and are sensitive to additional stress (USDOI, BOEM, 2012, p. 4-413). Threatened and endangered birds and marine and coastal birds could be impacted from vessel and aircraft noise associated with spill response. These activities would have a minor effect (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 85).

- Assuming an incrementally greater risk absent the proposed rule, marine mammals may be exposed to spilled oil by direct contact, inhalation, and ingestion (directly, or indirectly through the consumption of contaminated prey species). These exposures may result in a variety of lethal and sublethal effects, depending on the location, timing, and volume of the spills; the environmental settings of the spills; and the species exposed to the spills. Overall, small and large oil spills are expected to have minor to moderate impacts to marine mammals, while impacts from cleanup activities are expected to be minor (USDOI, BOEM, 2012, p. 4-376). A catastrophic oil spill could result in moderate to major impacts on marine mammals, as there is greater potential for more severe and population-level effects compared to a small or large oil spill (USDOI, BOEM, 2012, p. 4-376). Marine mammals could be impacted from vessel and aircraft noise associated with spill response. These activities would have a minor effect (USDOI, BOEM, Alaska OCS Region, 2011-c, pp. 89-108). The following analysis describes the effects of small, large, and catastrophic oil spills on specific marine mammal species.

    - Small oil spills would have a negligible effect on seal populations because the spill size would be insufficient to produce any population-level effects on small or large groups of seals. Additionally, most scientific observation leads to the conclusion that seals have the ability to detect and avoid oil spills, and the weathering process would most likely act to quickly break up or dissipate oil through the local environment to harmless residual levels that would eventually become undetectable (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 93). Contact with oil from a large oil spill could affect individual seals in a variety of negative ways (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 93). Short-term population impacts could result from exposure to oil, long-

term exposure to contaminants, and decreased availability of prey from a catastrophic oil spill (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 94). A small oil spill would dissipate over a few days and would result in a minor impact to individual walrus, rather than a population-level effect. A catastrophic oil spill could have moderate to major impacts to the walrus population if it were to occur in an area with a large concentration of the walrus population (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 96).

- A small oil spill would have negligible effects on mysticete whales. Such a small spill would be insufficient to produce any population-level effects on whales. Oil generally poorly adheres to the skin of mysticete whales, and cetaceans are believed to have the ability to detect and avoid oil spills. Additionally, the weathering process should act to quickly break up or dissipate oil through the local environment to harmless residual levels that would eventually become undetectable. Moderate effects to mysticete whales from large oil spills are possible through direct contact, reduction of prey availability, toxic exposure, and disturbance from cleanup operations. A catastrophic oil spill could cause significant direct and indirect effects under certain circumstances, such as very intense direct contact, reduction of prey availability, toxic exposure, and disturbance from cleanup operations. (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 103).

- Impacts to odontocetes from a small oil spill are unlikely because they are likely to avoid and disperse from areas with lots of human activity. We expect odontocetes to avoid the area of the spill as long as cleanup activities were ongoing. A large or catastrophic oil spill could result in moderate impacts to odontocetes through skin contact, inhalation, or ingestion of contaminated prey, or exposure in open water, which would likely be limited to short term, nonlethal effects such as skin irritation (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 104).

- Given the dispersed distribution of polar bears, it is likely that a small spill persisting for less than 30 days would affect few polar bears, resulting in a minor level of effect on polar bears and no adverse impact to critical habitat. If polar bears come into contact with oil from a large or catastrophic oil spill in water or on ice, their coats could become fouled. Polar bears rely on their thick fur to avoid hypothermia, and a heavily oiled bear would likely not survive. Polar bears could also ingest toxins while grooming or by foraging on seals that had become oiled. A large or catastrophic oil spill that came ashore or fouled a large area of sea ice could impact polar bears directly (and indirectly through their prey) and could result in moderate or major impacts to polar bears, as well as adverse impacts to critical habitat (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 106).

- Assuming an incrementally greater risk absent the proposed rule, potential impacts on sociocultural systems from accidental oil spills could vary from minor to major,

depending on the size, location, and timing of a spill. The impacts of a small oil spill are likely to be minor to moderate, with some impact on subsistence resources such as marine mammals and birds. Animals could be oiled or spooked by hazing. However, resources should recover in less than a year. However, impacts of a large or catastrophic oil spill on important subsistence resources, such as whales (beluga and bowhead), walrus, seabirds, waterfowl, fish, and land mammals, and sociocultural systems could be major depending on timing and location, especially if intertidal zones, lagoons, and estuaries were oiled (USDOI, BOEM, 2012, p. 4-568). The effects would be most serious if the release occurred during a whale migration and affected the migration route. Not only could contact with oil result in the deaths of some individual animals, but Alaska Native harvesters, perceiving the surviving oiled whales as tainted, also would be hesitant to harvest them. Oil contamination of beaches would have a profound impact on whaling because, even if bowhead whales were not contaminated, Iñupiat subsistence whalers would not be able to bring them ashore and process them on a contaminated shoreline (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 114). A catastrophic oil spill could also result in the deaths of a large number of birds and, if breeding populations were affected, a serious reduction in the availability of waterfowl to subsistence harvesters (USDOI, BOEM, 2012, p. 4-569). These disruptions could cause breakdowns in family ties, compromise a community's sense of well-being, and damage sharing linkages with other communities. They could likewise curtail community activities and traditional practices for harvesting, sharing, and processing subsistence resources, which are interconnected with the subsistence lifestyles of Alaska Native communities (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 117). The potential health effects of oil spills can disproportionately impact Alaska Natives, other minority population groups and low-income communities. These effects include those related to worker safety, toxicology in workers and community members, and mental health emanating from social and economic disruption. This may disproportionately affect low income persons in the North Slope Borough (USDOI, BOEM, 2012, p. 3-413).

Additive Adverse Effects That Could Occur with Promulgation of These Provisions of the Rule

While the PAA is expected to reduce or avoid some of the potential adverse environmental impacts associated with oil spills by reducing the likelihood of spills, proposed §§ 250.402(c) and 250.447 could also contribute to incremental or additive, adverse effects. The following activities associated with requirements of this proposed rule could contribute to adverse effects: the prolonged use of equipment, such as vessels and aircraft, already on-site, or the use of additional equipment. The source document for the analysis below is USDOI, BOEM (2011-c). Additive, adverse effects could include the following:

- Air quality could be adversely affected by the introduction of additional emissions from aircraft and vessels during any increased operational time, or the use of additional vessels (pp. 65-71). However, any effects would be localized and temporary. Based on these factors and the short duration of the potential increased operational time, these activities would have a minor effect.

- Water quality could be adversely affected by prolonged use of vessels or the use of

additional vessels during any increased operational time (pp. 72-73). However, any effects would be localized and temporary. Based on these factors and the short duration of the potential increased operational time, these activities would have a minor effect.

- Marine and coastal birds could be adversely impacted from vessel and aircraft noise during any increased operational time or from use of additional vessels. Routine vessel traffic has limited potential to disturb birds and could temporarily move them a short distance to another location (p. 84). Several species of birds, such as the spectacled and Steller's eiders, could also be subject to vessel collisions during this time because they fly low and fast over the ocean and often do not or cannot react in time to avoid vessels (p. 85). These effects would be localized and temporary. Based on these factors and the short duration of the potential increased operational time, these activities would have a minor effect.

- Fish could be adversely impacted from vessel and aircraft noise during any increased operational time or from use of additional vessels. Fish could also be indirectly affected by water quality degradation (pp. 89-108). These effects would be localized and temporary. Based on these factors and the short duration of the potential increased operational time, these activities would have a minor effect.

- Marine mammals could be adversely impacted from vessel and aircraft noise during any increased operational time or from use of additional vessels. Vessel noise may contribute to an incremental increase in communication masking and limited behavioral disturbance related to noise exposure (pp. 90-91, 96-97, 99, and 101). Some species of marine mammals could also be subject to vessel collisions during this time. Additionally, marine mammals could be indirectly affected by water quality degradation and impacts to prey species (pp. 89-108). These effects would be localized and temporary. Based on these factors and the short duration of the potential increased operational time, these activities would have a minor effect.

- Increased use of vessels or use of additional vessels on the OCS caused by §§ 250.402(c) and 250.447 of the PAA would increase the risk of accidental discharges (from collisions, allisions, vessel groundings, equipment failures, etc.). According to the United States Coast Guard (USCG), the majority of the oil spills in U.S. waters between 1969 and 2011 involved discharges between one and one hundred gallons (USCG, 2012). Given this statistic and the short duration of any increased operational time, the possibility of a large or catastrophic oil spill from such accidents is unlikely. A small spill, which would be localized and temporary, would have minor effects on the marine environment.

- These provisions may prolong the timeframe needed to drill and subsequently complete a well; thus, a well that could typically be drilled in one season may potentially require two seasons to complete. Whenever a well is re-entered or operations are interrupted, the likelihood of a well integrity event that could lead to an accidental release is increased.

Additive Adverse Effects: Cumulative Effects

In the Chukchi Sea and Beaufort Sea Planning Areas there are few nearby industrial emission sources and no substantial population centers (USDOI, BOEM, Alaska OCS Region, 2011-a, p. 52). The main sources of impacts have been associated with oil- and gas-related activities, military operations, scientific research activities, climate change, and subsistence hunting and other activities associated with regional native villages (USDOI, BOEM, Alaska OCS Region, 2011-c, p. C-1). Marine vessel traffic in the area is mainly attributed to fishing and hunting vessels, icebreakers, Coast Guard vessels, supply ships and barges with their associated towing vessels, and vessels supporting oil, gas, and research activities in the region. Marine vessel traffic has increased in recent years due to advances in the technology of ice strengthening and ice breaking capacities of marine vessels, receding ice cover as a result of climate change, and increased interest in scientific and economic pursuits in the area. Most observers expect these phenomena to continue increasing (USDOI, BOEM, Alaska OCS Region, 2011-c, pp. C-1 and C-2). Air traffic has historically been limited to the movement of people and supply materials between industry operations, native villages, and military outposts. In recent years, air traffic has increased mostly from academic and commercial ventures and military operations. Air traffic is expected to continue at present levels for the reasonably foreseeable future (USDOI, BOEM, Alaska OCS Region, 2011-c, p. C-2). Additionally, in the winter months, the Arctic atmosphere becomes contaminated with pollution through long-range transport of emissions from coal burning and metal smelting in Europe and Russia, referred to as the Arctic haze.

- Air quality is well within the NAAQS and State of Alaska AAQS (18 AAC 50). Impacts to air quality in the region can be attributed to various factors, including marine vessel and air traffic, the North Slope oil fields, and Arctic haze. All activities in the past and occurring now have caused little deterioration in air quality. Most observers do not expect this to change due to the reasonably foreseeable future of North Slope area activities, such as oil and natural gas development and production (USDOI, BOEM, Alaska OCS Region, 2011-b, p. 300). Sections 250.402(c) and 250.447 of the PAA could potentially give rise to the prolonged or additional use of marine vessels and aircraft, which could potentially deteriorate air quality. The additional air emissions would be relatively small compared with those from existing and projected activities in the area, and would be spatially and temporally limited. Therefore, cumulative impacts on air quality from these provisions of the PAA would be minor.

- Impacts to water quality are associated with climate change, industry-, community-, military-, and research-related discharges, and naturally occurring processes. As mentioned earlier, marine vessel traffic has increased in recent years and is expected to increase in the future. This increases the risk of vessel accidents, vessel groundings, potential oil and cargo spills, permitted discharges, and introduction of marine invasive species. Future impacts to water quality would be caused primarily by the effects of climate change and ocean acidification on ocean chemistry, discharge of pollution into marine waters from point-source and nonpoint-source discharges, and oil industry-related activities such as drilling operations and support vessel discharges (USDOI, BOEM, Alaska OCS Region, 2011-b, p. 300). Although §§ 250.402(c) and 250.447 of the PAA could result in additional vessel traffic in the areas surrounding the exploration drilling

sites for a short period of time, this increase would be negligible compared to existing and future activities in the area. Therefore, cumulative impacts on water quality from these provisions of the PAA would be minor. Further, they are designed to reduce the likelihood of oil spills that could result in adverse cumulative impacts on water quality.

- Cumulative impacts on bird species result from direct injury or mortality of marine and coastal birds due to collisions with onshore and offshore structures, digestion of trash or debris, or exposure to discharges or emissions; loss or degradation of habitat due to coastal development, climate change, or construction and operations activities; and behavioral disturbances due to commercial and recreational boating and small aircraft traffic (USDOI, BOEM, 2012, p. 4-886). Many bird species are currently experiencing a loss or degradation of habitat due to land development and climate change, and these impacts, along with impacts from oil and gas development and marine vessel and air traffic, are expected to continue into the foreseeable future (USDOI, BOEM, 2012, pp. 4-886 and 4-887). Sections 250.402(c) and 250.447 of the PAA could result in additional vessel and air traffic in the areas surrounding the exploration drilling sites for a short period of time. However, the increase in traffic would be negligible compared to existing and future activities in the region. Therefore, cumulative impacts on marine and coastal birds from these provisions of the PAA would be minor. Further, they are designed to reduce the likelihood of oil spills that could result in adverse cumulative impacts on birds.

- Fish and EFH in the region have been impacted by various activities such as subsistence fishing, commercial shipping, coastal modifications, hardrock mining, dredging and disposal operations, anchoring, and climate change (USDOI, BOEM, 2012, p. 4-809). As mentioned above, the number of marine vessels in the region will continue to increase, which could cause impacts to fish via water quality deterioration from potential cargo and oil spills and permitted discharges, noise, and the introduction of marine invasive species. Climate change is anticipated to cause major effects in the future, including warming sea surface, reduction in sea ice, and increased ocean water acidity. These factors are affecting and will continue to affect fish and fish habitat in a substantial way (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 83). Subsistence fishing in the region is likely to continue at a similar level (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 83). Sections 250.402(c) and 250.447 of the PAA could result in additional vessel traffic in the areas surrounding the exploration drilling sites for a short period of time. However, the increase in traffic would be negligible compared to existing and future activities in the area. Therefore, cumulative impacts on fish and EFH from these provisions of the PAA would be minor. Further, they are designed to reduce the likelihood of oil spills that could result in adverse cumulative impacts on fish and EFH.

- Ongoing and future activities or phenomena that affect marine mammals in Arctic waters include: onshore and offshore oil and gas development (and infrastructure); other kinds of onshore development on or near riverine systems flowing into Arctic waters; marine vessel traffic; commercial, recreational, and subsistence fishing; marine mammal subsistence harvests; pollution (and marine debris); climate change; diseases; and natural catastrophes (USDOI, BOEM, 2012, p. 4-885). Decreasing sea ice is changing patterns of

habitat use for marine mammals, increasing the available range of some whales but decreasing available habitat for ice seals, polar bears, and walrus. Changes in sea-ice extent related to climate change are altering the behavior and foraging opportunities of some marine mammal species, such as the walrus and polar bear (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 107). Activities entailing the use of marine vessels and aircraft can impact marine mammals by temporarily altering their behavior. Potential behavior changes include deflections away from vessels or aircraft, cessation of calling, masking of received sounds, temporary separations of mother/calf pairs, and interruptions of foraging, resting, or other behaviors, all of which have energetic costs (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 107). Sound specifically has the potential to cause deflection of whales from hunting and migration areas, masking of environmental sounds and intra-species communication, and physiological damage to marine mammal hearing (USDOI, BOEM, Alaska OCS Region, 2011-c, p. 89). Accidental vessel collisions with marine mammals are another concern, especially during inclement weather conditions. We expect these activities and phenomena to continue (and increase) in the foreseeable future (USDOI, BOEM, Alaska OCS Region, 2011-a, p. 67). Sections 250.402(c) and 250.447 of the PAA could result in additional vessel and air traffic in the areas surrounding the exploration drilling sites for a short period of time. However, the increase in traffic would be negligible compared to existing and future activities in the area. Therefore, cumulative impacts on marine mammals from these provisions of the PAA would be minor. Further, they are designed to reduce the likelihood of oil spills that could result in adverse cumulative impacts on marine mammals.

Reducing the Size and/or Duration of an Oil Spill

Summary Description:

§ 250.471	What are the requirements for Arctic OCS source control and containment equipment?
§ 250.472	What are relief rig requirements for the Arctic OCS?
§ 254.90	What are the additional requirements for exercises for your response personnel and equipment for facilities conducting exploratory drilling from a MODU on the Arctic OCS?

Proposed **§ 250.471** would require operators using a MODU for Arctic OCS exploratory drilling to have access to, and the ability to deploy SCCE (e.g., a capping stack, cap and flow system, and containment dome) within specified timeframes when drilling or working below the surface casing. Proposed § 250.471 would require operators to demonstrate that they would have access to, and could deploy, well control and containment resources that would be adequate to promptly respond to a loss of well control. Ensuring that operators have redundancies in place is critical, as there is no guarantee that any measure could control or contain a worst-case discharge scenario.

Proposed **§ 250.472** would require Arctic OCS exploratory drilling operators drilling or working below the surface casing to have access to a separate relief rig that would be staged at a location such that it could arrive on site and be capable of drilling a relief well under anticipated Arctic

OCS conditions within specified timeframes. Although SCCE may, in some circumstances, be able to contain or establish control over a well after a blowout, in some cases only a relief well will be able to kill and permanently plug an out-of-control well. Thus, it is crucial that operators have access to a relief rig capable of drilling a relief well, if needed, before the seasonal ice encroachment. This provision addresses the geographical and logistical challenges of bringing equipment and resources into the region, especially when the time available to mount response operations is limited by changing weather and ice conditions as the end of the drilling season approaches.

Proposed **§ 254.90** would require Arctic OCS exploratory drilling operators to incorporate additional elements into their oil spill response training and exercise activities and provide notice of the commencement and cessation of covered operations, and would clarify the authority of the Regional Supervisor to conduct exercises, prior to and during exploratory drilling operations, to test response preparedness.

Environmental Analysis:

§ 250.471	What are the requirements for Arctic OCS source control and containment equipment?
§ 250.472	What are relief rig requirements for the Arctic OCS?
§ 254.90	What are the additional requirements for exercises for your response personnel and equipment for facilities conducting exploratory drilling from a MODU on the Arctic OCS?

These provisions are designed to reduce the duration and/or magnitude of a potential oil spill and therefore lessen or potentially avoid resulting environmental effects. These provisions are not designed to reduce the possibility of a spill occurring like the provisions discussed previously (proposed §§ 250.402(c), 250.447, 250.452, and 250.473). However, both sets of provisions would reduce the likelihood of potential environmental effects from an oil spill. Therefore, the preceding environmental analysis of potential beneficial effects of proposed §§ 250.402(c), 250.447, 250.452, and 250.473 is generally applicable to these provisions. In summary, effects potentially reduced or avoided through promulgation of these provisions of the rule could include direct and indirect impacts to air and water quality; coastal, benthic, and pelagic habitat; and invertebrates, fish, EFH, coastal and marine birds, marine mammals, and sociocultural systems. The effects of these avoided impacts range from negligible to major depending on the size, timing, and location of the avoided (or reduced) oil spill.

While these provisions of the PAA are designed to reduce the duration and/or magnitude of a potential oil spill from Arctic OCS exploratory drilling operations, there are some potential adverse environmental effects associated with these provisions. The potential environmental effects associated with proposed §§ 250.471 and 250.472 would result from the additional vessels, aircraft, and/or operational time that may be needed to comply with the staging and deployment requirements for SCCE and relief rigs when an operator is drilling below or working below the surface casing in an exploratory well. While it is possible that the proposed requirements could be satisfied through strategic use of vessels and operational time already contemplated in drilling plans, there is a reasonable likelihood that additional vessels and/or

operational time may be needed. For example, under proposed § 250.471, operators could need access to another vessel to store and deploy a capping stack and containment dome, a vessel to receive fluids from the cap and flow system or containment dome, etc. The potential environmental effects associated with proposed § 254.90 would also result from the additional deployment of vessels and equipment to participate in oil spill response training and exercise activities. These provisions have the potential to increase operational time on the OCS and the number and use of vessels, aircraft, and other equipment in similar ways to other provisions previously discussed. As such, the preceding environmental analysis for proposed §§ 250.402(c) and 250.447 effectively analyzes the potential adverse environmental effects associated with these proposed provisions. Increased or additional use of vessels, aircraft, and other equipment could cause adverse direct and indirect impacts on air and water quality, marine and coastal birds, fish, and marine mammals. These effects would be localized and temporary. Therefore, these proposed provisions of the rule would have a minor effect on the marine environment. Additionally, the cumulative impact analysis from the preceding analysis determined that cumulative impacts on air and water quality, fish and EFH, marine and coastal birds, and marine mammals from comparable requirements of the PAA would be minor. That conclusion holds for these proposed provisions meant to reduce the size or duration of a spill.

5.1.4 Effects Summary

The PAA is designed to increase environmental protection and reduce the likelihood and severity of potential impacts on the environment resulting from Arctic OCS exploratory drilling operations. The provisions would largely contribute to the avoidance or minimization of effects that would otherwise occur. However, proposed §§ 250.300, 250.402, 250.447, 250.471, 250.472, and 254.90 could cause minor, adverse environmental effects.

5.2 Alternative B – Proposed Rulemaking Excluding the Requirement for More Frequent Blowout Preventer Testing

Under Alternative B, the proposed rule would be promulgated with the exception that the proposed change to 30 CFR 250.447(b), which would increase the BOP pressure testing frequency for exploratory drilling operations in the Alaska Arctic OCS from every 14 days to every seven days, would not take place. The environmental analysis provided above for the PAA remains the same under Alternative B except that the potential environmental effects—whether adverse or beneficial—associated with the implementation of proposed § 250.447(b) (as summarized above under the PAA) would not occur, and the environmental effects associated with existing standards would remain.

5.3 Alternative C – No Action Alternative (NAA)

Under the NAA, the proposed rule would not be promulgated. Any future exploration drilling on the Arctic OCS would be governed by the existing regulatory framework, potentially causing

effects comparable to those described in previous Arctic OCS NEPA documents (*See* USDOI, BOEM, Alaska OCS Region, 2011-a; USDOI, BOEM, Alaska OCS Region, 2011-b; USDOI, BOEM, Alaska OCS Region, 2011-c; USDOI, BOEM, 2012; USDOI, MMS, Alaska OCS Region, 2008). No substantially different effects to the environment would occur compared to those analyzed in the existing NEPA documents cited above. Selection of the NAA would not reduce the likelihood or severity of impacts on the Arctic environment vis-à-vis existing rules. Accordingly, the NAA would forego the potential benefits of reduced or avoided environmental effects anticipated from the PAA. The NAA would also obviate the limited potential adverse effects anticipated from the PAA.

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Appendix A. Regulatory Provisions of the Proposed Rule (Version 2.9.15)

PART 250—OIL AND GAS AND SULPHUR OPERATIONS IN THE OUTER CONTINENTAL SHELF

1. The authority citation for 30 CFR Part 250 is amended to read as follows:

Authority: 30 U.S.C. 1751, 31 U.S.C. 9701, 33 U.S.C. 1321(j)(1)(C), 43 U.S.C. 1334.

2. Amend § 250.105 by:

a. Revising the definition of "District Manager" and

b. Adding new definitions for "Arctic OCS", "Arctic OCS Conditions", "Cap and Flow System", "Capping Stack", "Containment Dome" and "Source Control and Containment Equipment (SCCE)" in alphabetical order, to read as follows:

§ 250.105 Definitions.

* ****

Arctic OCS means the Beaufort Sea and Chukchi Sea Planning Areas, as described in the Proposed Final OCS Oil and Gas Leasing Program for 2012-2017 (June 2012).

Arctic OCS Conditions means, for the purposes of this Part, the conditions operators can reasonably expect during operations on the Arctic OCS. Such conditions, depending on the time of year, include, but are not limited to: extreme cold, freezing spray, snow, extended periods of low light, strong winds, dense fog, sea ice, strong currents, and dangerous sea states. Remote location, relative lack of infrastructure, and the existence of subsistence hunting and fishing areas are also characteristic of the Arctic region.

* * * * *

Cap and Flow System means an integrated suite of equipment and vessels, including a

capping stack and associated flow lines, that, when installed or positioned, is used to control the flow of fluids escaping from the well by conveying the fluids to the surface to a vessel or facility equipped to process the flow of oil, gas, and water. A cap and flow system is a high pressure system that includes the capping stack and piping necessary to convey the flowing fluids through the choke manifold to the surface equipment.

Capping Stack means a mechanical device that can be installed on top of a subsea or surface wellhead or blowout preventer to stop the uncontrolled flow of fluids into the environment.

* ****

Containment Dome means a non-pressurized container that can be used to collect fluids escaping from the well or equipment below the sea surface or from seeps by suspending the device over the discharge or seep location. The containment dome includes all of the equipment necessary to capture and convey fluids to the surface.

* ****

District Manager means the BSEE officer with authority and responsibility for operations or other designated program functions for a district within a BSEE Region. For activities on the Alaska OCS, any reference in this part to District Manager means the BSEE Regional Supervisor.

* ****

Source Control and Containment Equipment (SCCE) means the capping stack, cap and flow system, containment dome, and/or other subsea and surface devices, equipment, and vessels whose collective purpose is to control a spill source and stop the flow of fluids into the environment or to contain fluids escaping into the environment. "Surface devices" refers to equipment mounted or staged on a barge, vessel, or facility to separate, treat, store and/or dispose

of fluids conveyed to the surface by the cap and flow system or the containment dome. "Subsea devices" includes, but is not limited to, remotely operated vehicles, anchors, buoyancy equipment, connectors, cameras, controls and other subsea equipment necessary to facilitate the deployment, operation and retrieval of the SCCE. The SCCE does not include a blowout preventer.

* ****

3. Revise § 250.188 by adding a new paragraph (c) to read as follows:

§ 250.188 What incidents must I report to BSEE and when must I report them?

*****

(c) On the Arctic OCS, in addition to the requirements of paragraphs (a) and (b) of this section, you must provide to the BSEE inspector on location, if one is present, or to the Regional Supervisor both of the following:

(1) An immediate oral report if any of the following occur:

(i) Any sea ice movement or condition that has the potential to affect your operation or trigger ice management activities;

(ii) The start and termination of ice management activities; or

(iii) Any "kicks" or operational issues that are unexpected and could result in the loss of well control.

(2) Within 24 hours after completing ice management activities, a written report of such activities that conforms to the content requirements in § 250.190.

4. Revise § 250.198 by adding paragraph (h)(89) to read as follows:

§ 250.198 Documents incorporated by reference.

*****

(h) ***

(h)(89) API RP 2N, Third Edition, "Recommended Practice for Planning, Designing, and Constructing Structures and Pipelines for Arctic Conditions;" incorporated by reference at § 250.470(g);

*****

5. Revise § 250.300 paragraphs (b)(1) and (b)(2) by adding regulatory text to read as follows:

§ 250.300 Pollution prevention

*****

(b)(1) * * * For Arctic OCS exploratory drilling, you must capture all petroleum-based mud to prevent its discharge into the marine environment. The Regional Supervisor may also require you to capture, during your Arctic OCS exploratory drilling operations, all water-based mud from operations after completion of the hole for the conductor casing to prevent its discharge into the marine environment, based on various factors including, but not limited to:

(i) The proximity of your exploratory drilling operation to subsistence hunting and fishing locations;

(ii) The extent to which discharged mud may cause marine mammals to alter their migratory patterns in a manner that impedes subsistence users' access to, or use of, those resources, or increases the risk of injury to subsistence users; or

(iii) The extent to which discharged mud may adversely affect marine mammals, fish, or their habitat.

(b)(2) * * * For Arctic OCS exploratory drilling, you must capture all cuttings from operations

that utilize petroleum-based mud to prevent their discharge into the marine environment. The Regional Supervisor may also require you to capture, during your Arctic OCS exploratory drilling operations, all cuttings from operations that utilize water-based mud after completion of the hole for the conductor casing to prevent their discharge into the marine environment, based on various factors including, but not limited to:

(i) The proximity of your exploratory drilling operation to subsistence hunting and fishing locations;

(ii) The extent to which discharged cuttings may cause marine mammals to alter their migratory patterns in a manner that impedes subsistence users' access to, or use of, those resources, or increases the risk of injury to subsistence users; or

(iii) The extent to which discharged cuttings may adversely affect marine mammals, fish, or their habitat.

* * * * *

6. Revise § 250.402 by adding a new paragraph (c) to read as follows:

§ 250.402 When and how must I secure a well?

* * * * *

(c) For Arctic OCS exploratory drilling operations, in addition to the requirements of paragraphs (a) and (b) of this section:

(1) If you move your drilling rig off a well prior to completion or permanent abandonment, you must ensure that any equipment left on, near, or in a well bore that has penetrated below the surface casing is positioned in a manner to:

(i) protect the well head; and

(ii) prevent or minimize the likelihood of compromising the down-hole integrity of the well or

the effectiveness of the well plugs.

(2) In areas of ice scour, you must use a well mudline cellar or an equivalent means of minimizing the risk of damage to the well head.

7. Revise § 250.418 by adding a new paragraph (k) to read as follows:

§ 250.418 What additional information must I submit with my APD?

* * * * *

(k) For Arctic OCS exploratory drilling operations, you must provide the information required by § 250.470.

8. Revise § 250.447 paragraph (b) to read as follows:

§ 250.447 When must I pressure test the BOP system?

* * * * *

(b) Before 14 days have elapsed since your last BOP pressure test, or for Arctic OCS exploratory drilling operations before 7 days have elapsed since your last BOP pressure test. You must begin to test your BOP system before midnight on the 14th day (or for Arctic OCS exploratory drilling operations, the 7th day) following the conclusion of the previous test. However, the District Manager may require more frequent testing if conditions or BOP performance warrant; and

* * * * *

9. Add new § 250.452 to read as follows:

§ 250.452 What are the real-time monitoring requirements for Arctic OCS exploratory drilling operations?

(a) When conducting exploratory drilling operations on the Arctic OCS, you must have real-time data gathering and monitoring capability to record, store, and transmit data regarding all

aspects of:

(1) The BOP control system;

(2) The well's fluid handling systems on the rig; and

(3) The well's downhole conditions as monitored by a downhole sensing system, when such a system is installed.

(b) During well operations, you must immediately transmit the data identified in paragraph (a) of this section to a designated onshore location where it must be stored and monitored by qualified personnel who have the capability for continuous contact with rig personnel and who have the authority, in consultation with rig personnel, to initiate any necessary action in response to abnormal data or events. Prior to well operations, you must notify BSEE where the data will be monitored during those operations, and you must make the data available to BSEE, including in real time, upon request. After well operations, you must store the data at a designated location for recordkeeping purposes as required in §§ 250.466 and 250.467.

10. Add new undesignated centered heading "ADDITIONAL ARCTIC OCS REQUIREMENTS" and §§ 250.470 through 250.473 in Subpart D to read as follows:

ADDITIONAL ARCTIC OCS REQUIREMENTS

§ 250.470 What additional information must I submit with my APD for Arctic OCS exploratory drilling operations?

In addition to all other applicable requirements included in this Part, you must provide with your APD all of the following information pertaining to your proposed Arctic OCS exploratory drilling:

(a) A detailed description of:

(1) the environmental, and meteorologic and oceanic conditions you expect to encounter at

the well site(s);

(2) how your equipment, materials, and drilling unit will be prepared for service in the conditions in (a)(1) of this section, and how your drilling unit will be in compliance with the requirements of § 250.417 of this Part.

(b) A detailed description of all operations necessary in Arctic OCS Conditions to transition the rig from being under way to conducting drilling operations and from ending drilling operations to being under way, as well as any anticipated repair and maintenance plans for the drilling unit and equipment. The description should include, but not be limited to:

(1) recovering the subsea equipment, including the marine riser and the lower marine riser package;

(2) recovering the BOP;

(3) recovering the auxiliary sub-sea controls and template;

(4) laying down the drill pipe and securing the drill pipe and marine riser;

(5) securing the drilling equipment;

(6) transferring the fluids for transport or disposal;

(7) securing ancillary equipment like the draw works and lines;

(8) refueling or transferring fuel;

(9) offloading waste;

(10) recovering the ROVs;

(11) picking up the oil spill prevention booms and equipment; and

(12) offloading the drilling crew.

(c) Well-specific drilling objectives, timelines, and updated contingency plans for temporary abandonment of the well, including but not limited to the following:

(1) When you will spud the particular well (*i.e.*, begin drilling operations at the well site) identified in the APD;

(2) How long you will take to drill the well;

(3) Anticipated depths and geologic targets, with timelines;

(4) When you expect to set and cement each string of casing;

(5) When and how you would log the well;

(6) Your plans to test the well;

(7) When and how you intend to abandon the well, including specifically addressing your plans for how to move the rig off location and how you will meet the requirements of § 250.402(c);

(8) A description of what equipment and vessels will be involved in the process of temporarily abandoning the well due to ice; and

(9) An explanation of how these elements will be integrated into your overall program.

(d) A detailed description of your weather and ice forecasting capability for all phases of the drilling operation, including:

(1) how you will ensure continuous awareness of potential weather and ice hazards at, and during transition between, wells;

(2) your plans for managing ice hazards and responding to weather events; and

(3) verification that you have the capabilities described in your BOEM-approved EP.

(e) A detailed description of how you will comply with the requirements of § 250.472 of this part.

(f) A statement that you own, or have a contract with a provider for, source control and containment equipment (SCCE) that is capable of controlling and/or containing a worst case discharge, as described in your BOEM-approved EP, when proposing to use a MODU to conduct

exploratory drilling operations on the Arctic OCS. The following information must be included in your SCCE submittal:

(1) A detailed description of your or your contractor's SCCE capabilities, including operating assumptions and limitations, reflecting that you have access to, and the ability to deploy in accordance with § 250.471, all SCCE necessary to regain control of the well, including the ability to evaluate the performance of the well design to determine how a full shut-in can be achieved without having reservoir fluids discharged into the environment;

(2) An inventory of the local and regional SCCE, supplies, and services that you own or for which you have a contract with a provider. You must identify each supplier of such equipment and services and provide their locations and telephone numbers;

(3) Where applicable, proof of contracts or membership agreements with cooperatives, service providers, or other contractors that will provide you with the necessary SCCE or related supplies and services if you do not possess them. The contract or membership agreement must include provisions for ensuring the availability of the personnel and/or equipment on a 24-hour per day basis while you are drilling below or working below the surface casing;

(4) A detailed description of the procedures for inspecting, testing, and maintaining your SCCE; and

(5) A detailed description of your plan to ensure that all members of your operating team who are responsible for operating the SCCE have received the necessary training to deploy and operate such equipment in Arctic OCS Conditions and demonstrate ongoing proficiency in source control operations. You must also identify and include the dates of prior and planned training.

(g) Where it does not conflict with other requirements of this Subpart, and except as provided

below, you must comply with the requirements of API RP 2N, Third Edition "Planning, Designing, and Constructing Structures and Pipelines for Arctic Conditions" (incorporated by reference as specified in § 250.198), and provide a detailed description of how you will utilize the best practices included in API RP 2N during your exploratory drilling operations. You are not required to incorporate the following sections of API RP 2N into your drilling operations:

(1) Sections 6.6.3 through 6.6.4;

(2) The foundation recommendations in Section 8.4;

(3) Section 9.6;

(4) The recommendations for permanently moored systems in Section 9.7;

(5) The recommendations for pile foundations in Section 9.10;

(6) Section 12;

(7) Section 13.2.1;

(8) Sections 13.8.1.1, 13.8.2.1, 13.8.2.2, 13.8.2.4 through 13.8.2.7;

(9) Sections 13.9.1, 13.9.2, 13.9.4 through 13.9.8;

(10) Sections 14 through 16; and

(11) Section 18.

§ 250.471 What are the requirements for Arctic OCS source control and containment?

You must meet the following requirements for all exploration wells drilled on the Arctic OCS:

(a) If you use a MODU when drilling below or working below the surface casing, you must have access to:

(1) A capping stack, positioned to ensure that it will arrive at the well location within 24 hours after a loss of well control and can be deployed as directed by the Regional Supervisor

pursuant to paragraph (h) of this section;

(2) A cap and flow system, positioned to ensure that it will arrive at the well location within 7 days after a loss of well control and can be deployed as directed by the Regional Supervisor pursuant to paragraph (h) of this section. The cap and flow system must be designed to capture at least the amount of hydrocarbons equivalent to the calculated worst case discharge rate referenced in your BOEM-approved EP; and

(3) A containment dome, positioned to ensure that it will arrive at the well location within 7 days after a loss of well control and can be deployed as directed by the Regional Supervisor pursuant to paragraph (g) of this section. The containment dome must have the capacity to pump fluids without relying on buoyancy.

(b) You must conduct a monthly stump test of dry-stored capping stacks. If you use a pre-positioned capping stack, you must conduct a stump test prior to each installation on each well.

(c) As required by § 250.465(a), if you propose to change your well design, you must submit an APM. For Arctic OCS operations, your APM must include a reevaluation of your SCCE capabilities for any new WCD rate, and a demonstration that your SCCE capabilities will meet the criteria in § 250.470(f) under the changed well design.

(d) You must conduct tests or exercises of your SCCE, including deployment of your SCCE, when directed by the Regional Supervisor.

(e) You must maintain records pertaining to testing, inspection, and maintenance of your SCCE for at least 10 years and make the records available to any authorized BSEE representative upon request.

(f) You must maintain records pertaining to the use of your SCCE during testing, training, and deployment activities for at least 3 years and make the records available to any authorized

BSEE representative upon request.

(g) Upon a loss of well control, you must initiate transit of all SCCE identified in paragraph (a) of this section to the well.

(h) You must deploy and use SCCE when directed by the Regional Supervisor.

§ 250.472 What are the relief rig requirements for the Arctic OCS?

(a) In the event of a loss of well control, the Regional Supervisor may direct you to drill a relief well using the relief rig described in your APD. Your relief rig must comply with all other requirements of this Part for drilling operations, and it must be able to drill a relief well under anticipated Arctic OCS Conditions.

(b) When you are drilling below or working below the surface casing during Arctic OCS exploratory drilling operations, you must have access to a relief rig, different from your primary drilling rig, staged in a location such that it can arrive on site, drill a relief well, kill and abandon the original well, and abandon the relief well prior to expected seasonal ice encroachment at the drill site, but no later than 45 days after the loss of well control.

(c) Operators may request approval of alternative compliance measures to the relief rig requirement in accordance with § 250.141.

§ 250.473 What must I do to protect health, safety, property, and the environment while operating on the Arctic OCS?

In addition to the requirements set forth in § 250.107, when conducting exploratory drilling operations on the Arctic OCS, you must protect health, safety, property, and the environment by using the following:

(a) Equipment and materials that are rated or de-rated for service under conditions that can be reasonably expected during your operations; and

(b) Measures to address human factors associated with weather conditions that can be reasonably expected during your operations including, but not limited to, provision of proper attire and equipment, construction of protected work spaces, and management of shifts.

11. Revise § 250.1920 by:

a. Amending paragraphs (b)(5), (c), and (d), by adding a new last sentence, and

b. Adding new paragraphs (e) and (f) to read as follows:

§ 250.1920 What are the auditing requirements for my SEMS program?

* * * * *

(b) * * *

(5) * * * For exploratory drilling operations taking place on the Arctic OCS, you must conduct an audit, consisting of an onshore portion and an offshore portion, including all related infrastructure, once per year for every year in which drilling is conducted.

* * * * *

(c) * * * For exploratory drilling operations taking place on the Arctic OCS, you must submit an audit report of the audit findings, observations, deficiencies and conclusions for the onshore portion of your audit no later than March 1 in any year in which you plan to drill, and for the offshore portion of your audit, within 30 days of the close of the audit.

(d) * * * For exploratory drilling operations taking place on the Arctic OCS, you must provide BSEE with a copy of your CAP for addressing deficiencies or nonconformities identified in the onshore portion of the audit no later than March 1 in any year in which you plan to drill, and for the offshore portion of your audit, within 30 days of the close of the audit.

(e) For exploratory drilling operations taking place on the Arctic OCS, during the offshore portion of each audit, 100 percent of the facilities operated must be audited while drilling

activities are underway. The offshore portion of the audit for each facility must be started and closed within 30 days after the first spudding of the well or entry into an existing wellbore for any purpose from that facility.

(f) For exploratory drilling operations taking place on the Arctic OCS, if BSEE determines that the CAP or progress toward implementing the CAP is not satisfactory, BSEE may order you to shut down all or part of your operations.

PART 254 – OIL-SPILL RESPONSE REQUIREMENTS FOR FACILITIES LOCATED SEAWARD OF THE COAST LINE

12. The authority citation for 30 CFR Part 254 continues to read as follows:

Authority: 33 U.S.C. 1321.

13. Amend § 254.6 by:

a. Revising the definition of "Adverse weather conditions,"

b. Adding a new definition for "Arctic OCS" in alphabetical order, and

c. Adding a new definition for "Ice intervention practices" in alphabetical order.

§ 254.6 Definitions.

* * * * *

Adverse weather conditions means, for the purposes of this Part, weather conditions found in the operating area that make it difficult for response equipment and personnel to clean up or remove spilled oil or hazardous substances. These conditions include, but are not limited to: fog, inhospitable water and air temperatures, wind, sea ice, extreme cold, freezing spray, snow, currents, sea states, and extended periods of low light. Adverse weather conditions do not refer to conditions under which it would be dangerous or impossible to respond to a spill, such as a hurricane.

Arctic OCS means the Beaufort Sea and Chukchi Sea Planning Areas, as described in the Proposed Final OCS Oil and Gas Leasing Program for 2012-2017 (June 2012).

* * * * *

Ice intervention practices means the equipment, vessels, and procedures used to increase oil encounter rates and the effectiveness of spill response techniques and equipment when sea ice is present.

* * * * *

14. Add § 254.55 to Subpart D to read as follows:

§ 254.55 Spill response plans for facilities located in Alaska State waters seaward of the coast line in the Chukchi and Beaufort Seas.

Response plans for facilities conducting exploratory drilling operations from a MODU seaward of the coast line in Alaska State waters in the Chukchi and Beaufort Seas must follow the requirements contained within Subpart E -- Oil Spill Response Requirements for Facilities Located on the Arctic OCS, in addition to the other requirements of this subpart. Such response plans must address how the source control procedures selected to comply with State law will be integrated into the planning, training, and exercise requirements of §§ 254.70(a), 254.90(a), and 254.90(c) in the event that the proposed operations do not incorporate the capping stack, cap and flow system, containment dome, and/or other similar subsea and surface devices and equipment and vessels referenced in those Sections.

15. Add new Subpart E to read as follows:

Subpart E—Oil-Spill Response Requirements for Facilities Located on the Arctic OCS

§ 254.65 Purpose.

This subpart describes the additional requirements for preparing spill response plans and maintaining oil spill preparedness for facilities conducting exploratory drilling operations from a

MODU on the Arctic OCS.

§§ 254.66 through 254.69 [Reserved]

§ 254.70 What are the additional requirements for facilities conducting exploratory drilling from a MODU on the Arctic OCS?

In addition to meeting the applicable requirements of this Part, your response plan must:

(a) Describe how the relevant personnel, equipment, materials, and support vessels associated with the capping stack, cap and flow system, containment dome, and other similar subsea and surface devices and equipment and vessels will be integrated into oil spill response incident action planning;

(b) Describe how you will address human factors, such as cold stress and cold related conditions, associated with oil spill response activities in adverse weather conditions and their impacts on decision-making and health and safety; and

(c) Undergo plan-holder review prior to handling, storing, or transporting oil in connection with seasonal exploratory drilling activities, and all resulting modifications must be submitted to the Regional Supervisor. If this review does not result in modifications, you must inform the Regional Supervisor in writing that there are no changes. The requirements of this subsection are in lieu of the requirements in § 254.30(a).

§§ 254.71 through 254.79 [Reserved]

§ 254.80 What additional information must I include in the "Emergency response action plan" section for facilities conducting exploratory drilling from a MODU on the Arctic OCS?

In addition to the requirements in § 254.23, you must include the following information in the emergency response action plan section of your response plan:

(a) A description of your ice intervention practices and how they will improve the effectiveness of the oil spill response options and strategies that are listed in your OSRP in the presence of sea ice. When developing the ice intervention practices for your oil spill response plan, you must consider, at a minimum, the use of specialized tactics, modified response equipment, ice management assist vessels, and technologies for the identification, tracking, containment and removal of oil in ice.

(b) On areas of the Arctic OCS where a planned shore-based response would not satisfy § 254.1(a):

(1) A list of all resources required to ensure an effective offshore-based response capable of operating in adverse weather conditions. This list must include a description of how you will ensure the shortest possible transit times, including but not limited to establishing an offshore resource management capability (*e.g.*, sea-based staging, maintenance, and berthing logistics); and

(2) A list and description of logistics resupply chains, including waste management, that effectively factor in the remote and limited infrastructure that exists in the Arctic and ensure you can adequately sustain all oil spill response activities for the duration of the response. The components of the logistics supply chain include, but are not limited to:

(i) personnel and equipment transport services;

(ii) airfields and types of aircraft that can be supported;

(iii) capabilities to mobilize supplies (*e.g.*, response equipment, fuel, food, fresh water) and personnel to the response sites;

(iv) onshore staging areas, storage areas that may be used en route to staging areas, and camp facilities to support response personnel conducting offshore, nearshore and shoreline

response; and

(v) management of recovered fluid and contaminated debris and response materials (*e.g.*, oiled sorbents), as well as waste streams generated at offshore and on-shore support facilities (*e.g.*, sewage, food, and medical).

(c) A description of the system you will use to maintain real-time location tracking for all response resources while operating, transiting, or staging/maintaining such resources during a spill response.

§§ 254.81 through 254.89 [Reserved]

§ 254.90 What are the additional requirements for exercises of your response personnel and equipment for facilities conducting exploratory drilling from a MODU on the Arctic OCS?

In addition to the requirements in § 254.42, the following requirements apply to exercises for your response personnel and equipment for facilities conducting exploratory drilling from a MODU on the Arctic OCS:

(a) You must incorporate the personnel, materials, and equipment identified in § 254.70(a), the safe working practices identified in § 254.70(b), the ice intervention practices described in § 254.80(a), the offshore-based response requirements in § 254.80(b), and the resource tracking requirements in § 254.80(c) into your spill-response training and exercise activities.

(b) For each season in which you plan to conduct exploratory drilling operations from a MODU on the Arctic OCS, you must notify the Regional Supervisor 60 days prior to handling, storing, or transporting oil.

(c) After the Regional Supervisor receives notice pursuant to § 254.90(b), the Regional Supervisor may direct you to deploy and operate your spill response equipment and/or your capping stack, cap and flow system, and containment dome, and other similar subsea and surface

devices and equipment and vessels, as part of announced or unannounced exercises or compliance inspections. For the purposes of this section, spill response equipment does not include the use of blowout preventers, diverters, heavy weight mud to kill the well, relief wells, or other similar conventional well control options.

PART 550—OIL AND GAS AND SULPHUR OPERATIONS IN THE OUTER CONTINENTAL SHELF

16. The authority citation for 30 CFR Part 550 continues to read as follows:

Authority: 30 U.S.C. 1751; 31 U.S.C. 9701; 43 U.S.C. 1334

17. Revise § 550.105 by adding new definitions for "Arctic OCS" and "Arctic OCS Conditions" in alphabetical order.

§ 550.105 Definitions.

* * * * *

Arctic OCS means the Beaufort Sea and Chukchi Sea Planning Areas, as described in the Proposed Final OCS Oil and Gas Leasing Program for 2012-2017 (June 2012).

Arctic OCS Conditions means, for the purposes of this Part, the conditions operators can reasonably expect during operations on the Arctic OCS. Such conditions, depending on the time of year, include, but are not limited to: extreme cold, freezing spray, snow, extended periods of low light, strong winds, dense fog, sea ice, strong currents, and dangerous sea states. Remote location, relative lack of infrastructure, and the existence of subsistence hunting and fishing areas are also characteristic of the Arctic region.

* * * * *

18. Revise § 550.200 paragraph (a) by adding the term "IOP" in alphabetical order:

§ 550.200 Definitions.

* * * * *

(a) * * *

IOP means Integrated Operations Plan.

* * * * *

19. Add a new § 550.204 to read as follows:

§ 550.204 When must I submit my IOP for proposed Arctic exploratory drilling operations and what must the IOP include?

If you propose exploratory drilling activities on the Arctic OCS, you must submit an Integrated Operations Plan (IOP) to the Regional Supervisor at least 90 days prior to filing your EP. Your IOP must describe how your exploratory drilling program will be designed and conducted in an integrated manner suitable for Arctic OCS Conditions and include the following information:

(a) Information describing how all vessels and equipment will be designed, built, and/or modified to account for Arctic OCS Conditions;

(b) A schedule of your exploratory drilling program, including contractor work on critical components of your program;

(c) A description of your mobilization and demobilization operations, including tow plans suitable for Arctic OCS Conditions, as well as your general maintenance schedule for vessels and equipment;

(d) A description of your exploratory drilling program objectives and timelines for each objective, including general plans for abandonment of the well(s), such as:

(1) contingency plans for temporary abandonment in the event of ice encroachment at the drill site;

(2) plans for permanent abandonment; and

(3) plans for temporary seasonal abandonment;

(e) A description of your weather and ice forecasting capabilities for all phases of the exploration program, including a description of how you would respond to and manage ice hazards and weather events;

(f) A description of work to be performed by contractors supporting your exploration drilling program (including mobilization and demobilization), including:

(1) How such work will be designed or modified to account for Arctic OCS Conditions; and

(2) Your concepts for contractor management, oversight, and risk management.

(g) A description of how you will ensure operational safety while working in Arctic OCS Conditions, including but not limited to:

(1) The safety principles that you intend to apply to yourself and your contractors;

(2) The accountability structure within your organization for implementing such principles;

(3) How you will communicate such principles to your employees and contractors; and

(4) How you will determine successful implementation of such principles.

(h) Information regarding your preparations and plans for staging of oil spill response assets;

(i) A description of your efforts to minimize impacts of your exploratory drilling operations on local community infrastructure, including but not limited to housing, energy supplies, and services; and

(j) A description of whether and to what extent your project will rely on local community workforce and spill cleanup response capacity.

20. Replace § 550.206 with the following:

§550.206 How do I submit the IOP, EP, DPP, or DOCD?

(a) *Number of copies.* When you submit an IOP, EP, DPP, or DOCD to BOEM, you must provide:

(1) Four copies that contain all required information (proprietary copies);

(2) Eight copies for public distribution (public information copies) that omit information that you assert is exempt from disclosure under the Freedom of Information Act (FOIA) (5 U.S.C. 552) and the implementing regulations (43 CFR part 2); and

(3) Any additional copies that may be necessary to facilitate review of the IOP, EP, DPP, or DOCD by certain affected States and other reviewing entities.

(b) *Electronic submission.* You may submit part or all of your IOP, EP, DPP, or DOCD and its accompanying information electronically. If you prefer to submit your IOP, EP, DPP, or DOCD electronically, ask the Regional Supervisor for further guidance.

(c) *Withdrawal after submission.* You may withdraw your proposed IOP, EP, DPP, or DOCD at any time for any reason. Notify the appropriate BOEM OCS Region if you do.

21. Amend § 550.220 by:

a. Revising paragraph (a), and

b. Adding a new paragraph (c).

§ 550.220 If I propose activities in the Alaska OCS Region, what planning information must accompany the EP?

* * * * *

(a) *Emergency Plans.* A description of your emergency plans to respond to a fire, explosion, personnel evacuation, or loss of well control, as well as a loss or disablement of a drilling unit, and loss of or damage to a support vessel, offshore vehicle, or aircraft.

* * * * *

(c) If you propose exploration activities on the Arctic OCS, the following planning information must also accompany your EP:

(1) *Suitability for Arctic OCS Conditions*. A description of how your exploratory drilling activities will be designed and conducted in a manner suitable for Arctic OCS Conditions and how such activities will be managed and overseen as an integrated endeavor.

(2) *Ice and weather management*. A description of your weather and ice forecasting and management plans for all phases of your exploratory drilling activities, including:

(i) A description of how you will respond to and manage ice hazards and weather events;

(ii) Your ice and weather alert procedures;

(iii) Your procedures and thresholds for activating your ice and weather management system(s); and

(iv) Confirmation that you will operate ice and weather management and alert systems continuously throughout the planned operations, including mobilization and demobilization operations to and from the Arctic OCS.

(3) *Source Control and Containment Equipment Capabilities.* A general description of how you will comply with § 250.471 of this Title.

(4) *Deployment of a relief well rig.* A general description of how you will comply with § 250.472 of this Title, including a description of the relief well rig, the anticipated staging area of the relief well rig, an estimate of the time it would take for the relief well rig to arrive at the site of a loss of well control, how you would drill a relief well if necessary, and the approximate timeframe to complete relief well operations.

(5) *Resource-sharing.* Any agreements you have with third parties for the sharing of assets or the provision of mutual aid in the event of an oil spill or other emergency.

(6) *Anticipated end of seasonal operations dates.* Your projected end of season dates, and the information used to identify those dates, for:

(i) the completion of on-site operations, which is contingent upon your capability in terms of equipment and procedures to manage and mitigate risks associated with Arctic OCS Conditions; and

(ii) the termination of drilling operations into zones capable of flowing liquid hydrocarbons to the surface consistent with the relief rig planning requirements under § 250.472 of this Title and with your estimated timeframe under paragraph (c)(4) of this section for completion of relief well operations.

Appendix B. Level of Effect Definitions

This section defines and explains the levels of effect used in the EA to evaluate potential environmental impacts of the PAA. Impacts are described in terms of frequency, duration, general scope, and/or size and intensity. Each level considers such factors as the nature of the impact, the spatial extent, recovery times, and the effects of mitigation. The following definitions and explanations are from the source document (USDOI, BOEM, Alaska OCS Region, 2011-b), which is incorporated by reference, except for the explanation of lower trophics, which is from the following source document: USDOI, BOEM, Alaska OCS Region, 2011-a. Aspects of the effects analyses are incorporated by reference from these documents.

Air Quality

Negligible

- Emission rates would be less than 100 tons per year for volatile organic compounds (VOCs) and all pollutants regulated under the NAAQS, and, if applicable, the Alaska AAQS.

Minor

- Emission rates would be equal to or greater than 100 tons per year for VOCs and all pollutants regulated under the NAAQS, and, if applicable, the Alaska AAQS.

Moderate

- Project-related emissions, such as from exploration drilling, cause pollutant concentrations of at least one pollutant to exceed one-half of the Prevention of Significant Deterioration maximum allowable increases; or project-related emissions cause pollutant concentrations of at least one pollutant to exceed one-half of the NAAQS, and, if applicable, the Alaska AAQS; or
- Increases in emissions of nitrogen oxides (NO_x) and VOCs would result in the formation of ozone to a level that would be expected to exceed one-half the ozone NAAQS.

Major

- Impact to the shoreline would be above the significance levels defined in 40 CFR 51.165(b)(2) for any criteria pollutant; or
- Increases in emissions of NO_x and VOCs would result in the formation of ozone to a level that would be expected to equal or exceed the ozone NAAQS.

Water Quality

Negligible

- Temporary and localized impacts to water quality that do not cause an “unreasonable degradation” under 40 CFR 125.122.

Minor

- Long-term and/or widespread impacts to water quality that do not cause an "unreasonable degradation" under 40 CFR 125.122

Moderate

- Impacts to water quality that exceed NPDES permit criteria or cause a temporary or localized "unreasonable degradation" under 40 CFR 125.122.

Major

- Impacts to water quality that cause long-term and widespread "unreasonable degradation" under 40 CFR 125.122.

Coastal, Benthic, and Pelagic Habitats

Negligible

- No measurable impacts. Population-level effects are not detectable.
- Localized, short-term disturbance or habitat effect experienced during one season that is not to accumulate across multiple seasons.
- No population-level impacts to reproductive success or recruitment are anticipated.
- Mitigation measures are implemented fully and effectively or are not necessary.

Minor

- Population-level effects are not detectable.
- Widespread annual or chronic disturbances or habitat effects are not anticipated to accumulate across one year, or localized effects that are anticipated to persist for more than one year.
- Mitigation measures may be implemented on some, but not all, impacting activities, indicating that some adverse effects are avoidable.
- Unmitigatable or unavoidable adverse effects are short term and localized.

Moderate

- Disturbances could occur, but not on a scale resulting in population-level effects.
- Widespread annual or chronic disturbances or habitat effects could persist for more than one year and up to a decade.

Major

- Disturbances occur that result in measurable population-level effects.
- Widespread seasonal, chronic, or effects from subsequent seasons are cumulative and are likely to persist for more than one decade.
- Mitigation measures are implemented only for a small portion of similar impacting activities, but more widespread implementation for similar activities could be more effective in reducing the level of avoidable adverse effects.

- Unmitigatable or unavoidable adverse effects are widespread and long lasting.

Lower Trophics

All levels of effects are the same as for marine benthic and pelagic habitats.

Fish and EFH

Negligible

- Negligible for fish and EFH are the same as negligible for marine benthic and pelagic habitats.

Minor

- Population-level effects are not detectable. Temporary, nonlethal adverse effects to some individuals.
- Widespread annual or chronic disturbances or habitat effects not anticipated to accumulate across one year, or localized effects that are anticipated to persist for more than one year.
- Low mortality levels may occur, measurable in terms of individuals or less than 1 percent of the local post-breeding fish populations.
- Mitigation measures may be implemented on some, but not all, impacting activities, indicating that some adverse effects are avoidable.
- Unmitigatable or unavoidable adverse effects are short term and localized.

Moderate

- Mortalities or disturbances could occur, but not on a scale resulting in population-level effects.
- Widespread annual or chronic disturbances or habitat effects could persist for more than one year and up to a decade.
- Some mortality could occur but remains limited to a number of individuals insufficient to produce population-level effects.
- Widespread implementation of mitigation measures for similar activities may be effective in reducing the level of avoidable adverse effects.

Major

- Same as for marine benthic and pelagic habitats.

Marine and Coastal Birds

Negligible

- Localized short-term disturbance or habitat effect experienced during one season that is not anticipated to accumulate across one year.
- No mortality is anticipated.
- Mitigation measures implemented fully and effectively or are not necessary.

Minor

- Widespread annual or chronic disturbances or habitat effects not anticipated to accumulate across one year, or localized effects that are anticipated to persist for more than one year.
- Anticipated or potential mortality is estimated or measured in terms of individuals or less than 1 percent of the local post-breeding population.
- Mitigation measures are implemented on some, but not all, impacting activities, indicating that some adverse effects are avoidable.
- Unmitigatable or unavoidable adverse effects are short term and localized.

Moderate

- Widespread annual or chronic disturbances or habitat effects anticipated to persist for more than one year, but less than a decade.

Major

- Widespread annual or chronic disturbance or habitat effect experienced during one season that would be anticipated to persist for a decade or longer.
- Anticipated or potential mortality is estimated or measured in terms of hundreds or thousands of individuals or less than 10 percent of the local post-breeding population, which could result in a long-term population-level effect.
- Mitigation measures are implemented for limited activities, but more widespread implementation for similar activities would be effective in reducing the level of avoidable adverse effects.
- Unmitigatable or unavoidable adverse effects are widespread and long lasting.

Marine Mammals

Negligible

- Localized, short-term disturbance or habitat effect experienced during one season that is not anticipated to accumulate across multiple seasons. Temporary, nonlethal adverse effects to a few individuals are possible.
- May cause brief behavioral reactions such as temporary avoidances of or deflections around an area.
- No mortality or population-level effects are anticipated.
- May affect an endangered or threatened species or critical habitat under the ESA.
- Mitigation measures are implemented fully and effectively or are not necessary.
- Unmitigatable or unavoidable adverse effects are difficult to measure or observe.

Minor

- Localized disturbance or habitat effects experienced during one season may accumulate across subsequent seasons, but not over one year.
- Temporary, nonlethal adverse effects to some individuals.
- May cause behavioral reactions such as avoidances of or deflections around a localized area.
- Mortality or population-level effects are not anticipated.
- May adversely affect an endangered or threatened species or critical habitat under the ESA.

- Mitigation measures are fully implemented or are not necessary.
- Unmitigatable or unavoidable adverse effects are short term and localized.

Moderate
- Widespread annual or chronic disturbances or habitat effects could persist for more than one year and up to a decade.
- Mortalities or disturbances could occur, but would be below the estimated Potential Biological Removal. Population-level effects are not anticipated.
- Likely to adversely affect an endangered or threatened species or modify critical habitat under the ESA.
- Widespread implementation of mitigation measures for similar activities may be effective in reducing the level of avoidable adverse effects.
- Unmitigatable or unavoidable adverse effects are short term and widespread or long term and localized.

Major
- Widespread seasonal or chronic effects from subsequent seasons are cumulative and are likely to persist for more than one decade.
- Mortalities or disturbances could occur at or above the estimated Potential Biological Removal, which could be a population-level effect.
- May adversely affect an endangered or threatened species or critical habitat under the ESA, but would not necessarily jeopardize the continued existence of an ESA-listed species.
- Mitigation measures are implemented only for a small portion of similar impacting activities, but more widespread implementation for similar activities could be more effective in reducing the level of avoidable adverse effects.
- Unmitigatable or unavoidable adverse effects are widespread and long lasting.

Sociocultural Systems

Negligible
- Periodic disruption of social organization, cultural values, and/or institutional arrangements occurs without displacement of existing social patterns.

Minor
- Disruption of social organization, cultural values, and/or institutional arrangement occurs for a period of less than one year, without a tendency toward displacement of existing social patterns.

Moderate
- Chronic disruption of social organization, cultural values, and/or institutional arrangements occurs for a period of more than one year, without a tendency toward displacement of existing social patterns.

Major

- Disruption of social organization, cultural values, and/or institutional arrangements with a tendency toward displacement of existing social patterns.

Subsistence

Negligible

- Subsistence resources could be periodically affected with no apparent effect on subsistence harvests.

Minor

- Adverse impacts to subsistence activities are of an accidental and/or incidental nature and limited to a short term.

Moderate

- Adverse impacts which disrupt subsistence activities, or make subsistence resources unavailable, undesirable for use, or only available in greatly reduced numbers, for a substantial portion of a subsistence season for any community.

Major

- Adverse impacts resulting in one or more important subsistence resources becoming unavailable, undesirable for use, or available only in greatly reduced numbers for any community.

The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Bureau of Ocean Energy Management Mission

As a bureau of the Department of the Interior, the Bureau of Ocean Energy Management's (BOEM) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS) in an environmentally sound and safe manner.

The Bureau of Safety and Environmental Enforcement

BSEE works to promote safety, protect the environment, and conserve resources offshore through vigorous regulatory oversight and enforcement.