

**ALASKA WILDERNESS LEAGUE—AUDUBON ALASKA
CENTER FOR BIOLOGICAL DIVERSITY—DEFENDERS OF WILDLIFE—
EARTHJUSTICE—GREENPEACE—NATIONAL WILDLIFE FEDERATION
NATURAL RESOURCES DEFENSE COUNCIL
NORTHERN ALASKA ENVIRONMENTAL CENTER—OCEANA
PACIFIC ENVIRONMENT—REDOIL—SIERRA CLUB
THE WILDERNESS SOCIETY—WORLD WILDLIFE FUND**

July 15, 2011

VIA FEDERAL ERULEMAKING PORTAL

Dr. James Kendall
Regional Director
BOEMRE Alaska OCS Region
3801 Centerpoint Dr.
Anchorage AK 99503-5820

**Re: National Environmental Policy Act Analysis of Shell Offshore Inc. Camden Bay
Exploration Plan**

Dear Regional Director Kendall:

On July 5, 2011, the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) deemed submitted an exploration plan for drilling in the Beaufort Sea starting in 2012 by Shell Offshore Inc. (Shell). BOEMRE stated that it will accept comments on the issues that should be considered in preparing an analysis and disclosure of the effects of the proposed drilling pursuant to National Environmental Policy Act (NEPA). The undersigned groups provide the following comments on the appropriate scope of BOEMRE's NEPA analysis and the need for careful scrutiny and full public participation in a full environmental impact statement (EIS).

We welcome the opportunity to provide these scoping comments on the issues BOEMRE must address in its environmental analysis of Shell's drilling plans. As we describe in this letter, BOERME must prepare an EIS, including the attendant public comment process, analyzing and disclosing the effects of Shell's drilling. If, however, BOEMRE decides to first prepare an environmental assessment to determine whether Shell's operations threaten significant effects, the agency must also provide an opportunity for the public to comment on the agency's analysis itself—opportunities to provide scoping comments and comments on the documents Shell submits in connection with its plan do not suffice.¹

¹ Fostering "active public involvement and access to information" is one of NEPA's primary objectives. *Price Rd. Neighborhood Ass'n, Inc. v. U.S. Dept. of Transp.*, 113 F.3d 1505, 1511 (9th Cir. 1997); *accord Dept. of Trans. v. Public Citizen*, 541 U.S. 752 (2004). To this end, NEPA's implementing regulations direct that agencies "shall involve environmental agencies, applicants, and the public, to the extent practicable, in preparing [environmental] assessments." 40 C.F.R. 1501.4(b).

BACKGROUND

The United States is at a crossroads with respect to planning and decision-making for offshore oil and gas activities in the Chukchi and Beaufort seas. President Obama and BOEMRE must decide whether to continue plans and grant further approvals that are based on inadequate science and preparedness and that have generated controversy, litigation, and—as the blowout in the Gulf of Mexico demonstrates—the potential for environmental and social disaster. The level of consideration given Shell’s proposal to drill in the Beaufort Sea is an important step in showing how and whether BOEMRE seeks to meet its stewardship obligations for the Arctic Ocean. Rather than relying on a failed model for making decisions, BOEMRE has the opportunity to move forward toward preparedness and a full public process.

The present plan is the fourth Shell has submitted to conduct exploration drilling in the Beaufort Sea. This plan differs substantially from Shell’s previous proposals. It is larger in scope. The Beaufort Sea plan is just one part of an Arctic Ocean drilling proposal that includes simultaneous drilling in the Chukchi and Beaufort seas over multiple years using separate drill ships and accompanying vessel and aircraft fleets. The potential effects of the plan differ from those of previous drilling Shell has proposed, as Shell itself acknowledges.² Further, since BOEMRE last approved a Shell proposal to drill in the Beaufort Sea, new information highly relevant to the decision about whether and how to approve drilling in the Arctic Ocean has emerged: the *Deepwater Horizon* spill occurred, followed by numerous investigations and reports, including by the National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling; the U.S. Geological Survey (USGS) completed an assessment of the myriad data gaps that hinder full assessment of Arctic Ocean oil and gas activities; the National Marine Fisheries Service (NMFS) in 2010 completed a new biological opinion recognizing the importance of Camden Bay as a feeding and resting area for endangered bowhead whales; and climate change has continued to have dramatic effects in the Arctic. As the first vessel-based exploration drilling in the Arctic Ocean in nearly ten years, the first since the *Deepwater Horizon* disaster, and a dramatic expansion of prior Shell drilling plans, Shell’s proposed exploration drilling warrants careful scrutiny and full public participation in a full EIS.

I. BOEMRE Must Prepare An Environmental Impact Statement

Before proceeding to consider Shell’s plan, BOEMRE must prepare a full EIS to analyze and disclose the effects of the proposed drilling. Pursuant to NEPA, “[a]n EIS *must* be prepared if substantial questions are raised as to whether a project ... *may* cause significant degradation of some human environmental factor.”³ The proposed activity threatens a number of significant effects, including effects to endangered bowhead whales from drilling and ice-breaking noise, effects from a very large oil spill, and cumulative effects, and has the potential to harm subsistence activities that are of central cultural significance to Arctic coastal communities. NEPA requires these effects to be analyzed in an EIS. Shell’s plan also implicates a number of factors that Council on Environmental Quality (CEQ) regulations require agencies to consider when determining when an action may significantly affect the environment, thus warranting an

² Shell Offshore Inc., Revised Outer Continental Shelf Lease Exploration Plan, Camden Bay, Beaufort Sea, Alaska at 1-2 (May 2011) (Shell Beaufort Plan).

³ *Idaho Sporting Cong. v. Thomas*, 137 F.3d 1146, 1149 (9th Cir. 1998) (citation omitted, emphasis in original).

EIS.⁴ The project affects the Arctic National Wildlife Refuge and increasingly vulnerable Arctic Ocean areas.⁵ There is a high degree of controversy about the impacts of the project.⁶ As demonstrated by BOEMRE's own documents and the recent USGS report,⁷ there are many unknowns regarding species in the Arctic Ocean and the potential effects of industrial activity in the region.⁸ The project affects endangered species,⁹ and there is a potential for cumulatively significant impacts.¹⁰ Any "one of these factors may be sufficient to require preparation of an EIS in appropriate circumstances."¹¹

NEPA applies to all actions taken by BOEMRE under OCSLA.¹² Accordingly, courts have long recognized that "NEPA may require an environmental impact statement at each stage: leasing, exploration, and production and development."¹³ Courts have also recognized that, as the agency attains more concrete information about projects at later stages of the outer continental shelf oil and gas development process, more detailed and site-specific analyses of impacts are required.¹⁴ In the context of an offshore exploration project, the preparation of an EIS under NEPA also serves an important role in facilitating the agency's compliance with OCSLA. OCSLA obliges Interior to "consider available relevant environmental information in making decisions (including those relating to exploration plans ...)"¹⁵ It requires Interior to deny an exploration plan if it determines that the proposed activity would probably cause serious harm or damage to the marine, coastal, or human environment, and the plan cannot be modified to avoid such a condition.¹⁶ Without analyzing potentially significant effects to wildlife and subsistence and fully exploring alternatives and mitigation measures to Shell's proposed drilling in an EIS, BOEMRE cannot fulfill its OCSLA mandate.

The recommendations of National Commission on the BP *Deepwater Horizon* Oil Spill also strongly support preparation of an EIS for Shell's exploration plan. The Commission concluded that when considering exploration or development plans in the Arctic and other

⁴ See 40 C.F.R. § 1508.27(b).

⁵ 40 C.F.R. § 1508.27(b)(3).

⁶ 40 C.F.R. § 1508.27(b)(4).

⁷ Holland-Bartels, Leslie, and Pierce, Brenda, eds., 2011, An evaluation of the science needs to inform decisions on Outer Continental Shelf energy development in the Chukchi and Beaufort Seas, Alaska: U.S. Geological Survey Circular 1370 (USGS Report), *available at* <http://pubs.usgs.gov/circ/1370/>. A compact disc of the sources cited in this letter was provided separately to BOEMRE. BOEMRE should consider those sources in assessing the impacts of Shell's drilling plan and the sources should be included in the administrative record for the decision to approve, deny, or ask for modification of the plan.

⁸ 40 C.F.R. § 1508.27(b)(5).

⁹ 40 C.F.R. § 1508.27(b)(9).

¹⁰ 40 C.F.R. § 1508.27(b)(7).

¹¹ *Ocean Advocates v. United States Army Corps of Eng'rs*, 402 F.3d 846, 865 (9th Cir. 2004).

¹² 43 U.S.C. § 1866(a).

¹³ *Vill. of False Pass v. Clark*, 733 F.2d 605, 614 (9th Cir. 1984).

¹⁴ *Tribal Vill. of Akutan v. Hodel*, 869 F. 2d 1185, 1192 (9th Cir. 1988); *False Pass*, 733 F. 2d at 614; *State of Cal. v. Watt*, 683 F.2d 1253, 1268 (9th Cir. 1982), *rev'd on other grounds sub nom Sec. of Interior v. Cal.*, 464 U.S. 312 (1984); *see also N. Alaska Envtl. Ctr. v. Kempthorne*, 457 F.3d 969, 976-77 (9th Cir. 2006).

¹⁵ 43 U.S.C. § 1346(d).

¹⁶ 43 U.S.C. §§ 1340(c)(1), 1334(a)(2)(A)(i).

frontier areas, BOEMRE should prepare full EISs.¹⁷ By contrast, “in all other areas,” the Commission recommended that exploration plans and development and production plans should be subject to NEPA review consistent with the CEQ’s implementing regulations, which might result in an EIS or another form of NEPA review.¹⁸ The Commission Report reflects preliminary recommendations offered by the Commission staff. In the December 2010 environmental review presentation to the Commission, the Proposed Staff Recommendation 2 included the following: “An Environmental Impact Statement should be conducted for Exploration Plans and Development and Production Plans in frontier areas.”¹⁹ The Beaufort Sea is indisputably a frontier area. BOEMRE should follow the Commission’s recommendation and prepare EIS to inform decisions about Shell’s plan.

The lack of basic scientific information about the Arctic Ocean also compels preparation of an EIS. Missing information is a central barrier to effectively managing and analyzing offshore oil and gas activities in the Arctic Ocean. The recently published USGS report, a culmination of a year-long study by the USGS designed specifically to analyze data gaps and research needs for the Arctic Ocean in connection with oil and gas activities in the region, underscores this problem.²⁰ It concludes that there are large information gaps about the Arctic Ocean, and these gaps are a “major constraint to a defensible science framework for critical

¹⁷ National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling, *Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling Report to the President at 262* (January 2011) (Commission Report or Report), *available at* <http://www.oilspillcommission.gov/final-report> (stating “Interior should require . . . environmental impact statements for . . . specific lease sales before plans for exploration, development, and production are approved in areas with complex geology, in ultra-deepwater, and in the Arctic and other frontier areas.”).

¹⁸ *Id.*

¹⁹ National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling, *Staff Presentation to the Commission: Environmental Review at 7* (Dec. 2, 2010), *available at* <http://www.oilspillcommission.gov/sites/default/files/documents/3%20-%20Environmental%20Review%2012-1%201900.pdf>.

²⁰ In May 2010, Secretary Salazar cancelled the remaining Arctic Ocean leases in the 2007-2012 Five Year OCS Leasing Program, stating “that the country must take a cautious approach in the Arctic, and gather additional scientific information about resources, risks, and environmental sensitivities before making decisions about potential future lease sales in frontier areas.” Department of the Interior, Fact Sheet, *A Comprehensive, Science-Based Offshore Energy Plan at 1* (May 27, 2010). He directed the USGS to conduct an evaluation of scientific needs in the region “[t]o better understand the resilience of Arctic coastal and marine ecosystems to potential OCS resource extraction activities . . .” *Id.*

Arctic decision making.”²¹ Gaps exist for nearly every species in the Arctic Ocean.²² Similar gaps exist in understanding of the effects of industrial oil activities on species.²³ The report underscores admissions in BOEMRE’s leasing schedule and lease sale documents that a lack of basic information about species in the Arctic, their use of habitat, and the effects of industrial disturbance render the agency unable in many instances to assess the effects of oil and gas activities on species and the ecosystem as a whole. This uncertainty implicates one of the CEQ significance factors²⁴ and seriously undermines the credibility of assertions that activities like drilling do not pose the threat of significant effects. NEPA compels preparation of an EIS in these circumstances so that the agency can obtain information essential to the decision at hand.²⁵

²¹ USGS Report at 151.

²² USGS Report at 59 (for marine mammals generally, “seasonal, annual, and geographic variability in diet are poorly quantified and foraging areas are poorly described”); *id.* (“Trophic interactions of marine mammals were first studied 30 years ago. Although trophic structure generally is understood for most species (for example, general prey types, where they feed in the food web), seasonal, annual, and geographic variability in diet are poorly quantified and foraging areas are poorly described.”); *id.* (“Population enumeration is poor, even non-existent, for many [marine mammal] species, and relatively good for a few. Without information on stock structure, however, which is poorly known for many species but fundamental to management, data are difficult to interpret even for species where abundance estimates exist.”); *id.* at 182 (for bowhead whales, “the understanding of essential spatial and temporal habitat needs . . . particularly the oceanographic parameters that most influence foraging, breeding, raising young, and migrating is not yet sufficient to confidently determine the times and places where whales might be most impacted by anthropogenic sounds”); *id.* at 184 (for beluga whales, the “present understanding of the essential spatial and temporal habitat needs . . . in the Arctic is limited and constrains the ability to confidently understand and efficiently mitigate potential anthropogenic noise impacts”); *id.* at 185 (same for gray whales); *id.* at 187 (for seals, “[t]here is a basic lack of information about ice seals. Key information about the abundance, distribution, and vital aspects of ice seals is incomplete”); *id.* at 69 (for fish “[i]nformation about status and trends, habitat requirements, relative distribution and abundance, and knowledge of life history stages . . . is incomplete and unavailable for large expanses of Arctic nearshore and shelf waters”); *id.* at 66 (for birds, “[s]tudies to examine seasonal dynamics of seabirds in the Chukchi Sea related to oceanography, climate, sea-ice dynamics, primary and secondary productivity and movements of birds from breeding colonies (for example, Cape Lisburne) . . .” and “[f]urther analyses and studies . . . to increase the understanding of seasonal and inter-annual variation in shorebird use (numbers of birds, timing of their use, change in site quality) of key post-breeding areas, especially coastal areas where oil development is likely to occur (for example, the deltas of the Meade, Ikpikpuk, Colville, Sagavanirktok, and Canning Rivers, and coastal sites on NPR–A)” are necessary).

²³ As just one example relevant to Shell’s drilling plans, the USGS report confirms that information about how ice-breaker noise affects marine mammals is missing. The report states that “[t]he paucity of data on icebreaker-generated noise is particularly critical because of sea ice’s importance as habitat for many marine mammals. It is difficult at present, if not impossible, to know how to define ‘takes’ from icebreaking or how to predict its impact on marine mammals.” USGS Report at 175.

²⁴ 40 C.F.R. § 1508.27(b)(5).

²⁵ 40 C.F.R. § 1502.22.

As we have previously explained, BOEMRE can prepare an EIS prior to determining that an exploration plan is complete and fully submitted. It has done so in the past.²⁶ After a completeness determination, agency regulations require BOEMRE to conduct an environmental analysis under NEPA.²⁷ If the agency determines at this stage that potentially significant effects require preparation of an EIS, it can require modifications to the plan and seek additional information about the activity.²⁸ This stops the thirty-day OCSLA review clock. The National Commission's report on the *Deepwater Horizon* oil spill and the CEQ NEPA guidance issued in the wake of the spill also confirm that BOEMRE has the flexibility to conduct an EIS at the exploration stage.²⁹

II. Prior NEPA Documents Do Not Satisfy BOEMRE's Obligation To Analyze Shell's Exploration Plan.

Prior BOEMRE NEPA documents for leasing schedules and lease sales have not analyzed the potential impacts of the particular Shell plan presently before the agency. The prior documents provide general analyses of exploration stage environmental effects, but defer further analysis until site-specific information is available. These general analyses conclude that exploration drilling may have substantial effects. For example, exploration activities could have biologically significant effects on the bowhead whale population,³⁰ and oil spills could have dramatic adverse effects on wildlife, significantly affecting the threatened polar bear population,³¹ the threatened spectacled eider,³² the long-tailed duck, the king eider, and the common eider.³³ However, the actual effects of any particular exploration activity cannot be determined at the time of a lease sale, because BOEMRE lacks site-specific information about

²⁶ See MMS, Draft Environmental Impact Statement for Delineation Drilling Activities In Federal Waters Offshore Santa Barbara County, California (June 2001), at 1-6, available at http://www.mms.gov/omm/pacific/enviro/EIS/DEIS_Table_of_Contents.htm. Because BOERME should withhold a determination that a plan is complete until the agency is able to fully evaluate the potential environmental impacts, 30 C.F.R. §§ 250.231(a)(1), .212(o), .227(a)(3), preparing an EIS prior to deeming the proposed exploration plan complete is the preferred approach, and BOEMRE should take this approach if it moves forward to evaluate Shell's proposed Chukchi Sea exploration plan.

²⁷ 30 C.F.R. § 250.232(c).

²⁸ 30 C.F.R. §§ 250.233(b), .234.

²⁹ National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling, *Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling, Recommendations* (Jan. 2011), available at <http://www.oilspillcommission.gov/final-report> (finding that the government "should not consider such plans officially 'submitted' until all of the required content, necessary environmental reviews, and other analyses are complete and adequate to provide a sound basis for decision-making"); CEQ, Report Regarding the Minerals Management Service's National Environmental Policy Act Policies, Practices, and Procedures as They Relate to Outer Continental Shelf Oil and Gas Exploration and Development at 32 (August 16, 2010) (CEQ NEPA Report) (noting that "even under current law rigorous NEPA analysis is needed" and "BOEM may have discretion under the existing regulatory structure to establish when an application is complete and the thirty-day review period begins").

³⁰ Minerals Management Service, Beaufort Sea Planning Area Oil and Gas Lease Sales 186, 195, and 202 Final Environmental Impact Statement, OCS EIS/EA MMS 2003-001 at IV-69 (Feb. 2003) (2003 Multi-Sale EIS) ("Effects of an actual icebreaker on migrating bowheads, especially mothers and calves, could be biologically significant.").

³¹ Beaufort Sea Lease Sale 202 Environmental Assessment (2006) (Lease Sale 202 EA) at 57 ("[t]he impact of a large oil spill, particularly during the broken-ice period, would be potentially significant to the polar bear population").

³² 2003 Multi-Sale EIS at IV-93-94.

³³ *Id.* at IV-108.

the timing, equipment, and location of the activity. As BOEMRE acknowledges, the biological significance of disturbance to wildlife from exploration activities is highly dependent on when and where those disturbances occur.³⁴ Accordingly, whether any particular exploration plan will or will not have significant effects cannot be analyzed until MMS has the details of a specific plan.³⁵

The recent USGS report also underscores the need for site-specific analysis at the exploration stage, because the “Arctic environment is highly variable both physically and biologically.”³⁶ Near-shore regions, including the Beaufort Sea coastal areas in which Shell proposes to drill, are highly variable from location to location. Much of the variability stems from: (i) the interaction of oceanic and coastal currents with bathymetry and the shape of the coastline, which affects the transport, retention and dispersion of larvae and pelagic productivity as well as the availability of nutrients; and (ii) the slackening and strengthening of winds in response to different coastal features that alter local currents, which affects the retention and dispersion of larvae and pelagic productivity as well as the availability of nutrients. The variability in the delivery of larvae and other productivity (including nutrient supply to benthic microalgae) to the benthic community in turn also affects benthic community productivity and structure, which results in high variability of near-shore regions. Without a site-specific analysis of impacts, BOEMRE cannot accurately assess the biological effects of disturbance caused by Shell’s proposed drilling.

Further, prior NEPA documents include assumptions about potential economic impacts of drilling activities that do not reflect current realities or are otherwise faulty.³⁷ These assumptions affect the potential effects analyses in these documents as well as the public benefits of the proposed activities.

ISSUES BOEMRE MUST CONSIDER IN CONDUCTING ITS NEPA ANALYSIS

As discussed above, Shell’s drilling requires preparation of an EIS. It threatens significant effects, including effects to endangered bowhead whales from noise and disturbance and catastrophic harm to the Beaufort Sea ecosystem and its communities in the event of a large oil spill. It triggers numerous CEQ significance factors. And missing information seriously impedes BOEMRE’s ability to credibly conclude that Shell’s drilling will not threaten significant effects. The following comments address the myriad issues BOEMRE must assess when conducting a NEPA analysis of Shell’s plan.

³⁴ See, e.g., 2003 Multi-Sale EIS at IV-115 (biological significance of disturbances of beluga whales and pinnipeds are highly variable depending on where and when they occur).

³⁵ See, e.g., MMS, Chukchi Sea Lease Sale 193 Final Environmental Impact Statement (2007) (Lease Sale 193 EIS) at IV-145 (stating that at the lease sale stage, MMS is “unable to determine at this time if significant impacts would or would not occur”); Lease Sale 202 EA at 64 (noting that “prior to commencement of exploration, development, and production activities, proposed activities will be analyzed on a case-by-case basis and effective mitigation measures developed accordingly”).

³⁶ USGS Report at 151.

³⁷ See, e.g., 2003 Multi-Sale EIS at Appendix B, B-1 (discussing the use of net present value calculations in determining which areas are open for leasing) & Appendix F, F-1 to F-9 (explaining formulation of the development scenario and the role played by oil prices).

I. Oil Spills

BOEMRE last conducted NEPA analysis of a large or very large spill in the Beaufort Sea in the 2003 Multi-sale EIS. In 2010, a massive blowout during exploration drilling at the Macondo well in the Gulf of Mexico resulted in the explosion of the *Deepwater Horizon* rig, the death of eleven workers, and the release of an estimated 4.9 million barrels of oil.³⁸ In the wake of that catastrophe, a range of experts has called for major improvements in the offshore oil and gas permitting process, and BOEMRE has implemented several regulatory changes.

The *Deepwater Horizon* disaster underscores the risks inherent in exploration drilling in challenging conditions and the need for full NEPA review of oil spill risks at the exploration stage. And the lessons from that spill and resulting regulatory changes also require full analysis in an environmental impact statement. For Chukchi Lease Sale 193, BOEMRE last month issued a Revised Draft Supplemental Environmental Impact Statement that updates its prior oil spill analysis for that Sea in several respects, including addressing the risk of very large spills and surveying new safety requirements.³⁹ BOEMRE should prepare an EIS to fully analyze the risk of oil spills from Shell's planned exploration drilling in the Beaufort Sea also.

A. *Very large oil spills are a risk of exploration drilling that BOEMRE should fully analyze at this juncture.*

In connection with a previous exploration plan submitted by Shell, BOEMRE concluded that oil spills larger than 1000 barrels were not a reasonably foreseeable environmental impact of exploration drilling for purposes of NEPA and declined to analyze impacts, mitigation, or alternatives relevant to such spills.⁴⁰ BOEMRE reached the same conclusion with regard to the exploration drilling that resulted in the *Deepwater Horizon* oil spill.⁴¹

The report of the Council on Environmental Quality setting out NEPA practice subsequent to the *Deepwater Horizon* spill indicates that BOEMRE has agreed to revise its prior conclusion that catastrophic spills need not be analyzed at the exploration stage.⁴² According to the CEQ, “[w]here . . . information regarding the effects of a catastrophic spill from exploratory drilling can be obtained without excessive costs, a Federal agency proposing to approve such activity is obliged to consider such information.”⁴³

BOEMRE's previous conclusion that exploration drilling presents no foreseeable risk of a catastrophic spill is untenable after the *Deepwater Horizon* spill, which occurred during

³⁸ Revised Draft Supplemental Environmental Impact Statement for Chukchi Lease Sale 193, Appendix B at B-1 (2011) (Chukchi Revised Draft Supplement) (citing Lubchenco J, McNutt M, Lehr B, Sogge M, Miller M, Hammond S, Conner W., National Oceanic and Atmospheric Administration, *Deepwater Horizon*/BP Oil Budget: What happened to the oil? (2010), available at http://www.noaanews.noaa.gov/stories2010/PDFs/OilBudget_description_%2083final.pdf).

³⁹ *Id.* at 121, 124.

⁴⁰ Environmental Assessment, Appendix A at A-1-1 (2009).

⁴¹ CEQ NEPA Report at at 27, 18.

⁴² *Id.* at 27.

⁴³ *Id.* at 27–28; *accord id.* at 26–27 (“[A]n agency must foresee those consequences which have a low probability of occurrence but could be potentially catastrophic based on credible scientific support.”).

exploration drilling. Indeed, the risk of well-control incidents is substantially *higher* during exploration drilling activities than it is during development, as BOEMRE has acknowledged.⁴⁴ BOEMRE should heed the CEQ—the agency charged with coordinating implementation of NEPA⁴⁵ and whose interpretations are ordinarily accorded deference⁴⁶—and conclude that exploration drilling in the challenging conditions of the Beaufort Sea presents a foreseeable risk of a catastrophic oil spill that must be analyzed in an EIS.

It is not sufficient for BOEMRE simply to tier to the analysis of a generic oil spill in the 2003 Multi-sale EIS. The lack of any site-specific spill analysis was a notable feature of the environmental review that preceded the *Deepwater Horizon* spill,⁴⁷ prompting the CEQ to criticize the former Minerals Management Service (MMS) for misusing tiering to “limit [appropriate] site-specific environmental analysis.”⁴⁸ The Presidential Oil Spill Commission agreed, noting that tiering should not be used to evade “deeper environmental analysis at more geographically targeted and advanced planning stages,” especially when prior programmatic analysis covers a large geographic expanse.⁴⁹ Because Shell’s proposed exploration drilling is a “more geographically targeted and advanced” stage of planning, and because the Multi-sale EIS analyzed oil spill impacts across a large and diverse geographic expanse, BOEMRE should conduct a site-specific analysis.

A site-specific analysis is also required because a very large oil spill during Shell’s planned exploration drilling would differ in important respects from the generic spill analyzed at the lease sale stage. As an initial matter, the Multi-sale EIS analyzed spills during development activities only; it assumed no spills during exploration. Moreover, the Multi-sale EIS assumed for purposes of analysis that very large spills would occur above water on gravel islands.⁵⁰ Shell’s planned exploration drilling, by contrast, will take place underwater. This distinction is crucial. Ecosystem impacts may vary, depending on where a spill originates.⁵¹ In addition, “the effectiveness of certain response and intervention techniques can depend on the type and exact location of the blowout”—at the sea surface, along the riser, at the sea floor, or below the sea floor.⁵² “Opportunities for operational intervention and response vary” according to the location of the spill in relation to the water.⁵³

In addition, Shell’s exploration drilling will be confined to two specific locations within the Beaufort—the Sivulliq and Torpedo prospects—whereas the Multi-sale EIS analyzed spills across much of the U.S. Beaufort Sea. Importantly, the Sivulliq and Torpedo prospects are

⁴⁴ Chukchi Revised Draft Supplement, Appendix B at B1.

⁴⁵ 42 U.S.C. § 4344.

⁴⁶ *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 372 (1989).

⁴⁷ CEQ NEPA Report at 18 (“[The former MMS] did not prepare a site-specific analysis to determine impacts from a potential site-specific spill.”).

⁴⁸ *Id.* at 23.

⁴⁹ National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling, *Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling Report to the President at 260* (January 2011) (Commission Report), available at <http://www.oilspillcommission.gov/final-report>.

⁵⁰ 2003 Multi-sale EIS at IV-229.

⁵¹ See Chukchi Revised Draft Supplement at 157 (noting the differential effects of surface and subsurface oil on pelagic organisms).

⁵² *Id.* at 140.

⁵³ *Id.*

located within the central corridor of the bowhead fall migration.⁵⁴ The Multi-sale EIS never analyzes a very large oil spill inside the bowhead migratory corridor or the risk it would pose to the species and the ecosystem. Even the raw results of the spill trajectory model in the tables of the EIS appendix—which for this spill area are neither acknowledged nor interpreted in the body of the EIS—present only the *average* risk from spills both inside and outside of the key corridor.⁵⁵ These and other site-specific characteristics indicate that “tiering is not adequate to address potentially significant environmental effects of the exploration”⁵⁶ BOEMRE should complete an EIS before approving Shell’s exploration plan.

B. BOEMRE’s prior analysis of very large oil spills in the Beaufort is inadequate in several respects and should be updated and improved at the exploration stage.

In January 2011, the National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling (Commission) released its final report and recommendations. The Commission called for a “comprehensive overhaul of both leasing and the regulatory policies and institutions used to oversee offshore activities”⁵⁷ It concluded “that the breakdown of the environmental review process for OCS activities [at the former Minerals Management Service] was systemic and that Interior’s approach to the application of NEPA requirements in the offshore oil and gas context needs significant revision.”⁵⁸ In light of these major failings, BOEMRE should not rely on the oil spill analysis contained in the 2003 Multi-sale EIS.

In any event, much of that analysis has been rendered obsolete by new developments and information. The *Deepwater Horizon* oil spill, for example, “constitutes significant new information and circumstances that may require reevaluation of some conclusions reached in prior NEPA reviews”⁵⁹ Indeed, BOEMRE has acknowledged that “the fact and effects of the [*Deepwater Horizon*] Spill requires revisiting prior assessments of the risk of catastrophic spills”⁶⁰ BOEMRE should prepare an EIS for Shell’s proposed exploration drilling to remedy the following shortcomings of the Multi-sale EIS’s oil spill analysis.

1. Impacts Analysis

BOEMRE should analyze the effects of a larger spill than the one analyzed in 2003. The Multi-sale EIS assumed that 140,000 barrels of oil will enter the water in the event of a very large oil spill in the Beaufort. As noted, the *Deepwater Horizon* spill released an estimated 4.9 million barrels. BOEMRE’s 2011 Revised Draft Supplement for Chukchi lease sale 193 assumes that a very large spill would be 2.2 million barrels.⁶¹

⁵⁴ Compare Shell Beaufort Plan at 1-5 with Beaufort Multi-sale EIS Maps A-2b and 7.

⁵⁵ 2003 Multi-sale EIS at Table A2-21.

⁵⁶ CEQ NEPA Report at 23.

⁵⁷ Commission Report at 250.

⁵⁸ *Id.* at 260.

⁵⁹ CEQ NEPA Report at 32.

⁶⁰ CEQ NEPA Report at 34.

⁶¹ Chukchi Revised Draft Supplement at 131.

The Multi-sale EIS based its calculation of total oil volume on the assumption that a large blowout spill would flow for only 15 days.⁶² The *Deepwater Horizon* well blowout released oil into the Gulf of Mexico for 87 days before it was successfully capped.⁶³ BOEMRE's 2011 Revised Draft Supplement for Chukchi lease sale 193 forecasts that a blown-out well will flow for 74 days before a relief well is complete.⁶⁴ Even Shell admits that it will take between 29 and 43 days after a blowout to complete a relief well at the Sivulliq or Torpedo prospect, depending on which of its drill rigs is utilized.⁶⁵ BOEMRE should utilize a realistic assessment of the time required to complete a relief well in calculating its volume estimate for a very large oil spill and structure its oil spill analysis accordingly. It also should update its estimates of flow rate to utilize site-specific data or upper-end estimates rather than use, as it did in the Multi-sale EIS, flow-rate estimates made by BP for a different prospect.⁶⁶ In doing so, at least "BOEMRE should incorporate the 'worst-case scenario' calculations from [Shell's] oil spill response plan"⁶⁷, and its assessment of the reasonableness of those predictions.

BOEMRE should acknowledge the real risk that a blown-out well could flow for even longer in the event of an overwintering spill or fracturing of the sea floor. If Shell cannot achieve well-control at a leaking well or remove all of the spilled oil before freeze-up, Shell expects to abandon the well and leave the oil uncontained under the ice until spring thaw.⁶⁸ In such an overwintering spill, oil could flow unchecked into the Beaufort Sea for many months. Even if the flow is stopped before freeze-up, the spilled oil that is left behind can travel considerable distances, either with the pack ice or carried by currents underneath it.⁶⁹ That oil could re-emerge directly in the path of bowhead whales during their spring migration, an event NMFS recognized "has the potential to impact a significant number of bowheads."⁷⁰ In the event of sea-floor fracturing, which may be occurring right now in China's Bohai Bay,⁷¹ oil flows into the ocean from multiple locations, making capping and containment difficult or impossible. BOEMRE should disclose and address these risks.

BOEMRE should address the weaknesses of the SINTEF Oil Weathering Model that the Multi-sale EIS utilized to make predictions about the behavior of oil in the water, including evaporation and dispersion.⁷² Weathering processes may be very different in Arctic conditions,

⁶² 2003 Multi-sale EIS at IV-228

⁶³ Commission Report at 165.

⁶⁴ Chukchi Revised Draft Supplement at 138–39.

⁶⁵ Shell Beaufort Plan at 2-6.

⁶⁶ 2003 Multi-sale EIS at IV-228.

⁶⁷ Commission Report at 267

⁶⁸ *See, e.g.*, Beaufort Spill Plan at 1-94, 1-27.

⁶⁹ National Research Council, Committee on Oil in the Sea: Inputs, Fates, and Effects, *Oil in the Sea III: Inputs, Fates, and Effects* 104-05 (2003) ("Because the outer edge of the ice pack is very dynamic as is the first year ice upon breakup, oil ice can spread over a long distance (perhaps as much as 100 km), and as the ice melts to release the oil, oil is spread over a wide area.").

⁷⁰ NMFS, *Oil and Gas Leasing and Exploration Activities in the U.S. Beaufort and Chukchi Seas, Alaska, and Authorization of Small Takes Under the Marine Mammal Protection Act* at 99 (July 2008) (2008 BiOp)

⁷¹ *See* Update on Bohai Bay Oil Cleanup and Production Curtailment, BUSINESS WIRE (July 13, 2011), *available at* <http://www.businesswire.com/news/home/20110713006209/en/Update-Bohai-Bay-Oil-Cleanup-Production-Curtailment>.

⁷² Beaufort Multi-sale FEIS, Appendix A, at A-1-5–6.

and the SINTEF model has never been field-tested beyond five days, in any location.⁷³ In addition, as the USGS noted in its recent survey of science gaps, the SINTEF model fails to incorporate currents, beaching, and the effect of slush ice on spreading and weathering. The presence of ice has been known to promote oil emulsification, which in turn slows biodegradation.⁷⁴ The lack of knowledge of microbial communities in the Arctic further constrains adequate forecasting of biodegradation.⁷⁵

BOEMRE should take the opportunity to improve its analysis of the movement of spilled oil and the resulting impacts to sensitive resources. The Multi-sale EIS makes extensive use of an “oil spill trajectory model” to estimate the risk of damage to coastline and other sensitive areas from a very large oil spill. This model fails to capture important aspects of the actual behavior of oil spills. Spilled oil spreads. But the trajectory model treats an oil spill—even a very large oil spill—as a single point.⁷⁶ It also assumes that an oil spill stops moving after it contacts the mainland.⁷⁷ Use of the model understates the risk to sensitive resources from oil spills.

BOEMRE should also employ more sophisticated modeling of currents to predict the trajectory of spilled oil. The Multi-sale EIS’s trajectory model incorporates information on wind and currents to predict where spilled oil will travel.⁷⁸ But as the USGS has noted, BOEMRE’s model of currents in the Beaufort Sea is less sophisticated than the one used in the Gulf of Mexico.⁷⁹ Ongoing work has yielded improvements in modeling of currents in the Arctic seas, including some that take better account of coastal circulation, small-scale eddies, and land-fast ice.⁸⁰ In the view of Wang, et al, those influences can be “crucial” to understanding coastal currents.⁸¹ BOEMRE should assess those more sophisticated models and, if possible, account for the effects of coastal circulation, small-scale eddies, and changes in land-fast ice in its oil spill analysis for Shell’s exploration plan.

Scientific information on the impacts to Gulf ecosystems of oil from the *Deepwater Horizon* spill is still emerging,⁸² and early reports may seriously underestimate the gravity of those impacts, including on cetaceans.⁸³ BOEMRE should fully integrate emerging science into its analysis of an oil spill from Shell’s proposed drilling before approving the exploration plan. BOEMRE should also address the threat that spilled oil, in combination with a massive spill response, would pose to cetaceans in the Beaufort Sea, especially migrating bowhead whales.

⁷³ USGS Report at 116.

⁷⁴ *Id.* at 117.

⁷⁵ *Id.* at 118.

⁷⁶ Multi-sale EIS, Appendix A at A-1-9.

⁷⁷ *Id.* at A-1-10.

⁷⁸ *Id.* at A-1-8, A-1-9.

⁷⁹ USGS Report at 119 (comparing the Arctic model to the Princeton-Dynalysis Ocean Model).

⁸⁰ USGS Report at 120–22; Wang, et al, *Coastal Marine Institute Report: Sea Ice-Ocean-Oil Spill Modeling System* (2010).

⁸¹ Wang at 13.

⁸² Commission Report at 174.

⁸³ Rob Williams, et al, *Underestimating the damage: interpreting cetacean carcass recoveries in the context of the Deepwater Horizon/BP incident*, 4 CONSERVATION LETTERS 228, 230–31 (2010).

2. Mitigation

“[O]ne important ingredient of an EIS is the discussion of steps that can be taken to mitigate adverse environmental consequences.”⁸⁴ “An essential component of a reasonably complete mitigation discussion is an assessment of whether the proposed mitigation measures can be effective.”⁸⁵ NEPA does not require BOEMRE actually to impose these mitigation measures, but BOEMRE must consider them to inform its decision on Shell’s exploration plan. BOEMRE should more thoroughly analyze the mitigation of oil spill risks through well-control and safety regulations. The 2003 Multi-sale EIS contained virtually no discussion of well control or drilling safety.

As BOEMRE has acknowledged, the *Deepwater Horizon* disaster “provided new information about systemic safety issues [and] deficiencies of blowout containment technologies and strategies”⁸⁶ Shoddy well-cement work was likely a major contributor to the *Deepwater Horizon* blowout. In the aftermath, the Presidential Oil Spill Commission traced the failure of well cement to inadequate testing and lax regulations.⁸⁷ The Commission also cited the need for automated alarms to serve as a failsafe in the event of human error; a lack of coordination among lessees and contractors; and overreliance on standards promulgated by the American Petroleum Institute, an advocate for industry.⁸⁸ More generally, the Commission determined that the absence of integrated safety management practices by operators in the United States, “practices that most other countries . . . embraced decades [ago],” undermined drilling safety on the U.S. outer continental shelf.⁸⁹ It noted that, compared to its international peers, the U.S. has both the highest rate of offshore oil and gas fatalities and the lowest reporting of injuries.⁹⁰

The Presidential Oil Spill Commission also determined that the former MMS was “an agency systematically lacking the resources, technical training, or experience in petroleum engineering that is absolutely critical to ensuring safety.”⁹¹ Its training was “abysmal,” its ethical culture “degenerate,” and its staff “demoralized.”⁹² Its salaries were too low to attract personnel with sufficient expertise to oversee industry.⁹³ In response to these problems, the Commission recommended a “comprehensive overhaul” of regulatory policies and institutions. These regulatory oversight issues are essential for evaluating the potential for mitigating spill risk. BOEMRE should address them in an EIS before approving Shell’s exploration plan.

⁸⁴ *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351 (1989).

⁸⁵ *S. Fork Band Council Of W. Shoshone of Nevada v. U.S. Dept. of Interior*, 588 F.3d 718, 727 (9th Cir. 2009).

⁸⁶ Chukchi Revised Draft Supplement at 124.

⁸⁷ Commission Report at 100–02, 106, 119; *see also id.* at 225.

⁸⁸ *Id.* at 121, 224, 225.

⁸⁹ Commission Report at 71.

⁹⁰ *Id.* at 251.

⁹¹ *Id.* at 57.

⁹² *Id.* at 76–78; *see also* General Accountability Office, Additional Guidance Would Help Strengthen the Minerals Management Service’s Assessment of Environmental Impacts in the North Aleutian Basin at 24, 26 (March 8, 2010), *available at* http://www.eenews.net/public/25/15077/features/documents/2010/04/07/document_pm_03.pdf.

⁹³ *Id.* at 79.

BOEMRE has made several changes to the regulatory regime governing drilling safety since the *Deepwater Horizon* spill, including a rule on Increased Safety Measures for Energy Development, a Safety and Environmental Management Systems Rule, and two Notices to Lessees.⁹⁴ Shell's compliance with these regulatory changes should be considered in an EIS.⁹⁵ BOEMRE should assess whether Shell's responses and exploration plan comply and address the problems identified by the Presidential Oil Spill Commission and other groups and evaluate their effectiveness for mitigating oil spill risk.

A major question in the aftermath of the *Deepwater Horizon* spill was why the failsafe mechanisms of the blowout preventer failed.⁹⁶ "Evidence . . . suggests that it is unlikely that these problems are unique to the *Deepwater Horizon* event; for example, most BOPs used in drilling on the OCS are of similar design and are produced by a limited number of manufacturers."⁹⁷ BOEMRE should not approve exploration drilling in the challenging Beaufort Sea environment until it has identified the flaws in the Macondo well's blowout preventer and analyzed the potential for mitigating that risk in the Arctic, including determining for itself the extent to which Shell's approach to blowout prevention mitigates oil spill risk.

BOEMRE should also consider as part of its NEPA process the conclusions and recommendations of the *Deepwater Horizon* Joint Investigation Team, whose Final Report is scheduled for release on July 27, 2011. In particular, BOEMRE should address the problems posed by lack of oversight of foreign-flagged vessels engaged in offshore drilling operations. BOEMRE should ensure that each vessel Shell will use in carrying out its exploration in the Beaufort Sea is subject to rigorous safety inspection and "suitable for the service in which it is to be employed" in challenging Arctic conditions.⁹⁸

In addressing mitigation of oil spill impacts BOEMRE should also assess the potential for effective spill response in the Arctic. In the past, BOEMRE has assumed no spill response for purposes of describing oil spill impacts. Given the serious limitations of Arctic spill response capacity, BOEMRE should continue in that approach. But this does not excuse BOEMRE from the obligation to discuss oil spill response capacity and consider ways to bolster that capacity.⁹⁹

Both the Presidential Oil Spill Commission and the U.S. Coast Guard have raised questions about the dearth of vessels within range to assist in spill response in the Arctic.¹⁰⁰ The Commission has also noted the need for improvement of federal-state-local coordination for spill response.¹⁰¹ After the *Deepwater Horizon* spill, in which huge numbers of public and private vessels had to be enlisted in spill response, BOEMRE should not approve exploration drilling in

⁹⁴ 75 Fed. Reg. 63346 (October 14, 2010); 75 Fed. Reg. 63345 (October 14, 2010); Revised Draft Supplement at 125–26.

⁹⁵ See Chukchi Revised Draft Supplement at 124–26 (surveying these changes).

⁹⁶ Commission Report, Foreword at xi.

⁹⁷ Increased Safety Measures for Energy Development on the Outer Continental Shelf, 75 Fed. Reg. 63346-01.

⁹⁸ 46 U.S.C. § 3307.

⁹⁹ *Robertson*, 490 U.S. at 351–52

¹⁰⁰ Commission Report at 304; *Arctic Oil Spill Would Challenge U.S. Coast Guard*, Reuters (June 20, 2011), available at <http://af.reuters.com/article/energyOilNews/idAFN1E75J1OG20110620>.

¹⁰¹ Commission Report, Foreword at ix.

the Beaufort without completing a realistic assessment of public and private spill response capacity that can inform efforts to bolster that capacity.

BOEMRE should also address whether Shell's subsea containment resources are adequate to contain a spill at Shell's proposed locations. Notice to lessees 2010-N10 indicates that BOEMRE will now evaluate subsea containment resources and require operators to demonstrate that they can adequately respond to a blowout. BOEMRE should assess the effectiveness of Shell's proposed subsea containment plans, including the training of responders and testing of equipment.¹⁰²

II. Effects On Bowhead Whales

BOEMRE must analyze and disclose the potentially significant effects that disturbance and noise from Shell's drilling activities will have on endangered bowhead whales. BOEMRE should also consider and include in the administrative record for its decision on Shell's plan the statement of Dr. Bain submitted with this letter.

1. Number of Affected Whales

Shell's planned exploratory activities in the Beaufort Sea will indisputably encounter large numbers of bowhead whales. Shell's prospects are located within the whales' migratory corridor and the drilling will substantially overlap in time with the fall westward migration across the Beaufort Sea, and could affect whales late in the spring migration. During migration, bowhead whales are known to react to received levels of sound as low as 120 dB.¹⁰³ For the *Kulluk*, Shell estimates close to 5,600 migrating bowhead whales would be potentially exposed to sounds of 120 dB in the first year of the drilling program alone.¹⁰⁴ As a result, approximately 40% of the Western Arctic bowhead population could be affected each year.¹⁰⁵

Even this estimate may significantly undercount the number of exposed whales. Based on modeling results from the *Kulluk*'s drilling in the Beaufort Sea in 1986, Shell determined that

¹⁰² Commission Report at 243.

¹⁰³ Southall, et al., *Marine Mammal Noise Exposure Criteria: Initial Scientific Recommendations*, 33(4) *Aquat. Mamm.* 446 at 458 (2007) (Southall 2007). Migrating bowheads may respond at even lower thresholds: the recent USGS report notes reactions to drillship noise at 110-115 dB. USGS at 181. *See also* National Research Council, *Ocean Noise and Marine Mammals* at 92 (2003) (NRC Report). Shell's vertical seismic profiling will also have effects on migrating bowheads well beyond the 160-dB threshold assumed by Shell. Southall 2007 at 452.

¹⁰⁴ Shell, *Application for Incidental Harassment Authorization for the Non-Lethal Taking of Whales and Seals in Conjunction with Planned Exploration Drilling Program During 2012 Near Camden Bay in the Beaufort Sea, Alaska* at 44 (May 2011) (Beaufort IHA App.).

¹⁰⁵ *See* 76 Fed. Reg. 30,110, 30,126 (May 24, 2011) (calculating the current bowhead population to be 14,247). If Shell is unable to commence its Chukchi Sea drilling program, allowing for the use of the *Discoverer* in the Beaufort Sea, Shell estimates approximately 1,400 potentially affected whales in the first year. *See* Beaufort IHA App. at 44. For the second year of the drilling program, presumably either the *Discoverer* (1,400 whales) or the *Kulluk* (5,600 whales) could be utilized. Even in the scenario in which only the *Discoverer* is used in the Beaufort Sea in 2012 and 2013, a large percentage of the bowhead whale population could be affected. For the purposes of this NEPA review, however, BOEMRE should assume that the *Kulluk* is used in the Beaufort Sea in both years in order to capture the full potential effects of Shell's request.

noise levels of 120 dB could extend as far as 13.3 kilometers from the source.¹⁰⁶ Shell applied a 1.5 multiplier, resulting in a distance of just under 20 kilometers.¹⁰⁷ According to NMFS, however, a more recent 1994 study found that the *Kulluk*'s operations, combined with associated ice management activities, resulted in the 120-dB threshold reaching over 100 kilometers from the source.¹⁰⁸ For Shell's proposed 2007 drilling in the Beaufort Sea, NMFS consequently adopted a "reasonably conservative distance" of 30 kilometers when calculating the number of marine mammals potentially exposed to the 120 dB.¹⁰⁹ Even this was likely not conservative enough: the study reveals that the *Kulluk* alone produced noise in excess of 120 dB beyond 100 kilometers at 20 meters below the surface.¹¹⁰

The 1994 study is particularly relevant because ice management for Shell's drilling is likely to take place concurrently with at least some portion of the drilling during the bowhead fall migration. Based on 2003-2005 ice presence at the drill site, Shell anticipates that the ice management vessels will be active for 38 percent of the 120-day drilling season, or approximately 45 days.¹¹¹ Although Shell maintains that ice management will be limited to early July and late October, the sheer number of days in which Shell estimates that ice could be present indicates that there will be overlap with the peak of the fall migration, occurring in mid-September through mid-October.¹¹² Moreover, it cannot be assumed that ice management will be neatly confined to the beginning and end of Shell's operations. As Shell recognizes, ice floes and pack ice "usually can be found anywhere offshore in the Beaufort," and ice can be blown in "during any part of the drilling season."¹¹³

Including ice management could greatly increase the estimated number of potentially harassed bowheads. As with drilling noise, ice management noise can disturb marine mammals at very low levels. Shell indicates that it prefers to manage ice by "pushing" floes, but concedes that ice breaking would be conducted if there is a safety risk.¹¹⁴ BOEMRE has previously cautioned that the noise and disturbance associated with ice management is a major concern, and any NEPA analysis must consider the noise associated with the two ice management vessels breaking as well as pushing ice.¹¹⁵ Even when vessels are limited to pushing ice they will be

¹⁰⁶ Beaufort IHA App. at 36-37.

¹⁰⁷ *Id.*

¹⁰⁸ 72 Fed. Reg. 17,864, 17,868 (April 10, 2007).

¹⁰⁹ *Id.*

¹¹⁰ Hall et al, 1993 Kuvlum Exploration Project Site Specific Monitoring Program Final Report at 102-04 (May 20, 1994).

¹¹¹ Shell Beaufort Plan at 7-1; Air Sciences, Inc., Supplement to EPA Outer Continental Shelf (OCS) Operating Permit Application at 20-12 (Feb. 28, 2011) (*Kulluk* Air App. Supp.).

¹¹² Beaufort IHA App. at 15; 2008 BiOp at 13-14..

¹¹³ Shell, Environmental Impact Analysis, Revised Outer Continental Shelf Lease Exploration Plan, Camden Bay, Beaufort Sea at 3-10 (May 2011) (Beaufort EIA). *See also* Shell Offshore Inc., Revised Request for the Establishment of Safety Zones for the Frontier Discoverer Drill Ship and the Semi Submersible Drill Unit *Kulluk* in the Beaufort Sea, Alaska (March 30, 2007) at 2 (noting that ice conditions similar to those in 2006 for Camden Bay would require that the drill rigs be "constantly ice managed"); Beaufort IHA App. at 15 (noting that ice floe frequency and intensity are "unpredictable").

¹¹⁴ Beaufort IHA App. at 15.

¹¹⁵ *See* MMS, Final EIS, Beaufort Sea Planning Area, Oil and Gas Lease Sales 186, 195, and 202 at IV-68 (2003) (2003 Multi-Sale EIS) (noting that drillship noise "frequently may be masked by icebreaker noise, which often is louder"); *id.* at IV-69 (the effects of icebreaker noise on migrating bowheads, especially mothers and calves, "could be biologically significant").

operating at either “relatively high” speed or with the continual use of “higher power,” resulting in elevated noise levels.¹¹⁶ Further, regardless of how ice is managed, the vessels would operate up to five kilometers from the drilling operations, expanding the sonic footprint of the project whenever drilling and ice management take place simultaneously, and therefore will expose a larger number of whales to potentially disturbing anthropogenic noise.¹¹⁷

BOEMRE must also consider that whales could be disturbed in higher numbers during the summer. Shell found that 23 whales could be exposed to noise from the *Kulluk* in July and August.¹¹⁸ This estimate, however, does not incorporate the number of days that drilling operations will take place. It is based solely on the area exposed at the two drill-sites and fails to factor in whales that may move in and out of the area over time.¹¹⁹

2. Missed Feeding Opportunities

Shell proposes to drill in an established feeding location for bowheads. NMFS has cautioned that concentrations of loud noise and disturbance during the open water period “have the potential to cause large numbers of these whales to avoid using areas for resting and feeding for long periods of time (days to months) while the noise producing activities continue.”¹²⁰ Consequences would be “of particular concern if [inaccessible] areas included those used for feeding or resting by large numbers of individuals or by females and calves.”¹²¹ Because of the “potential for noise disturbance to displace whales from important feeding areas, special scrutiny should be given to seismic and drilling operations that may impact those areas.”¹²²

Shell intends to drill four wells in 2012 and 2013 west of Camden Bay, near Flaxman Island and Brownlow Point. In a 2010 biological opinion, based on the best available information, NMFS identified the areas west and east of Camden Bay as having “special significance” to bowhead whales.¹²³ NMFS identifies the area near Camden Bay as one of three “key” feeding sites, along with Point Barrow and the eastern Beaufort Sea.¹²⁴ BWASP surveys have “long shown that areas within and on both sides of Camden Bay including, but not limited to, areas off Kaktovik and Brownlow Point were, in many years, areas of high use by bowhead

¹¹⁶ *Kulluk* Air App. Supp. at 32-33; *see also* Shell Beaufort Plan at 7-1 (ice management vessels “operating at maximum emission rates”); Beaufort EIA at 2-45 (Table 2.9-5) (noting source levels for active ice management vessels); 2003 Multi-Sale EIS at IV-68 (noting a study predicting “that roughly half of the bowhead whales would show avoidance response to an icebreaker pushing ice at a range of 4.6-20 kilometers . . . when the sound to noise ratio is 30 decibels”).

¹¹⁷ Shell Beaufort Plan at 13-2. Shell intends to include a “minimum” of 11 support vessels, including the primary and secondary ice breakers, adding to the overall noise and disturbance both at the drilling site and during transit across the Chukchi and Beaufort seas. There is also the risk that a vessel could collide with a whale, resulting in serious injury or death.

¹¹⁸ Beaufort IHA App. at 41 (Table 6-4).

¹¹⁹ This error is equally true for other marine mammals as well.

¹²⁰ 2008 BiOp at 89.

¹²¹ *Id.* at 86.

¹²² *Id.* at 99; *see also id.* at 68 (stating that “[s]mall deflections in individual bowhead swimming paths and a reduction in use of possible feeding areas near exploration units may result in adverse effects on the species”).

¹²³ NMFS, Authorization of Small Takes Under the Marine Mammal Protection Act for Certain Oil and Gas Exploration Activities in the U.S. Beaufort and Chukchi Seas, Alaska for 2010 at 24 (July 13, 2010) (2010 BiOp); *see also id.* (stating that “[l]arge numbers” of whales “have been documented feeding in the area in multiple years”).

¹²⁴ 2010 BiOp at 25.

whales.”¹²⁵ The BWASP data are further bolstered by industry sightings of feeding whales near Camden Bay in 2007 and 2008.¹²⁶ Nuiqsut hunters have reported bowheads feeding and resting in Camden Bay, and industry surveys in the area sighted a high percentage of resting bowheads in 2006 as well.¹²⁷

3. Effects on Bowhead Cows and Calves

Shell’s proposed drilling is likely to affect bowhead cows and calves. Bowhead whales are a long-lived, late-maturing species with relatively low reproductive rates and extremely high maternal investment in their young. As previously recognized by BOEMRE, any potential impacts on females and calves merit “special consideration.”¹²⁸ The ability of the female bowhead whale to provide adequate care to her offspring during its period of dependency is “critical to the continued recovery and the long-term viability of the population.”¹²⁹ Indeed, in the past, NMFS has consistently required 120-dB “safety zones” for multiple migrating cow-calf pairs in the Beaufort Sea when issuing harassment authorizations pursuant to the Marine Mammal Protection Act.¹³⁰

As noted, migrating bowhead whales are known to feed near the drill sites, and the noise resulting from Shell’s activities could result in cows and calves deflected away from the area.¹³¹ Further, Shell’s activities may disproportionately affect cows and calves. Bowhead cow-calf pairs are thought to be more sensitive to noise, and are thus more likely to respond to disturbances at lower thresholds.¹³² Cows and newly born calves are also known to favor the tail end of the spring migration, which could subject them to disturbance both from Shell’s vessels as they transit to the Beaufort and Chukchi sea drilling sites in July and from Shell’s Beaufort Sea operations.

4. Previous NEPA Reviews

The NEPA analyses conducted to date do not adequately consider the direct effects of Shell’s proposed drilling plans. The biological significance of disturbance to wildlife from

¹²⁵ *Id.* at 24; *see also id.* at 67 (noting that BWASP surveys indicate that aggregations of bowhead whales, including feeding aggregations, “more likely” to be encountered in some areas, listing Brownlow Point among others); Ferguson et al., *A Tale of Two Seas: Lessons from Multi-decadal Aerial Surveys for Cetaceans in the Beaufort and Chukchi Seas* (2011 powerpoint) (slide 15, showing feeding and milling bowhead whales around Camden Bay).

¹²⁶ Beaufort EIA at 3-79.

¹²⁷ Declaration of Dr. Robert Suydam in Support of Nos. 09-73944 and 10-70368 at 8 ¶ 19; LGL Alaska Research Assoc. Ltd., *Joint Monitoring Program in the Chukchi and Beaufort Seas July-November 2006* at 8-14 (Table 8.3) (Nov. 2007).

¹²⁸ MMS, *Final Programmatic Environmental Assessment, Arctic Outer Continental Shelf Seismic Surveys – 2006* at 110 (June 2006).

¹²⁹ *Id.*

¹³⁰ *See, e.g.*, NMFS, *Finding of No Significant Impact for the Issuance of an Incidental Harassment Authorization for Shell Offshore Inc., to Take Marine Mammals Incidental to Conducting an Offshore Drilling Program in the Beaufort Sea off Alaska* at 3 (Oct. 24, 2007).

¹³¹ *See* 2008 BiOp at 86; 2010 BiOp at 24 (observing that “females with calves have been documented using the area in approximately the same proportions as they exist in the population”).

¹³² *See* 2008 BiOp at 86 (noting that in other species “females with young are more responsive to noise and human disturbance than other segments of the population”); 2006 PEA at 111 (noting heightened response of female baleen whales accompanied by calves).

exploration activities is highly dependent on when and where those disturbances occur.¹³³ The analyses contained in the 2003 Multi-sale EIS cannot substitute for analysis of impacts at the site-specific stage. The Multi-sale EIS contains general analyses of hypothetical scenarios, but does not analyze the specific interplay of particular projects. Moreover, they acknowledge that this analysis must be done at the site-specific stages.¹³⁴

The existing EAs for Shell's exploration drilling plans do not fill these critical gaps. Shell's proposals have varied over the years, and the drilling EAs have to date avoided the necessary hard look required by NEPA. Shell's initial 2007 plan involved twelve wells over three years using two drilling rigs in the Beaufort Sea only. That plan was struck down by the Ninth Circuit for failing to adequately consider the direct effects of the drilling on bowhead whales and subsistence activities.¹³⁵ Shell's plans for 2010 included both the Beaufort and the Chukchi seas but were limited to a single season and a single drillship. The current scenario is decidedly different. Shell's pending exploration plans involve two rigs operating simultaneously in both seas to drill ten wells over two years. More is now known about bowhead feeding around Camden Bay. More is now known about oil spills and the effects of an oil spill response. More is now known about the extent of the scientific uncertainty in the Arctic. Simply put, prior EAs could not have considered the precise effects of Shell's 2012-2012 plans because the current information about the dimensions of project and the specific attributes of the Camden Bay was not available.¹³⁶

III. Cumulative Effects

1. Activities Across the Arctic

BOEMRE must consider Shell's request in the context of Shell's own multi-sea, multi-year drilling plans as well as the myriad other industrial activities reasonably foreseeable in the Arctic Ocean. Viewed in that light, it is all the more clear that Shell's proposed drilling will have potentially significant effects.

¹³³ See, e.g., 2008 BiOp at 86; see also Wright, A.J. (ed.), Report of the Workshop on Assessing the Cumulative Impacts of Underwater Noise with Other Anthropogenic Stressors on Marine Mammals: From Ideas to Action at 9 n.1 (2009) (noting that activities "do not necessarily have to occur at the same time or even in the same location to present a cumulative challenge to [a] population").

¹³⁴ See 2003 Multi-sale EIS at V-5 (stating potential for cumulative impacts to whales "warrant[s] continued close attention and effective mitigation practices"); MMS, Chukchi Sea Lease Sale 193 Final Environmental Impact Statement at IV-145 (2007) (stating that at the lease sale stage, MMS is "unable to determine at this time if significant impacts would or would not occur"); MMS, Environmental Assessment, Proposed OCS Lease Sale 202 Beaufort Sea Planning Area at 64 (Aug. 2006) (noting that "prior to commencement of exploration, development, and production activities, proposed activities will be analyzed on a case-by-case basis and effective mitigation measures developed accordingly").

¹³⁵ *Alaska Wilderness League v. Kempthorne*, 548 F.3d 815 (9th Cir. 2008), *withdrawn*, 559 F.3d 916 (9th Cir. 2009).

¹³⁶ When analyzing direct effects, issues such as masking, stress, and threshold shift must be considered as well. A more detailed discussion of direct effects can be found in the attached statement of Dr. David Bain, incorporated here by reference and submitted along with this letter.

NEPA requires an analysis of the incremental effects of Shell's proposed Beaufort Sea drilling when added to other past, present, and reasonably foreseeable future actions.¹³⁷ In *Natural Resources Defense Council v. Hodel*, the D.C. Circuit remanded the EIS for an OCSLA five-year leasing plan that evaluated geographic regions in isolation despite the presence of migrating species.¹³⁸ In doing so, the court provided guidance for how the agency should approach its task:

The Secretary could, first of all, examine cumulative impacts of simultaneous inter-regional OCS development in a single, coherent section rather than fragment his analysis by area. This comprehensive section could then . . . identify the various migratory species and the full range of their routes of migration, describe the OCS and non-OCS activities along those routes, and state the synergistic effect of those activities on the migratory species.¹³⁹

The cumulative effects of multiple noise disturbances from oil and gas activities in the Arctic Ocean on marine mammals, particularly endangered bowhead whales, are a major concern.¹⁴⁰ Where and when those activities occur is critical to assessing their incremental effects, and this is particularly true here, where activities are planned to take place proximate to a key feeding and resting area for bowhead whales.¹⁴¹

If Shell drills its wells in both the Beaufort and Chukchi seas in 2012 and 2013, as it intends, bowheads may encounter Shell's exploration activities in both seas over two consecutive years. Thousands of bowheads will be potentially affected by the drilling, ice management, borehole seismic surveying, and vessel traffic, and the danger of a biologically significant impact will be especially high if cows and calves are exposed to the multiple disturbances.

Activities by other oil and gas companies in the Arctic will further stress the bowhead population. The State of Alaska recently expressed a strong interest in exploiting oil and gas reservoirs that can be accessed in state waters. The State's decision to hold a lease sale this year that will include offshore areas could prompt seismic surveying as companies determine potential locations for exploration. Based on existing state leases, Donkel Oil & Gas has already submitted an initial four-year exploration plan for an area offshore of the Arctic National Wildlife Refuge, with drilling potentially to begin in 2015, just two years after Shell expects to complete its operations.¹⁴² Donkel plans to conduct 3D seismic surveying in 2013.¹⁴³

¹³⁷ 40 C.F.R. § 1508.7; *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 993-94 (9th Cir. 2004).

¹³⁸ 865 F.2d 288 (D.C. Cir. 1988).

¹³⁹ *Id.* at 299-300.

¹⁴⁰ 2008 BiOp at 98 ("concern is warranted for cumulative noise and multiple disturbance; the consequences of which might include long-term shifts in migrational paths or displacement from nearshore feeding habitats" for bowhead whales); *id.* at 99 ("Concern is warranted over the distribution in time and space of several noise-producing activities."); *see also id.* at 48 (noting uncertainty about potentially significant effects from long-term cumulative sound impacts to marine mammals).

¹⁴¹ *See, e.g.*, 2008 BiOp at 86 (stating that whether noise disturbances from oil and gas activities potentially will result in a biologically significant impact on the bowhead population depends on the "timing, location, and number" of the disturbances).

¹⁴² Donkel Proposes New Unit Off ANWR Coast, *Petroleum News*, (May 1, 2011), <http://www.petroleumnews.com/pnads/798272341.shtml>.

In federal waters, ION Geophysical's plans to conduct a late-season 2D survey across much of the Beaufort Sea have been abandoned for this year but may be re-submitted for 2012. It is estimated that ION's surveying will affect hundreds of bowhead whales and could interfere with feeding around Point Barrow.¹⁴⁴ Both ConocoPhillips and Statoil have indicated that they are preparing for exploratory drilling in the Chukchi Sea beginning in 2013, which – combined with Shell's efforts – could result in three drilling operations in close proximity to one another. Exploration activities in Canadian and Russian waters must be considered as well.¹⁴⁵

2. Previous NEPA Reviews

Previous NEPA documents do not provide an adequate examination of cumulative effects. As noted, the EISs and EAs issued in connection with the underlying lease sales analyze exploration drilling only generally, and the EAs associated with Shell's earlier plans examine decidedly different projects and lack a comprehensive scope. The documents do not analyze the potential effects of multi-year deflections around the feeding site west of Camden Bay and lack relevant information about what is now known about potential oil and gas activity throughout the Arctic in the coming years that could result in additive and synergistic effects.

IV. Alternatives

BOEMRE must consider alternatives to Shell's proposed drilling. Shell's plan would permit it to drill wells in two separate locations, operating between July 10 and October 31, with a "subsistence hunt break" beginning on August 25.¹⁴⁶ While we believe that BOEMRE should choose the no action alternative and should not permit Shell to drill in the Beaufort Sea before it obtains and analyzes essential missing information about the sea and before proven adequate oil spill response plans are in place, BOEMRE should consider in its NEPA analysis alternatives to Shell's proposal that are more protective of the Beaufort Sea. These alternatives could include an alternative in which Shell is not permitted to resume drilling after its subsistence hunting break in August; an alternative that requires Shell to cease drilling for the season once a certain number of bowhead whales have been spotted approaching the drilling area on their westward fall migration; an alternative that reduces the risk of an overwintering oil spill by, for example, requiring Shell to stop drilling earlier in the season, well before October 31; an alternative that recognizes information is missing about the Beaufort Sea and limits Shell to drilling one well

¹⁴³ *Id.*

¹⁴⁴ See Letter from Alaska Wilderness League et al., to BOEMRE, ION Geophysical's Proposed 2011 Seismic Surveying (Jan. 18, 2011).

¹⁴⁵ A more detailed discussion of cumulative effects can be found in the attached statement of Dr. David Bain, incorporated here by reference and submitted along with this letter. The need to accurately assess cumulative effects has been emphasized by the recent expert panel reviews conducted in conjunction with the annual Open Water Meetings. See Expert Panel Review of Monitoring Protocols in Applications for Incidental Harassment Authorizations Related to Oil and Gas Exploration in the Chukchi and Beaufort Seas, 2011: Statoil and ION Geophysical at 5 (March 9, 2011), *available at* http://www.nmfs.noaa.gov/pr/pdfs/permits/openwater/peer_review_report2011.pdf. It is also discussed extensively in the recent USGS report on the Arctic.

¹⁴⁶ Shell Beaufort Plan at 1-1, Table 1; *id.* at 1-4.

only during the first year of its plan and requires the company to gather data on bowhead whales and other species during the course of the activity.

V. Effects On Subsistence Activities

Shell's drilling may negatively affect Alaska Native subsistence whaling and hunting in Camden Bay. The area in which Shell proposes to drill is directly in the fall migration path of bowhead whales, provides important habitat for bowhead whales during their fall migration, and is adjacent to traditional subsistence hunting grounds. The drilling operations are likely to deflect whales from their migration route. Results of prior surveys of the reaction of migrating bowhead whales to drilling noise in the vicinity of Shell's proposed drilling confirm that whales will deflect at considerable distances around drilling operations.¹⁴⁷ If bowhead whales are deflected from their migratory route, Inupiat whalers are much more likely to be unable to meet their quotas and will subject themselves to far greater risk by having to travel further in open ocean conditions to reach deflected whales. Shell's drilling also threatens subsistence fishing and hunting of belugas, seals and potentially caribou. These threats extend beyond simple loss of food or human life. For the Inupiat of the Arctic, there is a direct connection between the continued health of the marine environment and the health of their food supply and culture. Coastal peoples in the Arctic use marine plants and animals for food, clothing, and other necessities. The whale hunt is a centerpiece of their culture. These communities prepare for the hunt year-round, celebrate successful hunts, and share food throughout the village. NEPA requires effects on subsistence to be analyzed in an EIS.

VI. Air Pollution Effects

The fleet of large vessels Shell plans to use for its Beaufort Sea operations will emit large amounts of air pollution that could harm human health and the environment, and significantly degrade the Arctic's clean air. Shell will emit these pollutants into a rapidly changing Arctic environment and in relatively close proximity to Alaska Native villages, and thus subsistence activities.¹⁴⁸ NEPA requires BOEMRE to analyze the effects of these emissions.

Shell may emit up to 336 tons per year of NO_x and up to 28 tons per year of PM_{2.5}.¹⁴⁹ Both of these pollutants are harmful to human health. According to EPA, NO_x/NO₂ acts mainly as an irritant affecting the eyes, nose, throat, and respiratory tract.¹⁵⁰ "Continued exposure to high NO₂ levels can contribute to the development of acute or chronic bronchitis. Low level NO₂ exposure may cause increased bronchial reactivity in some asthmatics, decreased lung function in patients with chronic obstructive pulmonary disease and increased risk of respiratory infections, especially in young children."¹⁵¹ Exposure to elevated levels of particulate matter, especially fine particulate matter (PM_{2.5}), can cause adverse health effects even in healthy individuals.¹⁵² However, people with heart or lung disease, children, and the elderly are most

¹⁴⁷ *See supra*.

¹⁴⁸ Shell Beaufort Plan at 7-23

¹⁴⁹ *Id.* at 7-7, 7-14.

¹⁵⁰ <http://www.epa.gov/iaq/no2.html#Health Effects Associated with Nitrogen Dioxide>

¹⁵¹ *Id.*

¹⁵² <http://www.epa.gov/oar/particlepollution/health.html>

vulnerable.¹⁵³ “Numerous scientific studies have linked particle pollution exposure to a variety of problems,” including development of chronic bronchitis, irregular heartbeat, nonfatal heart attacks, and premature death in people with heart or lung disease.¹⁵⁴ Shell’s impact on PM_{2.5} air quality could be substantial, as PM_{2.5} levels could easily exceed the allowable increase under the new 24-hour PM_{2.5} increments that will be in effect before Shell begins drilling and which are designed to keep clean air sheds clean.¹⁵⁵ Shell will also emit large amounts of NOx, a potential health hazard.

“Airborne emissions from OCS activities could contribute incrementally to the risk of [chronic] health problems,”¹⁵⁶ and BOEMRE must determine whether this risk exists here. The agency should carefully analyze potential effects, and may not simply rely on the Clean Air Act permitting process to prevent significant effects.¹⁵⁷ Indeed, BOEMRE has recognized this in the past, stating that

[e]missions [that] cause an increase in pollutants over an area of at least a few tens of square kilometers that exceeds half the increase permitted under the Prevention of Significant Deterioration [(PSD)] criteria or the National Ambient Air Quality Standards [(NAAQS)] for nitrogen dioxide, sulfur dioxide, or particulate matter less than 10 microns in diameter; or exceeds half the increase permitted under the [NAAQS] for carbon monoxide or ozone

are significant for purposes of NEPA.¹⁵⁸

Further, Shell will emit pollutants that drive regional and global warming. Dramatic warming is already occurring in the Arctic at almost twice the rate of the rest of the globe,¹⁵⁹ resulting in visible changes to Alaska’s land, water, wildlife, and people.¹⁶⁰ Perhaps the most dramatic change has been the disappearance of sea ice. “As a result of receding and thinning sea ice scientists have observed polar bears drowning and going hungry, walrus forced onto land, and sharp declines in numbers of ice-dependent sea birds.”¹⁶¹ The warming is also threatening indigenous cultures. Arctic animals and subsistence hunts play a central part in Alaska Native cultures. Today, subsistence hunters have to travel farther to access animals.¹⁶² Also, melting permafrost is accelerating coastal erosion and forcing communities to relocate.¹⁶³

¹⁵³ *Id.*

¹⁵⁴ *Id.*

¹⁵⁵ EPA Region 10, Supplemental Statement of Basis for Proposed Prevention of Significant Deterioration Permits, Noble Discoverer Drillship, Shell Offshore Inc., Beaufort Sea Exploration Drilling Program, Permit No. R10OCS/PSD-AK-2010-01 (July 6, 2011); 75 Fed. Reg. 64,863, 64,871.

¹⁵⁶ 2008 Multi-Sale DEIS at J-12.

¹⁵⁷ *S. Fork Band Council Of W. Shoshone Of Nevada v. U.S. Dept. of Interior*, 588 F.3d 718, 726 (9th Cir. 2009) (“A non-NEPA document . . . cannot satisfy a federal agency’s obligations under NEPA.”).

¹⁵⁸ 2003 Multi-Sale EIS at IV-3-5.

¹⁵⁹ Arctic Climate Impact Assessment: Executive Summary at 10, *available at* <http://amap.no/acia/>.

¹⁶⁰ Anne E. Gore & Pamela A. Miller, Broken Promises: The Reality of Oil Development in America’s Arctic (2nd Ed.) at 40 (Sep. 2009).

¹⁶¹ *Id.* at 41.

¹⁶² *Id.*

¹⁶³ *Id.*

NEPA requires that BOEMRE analyze the potential effects of Shell's emissions on regional and global warming. Shell will emit up to about 60,000 tons of greenhouse gases.¹⁶⁴ Draft guidance from the Council on Environmental Quality identifies 25,000 tons of annual CO₂ emissions as a "useful indicator" of environmental significance when evaluating a project's contribution to climate change for purposes of NEPA.¹⁶⁵ BOEMRE must evaluate the impacts of Shell's greenhouse gas emissions.

Also, a substantial proportion of Shell's PM_{2.5} emissions will be black carbon.¹⁶⁶ Black carbon contributes to global and regional warming in multiple ways. In the atmosphere, it captures heat energy by absorbing sunlight, and after falling to earth, it accelerates melting by darkening snow and ice. Black carbon is generally regarded as the second most important contributor to Arctic warming after CO₂. Emissions of black carbon from sources in the Arctic itself are particularly troubling because Arctic emissions can cause substantially more regional warming than similar amounts of black carbon emitted outside the Arctic.¹⁶⁷ Thus, due to the importance of the location of Shell's emissions, BOEMRE should analyze potential warming effects through a regional lens, in addition to a global one.

VII. Effects In The Context Of Climate Change

As described above, BOEMRE must analyze the effects of Shell's operations in contributing to climate change. It must also analyze Shell's operations in the *context* of climate change. BOEMRE must recognize that climate change is already dramatically affecting the Arctic Ocean, its species, and its coastal communities and factoring in those effects when assessing the effects of Shell's operations. The recently published USGS report provides important information about climate change effects on the Arctic.¹⁶⁸ CEQ's Draft climate change NEPA guidance instructs agencies to consider climate change as part of the affected environment or baseline against which it assesses impacts.¹⁶⁹ For instance, "[c]limate change can increase the vulnerability of a resource, ecosystem, or human community, causing a proposed action to result in consequences that are more damaging than prior experience with environmental impacts analysis might indicate."¹⁷⁰ Rapid climate change in the Arctic is stressing species, particularly ice-dependent marine mammals such as polar bears, seals, and walrus. BOEMRE must consider the heightened vulnerability of the Arctic ecosystem when assessing the potential effects of Shell's drilling plan.

¹⁶⁴ Shell Beaufort Plan, App. F at 3-3-3-4.

¹⁶⁵ Council on Environmental Quality, Memorandum for Heads of Federal Departments and Agencies re: Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions at 3 (February 18, 2010) (CEQ Climate Guidance).

¹⁶⁶ Venkatesh Rao & Joseph H. Somers, Black Carbon as a Short-Lived Climate Forcer: A Profile of Emission Sources and Co-Emitted Pollutants, *available at* <http://www.epa.gov/ttnchie1/conference/ei19/session5/rao.pdf> ("Some sources (such as diesel engines) can have 80% of the PM_{2.5} being black carbon . . .").

¹⁶⁷ D. Hirdman et al., Source identification of short-lived air pollutants in the Arctic using statistical analysis of measurement data and particle dispersion model output, 10 *Atmos. Chem. Phys.* 669 (2010).

¹⁶⁸ *See* USGS Report at Ch. 4.

¹⁶⁹ CEQ Climate Guidance at 6-7.

¹⁷⁰ *Id.* at 6.

VIII. Effects Of Introducing Invasive Species

Shell's proposed exploration activities could result in the introduction of invasive species to the Arctic marine environment. BOEMRE must fully analyze the potential effects of such introduction. BOEMRE has acknowledged that exploration activities, such as those proposed in Shell's plan, could contaminate Alaska's waters with invasive species.¹⁷¹ Other federal agencies and experts also recognize that oil and gas activities, including exploration drilling, could bring invasive species to Alaska's waters.¹⁷² "Once brought to Alaska, alien species contaminating a rig/vessel may subsequently disperse into Alaska's ecosystems."¹⁷³

As BOEMRE has recognized, "[t]he introduction of aquatic invasive species . . . into a marine ecosystem can result in adverse impacts."¹⁷⁴ For example, "vessels engaged in transportation and oil exploration may introduce invasive species that could disrupt the balance of predator and prey relationships and diversity within the ecosystem."¹⁷⁵ If exploration activities bring invasive species to Arctic waters, the nonnative species could "compete with or prey on Arctic marine fish or shellfish species, which may disrupt the ecosystem and predators that may depend on indigenous species."¹⁷⁶ Invasive species could "impact the biological structure of bottom habitat" or change habitat diversity,¹⁷⁷ or "could compete with marine mammal prey, such as an invasive mollusk replacing the indigenous mollusk that walrus feed on."¹⁷⁸ Other invasive species, such as rats, could prey upon seabirds or their eggs. Because "a significant portion of Alaska's economy . . . depends upon the pristine and natural quality of its aquatic ecosystems," establishment of a harmful invasive species could also threaten Alaska's economic well-being.¹⁷⁹ BOEMRE experts have warned that the introduction of nonnative species to Arctic waters "may very well yield much greater significant adverse impacts than a large oil spill."¹⁸⁰

BOEMRE has not adequately analyzed the risk and effects of introducing invasive species into Arctic waters in prior non-site-specific NEPA analyses. In the past, BOEMRE assumed that U.S. Coast Guard regulations would reduce the risk of the introduction of invasive species by exploration activities, or that that cold Arctic waters would be too harsh to support

¹⁷¹ See, e.g., MMS, 2007-2012 OCS Leasing Program Final Environmental Impact Statement (2007) (2007-2012 FEIS) at IV-15 (noting that exploratory drilling uses rigs and/or vessels that could harbor invasive species "attached to the hull structure," "on the vessel," or in ballast water); 2008 Multi-Sale DEIS at 2-20 (noting that invasive species could be introduced through "ballast-water discharge, hull fouling, and equipment placed overboard (e.g., anchors, seismic airguns, hydrophone arrays, ocean-bottom-survey cables).").

¹⁷² See, e.g., NMFS, *Environmental Assessment for the Arctic Fishery Management Plan* (August 2009) (Arctic FMP EA) at 76 ("With the increase of vessels traveling through the Arctic Management Area and the use of oil rigs from locations outside the Arctic Ocean, the risk of introducing an invasive species increases."); see also S. Gollasch, *The Importance of Ship Hull Fouling as a Vector of Species Introductions into the North Sea*, *Biofouling* 18(2):105-121 (2002).

¹⁷³ 2007-2012 FEIS at IV-15.

¹⁷⁴ 2008 Multi-Sale DEIS at 2-20.

¹⁷⁵ Arctic FMP EA at 205.

¹⁷⁶ *Id.* at 76.

¹⁷⁷ *Id.* at 141.

¹⁷⁸ *Id.* at 188.

¹⁷⁹ 2007-2012 FEIS at IV-14.

¹⁸⁰ E-mail from Jeff Childs, MMS, to Paul Stang, MMS, "RE: invasive species reassignment," (June 14, 2006).

invasive species.¹⁸¹ These assertions are unsupported and inadequate. The Coast Guard's regulatory scheme suffers from gaps and deficiencies and may not provide adequate protection against aquatic invasive species.¹⁸² Moreover, BOEMRE may not simply assume that Arctic waters are not susceptible to threats posed by invasive species. This is especially true when rapid climate change has made the Arctic more vulnerable to invasive species.¹⁸³

IX. Beluga Whales

Beluga whales are extraordinarily sensitive to noise. Beluga reactions to icebreaker noise "are among the most cited and dramatic" in the scientific literature, and there are indications of avoidance behavior at distances of up to 80 kilometers.¹⁸⁴ Although responses vary, belugas have been shown to flee from vessel noises as well.¹⁸⁵ As noted, there is likely to be some degree of ice management during Shell's drilling and a considerable number of support vessels are included in the operation. Furthermore, any analysis of impacts is complicated by inadequate baseline information. As confirmed in the recent USGS report, information on the essential spatial and temporal habitat needs of the beluga whale is limited, severely compromising BOEMRE's ability to assess the impacts of Shell's proposal.¹⁸⁶ Effects to beluga whales from Shell's drilling are discussed further by Dr. Bain in a statement included as an exhibit to these comments.

X. Polar Bears

Shell's proposed drilling is likely to affect polar bears and should be thoroughly analyzed, along with cumulative impacts including climate change, in BOEMRE's NEPA analysis. Polar bears were listed as a threatened species under the Endangered Species Act in 2008 based on the rapid melting of their sea ice habitat.¹⁸⁷ Shell's proposed drilling will occur in polar bear habitat. If there were to be a large oil spill from Shell's activities, there could be population-level effects on polar bears. Even in the absence of a spill, Shell's daily activities, including ship transits, over-flights, drilling and icebreaking, can have adverse impacts on polar bears, which are already struggling in a rapidly warming environment.

BOEMRE's NEPA analysis should examine the possible effects of a large oil spill on polar bears. A very large oil spill, such as a blowout spill, which BOEMRE now considers possible in the Arctic Ocean, would almost certainly have population level impacts on polar

¹⁸¹ See, e.g., 2007-2012 FEIS at IV-15; 2008 Multi-Sale DEIS at 2-20.

¹⁸² See generally E-mail exchange among Jeff Childs, MMS; Gregory Ruiz, Marine Invasions Research Lab, Smithsonian Environmental Research Center; and Robert Piorkowski, Invasive Species Program Coordinator, Alaska Department of Fish and Game (March 16, 17, 19 & 21, 2006) (noting shortcomings in Coast Guard regulations).

¹⁸³ See Arctic FMP EA at 76 ("[R]ising ocean temperatures, and sea ice retreat may allow the colonization of invasive species that otherwise would not have been able to survive in the Arctic."); see also 2007-2012 FEIS at IV-10 ("Ocean ecosystems and fisheries are highly vulnerable to changes in sea temperature and sea-ice conditions."). See also USGS Report at 211 (noting that invasive species are one of the issue that must be addressed when evaluating the cumulative impacts of offshore oil and gas activities).

¹⁸⁴ USGS Report at 183.

¹⁸⁵ NRC Report at 94-95.

¹⁸⁶ USGS Report at 184.

¹⁸⁷ 73 Fed. Reg. 28,212 (May 15, 2008).

bears. In considering a possible spill of much smaller size,¹⁸⁸ the FWS estimated that as much as 8 percent of the Southern Beaufort Sea population of polar bears could be oiled.¹⁸⁹ Given more realistic spill scenarios, an oil spill could contact a very large number of bears. Furthermore, even if the oil did not initially contact large numbers of bears, the long term impact of such a large spill would be significant, and large numbers of bears could be killed.¹⁹⁰ Any NEPA analysis must consider these impacts in the context of a warming Arctic.

In addition to the severe impacts to polar bears that would flow from an oil spill, oil activities have daily, cumulative impacts on struggling bears, even when everything goes right. FWS's recent proposed Marine Mammal Protection Act incidental take regulations for oil and gas activities in the Beaufort Sea demonstrates these impacts. The rule estimates that as many as 150 polar bears per year may experience harassment from oil and gas activities in the Beaufort Sea alone.¹⁹¹ That means that as much as 20 percent of the Southern Beaufort Sea population of polar bears could be impacted by Shell's and other industry operations in 2012 and 2013.

These impacts will accumulate with impacts from climate change to further imperil polar bears. A recent paper by Amstrup et al. (2010) concluded that polar bears have the best probability of survival if greenhouse gas emissions are reduced *and* other stressors, such as oil and gas development, are minimized as much possible.¹⁹² As sea ice melts, there is both an increased likelihood of industry encounters¹⁹³ as well as a higher likelihood that any such industry encounters will have more severe impacts on the bears because they are already in a weakened state. Scientists have noted increased incidence of drowning and starvation in polar bears as the sea ice melts.¹⁹⁴ They have also documented decreased skull size and body weight in the Southern Beaufort Sea population of bears, an indication of decreased fitness.¹⁹⁵ Therefore, in addition to the fact that more bears will encounter industry activities onshore and in the open water because of climate change, the bears that encounter such activities are also going to be more vulnerable to impacts because they are already nutritionally and energetically stressed.¹⁹⁶ Being deterred from industry operations or forced to change course to avoid industry activities can have much more severe impacts on a nutritionally stressed animal than on a healthy one. BOEMRE's NEPA analysis must take these impacts into account.

¹⁸⁸ 76 Fed. Reg. 13,454, 13,467 (Mar. 11, 2011).

¹⁸⁹ *Id.* at 13,479.

¹⁹⁰ *See Id.* at 13,474 (“Although it may be true that small numbers of bears may be affected by an oil spill initially, the long-term impact could be much greater”) and 13,480 (“In the event that an offshore oil spill contacted numerous bears, a potentially significant impact to the [Southern Beaufort Sea] population could result, initially to the percentage of the population directly contacted by oil. . . . Bears would also be affected indirectly either by food contamination or by chronic lasting effects caused by exposure to oil”).

¹⁹¹ *Id.* at 13,484.

¹⁹² Amstrup, S. C., E. T. DeWeaver, D. C. Douglas, B. G. Marcot, G. M. Durner, C. M. Bitz, and D. A. Bailey. 2010. Greenhouse gas mitigation can reduce sea-ice loss and increase polar bear persistence. *Nature* 468:955-960. (“Greenhouse gas mitigation and best possible wildlife management could allow polar bears to persist throughout current range. . . . When temperature rise is kept at or below the MIT scenario and when on-the-ground management of harvest, bear-human interactions, oil and gas activities etc. is maximized (influence run no. 2), extinction is not the most probable outcome in any of the four ecoregions.”).

¹⁹³ 76 Fed. Reg. at 13,485,

¹⁹⁴ 73 Fed. Reg. at 28,248, 28,263.

¹⁹⁵ *Id.* at 28,238.

¹⁹⁶ *Id.* at 28,259.

XI. Water Pollution Effects

BOEMRE must analyze the effects of Shell's ocean water discharges. It cannot simply rely on the existence of the Arctic Ocean National Pollution Discharge Elimination System general permit to avoid conducting a NEPA analysis of ocean discharge effects.¹⁹⁷ The general permit has already expired, and in any case it does not contemplate the levels of discharges Shell's operations would generate.¹⁹⁸ For example, in issuing the General Permit, EPA stated that non-contact cooling water discharges would be less than 210,000 gallons per day,¹⁹⁹ but Shell's discharges will far exceed this amount.²⁰⁰ Cooling water discharges can pose threats to the marine environment by increasing water temperature. The damage temperature changes can cause to aquatic life is well documented. For aquatic organisms, water temperature regulates metabolism and affects the ability to survive and reproduce effectively.²⁰¹ For fish, temperature shifts can kill adults or fry, affect activity levels, or limit reproduction.²⁰² Further, organisms stressed by toxic materials are even less capable of tolerating temperature changes;²⁰³ because Shell's operations will discharge other toxic pollutants,²⁰⁴ those operations potentially could expose Arctic organisms to a lethal combination of temperature changes and toxic pollution. Also, Shell will exceed EPA's estimate for the discharge of fire control system test water.²⁰⁵ This discharge may be harmful to aquatic life as it is treated with biocide. Finally, Shell indicates that the volume of its deck drainage discharge would be dependent on rainfall.²⁰⁶ BOEMRE should examine the potential impacts of this discharge, because deck drainage, depending on the chemicals used in daily operations, can be toxic.²⁰⁷ Water discharge issues are a major concern of residents of the Arctic coast, who depend on wildlife harvested from the sea for their cultural and nutritional subsistence. BOEMRE must analyze and disclose the potential impacts of these discharges.

XII. Effects On Other Species

BOEMRE must also of course analyze the potential effects of Shell's plans on other species that inhabit the Beaufort Sea. Seals, birds, and fish may all experience adverse effects from Shell's operations.

¹⁹⁷ *S. Fork Band*, 588 F.3d at 727.

¹⁹⁸ EPA, Authorization to Discharge under the National Pollution Discharge Elimination System (NPDES) for Oil and Gas Exploration Facilities on the Outer Continental Shelf and Contiguous State Waters (Jun. 26, 2006) (expired on June 26, 2011).

¹⁹⁹ EPA, Final Ocean Discharge Criteria Evaluation of the Arctic NPDES General Permit for Oil and Gas Exploration at 2-15 (Jan. 24, 2006) ("ODCE").

²⁰⁰ Shell Beaufort Plan at 6-4, 6-6, 6-8, 6-10.

²⁰¹ EPA, *Quality Criteria for Water 1986* at 276 (May 1, 1986).

²⁰² *Id.* at 279.

²⁰³ *Id.*

²⁰⁴ *See, e.g.*, Shell Beaufort Plan at 6-4 (indicating that Shell will discharge deck drainage); ODCE at 2-11 (stating that deck drainage "may include drilling fluids, ethylene glycol, lubricants, fuels, biocides, surfactants, detergents, corrosion inhibitors, cleaners, solvents, paint cleaners, bleach, dispersants, coagulants, and any other chemical used in the daily operations of the facility")

²⁰⁵ Shell Beaufort Plan at 6-4, 6-6, 6-8, 6-10; ODCE at 2-15.

²⁰⁶ Shell Beaufort Plan at 6-4.

²⁰⁷ ODCE at 2-11.

Ribbon, ring, spotted, and bearded seals each have distinct habitats and life histories and will occur in different densities within the project area. Thus, Shell's operations may have varying effects on each species, and BOEMRE must analyze these different effects. Anthropogenic noise harms seals. Low-frequency sounds, like those that Shell's operations will produce, can mask sounds that are biologically significant for seals.²⁰⁸ The noise from Shell's operations—for instance from ice breaking or low-flying aircraft—could also disrupt normal behavior in seals, causing them to flee and resulting in unnecessary energy expenditures.²⁰⁹ BOEMRE should also consider whether Shell's operations might cause mortality of seals during molt or when resting on ice. BOEMER must also consider the effects of a large oil spill on seals.

Shell's operations may encounter a number of bird species, including loons, gulls, and sea ducks, like the threatened spectacled eider and Steller's eider.²¹⁰ An oil spill would have a devastating effect on bird populations.

Physical contact with oil destroys the insulation value . . . feathers, causing birds . . . to die of hypothermia. In cold climates, an inch diameter oil drop can be enough to kill a bird. Heavily oiled birds can lose their ability to fly and their buoyancy, causing drowning. In efforts to clean themselves, birds . . . ingest and inhale oil. Ingestion can kill [them] immediately, but more often results in lung, liver, and kidney damage and subsequent death. Long-term or chronic effects on birds . . . are less understood, but oil ingestion has been shown to cause suppression to the immune system, organ damage, skin irritation and ulceration, damage to the adrenal system, and behavioral changes. Damage to the immune system can lead to secondary infections that cause death and behavioral changes may affect an individual's ability to find food or avoid predators.²¹¹

Anthropogenic disturbances, like aircraft and vessels, can disturb birds, causing stress and ultimately harm.²¹² In particular, BOEMRE should consider whether Shell could disturb some activity that is essential to the health of the species, like mating. Also, birds are sometimes attracted to lights, and as a result, Shell's operations create the risk of mortality by bird-strike, and Shell's onshore support activities could attract predators that prey on birds or their eggs.²¹³

Marine fish in the Beaufort include arctic cod, arctic cisco, twohorn and fourhorn sculpins, arctic flounder, and Pacific herring.²¹⁴ The arctic cisco has decreased in abundance, and this has caused concern for Alaska Natives.²¹⁵ Noise from Shell's operations, including noise from its icebreakers, could cause stress and harm to fish. BOEMRE should carefully

²⁰⁸ 2008 Multi-Sale DEIS at 4-185-86.

²⁰⁹ See, e.g., Center for Biological Diversity, *Petition to List Three Seal Species Under the Endangered Species Act: Ringed Seal (Pusa hispida), Bearded Seal (Erignathus barbatus), and Spotted Seal (Phoca largha)*, (May 28, 2008) at 119.

²¹⁰ U.S. Fish and Wildlife Service, Spectacled Eider Fact Sheet

http://alaska.fws.gov/media/SpecEider_FactSheet.htm; U.S. Fish and Wildlife Service, Steller's Eider Fact Sheet

http://alaska.fws.gov/media/StellerEider_FactSheet.htm.

²¹¹ U.S. Fish and Wildlife Service, Effects of Oil Spills on Wildlife and Habitat

<http://alaska.fws.gov/media/unalaska/Oil%20Spill%20Fact%20Sheet.pdf>.

²¹² Audubon Alaska, Birds and Oil Development in the Arctic Refuge at 3.

²¹³ *Id.* at 5.

²¹⁴ Beaufort Sea Multisale EIS at III-33.

²¹⁵ *Id.* at VII-47.

consider whether Shell could create noise that could mask communication, or impair the ability to listen for predators and prey. Fish also would be affected by an oil spill in a number of ways.

Fish can be impacted directly through uptake by the gills, ingestion of oil or oiled prey, effects on eggs and larval survival, or changes in the ecosystem that support the fish. Adult fish may experience reduced growth, enlarged livers, changes in heart and respiration rates, fin erosion, and reproductive impairment when exposed to oil. Oil has the potential to impact spawning success, as eggs and larvae of many fish species, including salmon, are highly sensitive to oil toxins.²¹⁶

As explained above, Shell's discharges into the ocean could harm or kill fish by changing the water temperature and adding toxins to the environment. Further, if exploration activities bring invasive species to Arctic waters, the nonnative species could "compete with or prey on Arctic marine fish . . . species, which may disrupt the ecosystem and predators that may depend on indigenous species."²¹⁷

XIII. Incorporation Of Traditional Knowledge And Wisdom

BOEMRE must incorporate local and traditional knowledge into its analysis of Shell's drilling plan. Local and traditional knowledge is a different but equally valid knowledge system that can help expand understanding of the effects of Shell's drilling plan and supplement and enhance existing knowledge. Indigenous peoples who have lived in the Arctic Ocean region for millennia have developed a wealth of knowledge about the region. They depend on local plants and animals for food, clothing, and shelter, and know a great deal about the species they use and see. In recent years, an increasing amount of research has focused on traditional knowledge in the Arctic. Major projects, such as the Arctic Council's Arctic Climate Impact Assessment,²¹⁸ have incorporated traditional knowledge in efforts to understand what is taking place in the region. Outreach to local governments, tribes, co-management organizations, and other Alaska Native organizations is one way of incorporating not just knowledge, but the holders of that knowledge into the decision-making process. Greater involvement by Arctic peoples in the governance of their regions and communities allows their knowledge to benefit modern institutions. BOEMRE should ensure adequate outreach to Arctic communities and incorporation of local and traditional knowledge into its analysis of effects of Shell's drilling.

XIV. Environmental Justice Analysis

BOEMRE must address environmental justice concerns and analyze the disproportionate impacts of Shell's exploration on Arctic coastal communities. Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on

²¹⁶ Effects of Oil Spills on Wildlife and Habitat.

²¹⁷ Arctic FMP EA at 76.

²¹⁸ Arctic Climate Impact Assessment, Impacts of a warming Arctic: Arctic Climate Impact Assessment. Arctic Council and the International Arctic Science Committee (IASC) (2004), *available at* <http://www.acia.uaf.edu>.

minority populations and low-income populations.”²¹⁹ The Executive Order requires agencies to work to ensure effective public participation and access to information: each agency should work to “ensure that public documents, notices, and hearings relating to human health or the environment are concise, understandable, and readily accessible to the public.”²²⁰

In the memorandum to heads of departments and agencies that accompanied Executive Order 12898, the President specifically recognized the importance of procedures under the NEPA for identifying and addressing environmental justice concerns. The memorandum states that “each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by [NEPA].” The memorandum particularly emphasizes the importance of NEPA’s public participation process, directing that “each Federal agency shall provide opportunities for community input in the NEPA process.” Agencies are further directed to “identify potential effects and mitigation measures in consultation with affected communities, and improve the accessibility of meetings, crucial documents, and notices.”²²¹

Arctic communities have consistently expressed concerns about the human health impacts from proposed oil and gas activities in the Beaufort and Chukchi seas. Community members have voiced concerns about air quality issues and subsequent increases in respiratory problems as well as contamination of subsistence resources through water and air pollution. BOEMRE is obligated by Executive Order 12898 and subsequent guidance from CEQ²²² to study possible human health impacts (including impacts on wildlife that would affect subsistence users) and to address community concerns. Environmental justice compels a full public process before BOEMRE makes decisions about Shell’s drilling plan.

XV. Ambiguities in Shell’s Plan

Shell’s plan contains a number of ambiguities. For example, Shell has not committed to the drill-ship it will use to conduct its operations in the Beaufort. It will either use the *Kulluk* or the *Noble Discoverer*. These ships are very different, however, and will have different effects. For example, the *Kulluk* drill-ship creates much more noise when drilling than does the *Discoverer*. In addition, Shell does not disclose how many wells it intends to drill in the Beaufort Sea per year. BOEMRE must analyze the effects of all the possible scenarios and configurations of Shell’s proposed operations.

²¹⁹ Executive Order No. 12898, 59 Fed. Reg. No. 32 (Feb. 16, 1994) (Section 1-1).

²²⁰ *Id.*

²²¹ Memorandum from the President to the Heads of Departments and Agencies. Comprehensive Presidential Documents No. 279. (Feb. 11, 1994).

²²² CEQ, *Environmental Justice: Guidance under the National Environmental Policy Act* (Dec. 10, 1997) available at http://www.epa.gov/compliance/resources/policies/ej/ej_guidance_nepa_ceq1297.pdf.

CONSULTATION WITH NMFS AND FWS PURSUANT TO THE ENDANGERED SPECIES ACT

BOEMRE's assessment of Shell's exploration plan also triggers the agency's obligations pursuant to the Endangered Species Act (ESA). A number of listed species may be affected by the activities associated with Shell's plan, including bowhead whales, polar bears, spectacled and Steller's eiders, humpback and fin whales. It also may destroy or adversely modify polar bear critical habitat.

The ESA states that agencies shall, "in consultation with" the Services, "insure that any action authorized, funded, or carried out" is "not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species[.]"²²³ The Ninth Circuit has emphasized that an agency cannot "abrogate its responsibility to ensure that its actions will not jeopardize a listed species; its decision to rely on a . . . biological opinion must not have been arbitrary or capricious."²²⁴ The court in *Pyramid* found that while consultation may satisfy procedural obligations under the ESA, the action agency could "not rely solely" on a biological opinion "to establish conclusively its compliance with its *substantive* obligations[.]"²²⁵ Moreover, BOEMRE is obligated to reinitiate consultation whenever new information reveals that the action "may affect" listed species in a manner or to an extent not previously considered.²²⁶ Although biological opinions exist for listed species that may be affected by oil and gas activities in the Beaufort Sea, none adequately consider the effects of Shell's planned exploratory activities.

For endangered bowhead whales, NMFS issued a regional biological opinion in July 2008 for oil and gas leasing and exploration.²²⁷ Although it concludes that jeopardy is not likely to occur based on a consideration of potential effects at the programmatic level, it also notes that there is the possibility of greater harm from site-specific exploration activities, including icebreaker operations and drilling. In summarizing the effects of noise and disturbance, the opinion states:

Depending on their timing, location, and number, these activities potentially could produce sufficient noise and disturbance that whales might avoid an area of high value to them and suffer consequences of biological significance. These consequences would be of particular concern if such areas included those used for feeding or resting by large numbers of individuals or by females and calves.²²⁸

The point is reiterated in the opinion's conclusion: Due to "the potential for noise disturbance to displace whales from important feeding areas, special scrutiny should be given to seismic and drilling operations which may impact those areas."²²⁹

²²³ 16 U.S.C. § 1536(a)(2).

²²⁴ *Resources Ltd., Inc. v. Robertson*, 35 F.3d 1300, 1304 (9th Cir. 1994) (quoting *Pyramid Lake Paiute Tribe v. U.S. Dep't of the Navy*, 898 F.2d 1410, 1415 (9th Cir. 1990)).

²²⁵ *Pyramid Lake Paiute Tribe*, 898 F.2d at 1415 (emphasis in original).

²²⁶ 50 C.F.R. § 402.16(b).

²²⁷ See 2008 BiOp.

²²⁸ *Id.* at 86.

²²⁹ *Id.* at 99.

In 2010, NMFS recognized the need for a site-specific ESA consultation based on industry requests to conduct surveys in the Arctic and Shell's plans to drill multiple exploration wells. NMFS continued to self-consult on the surveying activities even after the Secretary of the Interior and the President made clear that review of Shell's proposal in the wake of the Gulf of Mexico spill would require more time. In the subsequently issued biological opinion, NMFS found that, in the period since previous ESA reviews in 2006 and 2008, there has been considerable research focused on the bowhead whale in the Beaufort and Chukchi seas.²³⁰ And, as discussed in more detail, *supra*, NMFS confirmed in the opinion the significance of the feeding habitat around Camden Bay for migrating bowhead whales, including cows and calves.²³¹

The need for a site-specific analysis is equally clear given the 2008 opinion's conclusions as to the potential effects of an oil spill. When discussing production, NMFS recognizes that were a large amount of fresh oil to come into contact with a large aggregation of feeding whales, "effects could be greater than typically would be assumed."²³² With Shell's drilling operations planned in the whales' migration corridor, within an area that is favored for feeding, and during a period that will overlap with the fall migration, the probabilities that underlie NMFS's conclusions as to the possible harm from a spill must also be reconsidered.²³³

For polar bears, and spectacled and Steller's eiders, FWS issued a biological opinion on September 3, 2009 covering leasing and exploration in the Beaufort and Chukchi seas.²³⁴ However, BOEMRE is obligated to reinitiate consultation if new information reveals that an action will affect a listed species in a manner not previously considered.²³⁵ BOEMRE must consider whether new information from the BP *Deepwater Horizon* oil spill and subsequent investigations and reports and new information about the status of polar bears and the continued retreat of summer sea-ice requires re-initiation of consultation with FWS.

On December 7, 2010, approximately 187,157 square miles of polar bear critical habitat in and around the Beaufort and Chukchi seas was designated under the ESA.²³⁶ The rule became effective on January 6, 2011, triggering all the affirmative obligations and prohibitory restrictions of the ESA. Exploration drilling in the Beaufort Sea may destroy or adversely modify polar bear critical habitat through direct disturbance of sea ice, the water column, and onshore habitat from vessels, aircraft, and drilling platforms, impacts on prey, and the risks of catastrophic oil spills. Furthermore, the primary threat to the polar bear's sea-ice habitat is from the past, current and future impacts of global warming. Therefore, the direct, indirect and

²³⁰ 2010 BiOp at 11.

²³¹ In addition, the 2008 opinion is premised on the notion that "only 1-2 wells are expected" per drilling season in the Chukchi Sea. 2008 BiOp at 6. Shell plans to drill three wells in the first year, with the addition of a possible fourth partial well.

²³² *Id.* at 113.

²³³ *See id.* at 99, 115 (estimating the potential for harm based on uncertainties as to when and where drilling would occur).

²³⁴ FWS, *Final Biological Opinion For Beaufort And Chukchi Sea Program Area And Associated Seismic Surveys and Exploratory Drilling* (Sept. 3, 2009).

²³⁵ 50 C.F.R. § 402.16(b) (2011).

²³⁶ 75 Fed. Reg. 76086 (Dec. 7, 2010).

cumulative impacts of greenhouse gas emissions including carbon dioxide, methane, and black carbon emissions associated with and flowing from exploration drilling activities in the Beaufort Sea destroy and adversely modify the polar bear's critical habitat. Accordingly, BOEMRE must reinitiate consultation on the effects of Shell's drilling to polar bear critical habitat.

For the reasons stated above, BOEMRE must prepare a full EIS pursuant to NEPA that analyzes and discloses the potentially significant effects of Shell's Beaufort Sea exploration plan, and it must engage in and complete consultation with NMFS and FWS pursuant to the ESA before making decisions to approve, disapprove, or require modifications of the plan.

Respectfully,

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