

Outer Continental Shelf Oil and Gas Leasing Program: 2012-2017

Draft Programmatic Environmental Impact Statement

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Outer Continental Shelf Oil and Gas Leasing Program: 2012-2017

Draft Programmatic Environmental Impact Statement

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ABBREVIATIONS AND ACRONYMS

| | | |
|----|-----------------|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | ACSAR | Atlantic continental slope and rise |
| 5 | ABC | American Bird Conservancy |
| 6 | ABM | Alabama beach mouse |
| 7 | ACC | Arctic Coastal Current |
| 8 | ACIA | Arctic Climate Impact Assessment |
| 9 | ACP | Arctic Coastal Plain |
| 10 | ADCED | Alaska Department of Community and Economic Development |
| 11 | ADEC | Alaska Department of Environmental Conservation |
| 12 | ADF&G | Alaska Department of Fish and Game |
| 13 | ADNR | Alaska Department of Natural Resources |
| 14 | AEB | Aleutian East Borough |
| 15 | AEWC | Alaska Eskimo Whaling Commission |
| 16 | AFB | Air Force Base |
| 17 | AFN | Alaskan Federation of Natives |
| 18 | AHTS | anchor handling towing supply |
| 19 | Alaska OHA | Alaska Office of History and Archaeology |
| 20 | AMMP | adaptive mitigation and management plan |
| 21 | ANCSA | <i>Alaska Native Claims Settlement Act</i> of 1971 |
| 22 | ANILCA | Alaska National Interest Lands Conservation Act |
| 23 | ANIMIDA | Arctic Nearshore Impact Monitoring in Development Area |
| 24 | ANSC | Aleutian North Slope Current |
| 25 | ANWR | Arctic National Wildlife Refuge |
| 26 | AO | Arctic Oscillation |
| 27 | | |
| 28 | BBB | Bristol Bay Borough |
| 29 | Bbbl | billion barrels |
| 30 | bbl | barrels |
| 31 | bbl/yr | barrels per year |
| 32 | BBO | billion barrels of oil |
| 33 | BBOE | billion barrels of oil equivalent |
| 34 | Bcf | billion cubic feet |
| 35 | BCNP | Big Cypress National Preserve |
| 36 | BLM | Bureau of Land Management (USDOJ) |
| 37 | BNWR | Breton National Wildlife Refuge |
| 38 | B.P. | before present |
| 39 | bpd | barrels per day |
| 40 | BSAI | Bering Sea and Aleutian Islands, Alaska |
| 41 | BTEX | benzene, toluene, ethylbenzene & xylene |
| 42 | BPXA | British Petroleum (Exploration) Alaska |
| 43 | | |
| 44 | °C | degrees Centigrade |
| 45 | ¹⁴ C | carbon-14 |
| 46 | CAA | Clean Air Act or conflict avoidance agreement |

| | | |
|----|-----------------|---|
| 1 | CAH | Central Arctic Herd |
| 2 | CBM | Choctawhatchee beach mouse |
| 3 | CEC | Commission on Environmental Cooperation |
| 4 | CEI | Coastal Environments, Inc. |
| 5 | CEQ | Council on Environmental Quality |
| 6 | CER | categorical exclusion review |
| 7 | CFC | chlorofluorocarbons |
| 8 | CFR | Code of Federal Regulations |
| 9 | CH ₄ | methane |
| 10 | CIAP | Coastal Impact Assistance Program |
| 11 | CIRI | Cook Inlet Region, Inc. |
| 12 | cm | centimeter |
| 13 | CMP | coastal management program |
| 14 | cm/s | centimeter per second |
| 15 | CMSP | Coastal and Marine Spatial Planning |
| 16 | CO | carbon monoxide |
| 17 | CO ₂ | carbon dioxide |
| 18 | COE | Corps of Engineers (U.S. Army) |
| 19 | CPUE | catch per unit effort |
| 20 | CVI | coastal vulnerability index |
| 21 | CWA | Clean Water Act |
| 22 | CWPPRA | Coastal Wetlands Planning, Protection, and Restoration Act |
| 23 | CZM | Coastal Zone Management |
| 24 | CZMA | Coastal Zone Management Act |
| 25 | | |
| 26 | dB | decibel |
| 27 | dB re 1 μPa-m | dB referenced to 1 micropascal within 1 meter of the source |
| 28 | DDT | dichlorodiphenyltrichloroethane |
| 29 | DHHS | Department of Health and Human Services |
| 30 | DIN | dissolved inorganic nitrogen |
| 31 | DIP | dissolved inorganic phosphorus |
| 32 | DLP | defense of life and property |
| 33 | DOSS | dioctylsulfosuccinate |
| 34 | DPnB | dipropylene glycol n-butyl ether |
| 35 | DPS | distinct population segment |
| 36 | DTNP | Dry Tortugas National Preserve |
| 37 | DWH | Deepwater Horizon |
| 38 | DWH oil spill | Deepwater Horizon MC252 Spill of National Significance |
| 39 | | |
| 40 | E&D | exploration and development |
| 41 | EA | environmental assessment |
| 42 | ECOS | Environmental Conservation Online System |
| 43 | EDA | estuarine drainage area |
| 44 | EEZ | Exclusive Economic Zone |
| 45 | EFH | essential fisheries habitat |
| 46 | EIA | economic impact area |

| | | |
|----|------------------|---|
| 1 | EIS | environmental impact statement |
| 2 | EJ | environmental justice |
| 3 | ENP | Everglades National Park |
| 4 | ENSO | El Niño-Southern Oscillation |
| 5 | EO | Executive Order |
| 6 | ERS | Economic Research Service (USDOA) |
| 7 | ESA | Endangered Species Act |
| 8 | ESI | Environmental Sensitivity Index |
| 9 | | |
| 10 | °F | degrees Fahrenheit |
| 11 | FAD | fish aggregation device |
| 12 | FCMA | Fishery Conservation and Management Act of 1976 |
| 13 | FDA | fluvial drainage area |
| 14 | FEMA | Federal Emergency Management Agency |
| 15 | FGBNMS | Flower Garden Banks National Marine Sanctuary |
| 16 | FKNMS | Florida Keys National Marine Sanctuary |
| 17 | FLM | Federal land manager |
| 18 | FMC | fishery management council |
| 19 | FMP | fishery management plan |
| 20 | FOSC | Federal On-Scene Coordinator |
| 21 | FPSO | floating production, storage, and offloading |
| 22 | FR | Federal Register |
| 23 | FS | Forest Service (USDOA) |
| 24 | FSB | Federal Subsistence Board |
| 25 | FWPCA | Federal Water Pollution Control Act |
| 26 | FWS | Fish and Wildlife Service (USDOJ) |
| 27 | | |
| 28 | GCCF | Gulf Coast Claims Facility |
| 29 | GINS | Gulf Island National Seashore |
| 30 | GMFMC | Gulf of Mexico Fishery Management Council |
| 31 | GOA | Gulf of Alaska |
| 32 | GOM | Gulf of Mexico |
| 33 | GRS | geographic response strategy |
| 34 | GSA | Geographic Society of America |
| 35 | GWP | global warming potential |
| 36 | | |
| 37 | H ₂ S | hydrogen sulfide |
| 38 | ha | hectare |
| 39 | HAPC | habitat area of particular concern |
| 40 | HCA | Habitat Conservation Area |
| 41 | HDDC | high density deepwater communities |
| 42 | HIA | Health Impact Assessment |
| 43 | HPA | Habitat Protection Area |
| 44 | Hz | hertz |
| 45 | | |
| 46 | | |

| | | |
|----|---------------------|---|
| 1 | IBA | Important Bird Area |
| 2 | IPCC | Intergovernmental Panel on Climate Change |
| 3 | IPHC | International Pacific Halibut Commission |
| 4 | IUCN | International Union Conservation Network |
| 5 | IWC | International Whaling Commission |
| 6 | | |
| 7 | kHz | kilohertz |
| 8 | KIB | Kodiak Island Borough |
| 9 | km | kilometer |
| 10 | km ² | square kilometer |
| 11 | km/hr | kilometers per hour |
| 12 | KPB | Kenai Peninsula Borough |
| 13 | kwh | kilowatt hours |
| 14 | | |
| 15 | lb | pounds |
| 16 | LCI | Lower Cook Inlet |
| 17 | LMA | Labor Market Area |
| 18 | LME | Large Marine Ecoregion |
| 19 | LNG | liquefied natural gas |
| 20 | LPB | Lake and Peninsula Borough |
| 21 | LRRS | Long-Range Radar Site |
| 22 | LSU CMI | Louisiana State University Coastal Marine Institute |
| 23 | LCWCRTF | Louisiana Coastal Wetlands Conservation and Restoration Task Force |
| 24 | | |
| 25 | m | meter |
| 26 | m ³ | cubic meter |
| 27 | m ³ /s | cubic meter per second |
| 28 | m/s | meters per second |
| 29 | m/yr | meters per year |
| 30 | MAFLA | Mississippi, Alabama, and Florida |
| 31 | MAG-PLAN | MMS Alaska-GOM Modeling Using IMPLAN |
| 32 | MARPOL | International Convention for the Prevention of Pollution from Ships |
| 33 | Mbbl | million barrels |
| 34 | MCF | million cubic feet |
| 35 | mg/kg | milligrams per kilogram |
| 36 | mg/L | milligrams per liter |
| 37 | mi ² | square miles |
| 38 | mi ² /yr | square miles per year |
| 39 | ML | Richter low magnitude |
| 40 | mL | milliliters per liter |
| 41 | MMbbl | million barrels |
| 42 | MMPA | Marine Mammal Protection Act |
| 43 | MMS | Minerals Management Service (USDOJ) |
| 44 | MODU | mobile offshore drilling unit |
| 45 | MPA | Marine Protected Area |
| 46 | mph | miles per hour |

| | | |
|----|------------------|--|
| 1 | MPPRCA | Marine Plastic Pollution Research and Control Act |
| 2 | MPRSA | Marine Protection Research and Sanctuaries Act |
| 3 | MRFSS | Marine Recreational Fisheries Statistics Survey (NMFS) |
| 4 | MSA | metropolitan statistical area |
| 5 | MSP | marine spatial planning |
| 6 | M _w | moment magnitude |
| 7 | | |
| 8 | NAAQS | National Ambient Air Quality Standards |
| 9 | NAFTA | North Atlantic Free Trade Agreement |
| 10 | NAO | North Atlantic Oscillation |
| 11 | NASA | National Aeronautics and Space Administration |
| 12 | NAST | National Assessment Synthesis Team |
| 13 | NDBC | National Data Buoy Center |
| 14 | NEPA | National Environmental Policy Act |
| 15 | NGL | natural gas liquid |
| 16 | NGO | non-governmental organization |
| 17 | NHPA | National Historic Preservation Act |
| 18 | NIC | National Incident Command |
| 19 | NM | nautical miles |
| 20 | NMFS | National Marine Fisheries Service (USDOC, NOAA) |
| 21 | N ₂ O | nitrous oxide |
| 22 | NO ₂ | nitrogen dioxide |
| 23 | NO _x | nitrogen oxide |
| 24 | NOAA | National Oceanic and Atmospheric Administration (USDOC) |
| 25 | NOC | National Ocean Council |
| 26 | NORM | naturally occurring radioactive material |
| 27 | NO _x | nitrogen oxides |
| 28 | NP | National Park |
| 29 | NPDES | National Pollutant Discharge Elimination System |
| 30 | NPFMC | North Pacific Fishery Management Council |
| 31 | NPR–A | National Petroleum Reserve–Alaska |
| 32 | NRDA | Natural Resource Damage Assessment |
| 33 | NRDC | National Resources Defense Council |
| 34 | NRHP | <i>National Register of Historic Places</i> |
| 35 | NPS | National Park Service (USDOJ) |
| 36 | NRC | National Research Council |
| 37 | NSB | North Slope Borough |
| 38 | NSRE | National Survey on Recreation and the Environment (NOAA) |
| 39 | NTL | Notice to Lessees |
| 40 | NWA | national wilderness area |
| 41 | NWR | national wildlife refuge |
| 42 | NWS | National Weather Service |
| 43 | | |
| 44 | O&G | oil and gas |
| 45 | O ₃ | ozone |

| | | |
|----|-------------------|---|
| 1 | OBIS-SEAMAP | Ocean Biogeographic Information System-Spatial Ecological Analysis of |
| 2 | | Megavertebrate Populations |
| 3 | OBM | oil-based mud |
| 4 | OCD | Offshore and Coastal Dispersion Model |
| 5 | OCS | Outer Continental Shelf |
| 6 | OCSLA | Outer Continental Shelf Lands Act |
| 7 | OECM | Offshore Environmental Cost Model |
| 8 | OPA 90 | Oil Pollution Act of 1990 |
| 9 | OPAREA | (military) operating area |
| 10 | OSAT | Operational Science Advisory Team of the Unified Area Command |
| 11 | OSRF | oil-spill financial responsibility |
| 12 | OSV | offshore supply vessel |
| 13 | | |
| 14 | PAH | polyaromatic hydrocarbons |
| 15 | Pb | lead |
| 16 | PCB | polychlorinated biphenyl |
| 17 | PCH | Porcupine Caribou Herd |
| 18 | PCPI | per capita personal income |
| 19 | PDO | Pacific Decadal Oscillation |
| 20 | PEIS | programmatic environmental impact statement |
| 21 | PICES | North Pacific Marine Science Organization |
| 22 | PINS | Padre Island National Seashore |
| 23 | PKBM | Perdido Key beach mouse |
| 24 | PM | particulate matter |
| 25 | PM ₁₀ | particulate matter less than 10 microns in diameter |
| 26 | PM _{2.5} | fine particulates less than 2.5 microns in diameter |
| 27 | ppb | parts per billion |
| 28 | ppm | parts per million |
| 29 | ppt | parts per thousand |
| 30 | PSD | Prevention of Significant Deterioration |
| 31 | | |
| 32 | RCRA | Resource Conservation and Recovery Act |
| 33 | ROD | record of decision |
| 34 | ROP | required operating procedure |
| 35 | ROW | right-of-way |
| 36 | | |
| 37 | SAAQS | State Ambient Air Quality Standards |
| 38 | SABM | St. Andrew's beach mouse |
| 39 | SBF | synthetic-based drill fluids |
| 40 | SCAT | Shoreline Cleanup Assessment Team |
| 41 | SEED | Shelf Energetics and Exchange Dynamics |
| 42 | SIP | State Implementation Plan |
| 43 | SMB | synthetic-based muds |
| 44 | SO ₂ | sulfur dioxide |
| 45 | SO _x | sulfur oxides |
| 46 | SST | sea-surface temperature |

| | | |
|----|--------------------------|--|
| 1 | SSDC | single steel drilling caisson |
| 2 | SUA | Special Use Airspace |
| 3 | SUSIO | State University System of Florida Institute of Oceanography |
| 4 | | |
| 5 | t | metric ton (tonne) |
| 6 | TAPS | Trans-Alaska Pipeline System |
| 7 | Tbbl | trillion barrels |
| 8 | tcf | trillion cubic feet |
| 9 | TcfG | trillion cubic feet of gas |
| 10 | TcfGE | trillion cubic feet of gas equivalent |
| 11 | TEIA | Transboundary Environmental Impact Assessment |
| 12 | TERA | Troy Ecological Research Associates |
| 13 | Tg | teragram |
| 14 | TLH | Teshekpuk Lake Herd |
| 15 | TMDL | total maximum daily load |
| 16 | TLSA | Teshekpuk Lake Special Area |
| 17 | TT/E | Ten Thousand Islands/Everglades Unit |
| 18 | | |
| 19 | UCI | Upper Cook Inlet |
| 20 | $\mu\text{g}/\text{m}^3$ | micrograms per cubic meter |
| 21 | μm | micrometer |
| 22 | UNEP | United Nations Environment Programme |
| 23 | μPa | microPascal |
| 24 | $\mu\text{Pa-m}$ | microPascal at 1 meter |
| 25 | USCG | U.S. Coast Guard |
| 26 | USDOC | U.S. Department of Commerce |
| 27 | USDOD | U.S. Department of Defense |
| 28 | USDOE | U.S. Department of Energy |
| 29 | USDOI | U.S. Department of the Interior |
| 30 | USDOT | U.S. Department of Transportation |
| 31 | USEPA | U.S. Environmental Protection Agency |
| 32 | USFWS | U.S. Fish and Wildlife Service |
| 33 | USGS | U.S. Geological Survey (USDOI) |
| 34 | | |
| 35 | VLOS | very large oil spill |
| 36 | VOC | volatile organic compound |
| 37 | | |
| 38 | WA | Wilderness Area |
| 39 | WAH | Western Arctic Herd |
| 40 | WBF | water-based fluid |
| 41 | WBM | water-based muds |
| 42 | WEA | Wind Energy Area |
| 43 | | |
| 44 | yd^3 | cubic yards |
| 45 | | |

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SUMMARY

The Proposed Action

The U.S. Department of the Interior (USDOJ) proposes 15 lease sales in six of the Outer Continental Shelf (OCS) Planning Areas in the Gulf of Mexico (GOM) and offshore Alaska during the period 2012-2017 (Table S-1). Five area-wide lease sales each would be held in the Central and Western GOM Planning Areas, with one to two lease sales in the extreme western portion of the Eastern GOM Planning Area. Scheduled in the Alaska Region would be one sale with two whaling deferrals in the Beaufort Sea Planning Area, one sale with a 40 km (25 mi) buffer in the Chukchi Sea Planning Area, and one special interest sale in the Cook Inlet Planning Area. No lease sales are proposed off the U.S. east and west coasts. The proposed Program establishes a schedule that the USDOJ will use as a basis for considering where and when leasing might be appropriate over a 5-year period (Table S-1). A decision to adopt the Program proposal is not a decision to issue specific leases or to authorize any drilling or development.

Oil and gas activities may occur on OCS leases after a lease sale pursuant to the proposed action, and these activities may extend over a period of 40 to 50 years. These activities may include (1) seismic surveys; (2) drilling oil and natural gas exploration and production wells; (3) installation and operation of offshore platforms and pipelines, onshore pipelines, and support facilities; and (4) transporting oil using ships or pipelines.

TABLE S-1 Proposed 2012-2017 Program Lease Sale Schedule

| OCS Planning Area | Proposed Lease Sale Year |
|------------------------|--------------------------------|
| Western Gulf of Mexico | Annual sales beginning in 2012 |
| Central Gulf of Mexico | Annual sales beginning in 2013 |
| Eastern Gulf of Mexico | 2014, 2016 |
| Cook Inlet | 2013 |
| Chukchi Sea | 2016 |
| Beaufort Sea | 2015 |

Alternatives

Seven alternatives to the Proposed Action Alternative (Alternative 1) are evaluated in this draft programmatic environmental impact statement (PEIS). Each alternative represents a reduction from the proposed action, differing only in which planning areas (and associated number of lease sales) would be included for possible future lease offerings under the 2012-2017 OCS Oil and Gas Leasing Program (Program).

- 1 • Alternative 2 – Exclude the Eastern GOM Planning Area for the duration of
2 the Program. Leasing in the other five planning areas would be the same as
3 Alternative 1.
4
- 5 • Alternative 3 – Exclude the Western GOM Planning Area for the duration of
6 Program. Leasing in the other five planning areas would be the same as
7 Alternative 1.
8
- 9 • Alternative 4 – Exclude the Central GOM Planning Area for the duration of
10 the Program. Leasing in the other planning areas would be the same as
11 Alternative 1.
12
- 13 • Alternative 5 – Exclude the Beaufort Sea Planning Area for the duration of the
14 Program. Leasing in the other planning areas would be the same as
15 Alternative 1.
16
- 17 • Alternative 6 – Exclude the Chukchi Sea Planning Area for the duration of the
18 Program. Leasing in the other planning areas would be the same as
19 Alternative 1.
20
- 21 • Alternative 7 – Exclude the Cook Inlet Planning Area for the duration of the
22 Program. Leasing in the other planning areas would be the same as
23 Alternative 1.
24
- 25 • Alternative 8 – No Action. No lease sales would be conducted in any OCS
26 Planning Area during the period 2012-2017. Exploration, development, and
27 production activities would continue on blocks leased previously.
28
29

30 **Principal Issues and Concerns**

31
32 ***Risks of Oil Spills.*** Major regulatory reforms and advances in drilling and containment
33 technology have occurred following the Deepwater Horizon event, reducing the risk of oil spills
34 from OCS operations. The greatest concern related to oil and gas development following lease
35 sales under any of the alternatives addressed in this draft PEIS is that of an accidental oil spill.
36 The magnitude of effects from an accidental spill will depend on the location, timing, and
37 volume of the spill; the environmental setting of the spill (e.g., restricted coastal waterway,
38 deepwater pelagic location); and the species (and their ecology) exposed to the spill. Spill
39 cleanup operations could result in short-term disturbance of fauna in the vicinity of cleanup
40 activities.
41

42 Evaluating historical spill data and taking into account the amount of oil production
43 anticipated to occur with development following leasing, spill scenarios were developed for the
44 northern GOM, Cook Inlet, Beaufort Sea, and Chukchi Sea Planning Areas. Most expected
45 spills would be less than 50 bbl in size, and impacts to most resources from such small spills
46 would be minor, as dispersion and natural processes would be expected to quickly disperse and

1 degrade the spill, limiting exposure of, and effects to, resources in the vicinity of the spill. In
2 contrast, a large spill may be expected to affect more resources, do so over a much larger area
3 and for a much longer period of time, and result in potentially major impacts. For analytical
4 purposes, the draft PEIS presents analyses of the effects of varying sizes of oil spills on sensitive
5 resources.
6

7 While this analysis provides the Secretary of the USDOJ with information about the
8 potential impacts if spills were to occur and contact environmental resources, the analyses cannot
9 predict whether, when, or where specific oil spills will occur or whether any spills will contact
10 environmental resources. The draft PEIS does estimate the number of possible small and large
11 oil spills based on historical oil-spill data, which is independent from the severity of oil-spill
12 impacts.
13

14 In all program areas, the analyses considered the occurrence of at least one very large,
15 catastrophic spill event, even if the amounts of oil estimated to be developed suggest the
16 occurrence of such a spill unlikely. The analyses of these spills does not mean the USDOJ
17 expects such a catastrophic event to occur under any of the action alternatives considered in this
18 draft PEIS; rather, the analyses identify potential impacts to resources, should such a catastrophic
19 discharge event occur, even if it is unlikely that such an event would occur.
20

21 ***Impact-Producing Factors.*** It is important to note that establishing a schedule of lease
22 sales by itself will have no direct effects on most resources on the OCS, as the activities that
23 could impact resources would only occur following a lease sale, and then only following
24 approval for exploration and development to be initiated in the lease sale area. Because the
25 nature, location, and level of future project-specific oil and gas activities is unknown at this time,
26 the environmental analyses presented in this draft PEIS are based on reasoned assumptions about
27 future activities, and apply to each of the seven action alternatives under consideration for the
28 Program. Estimates of oil and gas resources that might be found in, and produced from, the
29 areas being considered for leasing provide the basis for making the assumption of the level of
30 development that might occur. Each scenario contains the major elements of activity needed to
31 support exploration, production, and transportation of oil and gas that may be discovered and
32 found to be economically producible.
33

34 Several types of routine oil and gas activities were identified that could cause impacts
35 under the proposed action or alternatives (excluding the No Action Alternative) following
36 subsequent lease sale, plan, or permit considerations. None of the action alternatives, if
37 implemented, would authorize oil and gas development activities. These activities were,
38 however, evaluated in the draft PEIS in resource-specific analyses to provide decision makers
39 with information regarding the nature and magnitude of potential impacts that may be incurred
40 with development following a lease sale under any of the seven action alternatives. Location-
41 and resource-specific impacts would be evaluated in subsequent lease sale and plan-specific
42 National Environmental Policy Act (NEPA) analyses and decision-making. The impact-
43 producing factors related to routine OCS activities and evaluated in this draft PEIS include:
44

- 1 • The disposal of liquid wastes, including drilling fluids (i.e., drill muds),
2 produced water, ballast water, and sanitary and domestic wastewater
3 generated by OCS-related activities.
4
- 5 • Solid waste disposal, including material removed from the well borehole
6 (i.e., drill cuttings), solids produced with the oil and gas (e.g., sands), cement
7 residue, bentonite, and trash and debris (e.g., equipment or tools) accidentally
8 lost.
9
- 10 • Gaseous emissions from offshore and onshore facilities and transportation
11 vessels and aircraft.
12
- 13 • Noise from seismic surveys, ship and aircraft traffic, pipeline trenching,
14 drilling and production operations, and explosive platform removals.
15
- 16 • Physical impacts from ship and aircraft traffic and use conflicts with oil
17 tankers and barges, supply/support vessels and aircraft, and seismic survey
18 vessels and aircraft.
19
- 20 • Physical emplacement, presence, and removal of facilities including offshore
21 platforms; seafloor pipelines; floating production, storage, and offloading
22 systems; onshore infrastructure such as pipelines, storage, processing, and
23 repair facilities; ports; pipe coating yards; refineries; and petrochemical plants.
24

25 In addition, accidental oil spills were also considered an impacting factor, although not resulting
26 from routine operations. Accidental spills may be associated with a loss of well control,
27 production accidents, transportation failures (e.g., tankers, other vessels, seafloor and onshore
28 pipelines, and storage facilities), and low-level releases from platforms.
29
30

31 **Sensitive Biological and Ecological Resources and Critical Habitats**

32

33 The Program encompasses large areas in the GOM and portions of Alaska. These areas
34 constitute diverse marine and coastal environments that support a tremendous diversity of
35 habitats and biota, including species and habitats protected by the Endangered Species Act and
36 other Federal and State laws and regulations. At this programmatic stage, it is not possible, or
37 appropriate, to conduct site-specific analyses of all the potentially affected resources or identify
38 all relevant mitigation. Therefore, in keeping with NEPA and Council on Environmental Quality
39 regulations, the draft PEIS focuses on those aspects of marine and coastal resources that are
40 unique, ecologically important, or most susceptible to impacts from offshore oil and gas
41 activities. The draft PEIS also concentrates on those life stages and habitats that may be most
42 sensitive to routine oil and gas activities, as well as to accidental oil spills.
43

44 The identification and evaluation of potential impacts focused on three main categories:
45 animals, plants, and habitats. Among the animal groups evaluated were marine mammals, birds,
46 fish, sea turtles, and benthic invertebrates. Special attention was drawn to migratory species,

1 species taken commercially and for Alaska Native subsistence (including whales, fish, and
2 birds), and threatened and endangered species. With respect to habitats, both marine (i.e., corals
3 and “hard bottom” areas) and coastal (i.e., estuaries, wetlands/marshes) areas were identified and
4 evaluated for possible adverse impacts from OCS oil and gas activities.
5
6

7 **Social, Cultural, and Economic Resources**

8

9 Specific concerns regarding social, cultural, and economic resources included potential
10 impacts on tourism, recreation, commercial and recreational fishing, subsistence harvests,
11 aesthetics, local economy (especially the “boom/bust” phenomenon), land and water use
12 conflicts, disproportionate impacts on low income and minority groups, and disproportionate
13 impacts on Alaska Natives. The social, cultural, and economic topics analyzed in the draft PEIS
14 are as follows:
15

- 16 • Population, employment, income, and public service issues from the effects of
17 the Program, including issues of “boom/bust” economic cycles.
18
- 19 • Land use and infrastructure, including construction of new onshore facilities,
20 and land use and transportation conflicts between the oil and gas activities and
21 other uses.
22
- 23 • Sociocultural systems effects, including concerns about the effects on
24 subsistence (e.g., bowhead whale hunting), loss of cultural identity, health
25 impacts including psychological health, and social cost of oil spills.
26
- 27 • Environmental justice (e.g., the potential for disproportionate and high
28 adverse impacts on minority and/or low-income populations [Executive
29 Order 12898]).
30
- 31 • Commercial and recreational fisheries.
32
- 33 • Tourism and recreation, including the use of coastal areas for sightseeing,
34 wildlife observations, swimming, diving, surfing, sunbathing, hunting, fishing,
35 boating, and visual impacts of offshore OCS structures.
36
- 37 • Archaeological resources, including historic shipwrecks and sites inhabited by
38 humans during prehistoric times.
39
40

41 **Climate Change**

42

43 The draft PEIS considers how climate change, based on the observed changes that have
44 been occurring during the past several decades, may affect baseline conditions of resources over
45 the 40 to 50 year period during which oil and gas production could occur following lease sales
46 under the Program. The effects of climate change on ecosystems are complex and non-uniform

1 across the globe and vary among atmospheric, terrestrial, and oceanic systems. Considerations
2 of climate change effects in OCS Planning Areas focus on impacts to marine and coastal systems
3 where environmental sensitivities are typically associated with increasing atmospheric and ocean
4 temperatures, sea level rise, and ocean acidification. These general categories of climate change
5 responses are occurring in addition to human-induced pressures related to coastal population
6 densities (e.g., land use changes, pollution, overfishing) and trends of increasing human use of
7 coastal areas. The draft PEIS presents resource-specific discussions of the affected environment
8 with discussions of the effects of ongoing, observable climate changes for those resources. In
9 addition, the impacts of the continuing trend in climate change during the life of the Program are
10 evaluated as well.

13 **Conclusions**

15 The analyses in this draft PEIS describe in detail the nature and extent of potential
16 impacts of future oil and gas activities on the OCS that may occur under the proposed action or
17 any of the action alternatives. Specifically, the draft PEIS evaluates the potential direct, indirect,
18 and cumulative impacts of routine operations and accidental oil spills. The analyses assume the
19 implementation of all mitigation measures currently required by statute, regulation, or Bureau of
20 Ocean Energy Management (BOEM) policy and practice. One objective of the draft PEIS is to
21 convey to decision makers and the public the relative extent of potential impacts. Conclusions
22 for most analyses generally indicate the ability of most affected resources to recover from
23 impacts that could result from oil and gas development following leasing.

25 Under the proposed action, or Alternatives 2 through 7, routine operations associated
26 with each of these phases will have the same or similar impact-producing factors associated with
27 them, and these have “typical” types of impacts, regardless of location. The magnitude and
28 importance of those impacts on the resource, however, will be very site- and project-specific.
29 The types of impacts identified and discussed below will be the same for each of the alternatives
30 except the No Action Alternative. The principal difference in potential impacts among the action
31 alternatives will be in where those impacts may be incurred. Each of the alternatives to the
32 proposed action excludes one of the six planning areas included in the proposed action from the
33 Program, and thus most resources in an excluded planning area would not be expected to be
34 affected by routine operations occurring in other planning areas. Because routine operations
35 include some impacting factors (such as seismic survey noise and support vessel traffic) that may
36 extend beyond planning area boundaries, resources in an excluded planning area may be affected
37 by some of the routine operations associated with development in adjacent planning areas.
38 Similarly, accidental oil spills may be transported from the planning area in which the spill
39 occurs to adjacent planning areas, affecting resources in those other areas.

41 The evaluation of a No Action Alternative is required by the regulations implementing
42 NEPA (40 CFR 1502.14(d)). If the Secretary were to adopt this alternative, it would halt OCS
43 presale planning, sales, and new leasing from 2012 to 2017. However, exploration,
44 development, and production stemming from past sales would continue.

1 **Water Quality**

2
3 In the GOM and Alaska Planning Areas, routine operations could result in minor to
4 moderate, localized, short-term impacts. Any such impacts would be associated with structure
5 placement and construction (pipelines, platforms) and operational discharges (produced water,
6 bilge water, and drill cuttings) and sanitary and domestic wastes. Structure placement and
7 removal could increase suspended sediment loads, while operational discharges, sanitary and
8 domestic wastes, and deck drainage could affect chemical water quality. Compliance with
9 National Pollutant Discharge Elimination System (NPDES) permit requirements, and U.S. Coast
10 Guard (USGS) regulations would reduce most impacts of routine operations.

11
12 The effects of accidental oil spills will depend upon the material spilled, spill size,
13 location, and remediation activities. Small spills would likely result in short-term, localized
14 impacts. Impacts from a large oil spill could persist for an extended period of time if oil were
15 deposited in wetland and beach sediments or low-energy environments because of potential
16 remobilization. The speed of natural recovery in Alaskan waters, as compared to GOM waters,
17 could be slowed by the persistence of oil in cold water temperatures and ice cover. A very large
18 oil spill (especially one associated with a catastrophic discharge event [CDE]) would affect water
19 quality over a much larger area, including possibly in planning areas adjacent to the one where
20 the spill occurs. The potential for more widespread and long-term water quality impacts may be
21 expected to be greater in cold Alaskan waters, especially under ice-cover conditions. In Alaska,
22 winter conditions (e.g., complete ice cover and extremely cold conditions) could substantially
23 complicate spill response given current spill control and remediation technologies.

24 25 26 **Air Quality**

27
28 Routine operations affecting air quality in the GOM and Alaska Planning Areas include
29 emissions from construction equipment, machinery supporting production operations,
30 helicopters, and ships. Only minor impacts to air quality are expected under any of the action
31 alternatives. Emissions during routine operations under any of the action alternatives would
32 cause some slight, localized increases in concentrations of nitrogen dioxide (NO₂), sulfur dioxide
33 (SO₂), particulate matter less than 10 or 2.5 microns in diameter (PM₁₀ and PM_{2.5}, respectively),
34 and carbon monoxide (CO) in the Planning Areas where such activities would occur.
35 Concentrations would be well within the U.S. Environmental Protection Agency (USEPA)
36 national ambient air quality standards (NAAQS) and the Prevention of Significant Deterioration
37 (PSD) increments. Increases in ozone may occur, but would be less than 1% of total
38 concentrations. Air quality impacts from oil spills and *in situ* burning would be localized and of
39 short duration. Overall, impacts from routine operations, oil spills, and spill response activities
40 are expected to be minor.

41 42 43 **Acoustic Environment**

44
45 Routine operations in the GOM and Alaska OCS Planning Areas could affect ambient
46 noise conditions, with impacts to ambient noise levels expected to be minor. Noise generating

1 sources associated with routine operations include seismic surveys, drilling and production,
2 infrastructure placement and removal, and vessel traffic. Depending on the source and activity,
3 changes in ambient noise levels could be short-term and localized (e.g., from vessel traffic),
4 long-term and localized (from production), or short-term and less localized (from seismic
5 surveys). Seismic surveys could result in short-term changes in ambient noise levels, but the
6 changes could extend well beyond the survey boundary.

9 **Marine and Coastal Habitats**

11 ***Coastal and Estuarine Habitats.*** Under any of the action alternatives, coastal and
12 estuarine habitats could incur minor to moderate impacts from routine operations such as
13 pipeline landfall and construction, maintenance dredging of inlets and channels, and vessel
14 traffic. Coastal and estuarine habitats could be disturbed by activities such as pipeline trenching
15 and onshore facility construction. Shoreline habitats may also be affected by wake-induced
16 erosion during routine dredging activities or ship traffic. Habitats potentially affected would
17 include coastal dunes, wetlands, and barrier islands. The magnitude of these impacts would
18 depend on the location of the construction activities, the level of dredging or shipping activity in
19 a specific area, and existing environmental conditions (such as ongoing shoreline degradation).

21 Coastal and estuarine habitats could also be affected by accidental oil spills. The
22 magnitude of potential impacts to coastal and estuarine habitats will depend on a variety of
23 factors, including the location, size, timing, and duration of the spill, the effectiveness of
24 remediation efforts, existing environmental conditions (e.g., vegetation, substrate type, ice
25 cover), and natural localized erosion and deposition patterns. The effects of small spill would be
26 very localized and relatively short-term. In the event of a large spill or a CDE, habitats over a
27 much greater geographic area may be affected, and may incur more severe impacts where oil is
28 concentrated. In some cases, habitats such as coastal wetlands may not fully recover even
29 following remediation.

31 ***Marine Benthic Habitats.*** Impacts from routine OCS oil and gas activities could result
32 from the construction and removal of infrastructure (wells, platforms, pipelines), vessel traffic,
33 and permitted operational discharges. Construction activities which involve the physical
34 disturbance of the seafloor will result in moderate impacts to benthic habitats within and
35 immediately adjacent to the disturbance footprint. In most cases, disturbed soft-bottom habitats
36 would recover. Protective measures, currently required at the lease sale phase through lease
37 stipulations, exist for seafloor habitats such as live bottom and pinnacle trend areas in the GOM.
38 These measures would help to reduce potential impacts on both nearshore and deeper-water
39 habitats.

41 Accidental oil spills could affect benthic habitats, and result in minor to moderate impacts
42 to affected habitats. The magnitude of these impacts would depend upon the location, size,
43 timing and duration of the spill; weather conditions; effectiveness of containment and cleanup
44 operations; and other environmental conditions at the time of the spill. Impacts from small spills
45 would be mostly localized and minor. However, if a large spill or a CDE at the seafloor

1 (i.e., from a wellhead or a pipeline) were to occur, a greater amount of habitat could be affected.
2 As a consequence, full recovery of oiled habitats could take many years in some locations.
3

4 ***Marine Pelagic Habitats.*** Overall, no permanent degradation of pelagic habitat is
5 anticipated and impacts would be negligible to minor in the GOM and Alaska Planning Areas.
6 During routine operations (including routine discharges), marine pelagic habitats could be
7 affected as a result of increased turbidity associated with bottom-disturbing activities, and from
8 operational discharges such as produced water and drilling muds and cuttings. Impacts would be
9 largely localized and short-term in duration.
10

11 Small accidental spills may be expected to result in only minor, localized impacts on
12 pelagic habitats. The effects from oil spills would depend on the location, magnitude, duration,
13 and timing of the spill, on environmental factors (e.g., presence of sea ice, storms, ocean
14 currents), and on the habitats affected by the spill. Large spills or a CDE could reduce habitat
15 quality over a larger area, and result in moderate impacts to some habitats. In the GOM, oil
16 contacting *Sargassum* mats could result in complete or partial short-term loss of these unique
17 habitats in some areas and cause localized population-level impacts on associated biota. In
18 Alaska, accidental spills occurring under ice cover or in sea ice habitats could result in small, but
19 long-term impacts to pelagic habitats.
20

21 **Marine and Coastal Fauna**

22

23 ***Mammals.*** Impacts to marine mammals from routine operations include noise
24 disturbance from seismic surveys, vessels, helicopters, construction and operation of platforms,
25 and removal of platforms with explosives; potential collision with vessels; and exposures to
26 discharges and wastes. Impacts to cetaceans could range from negligible to moderate, with
27 species or stocks inhabiting continental shelf or shelf slope waters most likely to be affected. In
28 Alaska, if the disturbance results in the temporary abandonment of young by adults
29 (e.g., abandonment of pups in Steller's sea lion rookeries), survival of young may be reduced,
30 and moderate impacts to local populations may result. Collisions with OCS-related vessels could
31 also injure or kill some individuals, although the incidence of such collisions is expected to be
32 very low. Meeting the requirements of the Endangered Species Act (ESA) and Marine Mammal
33 Protection Act would reduce the likelihood and magnitude of adverse impacts from routine
34 operations to most marine mammal species. For terrestrial mammals, no impacts are expected
35 from routine operations in the GOM to endangered beach mice subspecies or the Florida salt
36 marsh vole. In Alaska, impacts to terrestrial mammals from routine operations would be
37 negligible to minor.
38

39
40 Accidental oil spills may result in the direct and indirect exposures of mammals and their
41 habitats to the oil. Fouling of fur of some species (e.g., sea otter and fur seal) could affect
42 thermoregulation and reduce survival, while ingestion of oil and oil-contaminated food could
43 have acute and chronic effects. The magnitude of effects from accidental spills will depend on
44 the location, magnitude, duration, timing, and volume of the spills; the habitats affected by the
45 spills (e.g., coastal habitats); and the species exposed. Spills in open waters may be expected to
46 affect the fewest number of individuals. Very large spills, such as a CDE, would affect the

1 greatest number of species and individuals, and have the greatest potential for adversely affecting
2 local mammal populations. In Alaska, the greatest risk to marine mammals would be associated
3 with large spills reaching rookeries and haulout locations where large numbers of individuals
4 could be exposed and population-level impacts on some species (especially the Steller's sea lion)
5 could occur. Overall, small spills would affect relatively few individuals, while large spills
6 could affect many more species, and in some cases (such as a CDE) result in local population-
7 level effects.

8
9 ***Marine and Coastal Birds.*** Routine operations may result in negligible to moderate,
10 localized, short-term impacts. Impacts would be associated primarily with infrastructure
11 construction, and ship and helicopter traffic. The primary effect would be disturbance of birds in
12 the immediate vicinity of the activity. In most cases, disturbed birds would temporarily leave the
13 area, while in other cases, the displacement could be long-term. Because many birds tend to
14 habituate to human activities and noise, potential impacts from disturbance may be short-term
15 and not expected to result in population-level effects. However, construction activities near
16 coastal habitats could disrupt breeding and nesting activities of colonial nesting birds.
17 Depending on the species, the numbers of birds affected, and the activity disturbed (nesting,
18 molting, feeding, staging), the displacement of disturbed birds could reduce reproductive
19 success, foraging success, and survival. Some collision mortality with offshore platforms would
20 be expected. Loss or alteration of preferred habitat due to pipeline landfalls or other onshore
21 construction could result in the displacement and possible decrease of nesting activities.

22
23 Accidental oil spills pose the greatest threat to marine and coastal birds. The magnitude
24 and ecological importance of any effects would depend upon the size, location, duration, and
25 timing of the spill; the species and life stages of the exposed birds; and the size of the local bird
26 population. Exposure to spills in deep water would be largely limited to pelagic birds. Shallow-
27 water spills that reach coastal habitats could affect the greatest variety and number of birds,
28 including shorebirds, waterfowl, wading birds, gulls, and terns. Spills reaching onshore
29 locations have the greatest potential for affecting the greatest number of birds, especially if a
30 spill occurs in or reaches an area where birds have congregated and are carrying out important
31 activities (such as nesting, molting, and staging areas for some of the Alaskan waterfowl and
32 shorebirds). Exposed birds may experience a variety of lethal or sublethal effects, and the
33 magnitude and ecological importance of any such effects would depend upon the size and
34 location of the spill, the species and life stage of the exposed birds, and the size of the local bird
35 population.

36 37 38 **Fish Resources and Essential Fish Habitat**

39
40 Overall, impacts to fish from routine Program activities are expected to range from
41 negligible to minor, and no impacts on threatened or endangered fish species are expected. The
42 primary potential impacts on fish communities from Program activities could result from seismic
43 surveys and bottom-disturbing activities such as drilling, platform placement and mooring, and
44 pipeline trenching and placement, which could displace, injure, or kill fish in the vicinity of the
45 activity. Fixed platforms, particularly the large number projected for the GOM, would also serve
46 as artificial reefs that would attract substantial numbers of fish. Oil and gas activities would be

1 temporary, and no permanent or population-level impacts on fish are expected. Displaced fish
2 and invertebrate food sources would repopulate the area over a short period of time in the GOM,
3 but fish habitat recovery may be long-term in Alaskan waters. The effects of drilling muds and
4 produced water discharge on fish would be localized, and no population-level effects are
5 expected. Drilling waste and produced water discharge would be far less in Alaska because
6 fewer wells would be drilled in Alaska and because it is assumed that drilling muds and cuttings
7 from production wells and all produced water would be reinjected into the wells.
8

9 Small spills would be localized and are unlikely to affect a substantial number of fish
10 before dilution and weathering would reduce concentrations of toxic fractions to nontoxic levels.
11 Large spills and a CDE would affect a wider area, with the magnitude of the impacts depending
12 on the location, timing, and volume of spills, distribution and ecology of affected fish species,
13 and other environmental factors. Most adult fish are highly mobile and would likely avoid lethal
14 hydrocarbon exposures, although they may be subjected to sublethal concentrations. Smaller
15 species and egg and larval life stages are more likely to suffer lethal or sublethal exposures from
16 oil contact because of their relative lack of mobility. Under most circumstances, any single large
17 spill would affect only a small proportion of a given fish population; therefore, overall
18 population levels may not be affected. However, fish species that currently have depressed
19 populations or have critical spawning grounds present in the affected area could experience
20 population-level impacts. Oil contacting shoreline areas used for spawning or providing habitat
21 for early life stages of fish could result in large-scale lethal and long-term sublethal effects on
22 fish. In Alaskan waters, where oil may be slow to break down, coastal oiling could measurably
23 depress some fish populations for several years. However, no permanent impacts on fish
24 populations are expected.
25
26

27 **Reptiles**

29 Five species of sea turtles occur in the three GOM Planning Areas: green, hawksbill,
30 Kemp's ridley, leatherback, and loggerhead, and all are listed as threatened or endangered under
31 the ESA. All but the hawksbill have been reported to nest on beaches within the GOM Planning
32 Areas. In addition to these turtles, the American crocodile, which is federally endangered,
33 occurs in the Eastern GOM Planning Area along the southern coast of Florida. Routine
34 operations in the GOM are not expected to affect the American crocodile. This species could be
35 affected in the event there is a very large oil spill that reaches the southern Florida coast. In such
36 an event, adults and young could be directly exposed, and nest sites could be fouled. No reptiles
37 occur in the Alaska OCS Planning Areas.
38

39 Impacts to reptiles from routine operations associated with the Program are expected to
40 range from minor to moderate. Sea turtles could be directly affected by seismic surveys, vessel
41 traffic, construction of offshore and onshore facilities, operational discharges, and removal of
42 platforms. Noise generated during exploration and production activities and platform removal
43 may result in the temporary disturbance of some individuals, while some turtles may be killed
44 during the use of underwater explosives for platform removal. The construction and operation of
45 new onshore facilities may impact nest sites, possibly result in eggs being crushed, and disturb
46 hatchling movement from the nest sites to the water. Sea turtles may also be injured or killed by

1 collisions with OCS vessels. Permit requirements, ESA regulations and requirements, regulatory
2 stipulations, and BOEM guidelines could limit the seriousness of any potential effects on sea
3 turtles. Therefore, while routine operations could affect individual sea turtles, population-level
4 impacts are not expected.

5
6 Oil spills may expose one or more sea turtle life stages to oil or its weathering products.
7 Oil reaching nests may reduce egg hatching and hatchling survival, and inhibit hatchling access
8 to water. Exposed hatchlings, juveniles, and adults may incur a variety of lethal or sublethal
9 effects. The presence of oil on nesting beaches may affect nest site access and use. Small spills
10 are unlikely to affect a large number of sea turtles or their habitats and thus are not expected to
11 have substantial or long-term effects. The magnitude of effects from accidental spills would
12 depend on the location, timing, duration, and volume of the spills; the environmental settings of
13 the spills; and the species and life stages of sea turtle exposed to the spills. A very large spill
14 could affect many more individuals and habitats, including nesting beaches, and potentially lead
15 to population-level effects.

16 17 18 **Invertebrates**

19
20 Routine operations could result in negligible to moderate impacts to invertebrates,
21 especially to benthic invertebrates. The primary impacts of routine Program activities would be
22 from bottom-disturbing activities during the exploration and site development phases. Routine
23 operations involving bottom disturbance (including pipeline trenching) could displace, bury,
24 injure, or kill invertebrates in the immediate vicinity of the activities. Affected invertebrate
25 communities would generally repopulate the disturbed areas over a short period of time
26 (especially soft-bottom communities), although a return to the pre-disturbance community may
27 take longer, particularly in the Arctic. If discharged into open water, the effects of drilling muds
28 and produced water on invertebrates would be localized and no population-level effects are
29 expected. No permanent or population-level impacts on invertebrates are expected from routine
30 operations following lease sales under any of the action alternatives.

31
32 Small surface or subsurface oil spills would be rapidly diluted and likely result in only
33 minor localized impacts on invertebrates. Large spills could affect a large number of benthic and
34 pelagic invertebrates and their habitats. The location, size, duration, and timing of the spill
35 would be important determinants of the impact magnitude of large spills. A large spill
36 contacting shoreline areas with sensitive intertidal and shallow subtidal habitats could result in
37 large-scale and long-term sublethal and lethal effects to the benthic communities in those
38 habitats. In Alaska, local populations of intertidal organisms affected by such large spills could
39 be measurably depressed for several years and oil could persist in shoreline sediments for
40 decades.

41 42 43 **Areas of Special Concern**

44
45 Impacts to Areas of Special Concern (AOCs) resulting from routine Program activities
46 are expected to be negligible to moderate because of the existing protections and use restrictions.

1 Routine operations that could affect AOCs (e.g., National Marine Sanctuaries, National Parks)
2 include the placement of structures, pipeline landfalls, operational discharges, and vessel traffic.
3 However, impacts from these activities are unlikely, as no infrastructure (e.g., pipeline landfalls,
4 shore bases) would be sited in National Parks, National Wildlife Refuges (NWRs), or other
5 AOCs. In Alaska, no OCS-related activities would occur in National Park lands, thereby
6 minimizing the potential for impacts from routine operations to these AOCs, and impacts from
7 routine activities in adjacent areas would be minimal. However, offshore construction of
8 pipelines and platforms could have temporary effects on wildlife due to noise and activity levels
9 and on scenic values for park visitors.

10
11 While an oil spill could affect AOCs, the magnitude of the potential impact would
12 depend on the location, size, duration, and timing of a spill; the weather conditions at the time of
13 the spill; the effectiveness of cleanup operations; and other environmental conditions
14 (e.g., presence of sea ice) at the time of the spill. Accidental oil spills reaching AOCs could
15 negatively affect fauna and habitats, subsistence use, commercial or recreational fisheries,
16 recreation and tourism, and other uses.

17 18 19 **Impacts on Population, Employment, and Regional Income**

20
21 The main effect on population and employment of routine operations that could result
22 following leasing will be the employment generated by routine Program activities. In the GOM,
23 direct expenditures associated with routine operations would result in negligible impacts from
24 small increases in population, employment, and income in each region over the duration of the
25 leasing period, corresponding to less than 1% of the baseline. In Alaska, direct expenditures
26 would result in minor impacts from small increases in population, employment, and income in
27 each region over the duration of the leasing period, corresponding to less than 5% of the
28 baseline. Given existing levels of leasing activity, impacts on property values in the GOM and
29 Alaska Planning Areas would be negligible. In planning areas where tourism and recreation
30 provide significant employment, accidental oil spills (especially a low probability CDE) could
31 result in the short-term loss of employment, income, and property values. Expenditures
32 associated with spill cleanup activities would create short-term employment and income in some
33 parts of the affected coastal region(s).

34 35 36 **Land Use and Infrastructure**

37
38 Routine Program activities would result in negligible to minor impacts in the GOM, and
39 minor to moderate impacts in Alaska, on land use, development patterns, and infrastructure. In
40 the GOM, existing infrastructure generally would be sufficient to handle exploration and
41 development associated with potential new leases. In Alaska, additional infrastructure would be
42 necessary to support Program development. Projected impacts in both the GOM and Alaska
43 from an accidental oil spill (especially from a low-probability CDE) would alter land use
44 temporarily but would not likely result in long-term changes. The magnitude of the impacts
45 would depend upon the location, size, timing, and duration of the spill and the existing land use
46 at the spill location.

1 **Commercial and Recreational Fisheries**

2
3 Following leasing, routine Program operations could have minor impacts on subsistence,
4 commercial, and recreational fisheries. Impacts would be associated primarily with vessel traffic
5 and structure placement, presence, and removal, each of which could temporarily drive fishes
6 away from the area and preclude fishing. However, these impacts would be temporary, and
7 population-level effects on commercial and recreational fishery resources are not anticipated
8 from these routine operations. Once platforms are installed and production activities begin,
9 offshore structures would act as fish attraction devices for both pelagic and reef-associated
10 species; these structures would also be attractive for recreational fishing. Seismic surveys and
11 construction of platforms and pipelines could result in space-use conflicts with commercial and
12 recreational fishing activities, although these effects would be localized. Space-use conflicts, in
13 the case of seismic surveys, would be short-duration.

14
15 The level of effects from accidental oil spills on subsistence, commercial, and
16 recreational fisheries would depend on the location, timing, duration, and volume of spills, in
17 addition to other environmental factors. Small spills are unlikely to have a large effect before
18 dilution and weathering reduces concentrations and, therefore, would not have long-term effects
19 on subsistence, commercial and recreational fisheries. If large oil spills were to occur,
20 subsistence, commercial, and recreational fisheries could be affected. The potential for oil-
21 soaked fishing gear and potentially contaminated fish may reduce commercial and recreational
22 fishing efforts and affect subsistence use of the resource. Very large spills could also indirectly
23 affect fisheries by degrading habitats that are critical for the survival of target species, but would
24 only be serious if they led to severe declines in target species' populations. Highly mobile fish
25 species (tunas, sharks, and billfish) could move away from surface oil spills in deep water,
26 disrupting fishing efforts.

27 28 29 **Tourism and Recreation**

30
31 Routine operations would have minor, short-term negative effects on recreation and
32 tourism, with potential adverse aesthetic impacts on beach recreation and sightseeing and
33 potential positive impacts on diving and recreational fishing in the GOM coast; sightseeing,
34 boating, fishing, and hiking activities in the Cook Inlet area; and sightseeing, hiking, and boating
35 activities in the Chukchi Sea and Beaufort Sea Planning Areas.

36
37 Potential impacts on recreation and tourism resulting from an oil spill in any of the
38 planning areas would likely include direct impacts (e.g., oil contamination of a beach), access
39 restrictions to a particular area (e.g., no diving or fishing while cleanup is being conducted), and
40 aesthetic impacts. These impacts could persist for several months or more pending cleanup
41 completion and any required habitat restoration. The extent of the impacts would depend on the
42 location, size, duration, and timing of the spill and on the effectiveness of cleanup operations.
43 Since oiled coastal sediments are often removed via mechanical means, such shoreline activity
44 would effectively close the area to public use for the duration of cleanup operations. If
45 restoration is required (i.e., to restore the proper beach profile), additional time may be required
46 before public access is allowed. Historical evidence pertinent to the effects of major oil spills

1 has indicated that spills may prompt either a seasonal decline in tourist visits and/or tourist
2 movement to other coastal areas in the region.
3
4

5 **Sociocultural Systems and Environmental Justice**

6

7 Impacts on sociocultural systems and environmental justice vary across OCS regions. In
8 the GOM and Cook Inlet, where sociocultural systems have a long experience with offshore oil
9 and gas operations, impacts on sociocultural systems would be few and impacts would be minor.
10 The greatest impacts on sociocultural systems in the GOM are expected to result from the
11 ongoing expansion of oil and gas activities in the GOM, especially in expansion to deepwater
12 and ultra-deepwater areas. This expansion of oil and gas activities has contributed to the cultural
13 heterogeneity of the area by drawing the offshore workforce from a wider geographic range.
14 Expansion to deepwater and ultra-deepwater areas has resulted in the creation of jobs that require
15 more specialized skills and in requiring longer, unbroken periods of work offshore. While there
16 is extensive onshore oil development in the vicinity of Prudhoe Bay, there is currently no OCS
17 oil and gas development in the Arctic. Thus, impacts to sociocultural systems from routine
18 Program operations may range from minor to major. Of greatest concern to the Alaska Natives
19 who inhabit the area are threats to their subsistence base and way of life. Noise from seismic
20 surveys and exploratory drilling has the potential to deflect whales and other marine mammals
21 from their accustomed migration routes, making them more difficult to harvest.
22

23 A large environmental justice concern is the potential health risk to residents from nearby
24 OCS-related infrastructure, including helipads, heliports, waste management facilities, pipe
25 coating yards, shipyards, platform fabrication yards, supply bases, natural gas storage facilities,
26 repair yards, refineries, port facilities, and terminals. In the GOM, with existing industrial
27 infrastructure, routine Program operations are not expected to significantly change the health risk
28 exposure of nearby residents, and impacts are expected to be negligible. Impacts to
29 environmental justice from routine Program activities in the Cook Inlet and Arctic planning areas
30 are expected to be negligible to minor.
31

32 Much of Alaska's Native population, however, resides in coastal areas, and the Arctic
33 areas have a very high Native Alaskan population. The importance of marine mammals (such as
34 the bowhead whale) to subsistence by Alaska Natives (especially in the Arctic) raises particular
35 concerns. Any adverse environmental impacts on fish and mammal subsistence resources from
36 installation of infrastructure and routine operations of these facilities could have
37 disproportionately higher health or environmental impacts on Alaska Native populations. A
38 large oil spill that contacts subsistence resources could also have disproportionately high impacts
39 on the Alaska Native population if the subsistence resources were diminished or tainted as a
40 result of the spill.
41
42

43 **Archaeological Resources**

44

45 Archaeological resources that could be affected by the proposed action include historic
46 shipwrecks and inundated prehistoric sites offshore, and historic and prehistoric sites onshore.

1 Although shipwrecks tend to concentrate in shallow, nearshore waters in all OCS regions,
2 historic shipwrecks are scattered across the entire continental shelf, and many are found even in
3 deepwater areas. Inundated prehistoric sites may occur on those portions of the continental shelf
4 that were exposed as dry land during the period of lower sea levels of the last ice age. The extent
5 of the continental shelf that was exposed varies from area to area; however, globally, sea levels
6 were approximately 120 m (394 ft) lower than present approximately 21,000 to 19,000 years
7 ago. Onshore historic properties include sites, structures, and objects such as historic buildings,
8 forts, lighthouses, homesteads, cemeteries, and battlefields. Onshore prehistoric archaeological
9 resources include sites, structures, and objects such as shell middens, earth middens, campsites,
10 kill sites, tool manufacturing areas, ceremonial complexes, and earthworks.

11
12 Routine operations associated with the proposed action that may affect archaeological
13 resources in all regions include drilling wells, installing platforms, installing pipelines,
14 anchoring, and constructing onshore infrastructure. Existing Federal, State and local laws and
15 regulations require that archaeological surveys be conducted prior to permitting any activity
16 (onshore or offshore) that might disturb a significant archaeological site. Compliance with
17 existing laws and regulations should protect archaeological resources to the maximum extent
18 possible from most impacts associated with routine activities; however, it is still possible that
19 some impacts could occur.

20
21 Should a direct physical contact between a routine activity and a shipwreck site occur, it
22 could destroy fragile ship remains and/or disturb the site context, resulting in a loss of data on
23 ship construction, cargo, and the social organization of the vessel's crew, as well as the
24 concomitant loss of information on maritime culture for the time period from which the ship
25 dates. Ferromagnetic debris associated with OCS operations could mask the magnetic signature
26 of historic archaeological resources, making them difficult to detect with magnetometers.
27 Interaction between a routine activity and a prehistoric archaeological site could destroy artifacts
28 or site features and could disturb the stratigraphic context of the site.

29
30 Oil spills could affect coastal historic and prehistoric archaeological resources and could
31 result in unavoidable loss of information. The level of this impact would depend on the
32 significance and uniqueness of the information lost. Archaeological resource protection during
33 an oil spill requires specific knowledge of the resource's location, condition, nature, and extent
34 prior to impact; however, the coastal areas of the various OCS regions have not been
35 systematically surveyed for sites. Existing information indicates that prehistoric sites in all
36 regions occur frequently along the mainland coast and barrier islands, and along the margins of
37 estuaries, bays and lagoons; thus, any spill that contacts these areas could involve a potential
38 impact on a prehistoric site.

39 40 41 **Alternative 8 – No Action**

42
43 The evaluation of a No Action Alternative is required by the regulations implementing
44 NEPA (40 CFR 1502.14(d)). If the Secretary were to adopt this alternative, it would halt OCS
45 presale planning, sales, and new leasing from 2012 to 2017, even in the Central and Western

1 GOM Planning Areas. However, exploration, development, and production stemming from past
2 sales would continue.

3
4 This alternative would eliminate new leasing from mid-2012 through mid-2017. The
5 amounts of OCS natural gas (up to 35 trillion cubic feet) and oil (up to 8.1 billion barrels of oil)
6 that could help meet national energy needs would be forgone. That amount of energy would
7 have to be replaced by a combination of imports, alternative energy sources, and conservation.

8
9 Market forces are expected to be the most important determinant of the substitute mix for
10 OCS oil and gas. Key market substitutes for forgone OCS oil production would be imported oil,
11 conservation, switching to gas, and onshore production. For OCS natural gas, the principal
12 substitutes would be switching to oil, onshore production, imports, and conservation.

13
14 In addition to market-based substitutes, the nation or individual States might choose to
15 encourage or even impose programs designed to deal with the energy shortfall. To replace oil,
16 these programs might favor alternative vehicle fuels such as ethanol or methanol, vehicles with
17 greater fuel efficiency, or alternate transportation methods such as mass transit.

18
19 As a partial replacement for the forgone natural gas, governments might mandate
20 increased reliance on coal, nuclear, hydroelectric, or wind-generated electric power. In addition,
21 governments might give more emphasis to programs encouraging more efficient electricity
22 transmission and more efficient use of gas and electricity in factories, offices, and homes.

23 24 25 **Conclusions**

26
27 This PEIS is consistent with the requirements of Outer Continental Shelf Lands Act of
28 1953 (67 Stat. 462) as amended in 1988 (43 USC 1331 *et seq.*), NEPA (42 USC 4321), as
29 amended, and Council on Environmental Quality regulations for implementing NEPA
30 (40 CFR Part 1500). A scoping process was conducted to obtain input from stakeholders,
31 including individuals, public interest organizations, and governmental agencies, and this input
32 was used to develop the alternatives and issues analyzed in this PEIS.

33
34 On the basis of the analyses in this PEIS, the types of impacts that could occur during
35 routine Program activities would be the same among the action alternatives. The alternatives
36 differ primarily on the basis of where the impacts could occur, which is directly related to the
37 planning areas included in each alternative. Routine operations are expected to result in impacts
38 that range from negligible to major, with most being short-term and recovering following
39 completion of the routine activities. The greatest impacts would occur with a low-probability
40 catastrophic discharge event, but the nature and magnitude of impacts would depend on the
41 location, size, duration, and timing of the spill, the resources affected, and the effectiveness of
42 the spill containment and cleanup activities.

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