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Chukchi Sea Planning Area

**Oil and Gas Lease Sale 193 in the Chukchi Sea, Alaska
BOEM 2014-653
Outer Continental Shelf EIS/EA**

**Draft Second Supplemental Environmental Impact Statement
Volumes 1-2**

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Commissioned By:
* Greenpeace USA

* Prepared By:
David M. Augeri, Ph.D.

Associate Assistant Professor
College of Natural Resources
Colorado State University

Research Associate
Craighead Institute

* All Contact: John Deans (jdeans@greenpeace.org) ~ Greenpeace USA Arctic Campaign
Greenpeace USA ~ 702 H Street NW, Suite 300, Washington, D.C. 20001 ~ (202)-462-1177

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Introduction

Greenpeace hereby challenges Federal Lease Sale 193 (FLS 193) of approximately 29.4 million acres for oil and gas development in the Chukchi Sea, Alaska and the associated Draft Second Supplement Environmental Impact Statement (Draft SSEIS) published on 31 October 2014 by the Federal Bureau of Ocean Energy Management (BOEM). Pursuant to the U.S. Ninth Circuit Court of Appeals remand order on 22 January 2014, these public comments are provided by Greenpeace and the organization’s 260,000 members across the United States and 2.8 million members worldwide. Greenpeace USA calls on the United States Secretary of the Interior and BOEM to vacate FLS 193 or choose Alternative II – No Lease Sale – based on the following substantive issues:

Federal Lease Sale 193 and its associated Draft SSEIS (BOEM 2014a) are unlawful, flawed, negligent, arbitrary, and capricious and contravene:

** The National Environmental Policy Act (NEPA), the Clean Air Act, and Environmental Assessment process,*

** The Endangered Species Act (ESA) and legally mandated regulations of the United States Fish and Wildlife Service (USFWS), the National Marine Fisheries Service, and the National Oceanic and Atmospheric Administration,*

** Policies of the Environmental Protection Agency (EPA),*

** Recommendations of the United Nations Intergovernmental Panel on Climate Change (IPCC) supported by the United Nations Environment Program (UNEP), the World Meteorological Organization (WMO), and globally by all 195 IPCC member nations,*

** Recent actions by the Executive Office of the President of the United States, including multilateral international agreements to substantially reduce greenhouse gas emissions, and*

** Regulations and guidelines of the Executive Office of the President of the United States advised by the Council on Environmental Quality (CEQ).*

In particular:

- 1) BOEM conducts its analyses in its Draft SSEIS for FLS 193 based on the projected minimum recoverable resources despite its estimate of an average of nearly four times that amount. As a result, BOEM significantly underestimates likely scenarios and fails to consider all possible environmental impacts required by

NEPA. Such minimizations and underestimations are unlawful, contravene NEPA and the Clean Air Act, and are negligent, dismissive, arbitrary, and capricious.

2) As required by and in violation of NEPA and CEQ regulations and guidelines, BOEM failed to analyze the substantial and significant greenhouse gas (GHG) and black carbon (BC) emissions and the reasonably foreseeable proximate impacts of climate change caused by the end use of FLS 193 oil and gas production.

3) BOEM conducts its analyses in its Draft SSEIS for FLS 193 based only on the projected minimum recoverable resources (e.g. 4.3 Bbbls oil) despite its estimate of an average of nearly four times that amount at 15.38 billion barrels (Bbbls) of technically recoverable oil and 76.77 trillion cubic feet of undiscovered natural gas. Such minimizations and underestimations are unlawful, contravene NEPA, and are highly negligent, dismissive, arbitrary, and capricious.

4) As required by and in violation of NEPA and CEQ, BOEM failed to analyze the substantial and significant social and economic costs of the reasonably foreseeable proximate impacts of GHG emission effects on climate change caused by the end use of FLS 193 oil and gas production.

5) The affirmation and \$2.66 billion sale of FLS 193 is unlawful. This substantial sale occurred and its projected financial benefits were published prior to drafting and approval of a Final EIS and were significant factors in the Federal government's decision to a) approve the sale despite the known significant, severe, wide-spread, and long-lasting risks and negative impacts, b) uphold the lease *vs.* rescinding the lease and the Federal government's subsequent financial exposure from its i) legal obligation to buy back the lease and ii) loss of projected royalties in excess of \$46 - \$89 billion, and c) prejudice its analysis in favor of financial gain *via* selection of its preferred alternative of production despite the action's significant, long-term, wide-spread and in some cases, severe and irrevocable environmental, social, and cultural harms.

6) BOEM's impact scale and analyses are arbitrary and capricious. BOEM does not analyze the proposed action's impacts *via* a quantifiable metric or scale and instead a) uses an inadequate, biased, ambiguous, inconsistent, and subjective assessment, b) grossly minimizes the environmental impacts of the proposed action, c) contradicts its own analyses in favor of the preferred alternative to maintain the sale and develop the resources, and d) fails to provide sufficient information for an informed decision of alternatives.

7) The United States Department of the Interior, the United States Department of the Treasury, and BOEM proceeded with, affirmed, and accepted \$2.66 billion for the sale of Lease 193 in favor of its preferred alternative to develop oil and gas resources on public property despite its own conclusions as well as warnings by USFWS, EPA, NOAA, and NMFS that Federally listed and candidate Endangered and Threatened species could suffer significant, long-term, conspicuous, and/or

widespread population-level losses and irreparable harm as a result of the proposed action.

8) On 3 December 2014, the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) announced a critical habitat designation for Arctic subspecies (*Phoca hispida hispida*) of the ringed seal (*Phoca hispida*) under the Endangered Species Act (ESA) covering 350,000 square miles of the northern Bering, Chukchi, and Beaufort seas, which would encompass the FLS 193 project area. In addition, in December 2012, NMFS listed four subspecies of the ringed seal as Threatened or Endangered under the ESA (77 FR 76740). The proposed critical habitat rule notes that the seals and their habitats could be adversely affected by numerous oil and gas activities, including seismic surveys, drilling operations, production, development, and potential oil spills, among others. NOAA and the ESA state that oil and gas activities must consider the seals' critical habitat as well as that for other Federally listed species, including whales, walrus, Beringia bearded seal DPS, and polar bears. These species have a critical habitat of the ocean for essential resources and sea ice for resting, birthing and nursing. NMFS will be taking comments for 90 days until March 2015, and will hold public hearings in Alaska on all aspects of the proposal and relevant impacts of the proposed designation. Greenpeace and its 2.8 million members worldwide are on record strongly supporting this designation. Proceeding with FLS 193 would endanger ringed seals, bearded seals, polar bears, whales, Pacific walrus, and other species and would contravene the Endangered Species Act and Federal regulations of NOAA, NMFS, and the USFWS.

9) Significant abundances and densities of the cold water soft coral, *Gersemia rubiformis*, which is critical for, and a highly significant component of, the Arctic ecosystem upon which numerous threatened and endangered species rely, were newly discovered where the proposed activities of FLS 193 are intended to occur. These corals are equal to or greater than most coral rich areas of the world, but are under significant threat from oil and gas activities resulting from FLS 193 and its substantive contributions to climate change. Greenpeace provided this information to BOEM on 16 August 2012, but BOEM has failed to specifically consider and analyze this significant new information in its 2014 Draft SSEIS analyses as required by NEPA.

In consideration of these and additional substantive issues set forth in the proceeding comments, Greenpeace calls upon the United States Federal Government to vacate Federal Lease Sale 193 in its entirety or select Alternative II – No Lease Sale.

1) BOEM conducts its analyses in its Draft SSEIS (BOEM 2014a) for FLS 193 based on the projected minimum recoverable resources and, as a result, significantly underestimates the full range of likely scenarios and fails to consider all foreseeable direct and indirect impacts as legally required by NEPA.

As described by BOEM (2014a) below, all of the analyses in its Draft SSEIS (BOEM 2014a) for FLS 193 are based on the Agency's projected minimum production scenario of the minimum recoverable resources (e.g. 4.3 Bbbls oil) despite its estimate of a reasonably foreseeable mean of nearly four times that amount at 15.38 billion barrels (Bbbls) of technically recoverable oil and 76.77 trillion cubic feet of undiscovered natural gas:

“The Chukchi Sea OCS is viewed as one of the most petroleum-rich offshore areas in the country, with geologic plays extending offshore from some of the largest oil and gas fields on Alaska's North Slope. BOEM's current petroleum assessment indicates a mean technically recoverable oil resource of 15.38 billion barrels (Bbbl) with a 5% chance of 40.08 Bbbl (BOEMRE 2011a). The mean undiscovered gas resources total 76.77 trillion cubic feet (Tcf) with a 5% chance of 209.53 Tcf. At these levels, the leasing of offshore areas within the Chukchi Sea may lead to development and production, and could contribute significantly to the national energy supply.”

Ninth Circuit Court of Appeals records, along with BOEM's own communications and analyses, clearly demonstrate that the agency has been well aware of the magnitude of oil and gas production since at least 2006: “BOEM was fully aware from the very beginning that if one billion barrels could be economically produced, many more barrels could also be economically produced” (Fletcher et al. 2014). BOEM's (2014) impact analyses, however, only consider the minimum because, as stated in the Draft SSEIS, BOEM believes a) the likely scenario is zero production, b) it is unknown how much oil and gas would be produced, and c) it is unknown what those end uses would be and in what quantities. As a result, BOEM does not account for the full range of impacts, including cumulative effects, as required by NEPA if production is to occur. In a highly relevant legal precedent, Judge Jackson (2014) of the U.S. District Court of Colorado aptly states:

“The agency cannot—in the same FEIS—provide detailed estimates of the amount of coal to be mined (CRR-0154023 at 0154112-13) and simultaneously claim that it would be too speculative to estimate emissions from “coal that may or may not be produced” from “mines that may or may not be developed.” The two positions are nearly impossible to reconcile.”

As Judges Fletcher et al. (2014) of the Ninth Circuit Court of Appeals note: “BOEM considered only the *best* case scenario for environmental harm, assuming oil development. A best case scenario ‘skew[s]’ the data toward fewer environmental impacts, and thus impedes a ‘full and fair discussion of the potential effects of the project.’ *Native Ecosystems Council v. U.S. Forest Serv.*, 418 F.3d 953, 965 (9th Cir. 2005) (citation and internal quotation marks omitted)” (Fletcher et al. 2014). Although Judges Fletcher et al. (2014) refer to BOEM’s previous Final EIS (BOEM 2011a), BOEM continues to base all of its analyses, scenarios, and impact assessments using *only* its minimum production estimate in its latest Draft SSEIS (BOEM 2014a). According to Judge Fletcher of the Ninth Circuit Court of Appeals (Fletcher et al. 2014) (emphasis added):

“Under NEPA, BOEM is required to take into account the full environmental effects of its actions when deciding whether and in what manner to pursue the lease sale. 42 U.S.C. § 4332(2)(C). A later project or site-specific environmental analysis is an inadequate substitute for an estimate of total production from the lease sale as a whole. ***It is only at the lease sale stage that the agency can adequately consider cumulative effects of the lease sale on the environment, including the overall risk of oil spills and the effects of the sale on climate change.*** It is also only at the lease sale stage that the agency can take into account the effects of oil production in deciding which parcels to offer for lease.”

“***The agency cannot shirk its responsibility to ‘consider[] all foreseeable direct and indirect impacts’ of the proposed action in its EIS.*** *N. Alaska Env’tl. Ctr.*, 457 F.3d at 975 (internal quotation marks omitted). The agency also must ‘discuss[] . . . adverse impacts’ without ‘improperly minimiz[ing] negative side effects.’”

“Once BOEM made the determination that production is reasonably foreseeable, it was ***required to consider the full cumulative impact of that production.***”

Although BOEM raised its former minimum estimate from 1 Bbbls of recoverable oil to 4.3 Bbbls of recoverable oil for its current Draft SSEIS (BOEM 2014a), BOEM ignores in its 2014 Draft SSEIS determinations by both the Ninth Circuit Court of Appeals and the EPA to consider the full range of production and subsequent impacts (*as cited in*: Fletcher 2014). As a result BOEM grossly underestimates foreseeable and likely impacts. This is supported by the EPA, which stated that by BOEM maintaining its analyses based only on its minimum production estimate rather than on the mean it is “significantly underestimating likely scenarios” (*as cited in*: Fletcher 2014).

In its latest Draft SSEIS (BOEM 2014a) BOEM also determined that zero production is the most likely outcome for FLS 193, but if development occurs only one anchor field and one

satellite field would potentially be developed. As determined by the Ninth Circuit Court of Appeals, such analysis is “flawed” (*see* Fletcher et al. 2014):

“Defendants argue that...the most likely foreseeable outcome is no oil development at all....This analysis is flawed....BOEM concluded that oil production was ‘reasonably foreseeable.’ There is a substantial basis for this in the record because, as noted by BOEM, ‘the area has high oil resource potential and there is existing transportation infrastructure to move oil from northern Alaska to distant markets.’ Once BOEM made the determination that production is reasonably foreseeable, it was required to consider the full cumulative impact of that production. *See* 40 C.F.R. § 1508.7.”

BOEM (2014a) states that given current economic conditions, the most likely scenario would be 4.3 Bbbls of economically recoverable oil. Yet, BOEM (2014a) contradicts itself by stating that an approximate mean of 3 - 4 times more oil (15.4 Bbbls) than the minimum estimate of 4.3 Bbbls “could conceivably be discovered and produced” (emphasis added):

“BOEM’s 2011 Resource Assessment estimates that the Chukchi Sea OCS contains significant concentrations of naturally-occurring hydrocarbons that can conceivably be discovered and recovered. The report estimates that the Chukchi Sea OCS contains a mean UTRR of 15.4 billion barrels of oil (Bbbl) and 76.8 trillion cubic feet (Tcf) of gas. ***These volumes could conceivably be discovered and produced with current industry technology***....In BOEM’s latest Resource Assessment, at a \$110 per barrel oil price, 11.5 Bbbl of oil (75% of the UTRR) could be economic to develop, if discovered.”

Despite its own estimates of reasonably foreseeable production, BOEM uses only its estimated minimum to base all of its analyses and, consequently, conflates the impacts in all of its environmental assessments. Other federal agencies, such as the EPA and USFWS, as well as the Ninth Circuit Court of Appeals (*see* Fletcher et al. 2014) judged that the mean and a full range of estimates from low to high is “a more likely occurrence” and should be used (emphasis added):

“The mean estimate of economical oil production, at the center of the distribution curve, is by definition a more likely occurrence than is the lowest estimate of viable oil production. Previous EISs in the Chukchi Sea had used the mean estimate of oil production as the basis for their analyses, and those EISs had also included low and high estimate.”

“(H)aving decided that oil production was reasonably foreseeable, NEPA required BOEM to base its analysis on the full range of likely production if oil production were to occur.”

“The Division of Migratory Bird Management at the U.S. Fish and Wildlife Service (“FWS”) similarly challenged the one billion barrel estimate as inaccurate: ***The basic assumptions used in the analysis of effects are flawed with regards to the size of***

development scenarios. The [Draft EIS (“DEIS”)] states that the current petroleum assessment indicates a mean recoverable oil resource of 12 billion barrels; yet all environmental analyses reported in the DEIS are based on a development of 1 billion barrels, thereby significantly underestimating likely scenarios.”

Underestimating the environmental impacts of a proposed Federal action is in direct contravention of both the National Environmental Policy Act (NEPA) and regulations of the United States Environmental Protection Agency (EPA) and the Council on Environmental Quality (CEQ). In addition, the U.S. Fish and Wildlife Service (USFWS) informed BOEM that the possible impacts from only a 1 Bbbl level of production would have most likely led to a jeopardy finding by the USFWS for the Endangered spectacled and Steller’s eiders. As such, BOEM would not have been able to proceed with FLS 193 under the Endangered Species Act (ESA) or would have had to request an exemption from the “no jeopardy” rule (*as cited in*: Fletcher et al. 2014):

“BOEM’s estimate also informed FWS’s determination that Lease Sale 193 would not jeopardize listed species. The record suggests that FWS was close to finding, even under the one billion barrel assumption, that the lease sale would jeopardize the spectacled and Steller’s eiders. Had BOEM not selected the least amount of oil necessary for production, FWS may well have concluded that the listed species were in jeopardy. *See* 16 U.S.C. § 1536(a)(2).”

Given the current estimate of 4.3 Bbbls is more than four times greater, it is fairly certain that the USFWS would have determined that resulting impacts would have surely jeopardized these Endangered species.

Such minimizations and underestimations by BOEM, which are replete throughout the current Draft SSEIS and that BOEM relies on for its impact analyses to support its recommendation for its preferred alternative of production, contravene NEPA and are highly inadequate, dismissive, and negligent. Because, the CEQ, NEPA and the Ninth Circuit Court of Appeals require that BOEM “*consider all foreseeable direct and indirect impacts*” of the proposed action in its EIS, including during the lease sale stage, and that “*it must discuss adverse impacts without improperly minimizing negative side effects*” (emphasis added), the current Draft SSEIS (BOEM 2014a) is wholly insufficient and new analyses that account for all foreseeable direct and indirect impacts must be provided to the public for consideration. In fact, given BOEM’s “zero production” assumption is flawed and BOEM’s production scenarios, which were primarily designed only for the sake of the EIS exercise (BOEM 2014a), have been ruled to be arbitrary and capricious, then by law it must redraft the EIS with analyses of all possible direct and indirect

impacts, including based on projected minimum, mean, and maximum levels of production (*see* Fletcher et al. 2014).

Furthermore, given that BOEM's analysis indicates the probability of at least two large spills and subsequent impacts is 75% even at the minimum levels of production (BOEM 2014a), such a significant probability of an environmental disaster is wholly unacceptable by any standard or existing law and BOEM itself should never have proceeded with FLS 193. Indeed, the Deepwater Horizon and Exxon Valdez disasters, Shell's own ships grounding in Alaskan waters, and numerous other examples demonstrate that large spills can occur at any point in the process. According to a recent and highly important report by the National Research Council (NRC), consisting of the National Academy of Sciences, National Academy of Engineering, and the Institute of Medicine, "the risk of a serious oil spill in the Arctic is escalating" and "present an even greater challenge" (NRC 2014). Furthermore, much of the research and work on oil spill response and technologies have been done only for warmer regions with better climatic conditions (NRC 2014). The NRC (2014) stated that additional research, including validating current and emerging oil spill response technologies in Arctic environmental conditions on operational scales, is urgently needed to make informed decisions about the most effective response strategies for Arctic spills (NRC 2014). The NRC (2014) concludes:

"The risk of a serious oil spill in the Arctic is escalating due to potential increases in shipping traffic and oil and gas activities. To provide an effective response effort in challenging Arctic conditions—and minimize impacts on people and sensitive ecosystems—a full range of proven oil spill response technologies is needed."

"Mounting an effective oil spill response is difficult in any environment, but oil spills in Arctic waters present an even greater challenge."

NOAA (2014) validates this very serious problem: "oil spills under ice or in ice-covered waters...cannot be contained or recovered effectively in current technology," and that "tanker spills, pipeline leaks, and oil blowouts are likely to occur in the future, even under the most stringent regulatory and safety systems." (75 Fed. Reg. 77487, 77509) In its Draft SSEIS, BOEM (2014a) acknowledges that current emergency response infrastructure and technologies are insufficient in the region for handling large and very large oil spills, blowouts, etc. BOEM (2014a), and further acknowledges that a very large spill would have significant consequences (emphasis added):

“There is a lack of accident response resources in the Arctic as well as a lack of effective techniques for containing or cleaning up spilled oil under ice or in broken ice. There are also challenges associated with conducting a rapid, effective spill response in a region where weather is often severe, daylight may be limited, and accidents may happen in remote locations (AMAP 2007).”

“A very large oil spill and gas release would present sustained degradation of water quality from hydrocarbon contamination in exceedence of State and Federal water and sediment quality criteria. These effects would be significant. Additional effects on water quality would occur from response and cleanup vessels, in-situ burning of oil, dispersant use, discharges and seafloor disturbance from relief well drilling, and activities on shorelines associated with cleanup, booming, beach cleaning, and monitoring.”

Furthermore, the National Oceanic and Atmospheric Administration’s (NOAA) National Marine Fisheries Service (NMFS) (2014) specifically cautions:

“(O)il spills under ice or in ice-covered waters....cannot be contained or recovered effectively in current technology...tanker spills, pipeline leaks, and oil blowouts are likely to occur in the future, even under the most stringent regulatory and safety systems. (75 Fed. Reg. 77487, 77509).”

In essence, it is a highly negligent Federal action and abuse of discretion and authority that BOEM proceeded with the sale despite a) its own analysis and knowledge of a 75% probability of one or more large spills without adequate emergency response or technology available in the region and b) not providing sufficient analyses and information to the public and decision makers regarding the full range of direct, indirect and cumulative impacts for a reasoned choice of alternatives. Federal Lease Sale 193 must be vacated on this basis alone. Furthermore, in light of the fact that BOEM’s insufficient and dismissive analyses are also arbitrary, capricious and an abuse of discretion and authority in order to proceed with FLS 193 for significant financial gain, the United States Federal Government must vacate Federal Lease Sale 193 in its entirety or select Alternative II – No Lease Sale.

2) As required by and in violation of NEPA, BOEM fails to analyze the substantial and significant greenhouse gas (GHG) and black carbon (BC) emissions and the reasonably foreseeable proximate impacts of climate change caused by the end use of FLS 193 oil and gas production.

Over the course of this multi-year process and EIA, BOEM has consistently ignored its legal obligation to provide sufficient and quantitative information and analyses of this Federal action's effects on, and input to, climate change. The most recent 2014 guidelines (published in December 2014 for public review) on GHG emissions and the NEPA process from the Executive Office of the President of the United States, as advised by the Council on Environmental Quality (CEQ) are very clear. It is understood these new CEQ (2014) instructions (highly relevant portions of which are provided in part below), were released to the public after BOEM published its 2014 Draft SSEIS. Nevertheless, BOEM is now obliged to adhere to the newest guidelines (CEQ 2014), which state, unequivocally, that as a Federal agency BOEM must include substantive and quantitative analyses regarding GHG emissions (emphasis added):

“The analysis of impacts on the affected environment should focus on those aspects of the human environment that are impacted by both the proposed action and climate change. Climate change can affect the environment of a proposed action in a variety of ways...and result in a proposed action's effects being more environmentally damaging.”

“(A)n agency should compare the levels of GHG emissions caused by each alternative including the no-action alternative...to provide information to the public and enable the decision maker to make an informed choice.”

“Accordingly, if a comparison of these alternatives based on GHG emissions, and any potential mitigation to reduce emissions, would be useful to advance a reasoned choice among alternatives and mitigations, then an agency should compare the levels of GHG emissions caused by each alternative including the no-action alternative...and mitigations to provide information to the public and enable the decision maker to make an informed choice.”

“The current and expected future state of the environment without the proposed action represents the reasonably foreseeable affected environment that should be described based on available climate change information, including observations, interpretive assessments, predictive modeling, scenarios, and other empirical evidence.”

“If tools or methodologies are available to provide the public and the decision-making process with information that is useful to distinguishing between the no-action and proposed alternatives and mitigations, then agencies should conduct and disclose quantitative estimates of GHG emissions and sequestration...GHG estimation tools have become widely available, and are already in broad use not only in the Federal sector, but also in the private sector, by state and local governments, and globally.”

“When assessing direct and indirect climate change effects, agencies should take account of the proposed action - including ‘connected’ actions – emissions from activities that have a reasonably close causal relationship to the Federal action, such as...a consequence of the agency action (often referred to as downstream emissions) (and) should be accounted for in the NEPA analysis. After identifying and considering the direct and indirect effects, an agency must consider the cumulative impacts of its proposed action and reasonable alternatives.”

“‘Cumulative impact’ is defined in the CEQ Regulations as the ‘impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions’.”

“Consequently, agencies need to consider whether the reasonably foreseeable incremental addition of emissions from the proposed action, when added to the emissions of other relevant actions, is significant when determining whether GHG emissions are a basis for requiring preparation of an EIS.”

“40 CFR §§ 1508.7, 1508.8 (stating that:...(3) cumulative impacts consider the incremental addition to other past, present, and reasonably foreseeable future actions. This NEPA requirement applies to all proposed actions and calls for the disclosure of the full range of effects that flow from the action, regardless of the ability to control or regulate those effects.). See also 52 FR 22517 (June 12, 1987)...Once the scope of analysis is determined, the agency must then assess the direct, indirect and cumulative effects of the proposed [F]ederal action.”

BOEM openly acknowledges that the activities resulting from FLS 193 would contribute to climate change, yet claims the emissions from this action would supposedly be “negligible”:

“The exploration, development and production activities under the Scenario would produce greenhouse gas (GHG) emissions and particulate matter (PM) that would contribute to climate change. The GHG and PM emissions from the Scenario would be small relative to global GHG and PM emissions, and therefore, the contribution of the Scenario to global climate change would be negligible.” (Draft SSEIS, pg. 37).

Climate change is a global phenomenon and, by both definition and function, affects and causes changes in virtually every aspect on Earth, including human society. As such, the results of an action (e.g. GHG emissions) would need to be lasting and substantial to add to that phenomenon and “contribute” to its effects (IPCC 2013, 2014). BOEM acknowledges that the foreseeable impacts of this Federal action will contribute to climate change. However, emissions that actually contribute to climate change would not simply dissipate without exerting an effect. Thus, to make a contribution such effects could not be “negligible” (IPCC 2013, 2014). The scientific evidence is

clear that, at this point in time, anything that contributes to climate change is significant and could lead to irreversible impacts (IPCC 2013, 2014). BOEM (2014a) not only contradicts itself by stating that the action would produce GHGs that would “contribute to climate change”, but only provides a subjective, arbitrary, and capricious assumption of supposed negligible impacts without any basis, data, information, or quantitative analyses to support that assumption.

BOEM appears to be making the assumption that analyses are only required for direct local emissions from exploration, production and development activities resulting from FLS 193. In addition to the fact that BOEM also does not provide any data, information or quantitative analyses to support this theory, such an assumption is wholly invalid according to NEPA, the Executive Office of the President of the United States as advised by CEQ, the Ninth Circuit Court of Appeals (*see* Fletcher et al. 2014), the US District Court of Colorado (*see* Jackson 2014), and numerous precedents cited therein. In fact, climate impacts are also required under NEPA as “cumulative impacts”. As the CEQ (2014) instructs (emphasis added):

“(T)he statement that emissions from a government action or approval represent only a small fraction of global emissions...is not an appropriate basis for deciding whether to consider climate impacts under NEPA. Moreover, these comparisons are not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigations. This approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each make relatively small additions to global atmospheric GHG concentrations that collectively have huge impact.”

Even so, there would be local stationary and mobile sources of GHG and BC emissions resulting from these activities that, in addition to falling under NEPA requirements, are subject to numerous federal and state regulations. This includes GHG and BC emissions regulated by the Clean Air Act (CAA). Guidelines from the Executive Office of the President of the United States, as advised by CEQ (2010, 2014) clearly state:

“Where an activity is subject to GHG emissions accounting requirements, such as Clean Air Act reporting requirements that apply to stationary sources that directly emit 25,000 metric tons or more of CO₂-equivalent GHG on an annual basis, the agency should include this information in the NEPA documentation for consideration by decision makers and the public.” (CEQ 2010)

“In the agency’s analysis of direct effects, it would be appropriate to: (1) quantify cumulative emissions over the life of the project; (2) discuss measures to reduce GHG emissions, including consideration of reasonable alternatives; and (3) qualitatively discuss the link between such GHG emissions and climate change.”

“The estimated level of GHG emissions can serve as a reasonable proxy for assessing potential climate change impacts, and provide decision makers and the public with useful information for a reasoned choice among alternatives.”

It is necessary to emphasize that regardless of whether the federal action directly produces greater or less than 25,000 metric tons of CO₂-equivalent GHG emissions per year, particularly over long-lived actions such as FLS 193 (i.e., 77 years), CEQ (2010, 2014) clearly states as noted above that “*it would be appropriate to quantify cumulative emissions over the life of the project*” (emphasis added). However, BOEM provides no quantification even for direct source emissions from the oil and gas activities associated with FLS 193. In fact, CEQ (2010, 2014) recommends that analyses be conducted:

“Specifically, if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO₂-equivalent GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 metric tons of CO₂-equivalent, CEQ encourages Federal agencies to consider whether the action’s long-term emissions should receive similar analysis.”

The following are significant conclusions by the International Panel on Climate Change (IPCC) taken directly (emphases maintained) from the most recent IPCC (2014) Fifth Synthesis Report for Policymakers. These conclusions are based on and supported by more than 10,000 scientific studies and are highly relevant for Greenpeace’s comments herein regarding the multiple problems with BOEM’s Draft SSEIS (2014) and the consequences of Federal Lease Sale 193 to global climate change:

“It is *extremely likely* that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forcings together....Anthropogenic influences have *likely* affected the global water cycle since 1960 and contributed to the retreat of glaciers since the 1960s and to the increased surface melting of the Greenland ice sheet since 1993. Anthropogenic influences have *very likely* contributed to Arctic sea-ice loss since 1979 and have *very likely* made a substantial contribution to increases in global upper ocean heat content (0–700 m) and to global mean sea-level rise observed since the 1970s.”

“Year-round reductions in Arctic sea ice are projected for all RCP (Representative Concentration Pathway) scenarios. A nearly ice-free Arctic Ocean in the summer sea-ice minimum in September before mid-century is *likely*. A large fraction of species faces increased extinction risk due to climate change during and beyond the 21st century, especially as climate change interacts with other stressors (*high confidence*). Most plant

species cannot naturally shift their geographical ranges sufficiently fast to keep up with current and high projected rates of climate change in most landscapes; most small mammals and freshwater molluscs will not be able to keep up at the rates projected under RCP4.5 and above in flat landscapes in this century (*high confidence*). Future risk is indicated to be high by the observation that natural global climate change at rates lower than current anthropogenic climate change caused significant ecosystem shifts and species extinctions during the past millions of years. Marine organisms will face progressively lower oxygen levels and high rates and magnitudes of ocean acidification (*high confidence*), with associated risks exacerbated by rising ocean temperature extremes (*medium confidence*). Coral reefs and polar ecosystems are highly vulnerable. Coastal systems and low-lying areas are at risk from sea-level rise, which will continue for centuries even if the global mean temperature is stabilized (*high confidence*).”

“There is *high confidence* that ocean acidification will increase for centuries if CO₂ emissions continue, and will strongly affect marine ecosystems. Magnitudes and rates of climate change associated with medium- to high-emission scenarios pose an increased risk of abrupt and irreversible regional-scale change in the composition, structure, and function of marine, terrestrial and freshwater ecosystems, including wetlands (*medium confidence*). A reduction in permafrost extent is virtually certain with continued rise in global temperatures.”

“A large fraction of anthropogenic climate change resulting from CO₂ emissions is irreversible on a multi-century to millennial time scale, except in the case of a large net removal of CO₂ from the atmosphere over a sustained period.”

“Without additional mitigation efforts beyond those in place today, and even with adaptation, warming by the end of the 21st century will lead to high to very high risk of severe, widespread, and irreversible impacts globally (*high confidence*).”

“In most scenarios without additional mitigation efforts (those with 2,100 atmospheric concentrations >1,000ppm CO_{2-eq}), warming is more likely than not to exceed 4°C above pre-industrial levels by 2100. The risks associated with temperatures at or above 4°C include substantial species extinction, global and regional food insecurity, consequential constraints on common human activities, and limited potential for adaptation in some cases (*high confidence*). Some risks of climate change, such as risks to unique and threatened systems and risks associated with extreme weather events, are moderate to high at temperatures 1°C to 2°C above pre-industrial levels.”

“Substantial cuts in greenhouse gas emissions over the next few decades can substantially reduce risks of climate change by limiting warming in the second half of the 21st century and beyond. Cumulative emissions of CO₂ largely determine global mean surface warming by the late 21st century and beyond. Limiting risks across RFCs would imply a limit for cumulative emissions of CO₂.”

“Delaying additional mitigation to 2030 will substantially increase the challenges associated with limiting warming over the 21st century to below 2°C relative to pre-industrial levels. It will require substantially higher rates of emissions reductions from 2030 to 2050; a much more rapid scale-up of low-carbon energy over this period; a larger reliance on CDR in the long term; and higher transitional and long-term economic impacts.”

In essence, according to the IPCC, in the absence of significant mitigation and reductions *any* additional GHG emissions, including in the amounts produced from FLS 193, will not only lead to depleting the global carbon budget by the 2030s, but will lead to irreversible problems and costs caused by climate change.

A highly important direct-source pollutant affecting human health and the climate that is also missing in BOEM's analyses is black carbon (BC). According to the EPA (2014a):

"Black carbon (BC) is the most strongly light-absorbing component of particulate matter (PM), and is formed by the incomplete combustion of fossil fuels, biofuels, and biomass."
"BC contributes to the adverse impacts on human health, ecosystems, and visibility associated with PM (particulate matter)."

"Short-term and long-term exposures to PM are associated with a broad range of human health impacts, including respiratory and cardiovascular effects, as well as premature death."

"BC influences climate through multiple mechanisms:

- * Direct effect: BC absorbs both incoming and outgoing radiation of all wavelengths, which contributes to warming of the atmosphere and dimming at the surface."
- * Snow/ice albedo effect: BC deposited on snow and ice darkens the surface and decreases reflectivity, thereby increasing absorption and accelerating melting."
- * Other effects: BC also alters the properties of clouds, affecting cloud reflectivity and lifetime ("indirect effects"), stability ("semi-direct effect") and precipitation."

"Sensitive regions such as the Arctic and the Himalayas are particularly vulnerable to the warming and melting effects of BC. "

"Studies have shown that BC has especially strong impacts in the Arctic, contributing to earlier spring melting and sea ice decline. All particle mixtures reaching the Arctic are a concern, because even emissions mixtures that contain more reflective (cooling) aerosols can lead to warming if they are darker than the underlying ice or snow."

"BC's short atmospheric lifetime (days to weeks), combined with its strong warming potential, means that targeted strategies to reduce BC emissions can be expected to provide climate benefits within the next several decades."

"Mitigating BC can also make a difference in the short term for climate, at least in sensitive regions....Benefits in sensitive regions like the Arctic, or in regions of high emissions such as Asia, may include reductions in warming and melting (ice, snow, glaciers) and reversal of changes in precipitation patterns. BC reductions could help reduce the rate of warming soon after they are implemented. However, available studies also suggest that BC mitigation alone would be insufficient to change the long-term trajectory."

In essence, black carbon emissions are a highly significant detrimental and harmful consequence of FLS 193. BOEM (2014a) acknowledges both the existence and effects of BC:

“The “cloud” of BC occurs over the Arctic from early winter until springtime. Climate effects from black carbon are especially strong in sensitive areas such as the Arctic, resulting in earlier annual spring melting and sea-ice decline.”

However, BOEM fails to address this subject and its impacts in any substantive manner and does not provide sufficient, relevant or basic data, analyses or information regarding reasonably foreseeable impacts for an informed and reasoned choice of alternatives. This omission is highly negligent, arbitrary, capricious, and an abuse of discretion and authority.

BOEM simply fails to provide sufficient calculations for GHG and BC emissions, subsequent social, environmental, and economic costs, and reasonably foreseeable impacts that would result from the end use of recoverable oil and gas production from FLS 193. In addition, because BOEM does not consider the impacts from mean levels of production, which it states is a likely and reasonably foreseeable consequence of development (BOEM 2014a, Fletcher et al. 2014), the public, other federal and state government agencies, and other nations that would be impacted by FLS 193 and subsequent production, have not been provided sufficient information for a reasoned choice of action. Such an omission has been determined by a 2014 legal precedent for this precise issue to be “arbitrary, capricious or otherwise not in according to law. 5 U.S.C. § 706(2)(A)” (*see* Jackson 2014). For this reason, FLS 193 must be vacated according to precedent ruling by the US District Court of Colorado (*see* Jackson 2014):

“Under the Administrative Procedure Act the Court is directed to hold unlawful and to set aside agency action found to be arbitrary, capricious or otherwise not in according to law. 5 U.S.C. § 706(2)(A). Thus, “vacatur” of the non-compliant agency action appears to be mandatory.”

3) BOEM conducts its analyses in its Draft SSEIS for FLS 193 based only on the projected minimum recoverable resources (e.g. 4.3 Bbbls oil) despite its estimate of an average of nearly four times that amount at 15.38 billion barrels (Bbbls) of technically recoverable oil and 76.77 trillion cubic feet of undiscovered natural gas. Such minimizations and underestimations are unlawful, contravene NEPA and the CEQ, and are highly negligent, dismissive, arbitrary and capricious.

BOEM conducts its analyses in its Draft SSEIS (BOEM 2014a) for FLS 193 based only on the projected minimum recoverable resources (e.g. 4.3 Bbbls oil) despite its estimate of an average of nearly four times that amount at 15.38 billion barrels (Bbbls) of technically recoverable oil and 76.77 trillion cubic feet of undiscovered natural gas. Had BOEM conducted appropriate analyses, EPA (2014b) models of CO₂-equivalent emissions would demonstrate that if the mean levels of production occur that BOEM states are reasonably foreseeable and that BOEM uses for economic analyses and benefits, the resulting GHG emissions would be extraordinarily excessive and far beyond limits set by the IPCC and the current US Administration. Such emissions would not be sustainable and would add significantly to the effects of climate change, leading to irrevocable harm (IPCC 2013, 2014).

According to the EPA (2014b), “(t)he average heat content of crude oil is 5.80 mmbtu per barrel (EPA 2013)...the average carbon coefficient of crude oil is 20.31 kg carbon per mmbtu...(and) the fraction oxidized is 100 percent (IPCC 2006)” (*as cited in*: EPA 2014b). “Therefore, 5.80 mmbtu/barrel × 20.31 kg C/mmbtu × 44 kg CO₂/12 kg C × 1 metric ton/1,000 kg = 0.43 metric tons CO₂-equivalent/barrel” (EPA 2014b). At least 90% of oil consumed in the United States is burned as fuel (Graffe et al. 2011). Thus, based on the EPA (2014b) models, the end use of BOEM’s mean estimate of 15.38 Bbbls would produce the equivalent of approximately 5,952,060,000 metric tons (Mt) of CO₂-equivalent if 90% were burned as fuel.

In addition, the EPA (2013, 2014b) estimates that “(t)he average carbon dioxide coefficient of natural gas is 0.0544 kg CO₂ per cubic foot...(and) the fraction oxidized to CO₂ is 100 percent (IPCC 2006)” (*as cited in*: EPA 2014b). Based on these models, the end use of BOEM’s mean estimate of 76.77 trillion cubic feet would produce 4,176,288,000 MtCO₂-equivalent.

Thus, the reasonably foreseeable mean amount of CO₂-equivalent that would be produced over the 44 years of mean production and result from the end use of Federal Lease Sale 193 is: 10,128,348,000 MtCO₂-equivalent (or 10.128348 GtCO₂-equivalent), which equates to approximately 230,189,727 MtCO₂/yr over 44 years. According to the IPCC (2013), this amount of CO₂ from just 2/11 of the fossil fuel energy sources analyzed by the IPCC and EPA (excluding

the multiple sources within the 5 other emissions sectors) would lead to unsustainable levels and could result in significant and irrevocable harm to society and the environment from negative impacts on the global climate. In fact, the IPCC (2001a, 2001b, 2007, and 2014) noted:

“To achieve stabilization...the scenarios suggest that a very significant reduction in world carbon emissions per unit of GDP from 1990 levels will be necessary. The baseline SRES scenarios (for six gases included in the Kyoto Protocol) project a range of emissions of 11,500–14,000MtC_{eq} for 2010 and of 12,000–16,000MtC_{eq} for 2020.” (IPCC 2001a).

“Based on current understanding of climate-carbon cycle feedbacks, model studies suggest that stabilising CO₂ concentrations at, for example, 450ppm could require cumulative (global) emissions over the 21st century to be less than 1800 [1370 to 2200] GtCO₂, which is about 27% less than the 2460 [2310 to 2600] GtCO₂ determined without consideration of carbon cycle feedbacks.” (IPCC 2007).

“Multi-model results show that limiting total human-induced warming to less than 2°C relative to the period 1861-1880 with a probability of >66% would require cumulative (global) CO₂ emissions from all anthropogenic sources since 1870 to remain below about 2900 GtCO₂ (with a range of 2550-3150 GtCO₂ depending on non-CO₂ drivers). About 1900 GtCO₂ had already been emitted by 2011.” (IPCC 2014)

To place this in context, if 1,900 GtCO₂ equivalent had already been emitted worldwide by 2011, the total *global* amount of *all* anthropogenic sources of CO₂ equivalent emissions that would be sustainable by the end of the 21st Century needs to be less than 1,000 GtCO₂ equivalent (IPCC 2014) – or 11.2359 GtCO₂ equivalent /year based on 89 years beginning in 2011. However, emissions based on a mean level of production leading to the end use of FLS 193 would add 10.128348 GtCO₂ equivalent from just 2/11 of the fossil fuel sources analyzed by the IPCC (2014). Such emissions are significant, add cumulative irrevocable impacts on the climate (IPCC 2014), and are not “negligible” as BOEM negligently contends. Two conclusions noted above by the IPCC (2014) are important to reemphasize:

“A large fraction of anthropogenic climate change resulting from CO₂ emissions is irreversible on a multi-century to millennial time scale, except in the case of a large net removal of CO₂ from the atmosphere over a sustained period.”

“Without additional mitigation efforts beyond those in place today, and even with adaptation, warming by the end of the 21st century will lead to high to very high risk of severe, widespread, and irreversible impacts globally (*high confidence*).”

The total CO₂ emissions from all sources in the US in 2010 was 5.433057 GtCO₂-equivalent (Department of Energy Carbon Dioxide Information Analysis Center 2014). In 2012, U.S. GHG emissions totaled 6.526 GtCO₂-equivalent (EPA 2014c). Therefore, at the 2012 EPA rate and without any mitigation or reduction efforts, if the global emissions remained below the necessary 1,000 GtCO₂-equivalent threshold concluded by the IPCC (2014), the US would therefore be contributing more than half (58.1%) of the annual *global* CO₂ emissions (11.2359 GtCO₂-equivalent/year based on 89 years beginning in 2011) by the end of the 21st Century. However, this is over the course of a century. Climate scientist Dr. Malte Meinshausen confirmed the IPCC data and that the current rate of global emissions is 33 GtCO₂/year, which means that the global carbon budget will be depleted within 30 years (Readfearn 2014) (emphasis added):

“(F)rom 2011, the world could afford to emit no more than 1000bn tonnes (Gt) of CO₂ to have a good chance of staying below 2C of global warming (some poorer countries and low-lying states say the aim should be 1.5C)...***At current rates we churn through 33Gt a year – 1000Gt divided by 33 means we have about 30 years left from 2011 onwards. Then the carbon budget will be exhausted.*** At some point emissions have to go to zero, no matter what. There is no way around zero CO₂ emissions. As long as we continue to emit CO₂, the climate will continue to warm.” (Readfearn 2014)

Examined on a 30-year time frame when the global carbon budget would be depleted, the total emissions from 90% of the end use of fossil fuels produced from FLS 193 would be 337,611,600 MtCO₂-equivalent/year over 30 years or approximately 1% of the annual global carbon budget. Considering this is from only one supply of all global emissions, FLS 193 would be a highly significant contribution that would add to cumulative impacts. Indeed, the total emissions produced from FLS 193 are far more significant in this context. Given the current global emission rate of 33 GtCO₂-equivalent/year, the total emissions from 90% (10.128348 GtCO₂-equivalent) of the end use of fossil fuels produced via just this one supply would ultimately contribute as much as 1/3 of the entire *global* carbon annual budget. Importantly, this is projected to be produced from only the *mean* oil and gas production resulting from one anchor field and one satellite via FLS 193.

BOEM’s analyses also exclude Methane (CH₄), which is an extremely powerful and important hydrocarbon greenhouse gas with a GHG warming potential (GWP) of at least 25 times more than CO₂ over a 100-year period (EPA 2014d, WRI 2013) and at least 86-105 times stronger

over a 20-year time frame (IPCC 2013) – a significant increase from previous estimates of 72 times stronger over a 20-year period. The EPA (2014e, 2014f) estimated that more than 8.4 million metric tons of fugitive methane leaked from natural gas systems in 2011. Measured as CO₂-equivalent over a 100 year time scale, this equates to more GHGs than were emitted by all U.S. iron and steel, cement, and aluminum manufacturing facilities combined (WRI 2013). According to the EPA (2014g):

“Globally, over 60% of total CH₄ emissions come from human activities...Natural gas and petroleum systems are the largest source of CH₄ emissions from industry in the United States. Methane is the primary component of natural gas. Some CH₄ is emitted to the atmosphere during the production, processing, storage, transmission, and distribution of natural gas. Because gas is often found alongside petroleum, the production, refinement, transportation, and storage of crude oil is also a source of CH₄ emissions.”

“Methane is a greenhouse gas that contributes to climate change. Thus, impacts from an accidental release of natural gas are inextricable with respect to the impacts from emissions of greenhouse gases during development and production.”

“Releases of natural gas include accidental releases as well as fugitive releases occurring from leakage. Natural gas is comprised of about 95% methane (CH₄), a powerful greenhouse gas...Releases from oil and gas systems are considered a major anthropogenic source of CH₄ in the United States.”

Currently, the EPA uses earlier IPCC models (IPCC 2007) rather than the most current and robust data, models, and analyses from the IPCC (2013). Furthermore, by using a 100-year time scale, the EPA vastly underestimates the damage methane will cause to the climate in the next two decades when the global carbon budget is estimated to be depleted. The IPCC (2013, 2014) states that methane could push the climate over a “tipping point” in the next 18-25 years, causing irrevocable global warming, and making a 100-year timeline obsolete. Unfortunately, by combining a low GWP and an impractical 100-year time horizon, the EPA's methane estimate dilutes the impact of methane emissions.

In the Proceedings of the National Academy of Sciences, Alvarez et al. (2012) reported that natural gas leakage rates based on operator-reported, daily gas production data at the study well sites ranged between 0 - 5%, with six sites out of 203 showing leakage rates of 2.6% or higher just from routine emissions. EPA studies reported by the EPA Office of Air Quality Planning and Standards (OAQPS 2014) show that at least 68% of 58,421 components studied were either leaking or venting gas. In the same OAQPS (2014) report, the total fugitive leaks from

pipelines totaled more than 13 million MtCO₂-equivalent, accounting for greater than 10% of total methane emissions from natural gas:

“In 2012, the EPA reported that methane leaks from pipelines in the natural gas distribution sector accounted for more than 13 million metric tons of carbon dioxide equivalent emissions. These leaks are comprised of natural gas product, which is almost 100 percent methane, and account for more than 10 percent of total methane emissions from natural gas systems.”

The New York Times recently reported that studies by Stanford are revealing there is already approximately 50% more methane in the atmosphere than previously estimated by the EPA, indicating that more methane is leaking from the natural gas production chain than previously thought (Davenport 2014). Currently, the preponderance of data and studies indicate that fugitive methane leaks from only routine maintenance problems, transport, venting, etc. range from 3% to as much as 10%, excluding more significant sources like blowouts. Therefore, when considering only the mean level of natural gas production from FLS 193 (76.77 trillion ft³), the approximate amount of fugitive methane emissions resulting from FLS 193 would be 2,303,100,000,000 – 7,677,000,000,000 ft³. This would equate to 125,288,640 – 417,628,800 MtCO₂-equivalent. Importantly, these figures only consider routine leakage and venting, etc. and exclude more serious leaks, blowouts, and explosions, for which BOEM (2014a) acknowledges numerous possible scenarios with impacts ranging from negligible to severe. However, BOEM (2014a) ultimately contradicts itself and states that, overall, the impact would be “negligible”:

“Methane is not a pollutant regulated by BOEM under 30 CFR 550.303(d), and releases, either accidental or because of leakage, would cause a negligible to minor impact on local air quality due to the toxic nature of CH₄.”

It is very important to reemphasize a) the IPCC (2013) concluded that, without this additional source and at the current emission levels, the global carbon budget will be depleted within 30 years and, therefore, such an emission level of CO₂-equivalent in and of itself is unsustainable and b) these methane emissions are at least 25 times more potent than CO₂ over a 100-year period and at least 86-105 times more powerful over a 20-year time frame. Thus, when considering *only* the potential fugitive emissions of methane resulting from *only* the mean

production and transport of natural gas and routine leakage and venting, FLS 193 will be a highly significant single-source contributor to climate change and substantially add to cumulative effects. Clearly, BOEM's (2014) assessment is exceedingly narrow and limited and does not consider the full range of foreseeable direct and indirect impacts or local and cumulative effects. Based on these analyses alone, BOEM's (2014) Draft SSEIS assessment is highly negligent, arbitrary and capricious.

Producing oil and gas contributes to climate change locally and globally and, according to several legal precedents, NEPA, and the EPA, can no longer be narrowly considered a matter of only local activity emissions as BOEM negligently contends. Legally, the 77-year life span of FLS 193 is not taking a "hard look" at climate change and its impacts, causes and effects of GHG emissions, or cleaner (renewable) energy alternatives (see Jackson 2014). In fact, the IPCC (2014) stated that, at this point in time, fossil fuels must stay in the ground for the world to stay at or below the maximum amount of GHGs.

In November 2014, the United States formally agreed with China to reduce U.S. CO₂ emissions by 26-28% by 2025 (www.whitehouse.gov/the-press-office/2014/11/11/us-china-joint-announcement-climate-change). On 8 December 2014 a far more significant international agreement was formed in Lima Peru at the United Nations Climate Talks. According to the *Guardian* (see Readfearn 2014), "ADP 2-7 Agenda Item 3 - Elements For A Draft Negotiating Text", Section D (paragraph 13.2) outlines several long-term goals for a new global climate change agreement as supported by the UN, IPCC, the World Bank, and numerous member countries (emphasis added):

"Parties' efforts to take the form of:

a. A long-term zero emissions sustainable development pathway:

Consistent with emissions peaking for developed countries in 2015, ***with an aim of zero net emissions by 2050***; in the context of equitable access to sustainable development...

Consistent with carbon neutrality/net zero emissions by 2050, or full decarbonization by 2050 and/or negative emissions by 2100..."

This language is scheduled to be the foundation for the Paris Climate Accords in 2015 and is supported by the IPCC (2014), the United Nations (2014), and the World Bank (2014):

“Over the next year, countries will be developing their national commitments and contributions for the Paris agreement for lowering emissions and building resilience to climate change. To decarbonize economies on a trajectory necessary to reach net zero emissions before 2100, their commitments for mitigation and adaptation efforts will have to be ambitious.” (United Nations 2014).

“Several components are essential for a successful Paris agreement, each requiring ambitious commitment to building cleaner economies for the future...Binding language that should reinforce our collective ambition and provide a clear pathway to zero net emissions before 2100...Phasing out harmful fossil fuel subsidies, which are typically captured far more by the wealthy than the poor, is also overdue...” (World Bank 2014, as cited in United Nations 2014)

BOEM is obliged to support U.S. foreign policy goals regarding climate change. Pursuant to NEPA, U.S. Federal agencies are required to support initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in environmental quality (NEPA, Sec. 102 F-G):

“(F) recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind’s world environment; (G) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment...”

Total production of oil and gas from FLS 193 will occur over 44 years (BOEM 2014a). Therefore, based on the 2010 and 2012 US Department of Energy and EPA emissions data noted above, the US reduction target would equate to 1.69676 -1.82728 GtCO₂equivalent/yr or 74.65744 – 80.40032 GtCO₂equivalent in *reduction* of CO₂ over the 44 years of FLS 193 production. However, the total amount of CO₂equivalent emissions *added to the atmosphere* from the mean level of reasonably foreseeable oil and gas produced from the 44 years of production from FLS 193 would significantly contravene the 2014 US-China agreement for US emissions targets as well as the Lima and Paris climate agreements by *adding* an approximate mean of 10,128,348,000 MtCO₂equivalent (10.128348 GtCO₂equivalent). This amount, through its addition to the atmosphere, would negate a substantial 16.75– 18.04% of the U.S. - China agreed reduction target through added end use emissions rather than a reduction.

By any measure or standard, 10,128,348,000 MtCO₂equivalent is not “negligible” as BOEM carelessly contends. BOEM’s conclusion as such and its omission of this information are

significant abuses of discretion as well as unlawful according to NEPA. As a result, BOEM's Draft SSEIS (BOEM 2014a) misguides decision-makers and the public, leads to an uninformed choice of alternatives, and is highly negligent, arbitrary, and capricious (*see* Jackson et al. 2014; Grewal 2013 [*Center for Biological Diversity v. Bureau of Land Management*, No. 11-06174 (N.D. Cal. Dec 8, 2011)]).

According to the CEQ (2010, 2014) and a June 2014 precedent set by the US District Court of Colorado, “an EIS must disclose and evaluate all of the effects of a proposed action—direct, indirect, and cumulative” (Jackson 2014). Thus, BOEM is legally required by NEPA to examine all reasonably foreseeable direct and indirect impacts of its action. Clearly, BOEM's own assessments demonstrate the agency was well aware that mean recoverable oil and gas resources, which are significantly higher than the minimum used for its EIS analyses, are reasonably foreseeable and that the goal of FLS 193 is to “contribute significantly to the national energy supply”:

“The Chukchi Sea OCS is viewed as one of the most petroleum-rich offshore areas in the country, with geologic plays extending offshore from some of the largest oil and gas fields on Alaska's North Slope. BOEM's current petroleum assessment indicates a mean technically recoverable oil resource of 15.38 billion barrels (Bbbl) with a 5% chance of 40.08 Bbbl (BOEMRE 2011a). The mean undiscovered gas resources total 76.77 trillion cubic feet (Tcf) with a 5% chance of 209.53 Tcf. At these levels, the leasing of offshore areas within the Chukchi Sea may lead to development and production, and could contribute significantly to the national energy supply.” (BOEM 2014a).

Furthermore, it is reasonably foreseeable that at least 90% of oil and gas predicted to be generated from FLS 193 will be burned as fuel (*see* Jackson 2014; Graffe et al. 2011). Graffe et al.'s (2011) salient assertion regarding BOEM's refusal to provide analyses relative to GHG emissions and climate change in BOEM'S previous EIS for FLS 193 remains fully relevant and applicable to this current Draft SSEIS:

“BOEM's contrary conclusion is inconsistent with BOEM's own declaration of purpose in carrying out the action and with OCSLA. Both indicate that the ultimate objective of this lease sale is to develop energy supplies. The EIS cites the goal of — increased domestic energy supply in defining the — purpose and need of the lease sale. Ex. 3 at 17. *See also id.* (—[OCSLA's] purposes generally pertain to recognizing national energy needs . . . and addressing them by developing OCS oil and gas resources...). OCSLA directs the Secretary of Interior to schedule leasing in the way that, among other considerations, — will best meet national energy needs. 43 U.S.C. § 1344(a). BOEMRE's action is premised

on an assumption that OCS oil and gas production will contribute to the national energy supply. *See supra* at 9. This is plainly inconsistent with a conclusion that use of this oil and gas as energy is unforeseeable. NEPA requires that BOEM make an effort to estimate, using generally accepted theoretical approaches, the greenhouse gas emissions from burning this oil and gas.”

GHG emissions from the burning and combustion of oil and gas are considered both a direct effect on climate change (IPCC 2013) and an indirect effect of FLS 193 (CEQ 2014, Graffe et al. 2011). Importantly, “CEQ regulations define indirect effects as those caused by the action, [and] later in time or further removed in distance, [but] still reasonably foreseeable” (Graffe et al. 2011), including downstream sources by private individuals as noted above (CEQ 2014).

“It is well-established in the Ninth Circuit that the effects of an action must be analyzed even if private activity is part of the chain of causation. Greenhouse gas emissions from burning oil and gas forecast to be produced are a reasonably foreseeable, proximate consequence of this lease sale. NEPA requires that BOEM analyze those emissions and their contribution to global climate change” (Graffe 2014).

According to both the Ninth Circuit Court of Appeals’ remand decision of FLS 193 (*see* Fletcher 2014) and recent precedent by the US District Court of Colorado (*see* Jackson 2014):

“...the agency (BOEM) cannot shirk its responsibility to ‘consider[] all foreseeable direct and indirect impacts’ of the proposed action in its EIS. *N. Alaska Env’tl. Ctr.*, 457 F.3d at 975 (internal quotation marks omitted). The agency also must ‘discuss[] . . . adverse impacts’ without “improperly minimiz[ing] negative side effects.’ *Id*” (Fletcher 2014).

“This reasonably foreseeable effect (i.e. GHG emissions) must be analyzed, even if the precise extent of the effect is less certain” (Jackson 2014).

“Reasonable forecasting and speculation is . . . implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA” (Jackson 2014).

“(T)he decision to forgo calculating the reasonably foreseeable GHG emissions associated with the CRR (Colorado Roadless Rule) was arbitrary in light of the agencies’ apparent ability to perform such calculations and their decision to include a detailed economic analysis of the benefits associated with the rule” (Jackson 2014).

“...I am persuaded by an opinion from the Court of Appeals for the Eighth Circuit that rejected a nearly identical agency justification for not analyzing the future effects of coal combustion. In *Mid States Coalition for Progress v. Surface Transportation Board*, the court held that an agency violated NEPA when it failed to disclose and analyze the future coal combustion impacts associated with the agency’s approval of a railroad line. 345 F.3d 520, 549 (8th Cir. 2003).” (Jackson 2014).

BOEM is guided by the Executive Office of the President through the CEQ and legally required by NEPA to ensure that this agency action is “fully informed and well considered” (CEQ 2010, 2014; Graffe 2011). Both the decision by the Ninth Circuit Court of Appeals regarding FLS 193 (*see* Fletcher 2014) and the 2014 precedent for a coal mine lease vacatur ruling by the US District Court of Colorado regarding identical lack of analyses and the foreseeable impacts on climate change (*see* Jackson 2014) support this:

“*See* *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008) (holding that NEPA requires agencies to analyze the effects of its actions on global climate change)” (Jackson 2014).

“NEPA requires (that) (a)n agency must either obtain information that is ‘essential to a reasoned choice among alternatives’ or explain why such information was too costly or difficult to obtain. *Id.* § 1502.22” (Fletcher 2014)

“*See* 40 C.F.R. § 1502.22(a) ((NEPA) stating that an agency ‘shall’ obtain additional information if it ‘is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant’)” (Jackson 2014).

However, BOEM consistently refuses to provide or disclose any data, calculations, models or other analyses in any of its EIS documents quantifying direct or indirect emissions. Nor does BOEM justify its assumption that the direct and/or indirect GHG emissions resulting from this action would be supposedly “negligible”. BOEM does not provide its own decision-makers, the Federal government, the public, or other impacted nations with a fully informed or reasoned choice of alternatives as required by CEQ and the law under NEPA. BOEM’s conclusion here and its decision to omit such analyses violate NEPA, are unlawful, and are negligent, arbitrary, and capricious as supported by precedent from the US District Court of Colorado (*see* Jackson 2014):

“I find that the FEIS’s proffered explanation for omitting the protocol (re: GHG emissions and climate change effects) was arbitrary and capricious in violation of NEPA.”

“Under the Administrative Procedure Act the Court is directed to hold unlawful and to set aside agency action found to be arbitrary, capricious or otherwise not in according to law. 5 U.S.C. § 706(2)(A). Thus, “vacatur” of the non-compliant agency action appears to be mandatory.”

Therefore, Federal Lease Sale 193 is in direct violation of NEPA and the law and it is incumbent upon the federal government to vacate FLS 193 immediately and in its entirety or select Alternative II – No Lease Sale.

4) BOEM fails to analyze the substantial and significant social and economic costs of the reasonably foreseeable proximate impacts of GHG emission effects on climate change caused by the end use of FLS 193 oil and gas production.

In addition to failing to provide analyses regarding the environmental costs of greenhouse gas (GHG) and black carbon (BC) emissions as required by and in violation of NEPA, BOEM failed to analyze the substantial and significant social and economic costs of the reasonably foreseeable proximate impacts of GHG and BC emission effects on climate change caused by the end use of FLS 193 oil and gas production. According to a decidedly relevant June 2014 U.S. District Court of Colorado ruling (Jackson 2014):

“NEPA further defines impacts or effects to include “ecological[,]. . .economic, [and] social” impacts of a proposed action.”

“EPA recommend(s) to the State Department to ‘explore...means to characterize the impact of the GHG emissions, including an estimate of the ‘social cost of carbon’ associated with potential increases of GHG emissions.’”

The Council on Environmental Quality (CEQ 2014) further guides:

“When an agency determines it appropriate to monetize costs and benefits, then, although developed specifically for regulatory impact analyses, the Federal social cost of carbon, which multiple Federal agencies have developed and used to assess the costs and benefits of alternatives in rulemakings, offers a harmonized, interagency metric that can provide decision makers and the public with some context for meaningful NEPA review.”

Current EPA (2014j) models provide a range of social impacts from end-use GHG emissions using a low average of \$28/ton (5% discount rate) to a high of \$235/ton (95th percentile for a 3% discount rate) for the year 2050 (Table 1), which would be by the time FLS 193 is in full production if the lease were approved. The EPA (2014j) recognizes these models as the most current and acceptable methods for estimating the social costs of GHG emissions, particularly by the U.S. Interagency Working Group on the Social Costs of Carbon (IWGSC 2013). The IWGSC is composed of numerous U.S. Federal agencies and is recognized by the EPA as a leading authority on the social costs of carbon along with the IPCC:

- * U.S. Council of Economic Advisers
- * U.S. Council on Environmental Quality
- * U.S. Department of Agriculture
- * U.S. Department of Commerce
- * U.S. Department of Energy
- * U.S. Department of Transportation
- * U.S. Environmental Protection Agency
- * U.S. National Economic Council
- * U.S. Office of Management and Budget
- * U.S. Office of Science and Technology Policy
- * U.S. Department of the Treasury

Table 1. The most recent Social Cost of Carbon (SCC estimates (updated in 2013) every five years from 2015 – 2050 (from EPA 2014j).

	Discount Rate and Statistic			
Year	5% Average	3% Average	2.5% Average	3% 95th percentile
2015	\$12	\$39	\$61	\$116
2020	\$13	\$46	\$68	\$137
2025	\$15	\$50	\$74	\$153
2030	\$17	\$55	\$80	\$170
2035	\$20	\$60	\$85	\$187
2040	\$22	\$65	\$92	\$204
2045	\$26	\$70	\$98	\$220
2050	\$28	\$76	\$104	\$235

Based on these EPA (2014j) models for the mean GHG emissions (10,128,348,000 MtCO₂-equivalent) resulting from a mean level of production and conventional use of oil and gas from FLS 193, the approximate social cost of carbon (SCC) would be \$283,593,744,000 – \$2,380,161,780,000. Even at the minimum projected costs without the inclusion of other physical, economic, and ecological impacts in the models (EPA 2014j), and with just the mean level of production, the financial and social costs of FLS 193 are far in excess of all projected income, royalties, and financial benefits (estimated at ca. \$140,671,965,000; BOEM 2014a) for the U.S. government, State of Alaska, and local communities combined. Not only is this cost range

exceedingly significant, particularly from just one supply source, but more sobering is the question: who will ultimately pay this cost?

Under current laws and regulations, neither the suppliers of these combusted fuels (i.e. Shell, ConacoPhillips, Statoil, et al.) nor the public end user will pay the cost. Rather, while the supplier will benefit substantially, U.S. and other nation's taxpayers along with the local communities that suffer the significant and substantial losses of personal property, treasure, income, and life due to the effects of climate change will ultimately pay the cost. Importantly, these costs are likely substantially higher. The models used to develop these EPA SCC estimates, known as "Integrated Assessment Models", do not currently include all of the major physical, ecological, and economic impacts of climate change (EPA 2014j). The EPA and IPCC (2007) along with the IWGSC (2013) acknowledge this reality and note "it is very likely that [SCC] underestimates the damages" (IPCC 2007 *as cited in* EPA 2014j).

For local Iñupiat subsistence communities, such losses also do not include the substantial added social and economic costs associated with loss of subsistence hunting, including impacts on local nutrient supplies (e.g. proteins, fats, and vitamins). The latter will exert a significant displacement impact on every family's economy, i.e. local communities will be forced to buy imported food at high prices *vs.* subsistence hunting and gathering of local resources. Subsistence is not simply a traditional socio-cultural activity encompassing every facet of life, which would be lost; it is a very real, necessary, and important financial and health issue. Indeed, their lives depend on it. In addition to the "severe" impacts on physical, psychological, emotional, and cultural well-being acknowledged by BOEM (2014a), when considered in its entirety, BOEM's analysts acknowledge that the impacts on local communities will be significant and major (i.e. "severe") (emphasis added):

"The impacts of the Scenario on subsistence-harvest patterns are expected to be up to major over the life of the project. This is due to disruptions in subsistence hunting from degradation of subsistence resources and use areas, and actual or perceived tainting from potential large oil spills, rendering the resources unavailable or undesirable for use....When subsistence harvest patterns are adversely affected, sociocultural systems can in turn be impacted (major). Subsistence harvest patterns can be disrupted from routine activities during the Scenario or large oil spills...The impacts of the Scenario on public and community health would range from minor to major depending on the phase and nature of the activity. These impacts are closely related to impacts on subsistence harvest patterns...These effects can cause increased demands on community services and increased stressors to local communities"

“Effects from a large oil spill could exacerbate existing cultural and economic stressors on local resource populations and local hunting, causing significant impacts to Russian (and Alaskan) Native coastal communities (Newell, 2004; Nuttall, 2005).”

“If these resources are disrupted due to a discharge, food provided by the benthic community could become unavailable. If this occurs, food sources for humans and several other foraging specialists used for subsistence including walrus, gray whales, bearded seals, and spectacled eiders could realize impacts (Whitehouse, 2012).”

Although BOEM provides a relatively detailed, quantified, and highly favorable description of FLS 193 *financial benefits* in its Draft SSEIS (BOEM 2014a), it fails to provide sufficient and appropriate analyses of the social and environmental *costs*. Based on recent and highly relevant legal precedent, such failure and omission is arbitrary and capricious (*see* Jackson 2014) (emphasis added):

“While the agencies provided an adequate disclosure of effects on adjacent lands, **their treatment of the costs associated with GHG emissions from the mine was arbitrary and capricious.**”

“Even though NEPA does not require a cost-benefit analysis, **it was nonetheless arbitrary and capricious to quantify the benefits of the lease modifications and then explain that a similar analysis of the costs was impossible when such an analysis was in fact possible.**”

“In effect the agency prepared half of a cost-benefit analysis, incorrectly claimed that it was impossible to quantify the costs, and then relied on the anticipated benefits to approve the project.”

“As plaintiffs point out, however, the proffered explanation that future activities are too speculative to analyze is belied by the agencies’ decision to include detailed projections and analysis of tax revenue, employment statistics, and other environmental interests. CRR-0154023 at 0154350. ***It is arbitrary to offer detailed projections of a project’s upside while omitting a feasible projection of the project’s costs.***”

“(“There can be no ‘hard look’ at costs and benefits unless all costs are disclosed.”) In a nutshell, the agencies cannot claim that they are unable to predict the impacts of methane emissions because activities occurring under the rule are too speculative and then turn around and calculate down to the job and the nearest \$100,000 the economic impacts of the rule.”

Ultimately, BOEM’s omission of detailed analyses of FLS 193 social and economic costs is a substantial failure, a blatantly arbitrary and capricious exclusion that significantly biases its assessment in favor of its preferred Alternative and the financial benefits of oil and gas production, and is an abuse of discretion. Therefore, Federal Lease Sale 193 should be vacated or Alternative II – No Lease Sale – selected.

5) The Affirmation Of Federal Lease Sale 193 Along With Conveyance Of \$2.66 Billion To The United States Federal Government For FLS 193 Was Unlawful And Compromised the EIS Process

The significant government action of Federal Lease Sale 193 for \$2.66 billion occurred, the monies conveyed to the U.S. Department of the Treasury, and the projected financial benefits were published prior to a) the agency giving this Federal action the requisite “hard look...at all foreseeable direct and indirect impacts of the proposed action” as required by law under NEPA, including during the lease sale process (*see* Fletcher 2014 et al., Jackson 2014; Grewal 2013) and b) definitive approval of a Final EIS (BOEM 2014a). According to Federal and court records, this significant and substantial sale and the arbitrary and capricious omissions were primary factors in the federal government’s decision to a) approve the sale despite the known significant, severe, wide-spread, and long-lasting risks and negative impacts (Fletcher et al. 2014, Graffe et al. 2011), b) uphold the lease *vs.* rescinding the lease and the federal government’s subsequent financial exposure from its i) legal obligation to buy back the lease and ii) loss of projected royalties in excess of \$46 - \$89 billion (Graffe et al. 2011, BOEM 2014a), and c) prejudiced its analysis in favor of financial gain *via* its preferred alternative of production despite the action’s significant, long-term, wide-spread, and in some cases, severe and irrevocable environmental, social, and cultural harms.

Even though BOEM’s Draft SSEIS (BOEM 2014a) provides a broader, but very basic range of possible effects than its previous drafts, BOEM’s 2014 Draft SSEIS uses only the best case (i.e. minimal) production scenario due to the sale, which in turn biased all subsequent analyses to a best case impact assessment; minimized the negative effects; and occurred prior to a “hard look” at, and full consideration and analysis of, potential significant consequences (Fletcher et al. 2014).

“BOEM considered only the *best* case scenario for environmental harm, assuming oil development. A best case scenario “skew[s]” the data toward fewer environmental impacts, and thus impedes a “full and fair discussion of the potential effects of the project.” *Native Ecosystems Council v. U.S. Forest Serv.*, 418 F.3d 953, 965 (9th Cir. 2005) (citation and internal quotation marks omitted)” (Fletcher et al. 2014).

Although NEPA allows for more detailed analyses at later stages in the process, if there are no facts available during the lease sale, then later stage analysis as NEPA allows (e.g. during exploration or after development has begun) of missing or incomplete information that could

demonstrate significant negative impacts cannot provide a reasoned and appropriately informed choice for deciding whether or not the sale and potential harmful activities should even occur. According to both CEQ (2014) and the Ninth Circuit Court of Appeals (*see* Fletcher et al. 2014) “(a)n agency is required to analyze the environmental effects in an EIS as soon as it is “reasonably possible” to do so. *Kern*, 284 F.3d at 1072” (emphasis added).

Significant irrevocable impacts do occur prior to such analyses, such as with the Gulf of Mexico Deepwater Horizon disaster during its exploration phase. Exploration and all other stages of development have demonstrated that significant or catastrophic harm can occur in the much more difficult and dangerous offshore Arctic waters and environmental conditions. In other words, conducting more detailed environmental analyses only after activities have begun is too late. Without a fully detailed EIS of all direct, indirect, and cumulative impacts, the lease sale process a) cannot provide for reasonably informed decision-making, b) has been ruled to be an abuse of discretion (*see* Fletcher 2014 et al., Jackson 2014, Grewal 2013 [*Center for Biological Diversity v. Bureau of Land Management*, No. 11-06174 (N.D. Cal. Dec 8, 2011)], and c) is not based on consideration of relevant factors early enough to avoid disastrous and irrevocable consequences and irretrievable expense.

Furthermore, recommendations against proceeding along with warnings of flawed, unsupported, and assumptive analyses, and even “jeopardy” warnings – all by other federal agencies (e.g. EPA, USFWS, NMFS) – have been ignored and overruled before and after affirmation of FLS 193, including by the U.S. Secretary of the Interior (*see* Fletcher et al. 2014). In consideration of its remand decision, the Ninth Circuit Court of Appeals (*see* Fletcher et al. 2014) wrote regarding BOEM’s previous Draft Supplemental EIS (emphasis added):

“Numerous outside commentators expressed concern about the scenario BOEM had developed. For example, the Environmental Protection Agency wrote that the hypothetical development scenario that is used in the document add[s] additional layers of uncertainty regarding the probabilities of exploration, production and development activities and the risks associated with those activities...***EPA is concerned that, overall, the depth and diversity of uncertainties presented in the document resulted in the lack of adequate support for many of the document’s conclusions.***”

Although BOEM raised its minimum production estimate for its 2014 Draft SSEIS, it maintained the same scenarios and ambiguous and flawed impact analyses. Thus, the concerns expressed by

the EPA, USFWS, and the Ninth District Court of Appeals remain valid. By all accounts, Federal Lease Sale 193 was compromised from the start and should not be allowed to proceed.

According to the Ninth Circuit Court of Appeals remand decision regarding FLS 193, during a lease sale “the agency cannot shirk its responsibility to ‘consider all direct and indirect impacts of the proposed action in the EIS’...The agency also must discuss adverse impacts without ‘improperly minimizing negative side effects’” (Fletcher et al. 2014). In its essence, “(a)n agency must take into account all reasonably ‘foreseeable significant adverse effects’ of the proposed action in its analysis of environmental effects. 40 C.F.R. § 1502.22; *see also id.* § 1508.7...NEPA also requires an agency to analyze missing and incomplete information...(and)... obtain information that is “essential to a reasoned choice among alternatives”” at *all* stages of the process, including the lease sale stage (Fletcher et al. 2014, CEQ 2014). In addition, the CEQ (2014)states very clearly:

“As called for under NEPA, the CEQ Regulations, and CEQ guidance, the NEPA review process should be integrated with planning at the earliest possible time.”

Simply, BOEM failed to provide sufficient information for a reasoned choice of alternatives in any of its draft EIS documents prior to or after Federal Lease Sale 193. Several recent US District Court, Federal Magistrate, and Circuit Court of Appeals precedents support this fact (*see* Fletcher et al. 2014; Jackson 2014; Grewal 2013). The Ninth Circuit Court of Appeals remand decision regarding FLS 193 specifically stated (*see* Fletcher et al. 2014) (emphasis added):

“NEPA ‘protect[s] the environment by *requiring that federal agencies carefully weigh environmental considerations and consider potential alternatives to the proposed action before the government launches any major federal action.*’ *Barnes v. U.S. Dep’t of Transp.*, 655 F.3d 1124, 1131 (9th Cir. 2011) (internal quotation marks omitted). ‘NEPA imposes procedural requirements designed to force agencies to take a ‘hard look’ at environmental consequences’ of major federal action. *Id.* (quoting *Earth Island Inst. v. U.S. Forest Serv.*, 351 F.3d 1291, 1300 (9th Cir. 2003)). The statute requires federal agencies to ‘consider every significant aspect of the environmental impact of a proposed action’ and to ‘inform the public that [they] ha[ve] indeed considered environmental concerns in [their] decisionmaking process.’ *Balt. Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983) (internal quotation marks omitted).”

“*Under NEPA, BOEM is required to take into account the full environmental effects of its actions when deciding whether and in what manner to pursue the lease sale. 42 U.S.C. § 4332(2)(C). A later project or site-specific environmental analysis is an inadequate substitute for an estimate of total production from the lease sale as a whole.*”

“It is only at the lease sale stage that the agency can adequately consider cumulative effects of the lease sale on the environment, including the overall risk of oil spills and the effects of the sale on climate change. It is also only at the lease sale stage that the agency can take into account the effects of oil production in deciding which parcels to offer for lease.”

It is certain that, in and of itself, offering Federal Lease Sale 193 for oil and gas development on 29.4 million acres of U.S. public property is a “major federal action”. It is also certain that the U.S. government’s proceeding with and affirming this sale along with the conveyance of \$2.66 billion by several of the world’s largest and most powerful corporations (Shell, ConocoPhillips, Statoil, et al.) to, and its deposit by, the United States Department of the Treasury also constitute “major federal action(s)”. An EIS must be conducted assuming no leases have been sold. The fact that these major Federal actions occurred prior to the responsible Federal agency (BOEM) examining and providing the public “all foreseeable direct and indirect impacts’ of the proposed action in its EIS” (Fletcher et al. 2014) for a reasoned choice of alternatives is unlawful, an abuse of discretion and authority (Fletcher et al. 2014; Jackson et al. 2014; Grewal 2013) and violates CEQ (2014, 2010) regulations as well as BOEM’s (2014) own policies (Figure 1).



Figure 1. Federal Bureau of Ocean Energy Management (BOEM) lease sale process relative to final EIS (BOEM 2014b - <http://www.boem.gov/Five-Year-Program/>).

This sale should be held only *after* definitive approval and publication of the Final EIS and *after* all comments and legal actions have been addressed and all identified problems and foreseeable impacts mitigated. Although a “Final EIS” was published in 2007 prior to the sale and again in 2011, both were wholly insufficient and subject to scrutiny, legal action, and remand as ruled by Federal court. Yet, the sale was held prior to a) providing the public and decisions-makers

with sufficient information and analyses regarding all foreseeable direct, indirect, and cumulative impacts, b) addressing and mitigating all identified problems and foreseeable impacts, including those ruled by Federal court, and c) before a definitively and legally approved Final EIS that provides such information and is available for scrutiny, which remains unpublished and unavailable nearly 7 years after the sale.

Basing EIS analyses on missing, uncertain or incomplete information for a Federal lease sale is highly negligent and has been ruled to be unlawful, arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law (*see* Fletcher et al. 2014, Jackson et al. 2014, Grewal 2013, and numerous precedents cited therein). To permit a Federal lease sale to proceed and with significant monies exchanged without sufficient information to base informed decision-making has compromised the environmental impact assessment process and is also unlawful, arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law. Therefore, Federal Lease Sale 193 should be vacated immediately and in its entirety or Alternative II – No Lease Sale – should be selected.

6) BOEM's Impact Analyses Are Biased, Subjective, Ambiguous, Inconsistent, Arbitrary And Capricious.

BOEM does not analyze the proposed FLS 193 actions' impacts *via* a quantifiable metric or scale and does not provide the public, Federal or State agencies, or other impacted nations any data or rationale for its analyses. Instead, BOEM a) uses an inadequate, biased, ambiguous, inconsistent, and subjective assessment, b) grossly minimizes the environmental impacts of the proposed action, c) contradicts its own analyses in favor of the preferred alternative to maintain the sale and develop the resources, and d) fails to provide sufficient information for an informed choice of alternatives.

BOEM's description of its impact scale in its Draft SSEIS (BOEM 2014a) is extremely brief and devoid of detail or sufficient explanation:

“The impacts scale applied in the Draft Second SEIS is as follows:

- Negligible:** Little or no impact
- Minor:** Impacts are short-term and/or localized, and less than severe
- Moderate:** Impacts are long lasting and widespread, and less than severe
- Major:** Impacts are severe”

There are no details, data, accompanying information, science, quantifying metric(s), or other information in this Draft SSEIS to inform the reader what this “scale” is based on or how it was derived. BOEM attempts to excuse this exceedingly subjective assessment in its Draft SSEIS by claiming it “considered approaches of other Federal agencies” (BOEM 2014a). But, such a rationalization a) does not substantiate the validity of these other approaches nor of BOEM’s own flawed scale and b) is specious in and of itself, particularly in light of the fact that BOEM developed its own scale regardless.

In addition, BOEM does not sufficiently consider the highly interdependent synecological and food web dynamics that have significant effects in the Arctic (e.g. disturbance to and/or loss of prey and habitat). Impacts on these levels can not only significantly affect individual populations and species, but the ecosystem as a whole. If these effects were given more serious consideration as required by law, the impacts of FLS 193 would be shown to be more significant and could be analyzed and considered with more cogent information and much greater scrutiny.

However, BOEM’s impact analyses are qualitative at best and the agency relies solely on its analysts’ “professional judgment”, but does not provide any information on who the analysts are nor on their professional background, experience, expertise, or position. It is highly dubious that BOEM employed or contracted different specialists with expertise not only for every species, sector, culture, and subject impacted, but each who are also specialists regarding anthropogenic impacts on their respective subject. If BOEM did in fact employ or contract all such experts, then it is incumbent upon the Agency to provide detailed information supporting that individual’s expertise and qualifications to make such “professional judgment(s)”. In addition, it is clear that either a) different analysts apply their own *subjective* “judgment(s)” on the same subject or species in different sections of the Draft and contradict other sections and/or analysts, or b) the same analyst(s) contradict themselves. This Draft SSEIS is replete with myriad contradictions.

For example, BOEM analysts subjectively assume that with some species a large spill may “only” result in “Moderate” or even “negligible” impacts (e.g. polar bears, walrus), yet the population would suffer irreversible declines. How is the decline and eventual loss of an entire population assumed to be merely “negligible” and not considered “severe”? Furthermore, BOEM’s “analyses” of impacts on a species in some Draft SSEIS (BOEM 2014a) sections are *assumed* to be supposedly “Minor”, “negligible”, or “Moderate”, with supposedly minimal or no population impacts, yet the same spill scenario in other sections describes the *same* impacts for the *same* activities during the *same* exploration, production, or development phase on the *same*

species as causing “Major” population declines, behavioral changes, or movement shifts and determines these as “severe”. Such specious “analyses” are not simply “subjective” or “qualitative”; they are wholly arbitrary and capricious.

This not only demonstrates the inadequacy of this scale, but also the fact that much of the information provided in this Draft is flawed, assumptive, unsupported, subjective, dubious, arbitrary, and capricious. As such, BOEM’s Draft SSEIS (BOEM 2014a) a) does not take an objective and robust “hard look” at all possible direct, indirect, and cumulative impacts, b) does not provide for a fully informed and reasoned choice of alternatives, and c) does not comply in any manner with NEPA rendering the analyses highly negligent and FLS 193 illegal.

Importantly, how does BOEM actually quantify “severe” or accurately distinguish this category from others? According to the New Oxford American Dictionary, “severe” means: “(of something bad or undesirable) very great; intense; strict or harsh.” How then, does BOEM apply “of something bad, undesirable, strict, harsh,” etc. in any scientific form? How do BOEM analysts substantiate not using the “severe” category when a species’ population in the FLS 193 area suffers “significant impacts”, “large losses” or “conspicuous population level effects” according to their own assessment (BOEM 2014a)? How does BOEM actually distinguish this scientifically or otherwise from “impacts (that) are long lasting and widespread” yet are supposedly “less than severe”? Indeed, how can a Federal agency tasked with managing U.S. publicly owned natural resources, including endangered species, claim that “conspicuous population-level effects” or that (a)ll birds or polar bears contacted by crude oil “are assumed to die” (BOEM 2014s) are not “severe”, “something bad” or “undesirable”? In some cases, BOEM (2014a) predicts a “Major” impact that is “less than severe”, but “Major” is supposedly “severe” according to their scale as noted above (emphasis added):

“Overall, the activities conducted during this time period are anticipated to have a *major* impact on marine and coastal birds, including threatened and endangered marine and coastal birds, because they are long lasting and widespread, but less than severe.”

Numerous examples of such discrepancies abound in BOEM’s Draft SSEIS. For example, BOEM analyst(s) conclude “significant” population level impacts on polar bears (emphasis added):

“Some OCS operations might pose a *relatively high spill risk* to polar bear aggregations and, therefore, *to the polar bear population as a whole*”

“Were oil to contact one of these aggregations of bears, it would likely result in mortalities and constitute a *significant impact* to the SBS or CBS stock of polar bears.”

“If a VLOS (Very Large Oil Spill) were to occur, it could result in the *loss of large numbers of polar bears. This would have a significant impact* on the SBS and/or CBS stocks of polar bears.”

However, BOEM (2014a) analyst(s) determined that the impacts on polar bears are supposedly “Moderate” or even “negligible” via a misleading and false argument, including in their cumulative impacts analyses (Table 2).

Table 2 (from Table 5-18 in Draft SSEIS (BOEM 2014a). “Summary of Analyzed Effects That May add to Incremental Effects on Marine Mammal Species Effects.”

Beluga Whale	Moderate
Bowhead Whale	Moderate
Fin Whale	Negligible
Gray Whale	Moderate
Harbor Porpoise	Moderate
Humpback Whale	Negligible
Killer Whale	Moderate
Minke Whale	Moderate
Bearded Sea	Moderate
Ribbon Seal	Moderate
Ringed Seal	Moderate
Spotted Seal	Moderate
Pacific Walrus	Moderate
Polar Bear	Negligible

First, BOEM’s argument is highly presumptive and does not provide any data, science, theory, or information of any kind to base its conclusions for any of these species. Second, BOEM (2014a) states clearly that winter spills will affect polar bears and numerous other species:

“Much of the high level of activity during the Exploration and Development phase predicated in the Scenario is focused during the open water season when polar bears are not likely to be present. Polar bears are more likely to be present during the winter season and during the production phase. Because polar bears commonly move through oil industry areas on the North Slope and in the Beaufort Sea with *only negligible impacts*, it is likely that activity in the Leased Area would cause *negligible impacts*.” (BOEM 2014a)

Furthermore, BOEM's argument that large and very large spills occurring in Spring, Summer, or Fall when BOEM analysts subjectively assume polar bears are supposedly "not likely to be present" is flawed because a) the bears will be forced ashore at this time and will have a strong presence along spill-impacted coastal zones where dead and dying prey will be scavenged and b) the spills will have a strong probability of remaining through the winter with as much as a 79% probability of contact with bears within 360 days, causing significant harm. According to BOEM (2014a) (emphasis added):

"As demonstrated by this spill, small, chronic leaks in underwater pipelines could result in large volumes of oil being released underwater without detection. ***If such an event were to occur in offshore waters, there could be major impacts to the polar bear population.*** If such a spill occurred during winter, ***the release of oil trapped under the ice during spring breakup would be equivalent to the catastrophic release of the same amount of oil*** (Amstrup, Durner, and McDonald, 2000)".

"(If a spill were to occur late in the open water season, the liquid hydrocarbons may freeze into the sea ice, and could remain overwinter without any extensive amount of weathering. If this were to happen, ***quantities of unweathered oil could end up being transported to different areas in the Chukchi and Beaufort Seas and be released in the spring.***"

"The OSRA model estimates the percent chance of a large spill contacting the ERAs and coastal areas that are important resource areas to polar bears. The OSRA model estimates the percent chance of a large oil spill contacting ERA 23 within 30 days is 3-70% for all LAs and 10-78% for all PLs. The percent chance of a large oil spill contacting ERA 23 within 360 days is 6-71% for all LAs and 13- 79% for all PLs."

Importantly, the IUCN Species Survival Commission Polar Bear Specialist Group (PBSG 2014) concluded that 21% of the polar bear subpopulations are in decline, including the Southern Beaufort Sea subpopulation.

"The SB subpopulation is currently considered to be declining due to a negative trend in sea ice conditions, particularly over the continental shelf, resulting from the continuing effects of climate warming. If the region continues to lose high quality polar bear hunting habitat as forecasted by global climate models (Durner et al. 2009), it is likely that the SB subpopulation could face extirpation by mid-century (Amstrup et al. 2010). (PBSG 2014)"

In addition, the PBSG concludes that two-thirds of all polar bears could be lost by the middle of the century and possibly the entire population by the end of the century due to oil and gas development, pollution, and climate change impacts and loss of sea ice extent, prey, denning sites, etc. (PBSG, 2014, Schliebe et al. 2008). Clearly, substantive perturbations on any one

subpopulation could be highly detrimental, including to the population as a whole. Yet, BOEM (2014) analyst(s) subjectively concluded without any quantifiable data, evidence, analyses, science, or information that the direct, indirect, and cumulative impacts on polar bears from activities associated with FLS 193 would be “negligible” according to BOEM’s impact scale.

Third, BOEM’s assessment is flawed and highly misleading. For example, BOEM (2014a) acknowledges that some polar bear subpopulations are “in decline” and that further perturbations could have significant impacts. Given that “some OCS operations might pose a relatively high spill risk to polar bear aggregations” (BOEM 2014a) and that there is as much as a 79% chance of a spill contacting polar bears, which would have “significant impacts” on the population as whole (BOEM 2014a), clearly this is not “negligible” and, in fact, should be categorized as *severe*. Yet, a reader examining this document in other sections is informed by BOEM that the impacts are considered inconsequential, “minor” or “negligible”, including in BOEM’s cumulative effects analysis (Table 2). The latter is flawed and misleading. BOEM states in its Draft SSEIS (BOEM 2014a) that future exploration, development and production are reasonably foreseeable *via* future lease sales in the Chukchi Sea and that “industry interest will remain focused (‘within the core leasing area’) for the foreseeable future” (emphasis added):

“To inform the cumulative effects analysis, BOEM estimated how much exploration, development, and production could occur from reasonably foreseeable future lease sales in the Chukchi Sea. During this exercise, BOEM focused on the areas leased in Lease Sale 193 as well as nearby tracts within the “core” leasing area of the Chukchi Sea. ***This core area contains the most promising prospects***, and was the focus of leasing in Lease Sale 109 as well as Lease Sale 193 and ***is expected to be an area of industry focus in potential future lease sales. Therefore, this is the area where BOEM expects that industry interest will remain focused for the foreseeable future.***”

“Using data from actual prospects to more accurately develop the proxy fields analyzed here, BOEM estimated the additional 2.0 Bbbl of production attributed to future lease sales could occur from two additional satellite fields. These two satellite fields would contribute 1.6 Bbbl and 0.4 Bbbl of recoverable oil, respectively. Production would also include 1.7 TCF and 0.2 TCF of recoverable gas from these two satellite fields, respectively. Developing these fields would require 6 additional platforms and 360 additional production and service wells.”

As such, if there is a 75% probability of one or more large spills occurring from the development of only one anchor field and one satellite field for FLS 193, then obviously as the National Research Council clearly warns: the probability of more spills occurring increases with future lease sales and subsequent activities (NRC 2014). Indeed, “(d)velopment of these fields

(for FLS 193) would entail the drilling of 465 oil producing wells, 93 service wells, and installation of 8 platforms... (with) a 75% chance of one or more large spills occurring” (BOEM 2014a). The impacts of adding a *minimum* 6 additional platforms and (64.5%) an additional 360 production and service wells from future leases clearly will increase the probability of adding more spills and disturbances to the system (NRC 2014). Indeed, BOEM clearly states in its Draft SSEIS (BOEM 2014a) that there is “***considerable historical data***” indicating large spills $\geq 1,000$ bbls may occur during Development and Production (emphasis added):

“Two large spills of crude, condensate, or refined oil are assumed to occur during the Development and Production phases. ***This assumption is based on considerable historical data that indicates large spills $\geq 1,000$ bbls may occur during this phase*** (Anderson, Mayes and Labelle, 2012). This assumption is also based on statistical estimates of the mean number of large spills from platforms, wells, and pipelines, the number and size of large spills on the OCS, and project-specific information.”

In reality, the probability of a large spill occurring is likely higher and the possibility of effective emergency response is absent. BOEM acknowledges in its Draft SSEIS (BOEM 2014a) the predicted cumulative effects (emphasis added):

“Cumulative effects may include the development of offshore oil production other than the Chukchi Sea Leased Areas (i.e. Canada and Russia development), onshore oil and gas production and subsequent construction and maintenance of infrastructure, onshore mining, and other similar activities such as trenching for telecommunication development. ***These activities would create further effects of discharges from nonpoint sources, sedimentary displacement and deposition, potentials for hydrocarbon spills and natural gas releases, noise due to vessel traffic, and activities that could further increase cumulative effects on the Chukchi Sea Leased Areas.***”

“There is a lack of accident response resources in the Arctic as well as a lack of effective techniques for containing or cleaning up spilled oil under ice or in broken ice. There are also challenges associated with conducting a rapid, effective spill response in a region where weather is often severe, daylight may be limited, and accidents may happen in remote locations (AMAP 2007).”

BOEM’s rudimentary analyses show only the probability of a given number of events occurring in a fixed interval of time and/or space if these events occur with a known average rate and independently of the time since the last event (i.e. a Poisson distribution) and do not account for other significant confounding effects, particularly human error (e.g. Deepwater Horizon

disaster, Exxon Valdez disaster, etc.) sea, ice, weather, climate, and other environmental conditions – as well as the lack of accident response resources in the region. BOEM’s simplified analyses are based only on historical data of the mean number of spills that have occurred during other outer continental shelf (OCS) operations, which on average, have occurred in calmer and easier weather, sea, and environmental conditions compared to the Arctic (NRC 2014). In the much more difficult and dangerous offshore Arctic conditions, all oil and gas activities have demonstrated that significant or catastrophic accidents and harm can occur. Clearly, with the addition of at least 64.5% more wells from future leases, the probability is significantly higher for the occurrence of one or more large spills, industrial accidents, blow-outs, ship groundings, pipe bursts, etc. in addition to significantly more smaller spills, toxic discharges, construction, production, invasive species, human, industrial and transportation activities, and disturbance (NRC 2014) – all together with and exacerbated by the effects of climate change.

The preponderance of independent evidence-based scientific studies has led to the broadly accepted ecological principle that such impacts are generally synergistic. In essence, additional disturbances can compound the effects exponentially on species and populations – particularly those already threatened or endangered – that were previously impacted by earlier perturbations (e.g. disturbances, spills, etc. from oil and gas exploration, production, development and other activities) and/or other stresses on their populations. BOEM acknowledges in various sections of the document that such species could suffer “population-level” declines due to the various disturbances caused by FLS 193. As BOEM repeats multiple times throughout this Draft SSEIS (BOEM 2014a): “(i)n a declining population, losses are not recovered by recruitment.” In fact, as BOEM itself notes with regard to the Pacific walrus, which is a candidate species for the Endangered Species Act and, as such, is afforded relevant protections, the population is already in decline due to loss of sea ice and prey availability. Further loss if individuals or habitat resulting from any perturbation, whether oil spills, climate change, or prey loss, would “exacerbate that decline” (emphasis added):

“With a population in decline, any loss of large numbers of walruses, walrus habitat, or prey species would exacerbate that decline. Recovery would not occur unless the population begins to rebound from other factors that may be limiting population productivity or growth, such as decreasing sea ice extent, prey availability or harvest.”

“Walrus may continue to be exposed to hydrocarbons through their prey, which may lead to reduced fitness and possibly population-level effects over time.”

“Significant impacts to the walrus population would be most likely to occur if large scale contamination of prey and habitat persisted for years; or if a VLOS contacted a large concentration of walrus at a foraging area...”

With regard to both common and Federally listed endangered eiders, BOEM (2014a) notes that “(c)hronic disturbances to nesting spectacled eiders would be widespread and would persist throughout the 24-year period”.

“Should any population decline, the potential impact to that species could increase. Several seabird populations have experienced periodic declines (e.g., king eider, common eider) and the potential impact to those species could increase. Chronic disturbances to nesting spectacled eiders would be widespread and would persist throughout the 24-year period.”

Cumulative impacts can affect these and myriad other species with the addition of new spills and other perturbations. BOEM (2014a) notes the possible effects in its cumulative impact analyses:

“This analysis employs the definition of cumulative impacts found in the CEQ regulations (40 CFR 1508.7): ‘Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.’ Cumulative effects are assessed by determining the incremental impact of the action when added to the impacts of past, present, and reasonably foreseeable future actions in the vicinity of the project.”

If a large or very large spill were to occur or a series of smaller spills, which BOEM (2014a) estimated to number at least 800, combined with disturbance from the numerous disruptive activities associated with 558 wells, exploration, construction, production, sea and air transport, pipeline, and other oil and gas activities, etc. from FLS 193, species already “significantly” impacted or experiencing declines could suffer irrevocable harm from the addition of 360 more wells, probable spills, new disturbances, etc. from future leases. In addition, BOEM’s analyses do not account for large/very large spills occurring in adjacent leases, the Beaufort and Bering Seas, Russia, or Canada. It is simply misleading and erroneous to use this subjective scale and personal “judgment” to contend that the addition of substantive new impacts and perturbations would have supposed “negligible” effects. Because it is a Federal agency, it is possible much of BOEM’s analyses in any of its documents could be taken at face value, including Table 5-18 in its

2014 Draft SSEIS (Table 2 above). In the absence of more detailed analyses and information it can be difficult to distinguish the contradictory, flawed, and misleading information in BOEM's Draft SSEIS (BOEM 2014) from robust, valid, evidence-based, and well-supported scientific analyses.

Furthermore, BOEM minimizes potential impacts by suggesting that future mitigation measures would compensate for effects, but such an assertion is spurious as well as arbitrary and capricious. As noted by the U.S. District Court of Colorado (*see* Jackson 2014) (emphasis added):

“(T)he agencies’ contention that new technology might reduce carbon emissions from future coal combustion strikes this Court as anything but a “hard look.” ***The agency cannot rely on unsupported assumptions that future mitigation technologies will be adopted.*** Cf. *New York v. Nuclear Regulatory Comm’n*, 681 F.3d 471, 478-79 (D.C. Cir. 2012) (finding a NEPA violation where the agency decided to ignore future impacts based only on “reasonable assurance[s]” that the impacts would be avoided later); *see also Neighbors of Cuddy Mountain v. U.S. Forest Serv.*, 137 F.3d 1372, 1381 (9th Cir. 1998) (***holding that an EIS discussion of mitigation violated NEPA in part because it was “not clear whether any mitigation measures would in fact be adopted”***).

Ultimately, BOEM's impact and cumulative effects assessments are misleading, flawed, highly subjective and biased, negligent, arbitrary, capricious, and an abuse of discretion and authority. Furthermore, BOEM's assessments do not provide an accurate and appropriately well-informed representation of reality and reasoned choice of alternatives. As such, FLS 193 must be vacated or Alternative II – No Lease Sale – must be selected.

7) The U.S. Department of the Interior, U.S. Department of the Treasury, and BOEM affirmed the sale of Lease 193 despite the fact that federally listed and candidate endangered species would suffer significant, long-term, conspicuous, and/or widespread population-level losses and irreparable harm as a result of the proposed action.

The United States Department of the Interior, the United States Department of the Treasury, and BOEM proceeded with, affirmed, and accepted \$2.66 billion for the sale of Lease 193 in favor of its preferred alternative to develop oil and gas resources on public property despite its own conclusions as well as warnings by the USFWS, EPA, NOAA, and NMFS that numerous species, including Federally listed and candidate Endangered/Threatened species and their critical habitats, would suffer “significant”, “long-term”, “wide-spread”, “conspicuous”, “large-scale”, and “Major” (i.e. “severe”) “population-level impacts” and irreparable harm as well as by the cumulative impacts from future leases. Based on these warnings and conclusions alone, it was highly negligent and illegal for BOEM to knowingly proceed with Federal Lease Sale 193.

It is well-worth emphasizing that the extraordinarily high probabilities of polar bears and walrus and, thus, numerous other species contacting a large or very large oil spill are 79% and 76% respectively. In light of BOEM’s own statements and conclusions in its Draft SSEIS (BOEM 2014a) with regard to just these two Federally listed/candidate species as well as Endangered eiders, the impacts of FLS 193 are extremely serious. According to the law under the U.S. Endangered Species Act, Federal action FLS 193 must be retracted and vacated. BOEM’s own review of the impacts on these species is highly relevant despite its attempt to minimize the effects in other portions of the document (BOEM 2014a) (emphasis added):

Polar Bears

“(O)nce oiled, it is unlikely that an oiled bear would survive.”

“Long term or chronic oil ingestion may result in kidney damage, liver damage, or ulcers in the digestive tracts of seals and the polar bears that feed upon them.”

“If polar bears avoid coastal areas that have been fouled by oil, *they may be excluded from important resting or denning areas, which may impact fitness or breeding success.*”

“If the spill begins late in the open water drilling season (September to October), then the longer that the spill goes on, the more likely it becomes polar bears would encounter oil and/or disturbance from cleanup efforts. In recent years, more polar bears have congregated on shore while waiting for the sea ice to form. Large aggregations of bears from the SBS stock now occur near Cross Island and Barter Island, where bears scavenge on whale carcasses. Wrangel Island also has large numbers of bears from the CBS stock.

Were oil to contact one of these aggregations of bears, it would likely result in mortalities and constitute a significant impact to the SBS or CBS stock of polar bears.

“After cleanup efforts have ceased, the remaining oil would continue to weather and be subject to microbial degradation. This process is likely to be very slow in Arctic waters. Oil that has been suspended in the water column or in the sediment may continue to be ingested by the benthic organisms that bearded seals and walrus prey upon...***Polar bears that are eating bearded seals or walrus may continue to be exposed to hydrocarbons through their prey, which may lead to reduced fitness over time.***”

“The majority of the CBS (polar bear) stock is believed to den and come ashore on the Russian side of the Chukchi Sea, particularly at Wrangel Island. The majority of the SBS stock of polar bears come ashore and den further eastward in the Beaufort Sea. However there is a large area of overlap between the CBS stock and the SBS stock out on the sea ice in the northeastern portion of the Chukchi Sea. ***Both stocks are believed to be in decline. If a VLOS (very large oil spill) were to occur, it could result in the loss of large numbers of polar bears. This would have a significant impact on the SBS and/or CBS stocks of polar bears.***”

“Large spills up to 5,100 bbl could impact polar bears, particularly if they occurred in marginal sea ice habitat or onshore near barrier islands. ***Impacts could include disturbance and displacement; inhalation of contaminants; eye, mouth or mucous membrane injuries; or ingestion of contaminated prey. Oiled polar bears would likely ingest oil during grooming efforts and would be susceptible to hypothermia. Heavily oiled bears would not survive unless capture and cleaning efforts were successful. Polar bears that ingest contaminated prey could suffer injury or mortality due to liver and/or kidney damage. Cleanup activities may haze polar bears away from contaminated sites, but ingestion of contaminated prey over time would be difficult to mitigate.***”

“Depending upon the location of the spill site and other factors, ***oil could contact shore within 10 days of the initial event.***”

“***As demonstrated by this spill, small, chronic leaks in underwater pipelines could result in large volumes of oil being released underwater without detection. If such an event were to occur in offshore waters, there could be major impacts to the polar bear population. If such a spill occurred during winter, the release of oil trapped under the ice during spring breakup would be equivalent to the catastrophic release of the same amount of oil (Amstrup, Durner, and McDonald, 2000).***”

“***Spills during the fall or spring during the formation or breakup of ice present a greater risk because of difficulties associated with clean up during these periods and the presence of bears in the prime feeding areas over the continental shelf (USFWS, 2006). Oil would remain highly toxic to polar bears, even after the aromatic hydrocarbons have dissipated (St. Aubin 1990).***”

“***Some OCS operations might pose a relatively high spill risk to polar bear aggregations and, therefore, to the polar bear population as a whole.***”

“***Large aggregations of polar bears may be vulnerable to a spill along the arctic coasts or on Wrangel or Herald islands in late summer and fall, when they congregate in these areas to feed on walrus and whale carcasses (USFWS, 2006). Indirect sources of mortality may occur when seals or other mammals die from oil exposure.***”

Marine and Coastal Birds, Including Endangered Eiders

“All birds contacted by spilled fuel or crude oil are assumed to die.”

“A VLOS (very large oil spill) during periods of peak use could affect large numbers of marine and coastal birds, including loons, seabirds, and waterfowl including listed eiders. As a typical example, up to 45% of the estimated Pacific Flyway population of Pacific brant could be affected, if an oil spill reaches Kasegaluk Lagoon. Effects could range from direct mortality of approximately 60,000 brant to sublethal effects on an equal or smaller number of brant. The loss of up to 45% of the Pacific Flyway population would have conspicuous population-level effects.”

“The loss of all or part of the breeding female spectacled eiders of the Arctic Coastal Plain would be anticipated to result in large-scale population level effects. A similar impact could be experienced by Steller’s eiders using the spring lead system for staging prior to moving to the breeding grounds. A large spill contacting the spring lead system could affect a relatively large proportion of the Steller’s eider population. This would be considered a large-scale population-level effect on this species.”

“As many as 33,000 eiders, including the entire cohort of successfully breeding females and their young, use the Ledyard Bay molting area at one time. The loss of all or part of the breeding female spectacled eiders of the ACP would result in a major impact to this species.”

“For many of the same reasons, a spill contacting the spring lead system could affect a relatively large proportion of the Steller’s eider population staging enroute to the breeding grounds. A spill of this magnitude would result in a major impact on this species because they are clear, long-lasting and change the resource’s function in the ecosystem.”

“Several other seaduck populations have experienced periodic declines (e.g., king eider, common eider) and the potential impact to those species could increase. In a declining population, losses are not recovered by recruitment.”

“(A)ny collision mortality of spectacled or Steller’s eiders would be considered a major impact if these bird losses were not recovered within a generation.”

“Spectacled eiders would be the most impacted of the listed species, with direct effects to nesting habitats as well as likely direct mortality from vessel encounters....The potential level of mortality to these species, combined with habitat loss and longterm disturbances from pipeline corridor maintenance for the entire Scenario are anticipated to result in a major impact on threatened and endangered marine and coastal birds, especially the spectacled eider.”

Walrus

“Some researchers believe that the (walrus) population may be in decline based on age structure and productivity information (GarlichMiller, Quakenbush and Bromaghin, 2006) due to changes in sea ice and prey availability (Taylor and Udevitz, 2014). The Pacific walrus is listed as a candidate for threatened status under the Endangered Species Act due to the continuing loss of sea ice habitat caused by climate change (76 FR 7634 [Feb

10, 2011]). *With a population in decline, any loss of large numbers of walrus, walrus habitat, or prey species would exacerbate that decline. Recovery would not occur unless the population begins to rebound from other factors that may be limiting population productivity or growth, such as decreasing sea ice extent, prey availability or harvest.*”

“Walrus could be directly and indirectly affected by an offshore oil spill. Exposure to oil or associated fumes could cause respiratory distress and inflammation of mucous membranes and eyes, leading to damage such as abrasions and ulcerations. Walrus, which have large protruding eyes, would be particularly vulnerable. Walrus rely primarily on a thick layer of blubber for insulation and therefore are less likely than fur bearers to suffer from hypothermia as a result of oiling. However, they may be more likely to suffer skin inflammation and ulcers as a result of oil exposure. Studies have shown that while marine mammals such as walrus are not usually killed by surface contact with oil, ingestion of oil or oil contaminated prey items can cause tissue changes (Kooyman, Gentry and McAlister, 1976)...Chronic exposure may still result in lethal effects or long term sub-lethal effects that reduce fitness.”

“If pack ice is located within 10-20 mi (16-32 km) of the drilling unit, walrus would likely be affected.”

“During ice-breaking activities, walrus moved 12.4 to 15.5 mi (20 to 25 km) from the operations where sound energy levels were 11%-19% above ambient sound level. Thus, walrus were simply displaced away from vessels to areas where sound levels approached ambient levels.” NOTE: BOEM minimizes the effects here and contradicts related conclusions, particularly energetic and competitive costs from such displacement, such as the conclusion below:

“Walrus primarily feed on benthic invertebrates, such as clams and marine worms. Benthic invertebrates that come into contact with the spill would ingest hydrocarbons from water, sediments and food. Invertebrates could concentrate contaminants because they metabolize hydrocarbons poorly. Long-term or chronic oil ingestion may result in kidney damage, liver damage, or ulcers in the digestive tracts of walrus. Depending upon the level of impacts to benthic invertebrates, walrus could be forced to travel farther to forage, resulting in increased energetic costs and perhaps increased competition among walrus for food sources.”

“Depending upon the location of the spill site and other factors, oil could contact shore within 10 days of the initial event. Walrus could come into contact with oil at coastal haulouts. Regardless of whether contact occurred at sea, on ice or on land, the results to the physical health of the walrus would be the same as those listed under Phase 2. If walrus avoid coastal areas that have been fouled by oil, they may be excluded from important coastal resting areas once the sea ice retreats off of the continental shelf in late summer. Walrus cannot remain at sea indefinitely; they must haul out to rest...”

“Calves and young walrus are more restricted in the amount of time that they can spend at sea, and are unable to swim as far or for as long as adult walrus. This worst-case scenario could lead to population-level effects.”

“At that time of year, the females are calving and the calves may be especially sensitive to the effects of oil or disturbance. High rates of spontaneous abortions have been reported for some other marine mammal species after a spill...”

“Walrus may continue to be exposed to hydrocarbons through their prey, which may lead to reduced fitness and possibly population-level effects over time.”

“Significant impacts to the walrus population would be most likely to occur if large scale contamination of prey and habitat persisted for years; or if a VLOS contacted a large concentration of walrus at a foraging area such as the HSWUA or while the population is concentrated on sea ice or terrestrial haulouts.”

“During early spring and summer months, nearly the entire population of Pacific walrus can be found in the Chukchi Sea, and they could be extremely vulnerable to a large oil spill at this time. Areas where walrus are largely concentrated at some times of the year and therefore more vulnerable include the HSWUA, terrestrial haul out areas near Pt. Lay and the Russian coastline (USFWS, 2013; Jay et al., 2012).”

“At the highest level of activity in the scenario and without appropriate mitigation, population level impacts to walrus could occur.”

“Additional benthic habitat would be disturbed by an estimated 190-210 miles of offshore oil and gas pipelines. This loss of foraging habitat over a period of approximately 25 years could potentially result in population level effects to walrus unless project-specific mitigation measures are carefully applied.”

“The greater use of the coastline by large aggregations of walrus puts them at increased risk from oil spills and disturbance events onshore...”

Very simply, even according to BOEM’s own review, Federal Lease Sale 193 should legally never have been allowed to proceed. This sale and subsequent impacts would harm, threaten, and further endanger or even decimate Federally listed and candidate Endangered and/or Threatened species and their critical habitats. Federal Lease Sale 193 violates the law and the United States Endangered Species Act, the United States National Environmental Policy Act, and the United States Clean Air Act. FLS 193 also breaches regulations set and enforced by the United States Environmental Protection Agency, the United States Fish and Wildlife Service, the United States National Oceanic and Atmospheric Administration, and the United States National Marine Fisheries Service. Furthermore, FLS 193 contravenes recommendations by the United Nations Intergovernmental Panel on Climate Change and guidelines and regulations of the Executive Office of the President of the United States as advised by the United States Council on Environmental Quality.

Therefore, Federal Lease Sale 193 is highly negligent, contravenes Congressional Acts and Federal regulations, is illegal, and is a gross abuse of discretion and authority. It is incumbent upon the United States Federal government to vacate FLS 193 immediately in its entirety or select Alternative II – No Lease Sale.

8) On 3 December 2014, the National Oceanic and Atmospheric Administration’s (NOAA) National Marine Fisheries Service (NMFS) announced a critical habitat designation for Arctic subspecies (*Phoca hispida hispida*) of the ringed seal (*Phoca hispida*) under the Endangered Species Act (ESA) covering 350,000 square miles in the northern Bering, Beaufort, and Chukchi Seas, encompassing Federal Lease Sale 193. In addition, in December 2012, NMFS listed four subspecies of the ringed seal along as Threatened or Endangered under the ESA (77 FR 76740). The proposed critical habitat rule notes that the ringed seal along with other seals (*Beringia* DPS of the bearded seal) and species and their critical habitats could be adversely affected by numerous oil and gas activities, including seismic surveys, drilling operations, production, development, and potential oil spills, among others. NOAA stated that oil and gas activities must specifically consider the seals' habitat as well as that for other Federally listed species, including whales, Pacific walrus, and polar bears. Proceeding with FLS 193 would endanger ringed seals, polar bears, whales, walrus, and other species and would contravene the Endangered Species Act, NOAA, NMFS, and the USFWS.

The following comments are provided by both Greenpeace and the Center for Biological Diversity, which has over 320,000 members and online advocates and is dedicated to the protection of native species and their habitats through science, policy, and environmental law. Portions of these comments were first published in the Federal Register via www.regulations.gov on 25 March 2011 (“Re: Comments on the Proposed Threatened Status for Subspecies of the Ringed Seal (75 Fed. Reg. 77476); and Proposed Threatened and Not Warranted Status for Subspecies and Distinct Population Segments of the Bearded Seal (75 Fed. Reg. 77496)”) and are revised and updated herein by Greenpeace relative to Federal Lease Sale 193 and the current NMFS December 2014 critical habitat listing for ringed seals.

On 28 December 2012, the National Marine Fisheries Service (NMFS) published a final rule to list the Arctic subspecies (*Phoca hispida hispida*) of the ringed seal (*Phoca hispida*) as Threatened under the Endangered Species Act (ESA) (77 FR 76706). Section 4(b)(6)(C) of the ESA also requires the Secretary of Commerce to designate critical habitat. Both Greenpeace and the Center for Biological Diversity (we) strongly support the NMFS proposal to list critical habitat for the Arctic ringed seal due to climate change threats. Although we support NMFS’s determination that the foreseeable future for assessing impacts from climate change for the Arctic ringed seal is the end of the 21st century and that the proposed rules state that the IPCC data and analyses “currently form the most widely accepted version of the best available data about future conditions”, we strongly encourage NMFS to consider the most recent analyses by the IPCC

(2014) stating that, at current emissions rates, the global carbon budget will be depleted within 30 years of 2011.

As we discussed in our former ESA listing Petition and prior comment letters for these species, IPCC climate change projections represent the internationally accepted best-available science on future climate conditions. The sea-ice analyses for the Okhotsk and Bering Seas in the proposed rules are improved and more transparent than those presented in 12-month findings for the ribbon and spotted seals. In addition, we commend NMFS on its snow depth analysis for the ringed seal, which has advanced scientific understanding of changes in snow depth in the Arctic and its implications for Arctic species like the ringed seal.

In our comments below, we demonstrate that BOEM's assumptions and conclusions do not provide for a reasoned choice of alternatives, are negligent, arbitrary, capricious, an abuse of Federal agency discretion, and an unlawful violation of NEPA. BOEM must postpone or cancel FLS 193 because it would violate the ESA and harm Federally listed and candidate Endangered and Threatened species, including *via* critical habitat destruction. Federal Lease Sale 193 and any other Federal, state, or private action that could jeopardize such species in any way, including *via* habitat destruction, must be suspended, deferred, or cancelled until the responsible Federal agencies (NOAA, NMFS, USFWS, EPA) are fully consulted and informed of all direct, indirect, and cumulative impacts in the Final EIS, are able to advise and make a fully informed and reasoned choice of alternatives, and can finalize the necessary legal designations.

We further (1) retransmit new scientific studies on climate change and ocean acidification that support the proposed listings and critical habitat designation for the ringed seal; (2) discuss concerns about oversights in the proposed rules, including the failure to determine that ocean acidification along with oil and gas development threaten the continued existence of ringed and bearded seals; and (3) provide information to inform critical habitat designation for ringed and bearded seals within U.S. waters.

I. Suspension Of All Federal Actions That Would Harm Federally Listed And Candidate Species And/Or Their Critical Habitats

Pursuant to the United States Endangered Species Act (ESA), BOEM must suspend or cancel FLS 193 because it would violate the ESA by a) not “further(ing) the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species” and

b) “jeopardize(ing) the continued existence of endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary...to be critical”, and c) directly harming several Federally listed and candidate Endangered and Threatened species, including *via* habitat destruction – in particular for the polar bear (*Ursus maritimus*), Pacific Walrus (*Odobenus rosmarus divergens*), Arctic ringed seal (*Phoca hispida*), Stellar’s eider (*Polysticta stelleri*), spectacled eider (*Somateria fischeri*), and three whale species (bowhead (*Balaena mysticetus*), fin (*Balaenoptera physalus*), and humpback (*Megaptera novaeangliae*)). Although the Beringia bearded seal DPS (*Erignathus barbatus*) was officially listed as Threatened, a July 2014 court ruled that listing should be vacated until the designation is remedied. At the current time the population remains listed under the Endangered Species Act as well as by NOAA/NMFS (2014).

According to the ESA (emphasis added):

“SEC. 7. (a) FEDERAL AGENCY ACTIONS AND CONSULTATIONS — (1) The Secretary shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act. *All other Federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 4 of this Act.*

(2) Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an “agency action”) 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 which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available.

(3) Subject to such guidelines as the Secretary may establish, a Federal agency shall consult with the Secretary on any prospective agency action at the request of, and in cooperation with, the prospective permit or license applicant if the applicant has reason to believe that an endangered species or a threatened species may be present in the area affected by his project and that implementation of such action will likely affect such species.

(4) Each Federal agency shall confer with the Secretary on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under section 4 or result in the destruction or adverse modification of critical habitat proposed to be designated for such species. This paragraph does not require a limitation on the commitment of resources as described in subsection (d).”

Federal Lease Sale 193 and any other federal, state, or private action that could jeopardize such species in any way, including *via* habitat destruction, must be suspended, deferred, or cancelled until the responsible Federal agencies (NOAA, NMFS, USFWS, EPA) are fully consulted and informed through the “*best scientific and commercial data available*” of all direct, indirect, and cumulative impacts in the EIS of such Federal actions, are able to advise and make a fully informed and reasoned choice of alternatives, and can finalize the necessary legal designations for those endangered/threatened species. In particular, NOAA and NMFS have proposed critical habitat designation for the Arctic ringed seal in the Chukchi, Beaufort and Bering Seas that would encompass FLS 193. Pursuant to U.S. law and Congressional Act, the ESA supersedes all other Federal, State, and private land and sea natural resource management actions. NOAA and NMFS must be granted full authority to proceed with the proposed Endangered/Threatened species critical habitat designation without interference by any other Federal agency or action and without those agencies or actions negatively affecting either the Federally listed and candidate Endangered/Threatened species or their proposed critical habitats. Therefore, pursuant to the United States Endangered Species Act, the Federal government must suspend or vacate FLS 193 or choose Alternative II – No Lease Sale.

II. New Scientific Studies Support the Proposed Rules of the Ringed and Bearded Seal Due to Climate Change Threats

A. New Studies Indicate That The Risks From Climate Change And Ocean Acidification Are Substantially Greater Than Previously Assessed

Several prominent studies and reports, particularly by the IPCC (2013, 2014) have concluded that key risks from anthropogenic climate change and ocean acidification are substantially greater than previously assessed, as indicated by observations of climate change impacts and improved modeling studies (Fussler 2009, Smith et al. 2009). These studies, including the IPCC Fifth Reports (2013, 2014) raise cause for concern that previous climate change projections used in the NMFS Status Reviews as well as assessments by other agencies likely underestimated climate change risks to ringed and bearded seals along with dependent species, such as polar bears. Specifically, recent studies demonstrate that climatic indices are changing more quickly than projected by earlier reports; climate impacts are occurring at lower surface temperatures than previously estimated; temperature change and sea level rise during this century

will be greater than previously projected; and the climate is approaching “tipping points” beyond which the climate system is expected to switch to a different state (IPCC 2014, IPCC 2013, Lenton et al. 2008, Fussel 2009, McMullen and Jabbour 2009, Richardson et al. 2009). As summarized by the IPCC noted earlier in these comments and by Fussel (2009) here:

“[M]any risks are now assessed as stronger than in the AR4, including the risk of large sea level rise already in the current century, the amplification of global warming due the biological and geological carbon-cycle feedbacks, a large magnitude of “committed warming” currently concealed by a strong aerosol mask, substantial increases in climate variability and extreme weather events, and the risks to marine ecosystems from climate change and ocean acidification.”

In reviewing the projected impacts from continuing climate change, Anderson and Bows (2010) concluded that the impacts associated with a 2°C temperature rise have been “revised upwards, sufficiently so that 2°C now more appropriately represents the threshold between ‘dangerous’ and ‘extremely dangerous’ climate change”. Similarly, Kiehl (2011) concluded that the Earth’s sensitivity to CO₂ radiative forcing may be much greater than the sensitivity assumed in previous climate models, meaning that the Earth may warm faster than climate models have projected due to slow feedback processes that have not been accounted for. Based on paleoclimatic evidence from Earth’s past, this study found that the Earth’s CO₂ concentration is rapidly rising to a level not seen in approximately 30 - 100 million years when the Earth was much warmer and that, at these higher CO₂ concentrations, positive feedback processes would likely amplify global warming beyond current modeling estimates. This study estimated that the climate sensitivity or “climate feedback factor” for a doubling of CO₂ from the present-day climate state might be more than double than prior estimates. The climate sensitivity appears to be 2°C/W/m² in periods of past warming whereas climate models use a climate sensitivity of ~0.5 to 1°C/W/m². This study also suggests that the risks from climate change are much greater than assessed in the IPCC AR4 (i.e. IPCC 2007).

In addition, new analyses warn that the probability of reaching extremely dangerous temperature increases of 3°C or 4°C within this century is much greater, given the failure of governments to implement effective mitigation policies. New et al. (2010) and Anderson and Bows (2010) concluded that the continued rise in GHG emissions in the past decade and the delays in a comprehensive global emissions reduction agreement make limiting temperature rise

below 2°C “extremely difficult, arguably impossible, raising the likelihood of global temperature rises of 3°C or 4°C within this century” (New et al. 2011:6).

B. Arctic Summer And Winter Sea-Ice Continue To Decline; Arctic Summer Sea-Ice Is Likely To Disappear Almost Entirely In The 2030s

Arctic sea-ice extent and thickness has continued its precipitous decline, and Arctic summer sea ice has not recovered from the record low reached in September 2007. The minimum sea-ice extent for September 2010 was third lowest in the satellite record, behind 2007 (lowest) and 2008 (second lowest), despite the late date of the maximum winter sea-ice extent in 2010 (NSIDC 2010). The linear rate of decline of September ice extent over the period 1979 - 2010 is now 81,400 square kilometers (31,400 square miles) per year, or 11.5% per decade relative to the 1979 - 2000 average. According to the National Snow and Ice Data Center, 2010 began in a highly negative phase of the Arctic Oscillation, which typically favors the survival of old ice through the winter and more ice at the end of the summer (NSIDC 2010). However, much of the old ice that was transported into the southern Beaufort and Chukchi Seas melted in the summer months. In fact, current models suggest an ice-free summer by mid-century (IPCC 2013, 2014) and as early as the late 2030s (Zang 2010), which is also the project depletion of the global carbon budget (IPCC 2013). Sea ice was much thinner at the end of the summer of 2010; less than 15% of the ice remaining in the Arctic was more than two years old, compared to 50-60% during the 1980s, and virtually none of the oldest ice remained in the Arctic (NSIDC 2010).

Winter sea ice also continues to decline significantly. The winter sea-ice maximum in March 2011 tied with March 2006 as the lowest in the satellite record. At 4.64 million km² (5.65 million mi²), the sea-ice maximum on 7 March 2011 was 471,000 mi² (1.2 million km²) below the 1979 - 2000 average — an 8% decline (NSIDC 2011a). The sea-ice extent in March 2011 (Figure 2) was reduced to a level that the IPCC mean model ensemble did not project would occur until 2070 (Stroeve et al. 2007). Arctic sea ice in December, January and February also reached record lows as winter temperatures across much of the Arctic were anomalously warm, reaching 2 - 6°C (4 - 11°F) above normal in January (NSIDC 2011b, c).

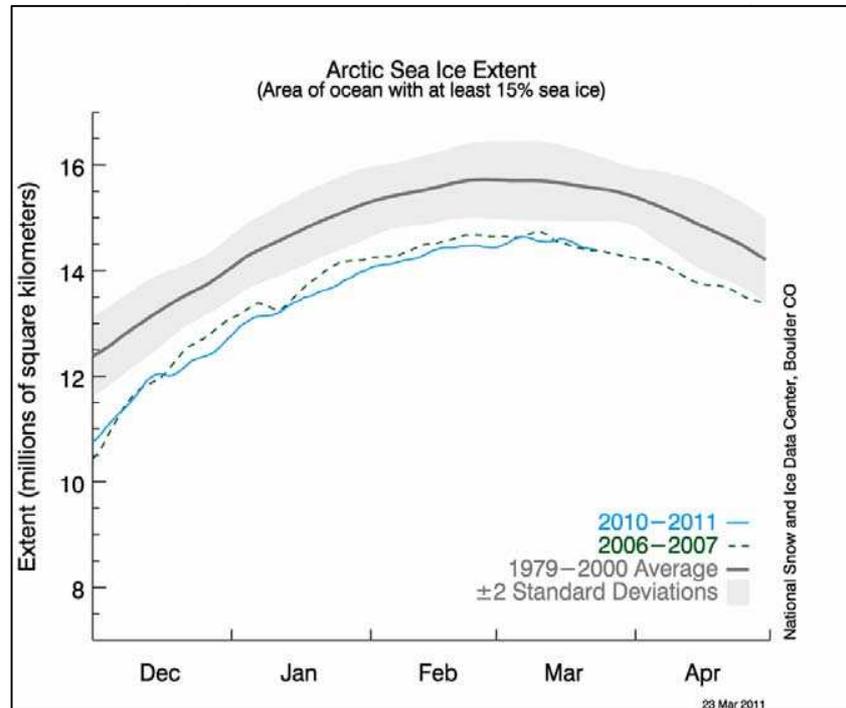


Figure 2. Arctic sea-ice maximum in March 2011 reaches a historic low (Stroeve et al. 2007).

A recent study by Zhang (2010) improved the sea ice projections of the IPCC AR4 models, which considerably underestimate the recent accelerating sea-ice reduction. Zhang (2010) evaluated the sensitivities of summer sea-ice coverage to global warming-forcing in models and observations. Zhang (2010) observationally constrained the selected model runs by the sensitivity analysis and the models better captured the observed changes in sea-ice area and surface air temperatures, reducing future projection uncertainties. Using these improved model runs, Zhang (2010) projected that an ice-free summer Arctic Ocean may occur as early as in the late 2030s using a criterion of 80% sea-ice area loss. In addition, the Arctic regional mean surface air temperature will likely increase by $8.5 \pm 2.5^{\circ}\text{C}$ in winter and $3.7 \pm 0.9^{\circ}\text{C}$ in summer by the end of this century. The projection by Zhang (2010) that Arctic summer sea ice will virtually disappear as early as the 2030s is consistent with prior estimates by Stroeve et al. (2008), Wang and Overland (2009), and Lindsay et al. (2009) as well as with the IPCC (2013) projections that the global carbon budget will be depleted by the mid 2030s.

C. Ocean Acidification Poses A Threat To The Ringed And Bearded Seal

New scientific studies continue to confirm that ocean acidification in the Arctic poses an imminent, high-magnitude threat to ringed and bearded seals along with numerous other species, including other Federally listed species under the Endangered Species Act. Azetsu-Scott et al. (2010) measured the saturation state with respect to calcite and aragonite for waters in the Canadian Arctic Archipelago—including Smith Sound, Barrow Strait, Baffin Bay, Davis Strait, Hudson Strait, and the Labrador Sea—and found the saturation states to be extremely low. The average aragonite saturation state (Ω aragonite) was 1.18 ± 0.17 in Barrow Strait and 1.31 ± 0.14 in Smith Sound, with areas where Ω aragonite < 1 . The aragonite saturation horizon was found at ~ 150 m in Barrow Strait; at 200 m in Baffin Bay, Davis Strait, and Hudson Strait; and at 2,300 m in the Labrador Sea. The study found that “[t]his level of saturation state is a great concern for organisms such as Arctic pelagic mollusk, which is an important component of marine food webs in high-latitude oceans.” As discussed in our May 2010 letter, seasonal aragonite undersaturation in other regions of the ringed and bearded seal range, including the Bering Sea, Chukchi Sea, and Canada Basin, is already occurring (Bates et al. 2009, Fabry et al. 2009, Yamamoto-Kawai et al. 2009).

D. Regulatory Mechanisms To Address Climate Change And Ocean Acidification Are Ineffective

As acknowledged by the proposed NOAA Fisheries rules, “there are currently no effective mechanisms to regulate GHG emissions, which are contributing to global climate change and associated modifications to [ringed and bearded] seal habitat. The risk posed to [ringed and bearded] seals due to the lack of mechanisms to regulate GHG emissions is directly correlated to the risk posed by the effects of these emissions” (75 Fed. Reg. 77508). As described below, the continued failure of the U.S. government and international community to implement effective and comprehensive greenhouse gas reduction measures places ringed and bearded seals at ever-increasing risk, where the worst-case IPCC scenarios are becoming more likely.

U.S. regulatory mechanisms are inadequate to effectively address climate change. While existing laws, including the Clean Air Act, Energy Policy and Conservation Act, Clean Water Act, Endangered Species Act, and others provide authority to Executive Branch agencies to require greenhouse gas emissions reductions from virtually all major sources in the U.S., these agencies

are either failing to implement or only partially implementing these laws for greenhouse gases. For example, the EPA recently issued a rulemaking regulating greenhouse gas emissions from automobiles (75 Fed. Reg. 25324, Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule), but has failed to implement the majority of other Clean Air Act programs, such as the new source review, the new source pollution standards, or the criteria air pollutant/national ambient air quality standards programs, to address the climate crisis (See, e.g. 75 Fed. Reg. 17004, Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by Clean Air Act Permitting Programs). While full implementation of these flagship environmental laws, particularly the Clean Air Act, would provide an effective and comprehensive greenhouse gas reduction strategy, due to their non-implementation the existing regulatory mechanisms must be considered inadequate to protect the ringed and bearded seals, polar bears, walrus, and other species from climate change. Additional mean emissions of 10.128348 GtCO₂-equivalent from the end use of FLS 193 would be a significant and excessive contribution (IPCC 2013, 2014) to ringed and bearded seal habitat destruction.

Despite the White House's 2014 pledge with China to reduce emissions along with all other current international initiatives, the additional mean emissions of 10.128348 GtCO₂-equivalent to the atmosphere from the end use of FLS 193 would relegate these agreements inadequate to effectively address climate change. The Kyoto Protocol's first commitment period only set targets for action through 2012, and there is still no binding international agreement governing greenhouse gas emissions in the years beyond 2012. While the 2009 U.N. Climate Change Conference in Copenhagen called on countries to hold the increase in global temperature below 2°C (an inadequate target for avoiding dangerous climate change), the non-binding "Copenhagen Accord" that emerged from the conference failed to enact binding regulations that limit emissions to reach this goal. Even if countries did meet their pledges, analyses of the Accord found that collective national pledges to cut GHG emissions are inadequate to achieve the 2°C target, and instead suggest emission scenarios leading to 2.5 - 5°C warming (Rogelj et al. 2010, UNEP 2010).

III. Concerns With The Proposed Rules

A. NMFS Should Re-Evaluate Whether The 25% And 15% Sea-Ice Concentration Thresholds For The Bearded Seal Are Protective Enough

According to the Draft SSEIS (BOEM 2014a), bearded seals (*ugruk*) are identified as the most harvested resource in the proposed FLS 193 area, providing meat and oil for consumption and are an important prey species for polar bears, Orca, and walrus. The availability of sea ice is a major habitat requirement for bearded seals (Kovacs and Lowry 2008). According to the IUCN Species Survival Commission Pinniped Specialist Group (Kovacs and Lowry 2008) (emphasis added):

“The availability of sea ice is a major habitat determinant for bearded seals. They are typically found in regions of broken free-floating pack ice; in these areas bearded seals prefer to use small and medium sized floes, avoiding large floes (Simpkins *et al.* 2003). They rarely haul out more than a body length from water and they use leads within shore-fast ice only if suitable pack ice is not available (Kovacs 2002). **Bearded Seals naturally occur at quite low densities** (e.g., Bengtson *et al.* 2005); they are typically solitary animals, but will form small, loose aggregations when ice availability is limited, such as at the time of moulting in midsummer.”

“Global climate warming is currently causing major reductions in the extent and duration of sea ice cover in the Arctic, creating a threat to many species of marine ice-associated mammals. Pinnipeds, such as the Bearded Seal that are dependent on sea ice for pupping, moulting, resting and access to foraging areas, may be especially vulnerable to such changes (Tynan and DeMaster 1997, Learmonth *et al.* 2006, Kovacs and Lydersen 2008, Laidre *et al.* 2008).”

“Oil spills from offshore extraction and transportation could negatively affect bearded seals through direct contact with oil and damage to foraging areas and stocks of prey, particularly benthic invertebrates, which are vulnerable to oil contamination (Kelly 1988)”

“An increase in human-created noise in the arctic environment could cause marine mammals, including Bearded Seals which are very vocal during their breeding season (VanParijs *et al.* 2001, 2003), to abandon areas of habitat (Tynan and DeMaster 1997). A reduction in sea ice cover would likely lead to increased human activity in the Arctic in the form of shipping and extractive industries, and an associated greater threat of marine accidents and disturbance of marine mammals (Pagnan 2000).”

When determining sea-ice requirements for the bearded seal, the NMFS biological review team (BRT) assumed that areas with sea-ice coverage in April and May below 25% concentration were inadequate for whelping and nursing. The BRT also assumed that ice coverage <15% in June would be insufficient for moulting. Although we appreciate that the BRT had limited information to estimate habitat suitability for bearded seals, we are concerned that these thresholds may not be protective enough. Three studies, only two of which were cited by the BRT, found that bearded seal probability of occurrence increased in areas of higher ice coverage: Simpkins et al. (2003), Ver Hoef et al. (in review), and Kingsley et al. (1985) which was not cited. Kingsley et al. (1985) found that bearded seals in the Canadian High Arctic prefer broken ice, particularly in large floes with ice cover of 6/8 - 7/8, also indicating that medium-high ice coverage provides the best habitat for seals. Although there is likely a sea-ice concentration below which bearded seals cannot use the sea ice, there is also likely a non-linear relationship between sea-ice concentration and probability of occurrence, where the probability of occurrence is maximized at medium-high coverage (~70 - 90%) and declines at higher and lower sea-ice concentrations. The sea-ice concentration thresholds used by the BRT for whelping, nursing, and moulting do not take into account the lower probability of occurrence of bearded seals at medium-low ice concentrations and, thus, may over-estimate the bearded seal's ability to use this marginal sea-ice habitat.

The preponderance of scientific data and analyses clearly indicate that Arctic sea ice is declining significantly due to climate change. Consequences of FLS 193 oil and gas exploration, production, and development will contribute to climate change and the impacts are significantly greater than BOEM has acknowledged. The additional effects as a consequence of FLS 193 will significantly impact ringed seal, bearded seal, polar bear, walrus, whale and other Endangered/Threatened species' critical habitat in direct contravention of the Endangered Species Act and the NMFS proposed critical habitat designation. Therefore, FLS 193 must be vacated or Alternative II – No Lease Sale – should be selected.

B. Ocean Acidification Should Be Determined To Be A Threat To The Ringed And Bearded Seals

Numerous scientific studies indicate that ringed and bearded seals are threatened by ocean acidification, especially when considered cumulatively on their habitat and with other climate change impacts. According to BOEM (2014a):

“(O)cean acidification and climate change would result in changing baseline conditions that would impact benthic, pelagic, and epontic lower trophic populations.”

The scientific evidence is as follows, much of which is acknowledged by the proposed rules and Status Reviews: (1) ocean acidification is a predictable consequence of rising atmospheric CO₂; (2) the waters of the Arctic and adjacent seas are among the most vulnerable to ocean acidification; (3) seasonal aragonite undersaturation is already documented in many Arctic regions; (4) prey items for ringed and bearded seals, including bivalves, fish, and squid are negatively impacted by ocean acidification in laboratory experiments at acidification levels expected in this century; (5) by 2050, all Arctic waters will be undersaturated with respect to aragonite; and (6) ocean acidification is irreversible for tens of thousands of years after emissions cease. Clearly the dramatic changes in pH and aragonite undersaturation threaten these seals’ food supply. Ocean acidification also exacerbates the impacts of ocean noise pollution, which was not analyzed in any of the findings, including BOEM’s Draft SSEIS (2014a).

In sum, FLS 193 cannot proceed until NMFS re-evaluates its determination that ocean acidification, seismic activity, and noise associated with seismic and other oil and gas exploration, development and production activities do not threaten these seals, particularly when considered cumulatively with other threats.

C. Declines In Benthic Biodiversity Due To Ocean Warming Should Be Determined To Be A Threat To The Ringed Seal and The Beringia DPS Of The Bearded Seal

According to the IUCN Species Survival Commission Pinniped Specialist Group (Kovacs and Lowry 2008):

“Bearded Seals feed primarily on or near the bottom and most diving is to depths of less than 100 m...They use their elaborate whiskers to search for prey on and in soft bottom substrates (Marshall *et al.* 2007, 2008). Because of their benthic feeding habits they live primarily in waters overlying the continental shelf...”

“Their (bearded seals) primary foods live on or near the bottom, but also include some infauna as well as schooling and demersal fish (Burns 1981, Hjelset *et al.* 1999). In the Kara and Barents seas, the diet is dominated by crustaceans (shrimps) and molluscs (gastropods and bivalves). Cod, other demersal fish, and worms are also regular components of the diet. A wide variety of prey has been reported from the Sea of Okhotsk with crabs and shrimps accounting for 87% of the total intake for animals in the north, and clams, worms, and gastropods making up 40%, 23%, and 12% respectively of the intake for animals in the south near Sakhalin Island. In the Bering and Chukchi Seas, snow crab

was the most important prey, followed by the crab *Hyas coarctatus*, while the reverse was true farther north. Shrimp species, gastropods, and octopus are important in both the northern and southern Bering Sea and the Chukchi Sea. The diet is similar in the Beaufort Sea with the addition of Arctic cod (*Boreogadus saida*) (Burns 1981)."

The bearded seal proposed rule found that changes in prey due to ocean warming do not pose a threat to this species, despite the scientific evidence indicating that benthic biomass in the northern Bering Sea and Chukchi Sea food webs is declining and that, as noted above, ocean acidification is impacting the benthic and pelagic food chain upon which the seals depend. In addition, ocean acidification is being exacerbated by climate change and oil and gas activities resulting from FLS 193 will add to and significantly compound these effects.

The best-available science indicates that reductions in sea-ice extent are resulting in a shift in the northern Bering Sea from a benthic-dominated ecosystem rich in bottom-dwelling prey for the bearded seal to one dominated by pelagic processes (Grebmeier et al. 2006a, Grebmeier et al. 2006b, Grebmeier 2010). While predicting detailed biological responses can be challenging, scientific studies to date provide sufficient guidance indicating that benthic food sources on the Beringia shallow shelf are declining and threaten these seals. Even according to BOEM in its Draft SSEIS (BOEM 2014a), oil and gas exploration, production and development activities resulting from FLS 193 would have "long-lasting and wide-spread effects" on the benthic community. Such effects directly and indirectly impact both ringed and bearded seals as well as other Endangered and Threatened species, such as walrus and polar bears (BOEM 2014a) and are, in fact, significant.

"After cleanup efforts have ceased, the remaining oil would continue to weather and be subject to microbial degradation. This process is likely to be very slow in Arctic waters. Oil that has been suspended in the water column or in the sediment may continue to be ingested by the benthic organisms..."

"The discharge of drill cuttings, drilling fluids, and well cellar sediment that is calculated to be discharged into the water during various drilling activities (see Table 4-7) could impact the availability of benthic prey...especially if the wells are located in prime...foraging areas."

"Each disturbed site would take approximately 1-5 years for benthic invertebrates to recolonize the site (see lower trophic levels Section 4.3.4). It would take an additional 2-3 years for benthic invertebrates such as clams and other mollusks to attain an optimum size as...prey. Each disturbed site would likely be unavailable...for foraging for approximately 3-8 years."

BOEM (2014a) suggests that the impacts are “negligible” or “minor” on the benthic community and does not adequately address subsequent impacts on ringed and bearded seals as well as numerous other Federally listed and candidate Threatened and Endangered species. As such, BOEM’s assumptions and conclusions do not provide for a reasoned choice of alternatives, are negligent, arbitrary, capricious, an abuse of federal agency discretion, and an unlawful violation of NEPA. BOEM must postpone or cancel any federal action that would violate the ESA and threaten Federally listed species, including via habitat destruction:

“Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of title 5, United States Code, and shall accompany the proposal through the existing agency review processes...” [National Environmental Policy Act, 42 U.S.C. 4331]

In this instance, NMFS has proposed critical habitat designation for species protected under the Endangered Species Act. This critical habitat protection would effectively prohibit oil and gas exploration, production, and development in the Chukchi, Beaufort and Bering Seas. Quite simply, proceeding with FLS 193 will cause direct and indirect harm and endangerment of, and contravene the Endangered Species Act requirements for, ringed seals, bearded seals, polar bears, whales, walrus, and numerous other species and their critical habitats. Therefore, FLS 193 must be vacated or Alternative II – No Lease Sale – must be selected.

D. Offshore Oil And Gas Development Should Be Determined To Be A Threat To Ringed And Bearded Seals

Offshore oil and gas development poses a significant threat to ringed seals and myriad other species by increasing the risk of oil spills and noise pollution (NRC 2014) in important breeding and foraging grounds and other critical habitats. Such impacts have been acknowledged by NMFS (2014) as well as BOEM in its Draft SSEIS (BOEM 2014a). The proposed ESA critical habitat rules acknowledge that offshore oil development is currently underway within the range of ringed and bearded seals in the United States, Canada, Greenland, Norway, and Russia, that “oil spills under ice or in ice-covered waters....cannot be contained or recovered effectively in current

technology,” and that “tanker spills, pipeline leaks, and oil blowouts are likely to occur in the future, even under the most stringent regulatory and safety systems. (75 Fed. Reg. 77487, 77509).” Shell’s unprecedented proposal seeks to expand drilling and oil and gas production in critical habitat for the ringed and bearded seals in the Chukchi Sea. After the tragedy of the Deepwater Horizon disaster and the National Oil Spill Commission’s cautionary recommendations regarding offshore drilling in the Arctic, Shell’s decision to pursue such an aggressive drilling proposal in the range of Federally listed ringed and bearded seals is cause for serious concern. As NMFS notes in its Federal listing on 3 December 2014 (emphasis added):

“A wide variety of activities may affect the proposed critical habitat for Arctic ringed seals and, if carried out, funded, or authorized by a Federal agency, would require ESA section 7 consultation. Such activities or actions include: In-water and coastal construction; activities that generate water pollution; dredging; commercial fisheries; oil and gas exploration, development, and production; oil spill prevention and response; and certain DOD activities.”

In addition to impacts from daily activities, including seismic testing, well drilling, overflights, and transit of ice breakers and other ships, increased oil and gas activity puts local subsistence communities, ringed and bearded seals, polar bears, walrus, eiders, whales, and myriad other species at higher risk of catastrophic impacts from a large oil spill or gas release. There is neither the technology nor the infrastructure to clean or contain an oil spill in treacherous Arctic waters (75 Fed. Reg. 77487) (NMFS 2014). BOEM (2014a) acknowledges these realities as well as the chain of events that would lead to deaths of other Federally listed species (i.e. polar bears) as a result of seal mortalities:

“Any marine mammals in the vicinity of a large natural gas release could be exposed to toxins and potentially die before the gas could volatilize. The species most likely to be affected would be ringed seals and bearded seals...”

“Indirect sources of mortality may occur (to polar bears) when seals or other mammals die from oil exposure.”

As the final rules note, an oil spill on the scale of the Deepwater Horizon would have severe and long-lasting effects on impacted wildlife, including ringed and bearded seals (75 Fed. Reg. 77487). Such impacts will act cumulatively with impacts from habitat and prey loss to further

imperial ringed and bearded seals and have been determined to be a threat in the final rule. As such, all activities associated with FLS 193 would imperil ringed and bearded seals and, therefore, would be an unlawful violation of the Endangered Species Act. Thus, FLS 193 must be vacated or Alternative II – No Lease Sale – selected.

IV. Critical Habitat

A. The Importance Of Critical Habitat Under The Endangered Species Act

According to the December 2014 proposed designation by NMFS:

“The proposed critical habitat area in the northern Bering, Chukchi, and Beaufort seas provides sea ice conditions that are essential for the survival of Arctic ringed seals. The designation of critical habitat areas, land or water under United States jurisdiction that includes habitat features essential to the conservation of a threatened or endangered species, is required for species listed under the ESA.”

Critical habitat is defined in Section 3 of the Endangered Species Act (“ESA”) as: (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 1533 of this title, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 1533 of this title, upon a determination by the Secretary that such areas are essential for the conservation of the species. 16 U.S.C. §1532(5).

“Conservation” includes not only actions that support the survival of the species, but also its recovery to the point where ESA protections are no longer necessary. 16 U.S.C. § 1532(3). The designation and protection of critical habitat is one of the primary ways in which the fundamental purpose of the ESA “provide(s) a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved”. 16 U.S.C. §1531(b).

The legislative history of the ESA shows Congress clearly recognized the importance of critical habitat designation in conserving listed species:

“[C]lassifying a species as endangered or threatened is only the first step in insuring its survival. Of equal or more importance is the determination of the habitat necessary for that species’ continued existence...If the protection of endangered and threatened species

depends in large measure on the preservation of the species' habitat, then the *ultimate effectiveness of the Endangered Species Act will depend on the designation of critical habitat*. (H.R. Rep. No. 94-887 at 3 (1976))” (emphasis added).

“The primary mechanism by which critical habitat protects a listed species is through the Section 7 consultation process. 16 U.S.C. §1536(a)(2) (1994). Section 7 requires federal agencies to ensure that no action they authorize, fund, or carry out will ‘jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical habitat].’”

NMFS (2014) acknowledged several important benefits of critical habitat designation. These include educational benefits:

“A critical habitat designation contributes to species conservation primarily by identifying critically important areas and by describing the features within those areas that are essential to the species, thus alerting public and private entities to the area’s importance. 63 Fed. Reg. 46693, 46696 (September 2, 1998) (‘Designated Critical Habitat: Green and Hawksbill Sea Turtles’).”

NMFS (2014) also acknowledged in its December 2014 proposed critical habitat designation the Section 7 benefits provided by critical habitat designation:

“A designation of critical habitat, in addition to emphasizing and alerting public and private entities to the critical importance of said habitat to listed species, provides a clear indication to Federal agencies regarding when section 7 consultation is required, particularly in cases where the action would not result in direct mortality, injury, or harm to individuals of a listed species (e.g., an action occurring within the critical area when a migratory species is not present). The critical habitat designation, describing the essential features of the habitat, also assists Federal action agencies in determining which activities conducted outside the designated area are subject to section 7 (i.e., activities that may affect essential features of the designated area). For example, discharge of sewage or disposal of waste material, or construction activities that could lead to soil erosion and increased sedimentation in waters in, or adjacent essential feature of the designated habitat (water quality) and would be subject to the provisions of section 7 of the ESA.”

“A critical habitat designation also assists Federal agencies in planning future actions since the designation establishes, in advance, those habitats that will be given special consideration during Section 7 consultations. With a designation of critical habitat, potential conflicts between projects and endangered or threatened species can be identified and possibly avoided early in the agency’s planning process.” Id. at 46696-97

According to NMFS (2014) critical habitat also can provide benefits beyond the Section 7 process:

“Another indirect benefit of a critical habitat designation is that it helps focus Federal, state, and private conservation and management efforts in such areas. Management efforts may address special considerations needed in critical habitat areas, including conservation regulations to restrict private as well as Federal activities. Other Federal, state, and local

laws or regulations, such as zoning or wetlands protection, may also provide special protection for critical habitat areas.” Id. at 46697.

While NMFS has recognized many benefits of critical habitat designation, until recently, NMFS had interpreted the ESA’s prohibition against destruction or adverse modification of critical habitat to be largely indistinguishable from the statute’s jeopardy prohibition. The Ninth Circuit rejected this merger of the jeopardy and adverse modification inquiries, which previously had the effect of allowing agencies to focus exclusively on whether actions in critical habitat affect a listed species’ survival. *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service*, 378 F. 3d 1059, 1070 (9th Cir. 2004). The court concluded that this narrow focus “offends the ESA because the ESA was enacted not merely to forestall the extinction of species (i.e., promote a species survival), but to allow a species to recover to the point where it may be delisted.” Id. (citing the ESA’s definition of “conservation,” 16 U.S.C. § 1532(3)).

In sum, Congress, the courts, and NMFS have repeatedly recognized the significant benefits of critical habitat designation to listed species. Such benefits are not merely theoretical. Studies demonstrate that species with critical habitat protection are twice as likely to recover as those without it (Taylor et al. 2005). It has been clearly demonstrated, acknowledged, and warned that Federal Lease Sale 193 would endanger and very likely destroy critical habitat for the ringed and bearded seals along with polar bears, walrus, spectacled and Steller’s eiders, whales, and numerous other species. Therefore, FLS 193 is illegal and contravenes the Endangered Species Act and must be vacated or Alternative II – No Lease Sale – must be selected.

B. Physical And Biological Features Essential To The Conservation Of The Ringed And Bearded Seals

The ESA mandates that specific areas in which are found “physical or biological features essential to the conservation of the species” qualify as critical habitat. 16 U.S.C. §1532(5). According to NMFS’ regulations, in designating critical habitat NMFS must consider the requirements of the species, including, but not limited to (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, or rearing of offspring; and, generally, (5) habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of the species. 50 CFR 424.12(b).

NMFS's regulations require the agency to list "primary constituent elements" when designating critical habitat. 50 CFR 424.12(b). Primary constituent elements "shall focus on principal biological and physical" elements within the designation area and "may include, but are not limited to, the following: roost sites, nesting grounds, spawning sites, feeding sites, seasonal wetland or dryland, water quality or quantity, host species or plant pollinator, geological formation, vegetation type, tide, and specific soil types." 50 CFR 424.12(b).

Proposed critical habitat for the ringed and bearded seals must include all principal biological and physical elements for these species, including but not limited to the following: (1) sea-ice types used by the ringed and bearded seals for breeding, feeding, resting, moulting, and other ecological requirements; (2) snow depth during the breeding season, which is an important factor determining the ringed seal's ability to excavate snow caves for resting and breeding purposes; (3) the water column, which represents the three-dimensional foraging habitat for these seals; (4) the benthos, which represents important foraging habitat for the bearded seal; and (5) food resources for these seals.

C. The Principal Physical And Biological Features Require Special Management Considerations And Protection, And Critical Habitat Is Prudent And Determinable

The ESA mandates that designated critical habitat for Endangered or Threatened species must have "physical or biological features which may require special management considerations or protection." 16 U.S.C. §1532(5). The proposed principal biological and physical elements listed above are threatened by climate change, oil and gas development, fisheries, and human disturbance and, thus, require special management considerations and protections. Critical habitat for ringed and bearded seals is both prudent and determinable as required under the ESA. 50 CFR 424.12. Key findings by NOAA under its Federal listing on 3 December 2014 (www.federalregister.gov/articles/2014/12/03/2014-28229/endangered-and-threatened-species-designation-of-critical-habitat-for-the-arctic-ringed-seal#h-20) provide unquestionable support (emphasis added):

"This proposed rule would designate critical habitat for the Arctic ringed seal pursuant to section 4(b)(2) of the ESA."

"Once critical habitat is designated, section 7(a)(2) of *the ESA requires Federal agencies to ensure they do not fund, authorize, or carry out any actions that will destroy or adversely modify that habitat*. This requirement is additional to the section 7 requirement

that Federal agencies ensure their actions do not jeopardize the continued existence of listed species.”

“(T)he protection afforded under the ESA section 7 requirement for Federal agencies to ensure their actions are not likely to destroy or adversely modify designated critical habitat is in addition to ESA requirements to protect listed species. Specifically, ESA section 7(a)(1) requires all Federal agencies to use their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered and threatened species, and **section 7(a)(2) requires Federal agencies to ensure their actions are not likely to jeopardize the continued existence of listed species.**”

“In addition, the critical habitat designation may result in indirect benefits, as discussed in detail in the draft economic report (Cardno Entrix, 2014), including education benefits and enhanced public awareness, which may help focus and contribute to conservation efforts for the Arctic ringed seal and its habitat. For example, by identifying features essential to conservation of the Arctic ringed seal and where those features are found, complementary protections may be developed under state or local regulations or voluntary conservation plans. **These other forms of benefits may be economic in nature (whether market or non-market, consumptive, non-consumptive, or passive), educational, cultural, or sociological, or they may be expressed through beneficial changes in the ecological functioning of the species' habitat, which itself yields ancillary welfare benefits (e.g., improved quality of life) to the region's human population.** For example, **because the critical habitat designation is expected to result in enhanced conservation of the Arctic ringed seal over time, residents of the region who value these seals, such as subsistence users, are expected to experience indirect benefits.** As another example, **the geographic area of the proposed critical habitat overlaps substantially with the range of the polar bear in the United States, and the Arctic ringed seal is the primary prey species of the polar bear, so the designation may also provide indirect conservation benefits to the polar bear. Indirect conservation benefits may also extend to other co-occurring species, such as the Pacific walrus and other seal species.**”

“The Secretary...cannot exclude any particular area if, based on the best scientific and commercial data available, the Secretary determines that the failure to designate that area as critical habitat will result in the extinction of the species concerned. Because the authority to exclude any area from the critical habitat designation is discretionary, exclusion is not required for any particular area...We do not propose to exercise our discretion to exclude any areas from the proposed critical habitat designation.”

“The primary impacts of a critical habitat designation arise from the ESA section 7(a)(2) requirement that Federal agencies ensure their actions are not likely to result in the destruction or adverse modification of critical habitat (i.e., adverse modification standard). Determining these impacts is complicated by the fact that section 7(a)(2) contains the overlapping requirement that **Federal agencies ensure their actions are not likely to jeopardize the species' continued existence (i.e., the jeopardy standard).** One incremental impact of critical habitat designation is the extent to which Federal agencies modify their proposed actions to ensure they are not likely to adversely modify the critical habitat, beyond any modifications they would make because of listing and the jeopardy standard. Additional impacts of critical habitat designation include any state and/or local protection that may be triggered as a direct result of designation (we did not identify any such impacts), and benefits that may arise from education of the public to the importance of an area for species conservation.”

V. Conclusion

In December 2012, NMFS listed four subspecies of the ringed seal along with the Beringia bearded seal DPS as Endangered or Threatened under the ESA (77 FR 76740). On 3 December 2014, NMFS publicly announced its proposed critical habitat designation in the Chukchi, Beaufort, and Bering Seas for these species, most particularly for the Arctic Ringed Seal. As a result, all other Federal agencies are required to consult with NOAA Fisheries regarding any actions that would affect these species and their critical habitats (emphasis added):

“After reviewing the best available information, our scientists identified the habitat features that are essential for sustaining Arctic ringed seals--a species that is likely to become endangered in the foreseeable future due to climate change.... ***Upon designation of a critical habitat area, federal agencies are required to consult with NOAA Fisheries on actions they authorize, fund, or carry out to ensure their actions are not likely to destroy or adversely modify critical habitat.*** Designation of critical habitat would not affect subsistence harvest of ringed seals by Alaska Natives.” (NOAA, 2 December 2014).

The best available scientific evidence indicates that the ringed and bearded seals face significant threats from the rapid loss and degradation of sea-ice habitat and snow depth from rising greenhouse gas emissions, ocean acidification, oil and gas development, and other factors. We strongly support the National Marine Fisheries Service proposal listing critical habitat for ringed seals, which will also serve as equal protection for bearded seals, polar bears, walrus and numerous other Arctic species. Proceeding with Federal Lease Sale 193 would significantly contravene laws and Federal protections under the Endangered Species Act as well as numerous regulations imposed and enforced by NOAA, NMFS, and the USFWS, among others, for these species and their habitats.

Proceeding with Federal Lease Sale 193 would be an unlawful Federal action. It is incumbent upon the United States federal government to vacate Federal Lease Sale 193 immediately and in its entirety or select Alternative II – No Lease Sale.

9) BOEM has failed to specifically consider significant new information provided by Greenpeace on 16 August 2012 in its Draft SSEIS analyses as required by NEPA the significant abundances and densities of the cold water soft coral, *Gersemia rubiformis*, in the FLS 193 planning area.

Greenpeace scientists identified high densities of the soft coral *Gersemia rubiformis* in the Chukchi Sea where BOEM proposes exploration drilling should begin.¹ Although a Shell-funded study from 2008 detected these corals at Shell's "Burger" prospect (Blanchard et al. 2010), the Interior Department never considered the presence of the corals in approving Shell's exploration program or the lease sale behind it. The Greenpeace and Blanchard et al. (2010) studies both observed coral abundance that was equal to or greater than most coral rich areas of the world (Miller et al. 2012). This significant new information requires the Department of the Interior under NEPA to supplement its environmental analysis of the impacts of FLS 193 specifically focused on these corals and their significant influence in this Arctic ecosystem.

NEPA requires federal agencies to contemplate the environmental impacts of their actions before committing to a course of action. *Inland Empire Pub. Lands v. United States Forest Serv.*, 88 F.3d 754, 758 (9th Cir. 1996) (finding that NEPA is concerned with the process of disclosure, not any particular result). NEPA "ensures that the agency...will have available, and will carefully consider, detailed information concerning significant environmental impacts; it also guarantees that the relevant information will be made available to the larger [public] audience." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349, 104 L. Ed. 2d 351, 109 S. Ct. 1835 (1989); *Inland Empire*, 88 F.3d at 758. Therefore, NEPA requires Federal agencies to include an environmental impact statement (EIS) "in every recommendation or report on...major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). An EIS *must* be prepared if "substantial questions are raised as to whether a project . . . may cause significant degradation of some human environmental factor." *Greenpeace Action v. Franklin*, 14 F.3d 1324, 1332 (9th Cir. 1992) (citation omitted); *Sierra Club v. United States Forest Serv.*, 843 F.2d 1190, 1193 (9th Cir. 1988).

Under NEPA, agencies must not only undertake an EIS prior to taking federal action, but they must also undertake a supplemental EIS whenever: (i) the agency makes substantial changes

¹ See Press Release, Abundant Corals Discovered at Shell's Chukchi drill site (July 30, 2012), available at: <http://www.greenpeace.org/usa/en/media-center/news-releases/Abundant-corals-discovered-at-Shells-Chukchi-drill-site/>.

in the proposed action that are relevant to environmental concerns; or (ii) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. 40 C.F.R. § 1502.9(c)(1).

Here, the initial major Federal action is Lease Sale 193 in the Chukchi Sea, for which Interior produced an EIS in 2007 (MMS 2007) and, pursuant to court order, a supplemental EIS in 2011 (BOEM 2011b) and a Draft Second Supplemental EIS in 2014. None of these documents adequately discuss the impacts on *Gersemia rubiformis* or any other corals in the lease sale area. In 2011 Interior produced an environmental analysis (EA) that tiered to the Lease Sale 193 EIS and SEIS and purported to analyze the environmental impacts of Shell's proposed Chukchi Sea exploration plan (BOEM 2011c). This document also fails to mention or discuss the presence and importance of *Gersemia rubiformis* in the exploration plan area.

The discovery of dense concentrations of *Gersemia rubiformis* in Shell's proposed drilling location qualifies as "significant new circumstances or information" that triggers supplemental NEPA analysis. See, e.g., *Native Ecosystems Council v. Tidwell*, 599 F.3d 926, 935, 937-38 (9th Cir. 2010) (revelation of nesting habitat in project area, discovered after Forest Service's Environmental Assessment stated that there were no known nesting grounds in area, triggered supplemental NEPA analysis). The public record demonstrates that in a certified and electronic letter dated 16 August 2012, Greenpeace provided this significant new information to U.S. Secretary of the Interior, Ken Salazar, along with the Director of BOEM, Tommy Beaudreau, and the Director of the Federal Bureau of Safety and Environmental Enforcement, James Watson. This letter requested that Interior not issue Shell's final permits to drill until it has analyzed this new information and incorporated it into a supplemental NEPA document. However, BOEM has failed to specifically consider or provide any specific analyses or information concerning this significant scientific information in its 2014 Draft SSEIS. The importance of this coral discovery is discussed in more detail below.

I. Importance of Cold Water Corals

Although there has been little research on corals in the Chukchi Sea specifically, information regarding cold water corals elsewhere in Alaska and the world demonstrates their significance to ocean ecosystems. Cold water corals provide a three-dimensional habitat on the sea floor, which then attracts fish, invertebrates and other species groups to areas of cold water coral, making these coral a critical part of the benthic ecosystem (Krieger 1993, Yoklavich et al. 2000,

Heifetz et al. 2005, Miller et al. 2012). Impacts to the Arctic ecosystem from the destruction and, thus, removal of cold water corals could affect a variety of species, from marine invertebrates and fish to Federally listed Endangered and Threatened seabirds and marine mammals.

Cold water corals comprise important habitat and resources for adult fishes, crustaceans, sea stars, sea anemones, sponges, and other invertebrates. First, cold water corals provide a high relief habitat that serves to protect these species from predators and shelters them from the strong currents that often occur in these areas (Krieger and Wing 2002). The gaps between coral branches or fans provide shelter and refuge for eggs, larvae, and juveniles of shrimp, crabs and fishes, and for many adult species (Krieger and Wing 2002, Reed et al. 2006). The branches of *Gersemia rubiformis* are frequently used as habitat by juvenile basket stars, which are an important part of the benthic community of the Chukchi Sea. Filter feeders use cold water corals as an elevated feeding platform for raising them into the currents above the seafloor where more food is available, and a variety of animals forage in cold water coral areas (Buhl-Mortensen and Mortensen 2005, Krieger and Wing 2002, Parrish et al. 2002). It is clear that fish and invertebrates utilize cold water corals preferentially to other benthic habitats as well as numerous marine mammals and birds, some of which are Federally listed or candidate Endangered or Threatened Species, such as polar bears, walrus, eiders, seals, and various whales. These species groups along with local Iñupiat subsistence communities critically depend on this benthic system directly, on other benthic-dependent species, and in direct food chains (e.g. invertebrates → fish → ringed seals → polar bears/ Iñupiat subsistence hunters) provided only by cold water corals.

Ultimately, the highly significant functional role cold water corals provide for the benthic community is critical to the Arctic ecosystem. As a keystone species, cold water corals play an integral role in maintaining the structure, function, and diversity of an ecosystem. Thus, damage or removal of cold water coral, or habitat loss and degradation, may impact not just the affected coral species, but the entire Arctic ecosystem in which the corals reside (Aydin et al. 2007).

Not only are corals significant to the ecosystem, they are also extremely vulnerable to disturbance and climate change. The preponderance of scientific data, controlled, experimental, and *in situ* studies, and robust analyses are replete with indisputable evidence that physical damage, burial, and increased ocean temperatures and acidification kill corals regardless of their location on the planet. Normal oil and gas exploration activities can adversely impact cold water coral habitats through physical placement of structures, such as anchors, or the discharge of drill cuttings, pipeline construction, and drilling fluids and chemicals (Olsgard and Gray 1995). BOEM

(2014a) along with numerous other studies determined that exposure to drill cuttings and fluids can have a variety of impacts, including alteration of feeding behavior or even death of the coral colony (Rogers 1999), which will impact the entire Arctic food web, including Federally listed and candidate Endangered and Threatened marine mammals, birds, and fish.

Re-colonization and recovery of coral communities where corals have been killed directly, broken, damaged, overturned, or killed from increasing human activity, ocean temperatures, and acidification is on the order of multiple decades to centuries at best, and may not occur at all due to the corals' unique habitat requirements, structural fragility, slow growth rates, reproductive limitations, and extended life histories (Althaus 2009, Hourigan et al. 2009, Williams et al. 2010). Corals may live hundreds to thousands of years (Andrews et al. 2009, Roark et al. 2009). They are not adapted to disturbance and have little genetic variation on which to fall back for re-colonization or recovery of disturbed areas (Hofmann et al. 2010, Miller et al. 2011). Any disturbance created by drilling, exploration, and construction activities will have significant, wide-spread, long-term, if not permanent, and severe impacts on *Gersemia rubiformis*. Consequently, both the direct physical activities from FLS 193 exploration, production and development of oil and gas resources as well as the indirect effects on climate change through the end use of oil and gas produced from FLS 193 will have significant, long-term, wide-spread, and severe impacts on *Gersemia rubiformis* and the northern Alaska Arctic ecosystem.

Given the significance of corals such as *Gersemia rubiformis* to the Chukchi Sea ecosystem, as well as the corals' extreme vulnerability to disturbance and climate change, Interior must specifically address, analyze and provide substantive information regarding the impacts of FLS 193 on these corals before allowing any oil and gas exploration, production, or development to proceed. Not only should no activities in the Chukchi Sea be permitted until Interior has undertaken specific analysis under NEPA, but given that BOEM has been aware of this information for more than two years, but has consistently failed in multiple environmental assessments to specifically address this significant scientific data and provide explicit analyses of the potential impacts on *Gersemia rubiformis* and the surrounding ecological and subsistence communities resulting from FLS 193, such omissions are an abuse of discretion and are arbitrary and capricious. Therefore, BOEM is in direct violation of NEPA and FLS 193 should be vacated or Alternative II – No Lease Sale – should be selected.

Summary Conclusion

Given the substantive issues and supporting information provided in these comments, it is highly evident that Federal Lease Sale 193 and its associated Draft SSEIS (BOEM 2014a) are unlawful, flawed, negligent, arbitrary, capricious, and otherwise not in accordance with law. Federal Lease Sale 193 and its associated Draft SSEIS (BOEM 2014a) violate: NEPA, the Clean Air Act, and the Environmental Assessment process; the ESA and legally mandated regulations of the USFWS, NOAA, and NMFS; and policies and regulations of the EPA. In addition FLS 193 and its associated Draft SSEIS (BOEM 2014a) contravene recommendations of the IPCC as supported by the UNEP, WMO, and globally by all 195 IPCC member nations; recent actions by the Executive Office of the President of the United States, including multilateral international agreements to substantially reduce greenhouse gas emissions; and regulations and guidelines of the Executive Office of the President of the United States advised by the CEQ.

In consideration of the substantive problems of FLS 193 and its associated Draft SSEIS (BOEM 2014) along with the significant and irrevocable harm FLS 193 and its associated activities would cause to Greenpeace USA, its 260,000 members across the United States, local Iñupiat communities and other U.S. citizens, numerous Federally listed and candidate Endangered and Threatened species, and countless other communities and nations throughout the world, Greenpeace USA as supported by its 260,000 members calls upon the U.S. Federal Government to vacate Federal Lease Sale 193 in its entirety or select Alternative II – No Lease Sale.

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