

**OCEANA, ALASKA'S BIG VILLAGE NETWORK,
CENTER FOR BIOLOGICAL DIVERSITY, CENTER FOR WATER ADVOCACY,
DEFENDERS OF WILDLIFE, GULF RESTORATION NETWORK,
OCEAN CONSERVATION RESEARCH,
SOUTHERN ENVIRONMENTAL LAW CENTER, SIERRA CLUB**

January 9, 2011

Via Electronic Submission

James F. Bennett
Chief, Environmental Assessment Division
Bureau of Ocean Energy Management
381 Elden Street
Herndon, VA 20170

**RE: Draft Programmatic Environmental Impact Statement for Proposed Outer
Continental Shelf Oil and Gas Leasing Program for 2012-2017**

Dear Mr. Bennett:

Oceana, Alaska's Big Village Network, Center for Biological Diversity, Center for Water Advocacy, Defenders of Wildlife, Gulf Restoration Network, Ocean Conservation Research, Southern Environmental Law Center and Sierra Club appreciate the opportunity to comment on the Draft Programmatic Environmental Impact Statement ("PEIS") for the Proposed Outer Continental Shelf Oil and Gas Leasing Program 2012-2017 ("5-Year Program"). The 5-Year Program provides a framework for offshore oil and gas exploration for the next five years. Given the 5-Year Program's significance, it is crucial that the environmental impacts of the Program be fully accounted for in the Final PEIS in order to clearly and fully understand and explain the potential environmental impacts of the Program to the public and stakeholders. Equally important is that all reasonable alternatives to the 5-Year Program be carefully analyzed and considered. The Final PEIS should assure that both of these ends are achieved.

To assist the Bureau of Ocean Energy Management ("BOEM") in this necessary effort, Oceana has identified numerous shortcomings and illegalities in the Draft PEIS that the agency must address as it prepares the Final PEIS. While this letter focuses on the Gulf of Mexico, many of the concerns apply nationwide, including in the Arctic. As such, this letter complements Arctic-focused comments submitted by Oceana and others.

Failing to correct the shortcomings and illegalities discussed in this letter would violate the National Environmental Policy Act ("NEPA") and the Outer Continental Shelf Lands Act ("OCSLA"). Perhaps more importantly, failing to correct these deficiencies would leave BOEM on a path that will, sooner or later, lead to another disastrous loss of life and harm to the environment. Said deficiencies are listed below and subsequently discussed at length.

- I. The selection and analysis of alternatives in the Draft PEIS violates NEPA. The Final PEIS should fully analyze the following alternatives:
 - o Excluding lease sales in the Gulf of Mexico in 2012 and 2013.
 - o Excluding deepwater leases in the Gulf of Mexico.
 - o Developing alternate/renewable energy sources to replace oil and gas from offshore drilling.
- II. The Draft PEIS violates NEPA by failing to quantify greenhouse gas emissions resulting from the combustion of produced oil and gas and from all activities within the scope of the 5-Year Program.
- III. The Draft PEIS violates NEPA by inaccurately portraying the relationship between the short- and long-term tradeoffs of the 5-Year Program. In particular, the Draft PEIS's discussion of that relationship fails to consider climate change and the impacts of oil spills, including catastrophic spills.
- IV. The Draft PEIS violates NEPA by relying on an overly-simplistic oil spill risk analysis that underestimates the risk, and consequently the effects, of large and catastrophic spills.
- V. The Draft PEIS violates NEPA by failing to sufficiently analyze potential cumulative impacts of the Proposed Action.
 - o The discussion of cumulative impacts from climate change on marine mammals in the Gulf of Mexico fails to adequately account for incomplete or unavailable scientific information.
 - o The method by which BOEM aggregates the effects of cumulative impacts is not discernible.
 - o No consideration is given to potential synergistic and multiplicative effects between cumulative impacts.
 - o The cumulative impacts analysis incorrectly claims that missing information pertaining to climate change impacts is not essential to a reasoned choice among alternatives.
- VI. The Draft PEIS does not acknowledge the persistent shortcomings in the regulation and safety of offshore oil and gas drilling, which directly affect the risk of spills and other potential impacts to humans and the environment.
- VII. The Draft PEIS does not adequately account for the impacts of the Deepwater Horizon spill or attempt to establish the appropriate environmental sensitivity analyses that show the comprehensive impacts of the 5-Year Program on Gulf of Mexico marine resources.

I. BACKGROUND

OCSLA stipulates that the timing and location of offshore leasing balance “the potential for environmental damage, the potential for the discovery of oil and gas, and the potential for adverse impact on the coastal zone” (Section 18.3). BOEM’s recent actions, including the Draft PEIS and 5-Year Program, have failed to strike this balance. Indeed, generally speaking, the Draft PEIS and 5-Year Program are the most recent in a series of actions and documents that suggest that BOEM is more concerned with fostering offshore drilling than with sufficiently safeguarding the environment and communities.

In numerous comments previously submitted to BOEM during the decision-making processes for lease sales, exploration plans, and safety rulemakings, Oceana and other groups have highlighted many concerns regarding the impacts on wildlife and the environment in the Gulf of Mexico, the

safety of offshore drilling, and the state of offshore regulation. Concerns we have repeatedly brought to BOEM's attention include:

- the need for an updated, quantitative, and rigorous spill risk analysis that goes beyond simple ratios based on historical, marginally relevant data and includes lessons learned from the Deepwater Horizon disaster;
- the need to delay drilling in the Gulf of Mexico until more stringent safety measures are implemented and more data on the short- and long-term effects of the Deepwater Horizon disaster on the ecosystem and coastal community are gathered;
- the need to consider climate change effects on the environmental baseline in the Gulf of Mexico and to fully account for greenhouse gas emissions from Outer Continental Shelf oil and gas activities;
- the significant shortcomings in the regulation of offshore drilling that increase the risk of shortcuts, violations and mismanagement, many of which were implicated in the Deepwater Horizon disaster and could lead to future oil spills;
- the failure of new post-Deepwater Horizon safety regulations to greatly improve the safety of offshore drilling; and
- the persistent inadequacies in the oil industry's oil spill response and cleanup capabilities, as demonstrated during the Deepwater Horizon disaster.

In past documents as well as in this Draft PEIS, BOEM has largely ignored these concerns, even though they are supported by copious amounts of data and impartial analysis.

The most recent analysis supporting many of the above conclusions is the National Academy of Engineering's ("NAE") and National Research Council's ("NRC") report on the Deepwater Horizon disaster, titled *Macondo Well-Deepwater Horizon Blowout: Lessons for Improving Offshore Drilling Safety*.¹ Notably, this report was requested by Secretary of the Interior Ken Salazar and is the result of more than a year and a half of intensive research, analysis and consultation with numerous industry organizations, companies and government agencies. The report arrived at a number of conclusions, many of which are highly alarming even though they are not new. Nonetheless, given the impartiality and prestige of the NAE and NRC, it is particularly worth noting the report's findings including the following direct quotes.

- "The committee's assessment of the available information on the capabilities and performance of the [blowout preventer] system at the Macondo well points to a number of deficiencies... that are indicative of *deficiencies in the design process*. Past studies suggest that the shortcomings *also may be present for BOP systems deployed for other deepwater drilling operations*." (54)
- "*BOP systems should be redesigned* to provide robust and reliable cutting, sealing, and separation capabilities for the drilling environment to which they are being applied..." (55)
- "Processes within the oil and gas industry to *assess adequately the integrated risks* associated with drilling a deepwater well, such as Macondo, *are currently lacking*." (77)

¹ National Academy of Engineering, National Research Council. *Macondo Well – Deepwater Horizon Blowout: Lessons for Improving Offshore Drilling Safety*. 14 Dec. 2011.

- “[The offshore] industry’s R&D efforts have been *focused disproportionately on exploration, drilling, and production technologies as opposed to safety.*” (79)
- “Industry should *greatly expand R&D efforts* focused on improving the overall safety of offshore drilling...” (80)
- “For operations to proceed safely and efficiently in challenging environments, it is essential for private industry and [the Bureau of Safety and Environmental Enforcement (“BSEE”)] to work in close collaboration in developing a list of *safety critical points and in establishing safe operating limits*” (89-90) that “*warrant explicit regulatory review and approval* [by BSEE and other regulators] before operations can proceed.” (91)
- “[The Department of the Interior (“DOI”)] should require BSEE to provide the Secretary of the Interior with a net assessment of the risks of future drilling activities so that such risks can be factored into decisions with regard to new leases.... the assessment should be a *formal probabilistic risk analysis* that evaluates risks associated with all operations having the potential for significant harm to individuals, environmental damage, or economic loss.” (94)

Many of the conclusions of the NAE and NRC report echo those of the National Commission on the BP Deepwater Horizon Oil Spill², the federal Joint Investigation Team³ and previous complaints lodged by Oceana and other groups⁴, underscoring that the fundamental flaws in the regulation and safety of offshore drilling are well-established and well-known.

BOEM cannot simply continue to sweep these concerns under the rug in the face of great uncertainty, and proceed with leasing and permitting as if nothing is amiss. The NRC and NAE report requested by Secretary Salazar demonstrates that such a course of action would be poorly-informed and could lead to disastrous consequences. The 5-Year Program and Draft PEIS present a perfect opportunity for BOEM to conduct a considered analysis and to reestablish the balance of environmental protection and oil and gas production required by law.

II. THE SELECTION AND ANALYSIS OF ALTERNATIVES IN THE DRAFT PEIS VIOLATES NEPA

The Draft PEIS violates NEPA by failing to consider three reasonable alternatives that would greatly alter the environmental impact and cost-benefit balance of the 5-Year Program. One of NEPA’s fundamental requirements is that the agency “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources” (42 U.S.C. § 4332(2)(E)). Indeed, the discussion of alternatives “is the heart of the [EIS]” (40 C.F.R. § 1502.14), as one of the main purposes of an EIS is to “rigorously explore and objectively evaluate all reasonable alternatives” to the Proposed Action (40 C.F.R. § 1502.14(a)). Only by doing so can the EIS “guarantee that agency decision-makers have before them and take into proper account all possible approaches to a particular project (including total

² National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. *Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling. Report to the President.* 11 Jan. 2011.

³ Joint Investigation Team. "Volume II: Report regarding the causes of the April 20, 2010 Macondo well blowout." *Report of Investigation.* 14 Sept. 2011.

⁴ E.g., see comments jointly filed by Center for Biological Diversity, Defenders of Wildlife, Oceana, and the Southern Environmental Law Center regarding the Draft Supplementary Environmental Impact Statement for Central Planning Area Lease Sale 216/222, submitted via email on August 16, 2011.

abandonment of the project) which would alter the environmental impact and the cost-benefit balance.”⁵

All three reasonable alternatives discussed below would significantly alter the environmental impact and cost-benefit analysis of the 5-Year Program. BOEM does not provide valid reasons for failing to consider these alternatives in the Draft PEIS, as detailed below. Thus, the Final PEIS, in order to comply with NEPA, must fully consider and analyze these three alternatives.

The Draft PEIS Violates NEPA by Failing to Consider an Alternative that Would Forego Lease Sales in the Gulf of Mexico in 2012 and 2013

The Draft PEIS violates NEPA and OCSLA by failing to consider an alternative that would forego any lease sales in the Gulf of Mexico Planning Areas during 2012 and 2013 so that additional data on the impacts of the Deepwater Horizon spill can be gathered. As previously stated, the alternatives analysis is integral to an EIS and should ensure that decision-makers can consider “all possible approaches to a particular project (including total abandonment of the project) which would alter the environmental impact and the cost-benefit balance.”⁶ The alternative proposed here is reasonable and is crucial to a reasoned choice among alternatives. In fact, by not considering the alternative, the Draft PEIS is less able to achieve one of its stated purposes.

While many large offshore oil spills have occurred and continue to occur,⁷ the Deepwater Horizon spill was unique in that it was much larger than previous spills and occurred in deep water. The impacts of the Deepwater Horizon disaster, though, are still not fully known. As the Draft PEIS acknowledges, great uncertainty still exists regarding what significant adverse effects the Deepwater Horizon spill had on resources in the Gulf of Mexico (1-8). Partly as a result of this incomplete information, the extent to which oil spills affect Gulf of Mexico resources is currently unknown. The Draft PEIS acknowledges this uncertainty, noting, for instance, that impacts from oil spills on marine mammals (4-590) and birds (4-595) would be small to large, depending on a number of variables, and furthermore that oil spills “could represent a major component of the overall exposure of marine and coastal birds in the Gulf of Mexico OCS planning areas” (4-593).

Having more information on the effects of the Deepwater Horizon spill would therefore allow for a more informed choice among alternatives, as it would shed light onto the economic and environmental effects of oil spills, which constitute a large portion of the impacts from offshore oil and gas activities (Draft PEIS 4-593). Eliminating lease sales in the Gulf of Mexico during 2012 and 2013 would allow time for information on the effects of the Deepwater Horizon disaster to be collected and produce a better analysis of potential damage to the environment from the proposed activities. Such an alternative is exactly the sort that should be considered according to NEPA, as it is reasonable (40 C.F.R. § 1502.14(a)) and presents a different environmental impact and cost-benefit balance. Thus, by not considering the alternative in question, the Draft PEIS violates NEPA.

⁵ *Alaska Wilderness Recreation & Tourism Ass’n v. Morrison*, 67 F.3d 723, 729 (9th Cir. 1995) (quoting *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228 (9th Cir. 1988)); see also *California v. Block*, 690 F.2d 753, 767 (9th Cir. 1982).

⁶ *Id.*

⁷ E.g., Shell’s oil spill offshore Nigeria on December 20, 2011, Chevron’s oil spill offshore Brazil on November 7, 2011, and ConocoPhillip’s oil spill offshore China in June, 2011.

By not considering the alternative in question, the Draft PEIS also lessens its ability to achieve one of its stated purposes. The Draft PEIS “sets forth alternatives for the Secretary to consider and analyzes issues of programmatic concern” (1-8). According to the Draft PEIS, “risk of potentially severe consequences of oil spills, especially the risk and consequence of low-probability, large volume spills [like the Deepwater Horizon disaster], is an issue of programmatic concern” (Draft PEIS 4-65). The Deepwater Horizon spill is the first opportunity to understand and analyze the impacts of catastrophic spills, but great uncertainty surrounds the impacts of the Deepwater Horizon spill at this time. As a result, only an incomplete analysis of the risk of potentially severe consequences of future catastrophic spills is possible at present. However, in time, more will be known and less uncertainty will exist. By not considering an alternative that would allow for this issue of programmatic concern to be more fully analyzed and discussed, the Draft PEIS hinders its own goal.

Not only would the alternative better achieve one of the stated purposes of the Draft PEIS, it would also appropriately strike the balance mandated by OCSLA and do so in a more appropriate manner than the Proposed Action, as it would allow for a more accurate analysis of potential environmental damage and not hinder oil and gas discovery. OCSLA stipulates that the timing and location of lease sales should “balance... the potential for environmental damage, the potential for the discovery of oil and gas, and the potential for adverse impact on the coastal zone” (Sec. 18.3). If lease sales in the Gulf of Mexico were cancelled for 2012 and 2013, oil and gas companies could still explore for oil and gas on thousands of preexisting leases, so oil and gas discovery would not be hindered by the alternative. Oil and gas companies currently hold 4,251 leases in the Gulf of Mexico that are inactive, meaning they have no approved exploration or development plan, roughly double the number of active leases in the Gulf.⁸ These inactive leases, according to the Department of the Interior, contain approximately 70% of the Undiscovered Technically Recoverable Resources in the Gulf of Mexico, totaling 11.6 billion barrels of oil and 59.2 tcf of natural gas.⁹

BOEM does state that it considered including a similar alternative - namely, delaying sales until further evaluation of oil spill response and drilling safety is completed (hereafter referred to as the “oil spill response alternative”; Draft PEIS 2-10) - to the one proposed here. The alternatives are similar in that both would delay leasing until additional information is gathered. However, BOEM’s explanation for why it did not fully consider and analyze the oil spill response alternative misses the mark.

For one, the Draft PEIS states, “[w]aiting until further evaluation is completed would delay the Program beyond the 5-year revision requirement specified in Section 18 of OCSLA” (2-10). This is not a valid reason for not considering an alternative. BOEM has had a reasonable amount of time to complete the Draft PEIS and to consider all relevant alternatives. BOEM cannot use the excuse that it has insufficient time to avoid the need to consider an alternative. More importantly, though, considering the alternative proposed here would not necessarily delay the 5-Year Program, as the creation of the 5-Year Program itself would not need to be delayed until a full evaluation of the effects of the Deepwater Horizon disaster is completed. Rather, the 5-Year Program would need to analyze and consider an alternative that would delay lease sales in the Gulf of Mexico for 2012 and 2013, until additional information on the Deepwater Horizon impacts is gathered.

⁸ U.S. Department of the Interior. *Oil and Gas Lease Utilization – Onshore and Offshore. Report to the President*. Mar. 2011. Pg. 4.

⁹ *Id.*

The other reason BOEM gives for not considering the oil spill response alternative is that the Secretary of the Interior can delay or cancel any lease sale in the future, for any reason, such as a need for further evaluation of spill response issues (Draft PEIS 2-10). Although BOEM uses this rationale throughout the Draft PEIS to avoid analyzing various alternatives and data, it is a specious argument. The point of an EIS is to analyze potential environmental and economic impacts of a proposed action and its reasonable alternatives. Here, delaying Gulf of Mexico lease sales is a reasonable alternative, and BOEM is obligated to analyze its environmental impacts. BOEM's ability to cancel scheduled lease sales does not obviate, and indeed is completely irrelevant to, its duty to conduct this environmental analysis. And while BOEM could analyze the impacts of cancelling individual lease sales in subsequent EISs at the lease sale stage, that in no way negates BOEM's duty to analyze, in this EIS, the environmental impacts of a programmatic alternative in which Gulf of Mexico lease sales are not scheduled at all in 2012 and 2013.

An alternative that would exclude lease sales in the Gulf of Mexico for 2012 and 2013 satisfies the OCSLA mandate that the 5-Year Program balance environmental protection and oil and gas development better than the Proposed Action. Furthermore, in order to be internally consistent and comply with NEPA, the Final PEIS must consider such an alternative. Finally, the reasons given by the Draft PEIS for not considering a similar alternative are not viable. BOEM should include and analyze an alternative that excludes lease sales in the Gulf of Mexico Planning Areas for 2012 and 2013 in the Final PEIS.

The Rationale for Not Considering a "No Deepwater Leases" Alternative in the Draft PEIS is Flawed

The Draft PEIS rejects the need to consider an alternative in which oil and gas leasing in deepwater areas of the Western and Central Gulf of Mexico Planning Areas would be deferred. Such an alternative is reasonable and appropriate per NEPA and OCSLA, which mandates a balance between the potential for environmental damage and the discovery of oil and gas (Sec. 18.3). The alternative would afford better protection to the environment by prohibiting new deepwater leases, as deepwater drilling is riskier than shallow water as demonstrated below. Furthermore, it would not greatly hinder oil and gas discovery and production, as discovery and production could still continue on the many existing but inactive deepwater leases (see above) and in shallow water.

Not only is the alternative reasonable and appropriate, BOEM's rationale for rejecting it is flawed in two ways. First, the Draft PEIS essentially presupposes that the impacts of this alternative on oil and gas production outweigh its potential environmental benefits. This presupposition violates NEPA by circumventing the intent and purpose of an EIS, which requires a detailed analysis of the potential environmental benefits of an action before concluding that those benefits are outstripped by other factors. Second, the Draft PEIS incorrectly identifies water depth "as just one of many risk factors" to be considered in leasing decisions (2-12), when in fact water depth is a general proxy for drilling risk. On account of these two flaws and the fact that the alternative is reasonable and appropriate, the Final PEIS must incorporate a formal analysis of the "no deepwater leases" alternative in order to comply with NEPA.

In regard to the first flaw, the Draft PEIS refutes the need to consider the alternative in question by stating:

to exclude all deepwater areas in the GOM from potential oil and gas exploration and development would not be reasonable in light of the purpose and need for the oil and gas leasing program, which is to help meet the Nation's energy needs by developing oil and gas resources in a manner consistent with environmental protection and the laws and policies of affected States. (2-12)

In other words, BOEM claims that deferring deepwater leasing would not be reasonable because allowing deepwater leasing strikes the right balance between potential benefits (specifically, helping to meet the Nation's need for oil and gas) and adverse impacts, such as environmental damage to the ocean and coastal zone.

How the Draft PEIS arrives at this conclusion – that allowing deepwater leasing “ensure[s] a proper balance between oil and gas production and possible environmental impacts” (2-13) – is not at all clear. Indeed, no analysis in support of this statement is conducted; it is simply stated as a self-evident truth. That approach is exactly backward. The purpose of an EIS is to evaluate the “comparative merits” of the Proposed Action and reasonable alternatives (40 C.F.R. § 1502.14) and *then* determine which action is most appropriate in light of the environmental impacts of each. In the Draft PEIS, however, BOEM simply *presumes* that maximum oil and gas production – including deepwater leases – is more appropriate than an option that excludes deepwater leases. BOEM's approach ignores the purpose of NEPA review by rejecting out of hand a reasonable alternative that would “avoid or minimize” the adverse environmental impacts of the 5-Year Program (40 C.F.R. § 1502.1). In order to comply with NEPA, BOEM should therefore formally consider the alternative in question within the Final PEIS.

With regard to the second flaw, the Draft PEIS “identifies water depth as just one of many risk factors that should be considered with other factors when making specific leasing decisions” (2-12). In other words, the Draft PEIS states that water depth is a risk factor, but is no more important than other risk factors. BOEM does not explain why considering an alternative that takes into account water depth is unreasonable, *even if* it is not the only relevant risk factor. Such an alternative is, in fact, reasonable and BOEM should analyze it in the Final PEIS. Moreover, while it is true that there are many risk factors in offshore drilling, all of which should be accounted for when making leasing decisions, it is not true that water depth in the Gulf of Mexico is “just one of many risk factors” (Draft PEIS 2-12). Rather, as noted below, water depth positively correlates with many other risk factors in the Gulf of Mexico. As a result, it can serve as a general proxy for drilling risk and so should be accorded greater importance among risk factors by BOEM. In this light, an alternative that defers deepwater leasing is reasonable and greatly alters the cost-benefit analysis of environmental and economic impacts, and so should be considered by the Draft PEIS per NEPA.

The Draft PEIS lists many risk factors that affect catastrophic discharge events in Table 4.3.4-1. In addition to water depth, the listed risk factors are geology; well design and integrity; loss of well control prevention and intervention; human error; containment capability; response capability; scale and expansion; geography; and oil type, weathering and fate. As is demonstrated below, of these nine additional risk factors, the first six all correlate with water depth. In other words, the risk of a

catastrophic discharge event associated with these six factors is greater in deepwater and ultra-deepwater environments. The correlation of each risk factor with water depth is discussed in turn below.

Geology varies between areas in the Gulf of Mexico, but geologic risk in general increases with increasing drilling depth (i.e., water depth) (Draft PEIS 4-68). Geologic risk also increases when drilling in “frontier areas” (id. 4-68), which includes deepwater and ultra-deepwater areas. Furthermore, deepwater reservoirs in the Gulf of Mexico have many challenging geologic characteristics, e.g. narrow margins in pore pressure and fracture gradient (id. 4-70) and high-pressure/high-temperature conditions (id. 4-70).

Well design and integrity risk also positively correlates with water depth. Geologic factors like high-pressure/high-temperature conditions and narrow margins in pore pressure and fracture gradient “represent key concerns for the potential influence geology exerts on wellbore integrity” (Draft PEIS 4-70). Thus, geologic risk positively correlates with well integrity risk; as geologic risk increases, well integrity becomes harder to maintain and so the risk of losing well integrity increases. Since geologic risk increases with water depth, so too then does well integrity risk. Indeed, the Draft PEIS states that drilling deepwater and ultra-deepwater wells challenges drilling engineers, as more casing strings are necessary, which makes it harder to achieve good cement isolation (4-73). Furthermore, water depth increases the complexity of operations (Draft PEIS 4-68, Table 4.3.4-1), and greater complexity “may present more opportunity for mechanical breakdown and accidents” (id. 4-71).

Loss of well control prevention and intervention risk, or the potential inability of an operator to prevent or intervene in the case of loss of well control, is also greater at increased water depths. In deepwater and ultra-deepwater environments, intervention operations after a blowout must be conducted remotely, e.g. by using a remotely operated vehicle (“ROV”; Draft PEIS 4-75). ROVs and other remote systems, though, can fail, increasing the failure risk of intervention operations. High pressure blowouts, which are generated by high-pressure reservoir conditions such as those in deepwater environments (see above), can render blowout preventers (“BOPs”) not functional, thereby eliminating the last line of defense against a loss of well control. And if a blowout does occur, the need for remote operations makes subsea efforts to stop a blowout more difficult, as the Deepwater Horizon disaster demonstrated.

Human error risk also positively correlates with water depth. Water depth increases the complexity of operations (Draft PEIS 4-68, Table 4.3.4-1), and greater complexity increases the number of routine operations and incidence of unusual operations (Draft PEIS 4-71). More routine and especially unusual operations increase the risk that human error can occur.

Containment capability also varies with water depth, as well containment operations are harder to conduct in deepwater and ultra-deepwater environments, i.e. frontier areas. Containment caps have not yet been built to withstand water depths beyond 10,000 feet and pressures above 15,000 psi, so containment is not an option for ultra-deepwater operations taking place at water depths or pressures greater than these values. More importantly, containment systems like capping stacks are more difficult to install in deepwater, ultra-deepwater and other frontier areas due to inhospitable environments and the need for remote operations.

Response capability also positively correlates with water depth. The Deepwater Horizon disaster was the first deepwater blowout and revealed significant differences in response capability between blowouts in shallow and deepwater. Because of the depth of the Macondo well, a large portion of the oil and gas that escaped from the well formed subsea plumes and/or dispersed into the water column, rather than rising to the surface where it could be recovered or would aerosolize.¹⁰ Thus, the capability to respond to the spill through oil removal was undercut because the well was located in deepwater.

As demonstrated above, six of the nine non-water depth risk factors for catastrophic discharge events positively correlate with water depth. Thus, water depth is not “just one of many risk factors” (2-12) as the Draft PEIS states, but rather is more broadly representative of the risk of offshore drilling. Certainly water depth is not the only risk factor that should be considered in making leasing decisions. But the link between water depth and additional risk factors for catastrophic discharges demonstrates that environmental impacts will be significantly different in deepwater leasing, and underscores the need to consider an alternative in which deepwater leasing would be deferred. Consequently, BOEM should consider the alternative in its Final PEIS.

The Rationale for Not Considering a “Develop Alternate/Renewable Energy Sources” Alternative in the Draft PEIS is Flawed

In the Draft PEIS, BOEM incorrectly dismisses the need to analyze an alternative where alternate/renewable energy sources would be developed in lieu of oil and gas leasing on the Outer Continental Shelf. Such an alternative is reasonable and meets the objectives of the Proposed Action, and the rationales BOEM offers for dismissing this alternative are flawed. Consequently, the Draft PEIS fails to “rigorously explore and objectively evaluate all reasonable alternatives” to the Proposed Action (40 C.F.R. § 1502.14(a)) and so violates NEPA. BOEM should formally and fully analyze this alternative in its Final PEIS.

NEPA requires BOEM to consider a range of “reasonable” alternatives to the Proposed Action, meaning those that are “*practical or feasible* from the technical and economic standpoint”¹¹ and that will meet the objectives of the proposed federal action. “[A]n alternative is properly excluded from consideration in an environmental impact statement only if it would be reasonable for the agency to conclude that the alternative does not ‘bring about the ends of the federal action.’”¹² The option of developing alternate/renewable energy sources appears to meet the criteria for consideration, and not exclusion. The purpose and need for the 5-Year Program, according to BOEM, is to “best meet national energy needs for the 5-year period following its approval . . . by balancing the potential for adverse environmental and societal impacts with the beneficial impacts of the discovery and development of oil and gas” (1-3 to 1-5). Developing alternate/renewable energy sources in lieu of some or all offshore oil and gas could bring about that objective because alternate/renewable energy sources could meet national energy needs while striking a balance that is more environmentally

¹⁰ E.g., Reddy, C.M., J.S. Arey, J.S. Seewald, S.P. Sylva, K.L. Lemkau, R.K. Nelson, C.A. Carmichael, C.P. McIntyre, J. Fenwick, G.T. Ventura, B.A.S. Van Mooy, and R. Camilli. (2011). Composition and fate of gas and oil released to the water column during the *Deepwater Horizon* oil spill. *Proc. Natl. Acad. Sci* Early Edition.

¹¹ Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations, 46 Fed. Reg. 18026, 18027 (Mar. 23, 1981).

¹² *City of Alexandria v. Slater*, 198 F.3d 862, 867 (D.C. Cir. 1999) (quoting *Citizens Against Burlington, Inc. v Busey*, 938 F.2d 190, 195 (D.C. Cir. 1991).

protective than BOEM’s preferred alternative. It would afford much greater protection to the environment by protecting offshore and coastal areas from spills, acoustic disturbances and other impacts and by reducing the nation’s greenhouse gas emissions. Moreover, replacement of offshore oil and gas with alternate/renewable energy sources appears to be economically and technically feasible.¹³ Many alternate/renewable energy technologies already are technologically proven, commercially available and scalable. In fact, alternate/renewable energy sources are already a growing focus of energy markets and will play an increasingly-large role in the world’s energy supply in the coming decades.

The Draft PEIS offers two rationales for failing to fully consider an alternate/renewable energy sources alternative. First, the Draft PEIS states that “such sources could not replace the energy supplied by oil and gas from OCS sources” (2-10). Second, the Draft PEIS explains that it has already indirectly analyzed the environmental impacts of this alternative because the impacts would be the same as those of the No Action Alternative (2-10). Neither of these rationales is legally sufficient to exclude a reasonable, feasible alternative capable of meeting the 5-Year Program’s stated purpose and need. Moreover, even if those rationales were legally sufficient, as detailed below, they are factually incorrect.

With regard to the first claim, Oceana’s own analysis demonstrates that alternate/renewable energy sources can, in fact, replace oil and gas from the OCS by 2020.¹⁴ We show that this goal can be achieved with reasonable action and without significant subsidies or other government support. Other reports have demonstrated that similar reductions in oil consumption are achievable in the near future.¹⁵ Even so, for the Draft PEIS, alternate/renewable energy sources must only replace the oil and gas developed as a result of the 5-Year Program, which is a much lower bar.

To its credit, the Draft PEIS discusses alternate/renewable energy sources that could replace oil and gas in Section 4.5.7.1. However, this discussion has one critical flaw that undermines the entire discussion: it ignores the effect that increased research and development (“R&D”) and deployment of alternate/renewable energy sources, spurred by a reduced emphasis on oil and gas production, could have on the future ability of these sources to supplant oil and gas.

Take, for instance, the Draft PEIS’s discussion of the future potential of electric vehicles (“EVs”) and plug-in hybrid electric vehicles (“PHEVs”) to reduce the nation’s oil consumption (4-479). The Draft PEIS cites a 2010 National Research Council (“NRC”) report to estimate the number of PHEVs and EVs that could be on the road in the near future and by how much they could reduce oil consumption. But the NRC report does not consider what effect augmented R&D or deployment would have on potential market penetration of EVs and PHEVs, despite highlighting the crucial role

¹³ Craig, M.T., and S. Mahan. Breaking the Habit: Eliminating our Dependence on Oil from the Gulf of Mexico by 2020, the Persian Gulf by 2023, and All Other Nations by 2033. *Oceana*. Apr. 2011. <http://na.oceana.org/en/news-media/publications/reports/breaking-the-habit-eliminating-our-dependence-on-oil-from-the-gulf-of-mexico-by-2020-the-persian>.

¹⁴ Id.

¹⁵ Dutzik, T., E. Ridlington, R. Kerth, T. Madsen, and D. Gatti. Getting Off Oil: A 50-State Roadmap for Curbing our Dependence on Petroleum. *Environment America*. July 2011. <http://www.environmentamerica.org/home/reports/report-archives/global-warming-solutions/global-warming-solutions/getting-off-oil-a-50-state-roadmap-for-curbing-our-dependence-on-petroleum>.

R&D plays in improving battery technology and driving down electric vehicle costs.¹⁶ An alternative under which alternate/renewable energy sources are emphasized in place of oil and gas would facilitate R&D and deployment of alternate/renewable energy sources, as it would send a clear market signal to investors that our nation is committed to developing alternate/renewable energy sources rather than oil and gas. Market certainty is a key factor in investment decisions, so signaling a commitment to alternate/renewable energy sources would likely increase investment in those sources.¹⁷ Increased investment, in turn, would boost R&D and deployment of those sources.

By not considering the potential for augmented R&D and deployment of oil and gas alternatives in an alternate/renewable energy sources alternative, the Draft PEIS fails to adequately characterize the potential for those alternatives to displace the oil and gas that would be produced under the Proposed Action. This shortcoming does not apply only to the Draft PEIS's discussion of electric vehicles, but to its discussion of oil and gas alternatives as a whole. Thus, the Draft PEIS fails to properly substantiate its claim that alternate/renewable energy sources could not replace oil and gas that would be produced under the Proposed Action (2-10). To do so would require a formal analysis of an alternate/renewable energy sources alternative, which should be included in the Final PEIS.

In regards to the second claim, the alternative in question would have markedly different impacts than the No Action Alternative because it would augment the R&D and deployment of alternate/renewable energy sources. Under the No Action Alternative, alternate/renewable energy sources would be developed as they would be if oil and gas were developed, i.e. under the Proposed Action. As described above, though, expedited development and deployment of alternate/renewable energy sources would occur under the proposed alternative compared to the No Action Alternative. Consequently, alternate/renewable energy sources would replace more oil and gas and eliminate the need for more oil and gas exploration and development. Thus, the Draft PEIS's treatment of the alternate/renewable energy sources alternative as having similar environmental impacts as the No Action Alternative is inaccurate.

The two reasons given by the Draft PEIS for not considering an alternate/renewable energy sources alternative are invalid. Furthermore, the alternative merits consideration under NEPA, as it is reasonable and would greatly alter the environmental impact and cost-benefit balance of the Proposed Action.¹⁸ Thus, the Final PEIS must consider the alternative in order to comply with NEPA.

III. THE DRAFT PEIS VIOLATES NEPA BY FAILING TO QUANTIFY GREENHOUSE GAS EMISSIONS RESULTING FROM THE COMBUSTION OF PRODUCED OIL AND GAS

The Draft PEIS violates NEPA by failing to quantify greenhouse gas ("GHG") emissions that would result from the combustion of oil and gas developed as a result of the Proposed Action. The 5-Year Program leads to the generation of GHG emissions directly, via activities related to exploration,

¹⁶ National Research Council. *Transitions to Alternative Transportation Technologies – Plug-in Hybrid Electric Vehicles*. Summary. 2010. Pg. 4.

¹⁷ Freed, J., E. Horwitz, and N. Cunningham. "A Clean Energy Standard: Getting the United States Back into the Clean Energy Race." *Third Way*. Mar. 2011. http://content.thirdway.org/publications/382/Third_Way_Policy_Memo_-_A_Clean_Energy_Standard-Getting_the_United_States_Back_into_the_Clean_Energy_Race.pdf

¹⁸ *Alaska Wilderness Recreation & Tourism Ass'n v. Morrison*, 67 F.3d 723, 729 (9th Cir. 1995) (quoting *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228 (9th Cir. 1988)); see also *California v. Block*, 690 F.2d 753, 767 (9th Cir. 1982).

development, transportation of product and product processing, as well as indirectly, via the combustion of the oil and gas extracted as a result of the Program. Nonetheless, the Draft PEIS fails to quantify GHGs, which contribute to climate change,¹⁹ from the combustion of oil and gas and from all routine activities within the scope of the Draft PEIS. Both omissions violate NEPA, and the rationale for the omissions given by the Draft PEIS is flawed.

NEPA Requires the Draft PEIS to Fully Account for Greenhouse Gas Emissions Resulting from the 5-Year Program

Because climate change could have significant impacts on the oceans and coastal environments of the United States, the omission of a full GHG accounting prevents the Draft PEIS from “providing a full and fair discussion of environmental impacts” (40 C.F.R. § 1502.1). The Draft PEIS itself notes that many impacts associated with climate change have already been observed in U.S. coastal regions, including “changing air and water temperatures, rising sea levels, more intense storms, ocean acidification, coastal erosion, sea ice loss, declining coral reef conditions, and loss of critical habitats such as estuaries, wetlands, barrier island, and mangroves” (3-18). The Draft PEIS further notes that climate change could impact coastal wetlands (4-553), benthic and pelagic habitats (4-556), coral communities (4-558), essential fish habitat (4-562), and other resources.

While the Draft PEIS recognizes that climate change may significantly impact the coasts and oceans of the United States, it fails to connect these and other climate change-induced threats to GHG emissions from the combustion of oil and gas and from all routine activities, which have a cumulative impact on climate change. An EIS must “consider the cumulative impact of the proposed action.”²⁰ “The impact of greenhouse gas emissions on climate change is precisely the type of cumulative impacts analysis that NEPA requires agencies to conduct.”²¹ GHGs accumulate in the atmosphere and ultimately cause climate change. As “individually minor but collectively significant actions taking place over a period of time” (40 C.F.R. § 1508.7), GHG emissions clearly qualify as cumulative impacts, and so the failure of the Draft PEIS to account for and consider the cumulative impacts of GHGs is a violation of NEPA.

NEPA Requires the Draft PEIS to Account for Greenhouse Gas Emissions from Upstream and Downstream Operations Resulting from the 5-Year Program

Routine activities, including those upstream and downstream of oil and gas production, emit significant amounts of GHGs that must be quantified. Currently, the Draft PEIS only quantifies GHG emissions from activities on the OCS associated with production and exploration, e.g. service vessel trips and helicopter operations (see 4-133, Table 4.4.4-1 and 4-138, Table 4.4.4-2). However, routine activities at all stages of oil and gas production, from exploration to development to transportation to refining to decommissioning, would result from the Proposed 5-Year Program and so fall in the scope of the Draft PEIS (40 C.F.R. § 1508.25). Therefore, their impacts must be considered in the Final PEIS. The emissions from these activities would have significant environmental impacts. Yet, the Draft PEIS neglects GHG emissions from activities downstream of production, such as the refining of

¹⁹ Core Writing Team, Pauchauri, R.K., and A. Reisinger (eds.). *Contribution of Working Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, 2007. IPCC, Geneva, Switzerland.

²⁰ *Kern v. US Bureau of Land Mgmt.*, 284 F.3d 1062, 1076 (9th Cir. 2002).

²¹ *Center for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1217 (9th Cir. 2008)

oil and gas and transportation of refined products to their point of consumption, and upstream of development, such as the construction of platforms. Given the need for the Final PEIS to fully account for GHG emissions resulting from the 5-Year Program as explained above, the Final PEIS must quantify GHG emissions from all activities upstream and downstream of oil and gas development and production on the OCS. To do so, BOEM could draw its system boundaries from the production of infrastructure necessary to produce OCS oil and gas to the combustion of the oil and gas products.

BOEM's Rationale for Not Calculating Greenhouse Gas Emissions from the Combustion of Oil and Gas is Flawed

BOEM's rationale for not calculating the GHG emissions resulting from the combustion of oil and gas produced under the Proposed 5-Year Program is flawed. BOEM claims that the scope of the Draft PEIS is too limited to account for such emissions, stating that "[c]onsumption of oil and gas is considered at a broader level when decisions are made regarding the role of oil and gas generally, including domestic production and imports, in the overall energy policy of the United States" (1-18). Although one could argue that the 5-Year Program is an important part of U.S. energy policy, BOEM claims that general decisions relating to oil and gas – including how much should be consumed and whether it should be produced domestically or imported – are not within the scope of the Proposed 5-Year Program and Draft PEIS. Put another way, BOEM suggests that the 5-Year Program has no direct bearing on general decisions relating to oil and gas. This statement, though, is disproved by the Draft PEIS itself.

The Draft PEIS finds that under the No Action Alternative, in which new leasing is not allowed under the Proposed 5-Year Program, reduced demand would substitute for 6% of the lost OCS oil and gas (4-496, Table 4.5.7-1).²² Clearly, then, the Proposed 5-Year Program does have a direct bearing on the general decision of how much oil and gas the nation will consume, and where that oil and gas will come from. Similarly, determining how much oil the nation will consume falls within the scope of the Draft PEIS, because the direct impacts of the Proposed Action (40 C.F.R. § 1508.25) include consumption of the oil and gas produced. Consequently, the impacts of that consumption – including GHG emissions from the combustion of the oil and gas produced – must be included in the Draft PEIS.

Contrary to the Draft PEIS's claims, the fact that OCS oil and gas is merged with oil from other sources into a single, undifferentiated stream (1-18) does not preclude the need to account for GHG emissions from the combustion of oil and gas. Climate change is a global phenomenon, and GHG emissions contribute to climate change regardless of their point of origin. Although BOEM cannot predict where OCS oil and gas will be combusted, BOEM can predict and quantify in what sector OCS oil and gas will be combusted and the consequent GHG emissions. The U.S. Energy Information Administration ("EIA") projects levels of consumption of oil and gas by sector to 2035.²³ From these data, BOEM can determine the proportion of oil and gas produced under the 5-Year Program that will be consumed in each sector in the future. How much of each petroleum product a barrel of crude oil yields after refining is also available.²⁴ Finally, GHG emissions coefficients for the

²² See "Reduced Demand" row at bottom of table.

²³ Energy Information Administration. *Annual Energy Outlook 2011*. 26 Apr. 2011.

²⁴ "Oil (petroleum): What Fuels Are Made From Crude Oil?" *Energy Information Administration*. Accessed 23 Dec. 2011. http://www.eia.gov/kids/energy.cfm?page=oil_home-basics

combustion of oil and gas in various sectors/applications are available from the U.S. Environmental Protection Agency (“EPA”).²⁵ With the above datasets, BOEM is able to calculate GHG emissions from the oil and gas produced under the 5-Year Program, and as explained above must do so in order to satisfy NEPA.

Rough Sample Calculation of Greenhouse Gas Emissions from the Combustion of Oil and Gas

Even if BOEM deems it too difficult to calculate GHG emissions from the combustion of oil and gas produced under the 5-Year Program using the above datasets – a conclusion that, if made, must be thoroughly explained – BOEM is not exempt from calculating those GHG emissions. The calculation of GHG emissions from the combustion of oil and gas produced under the Proposed 5-Year Program can be greatly simplified. The emissions factors for the combustion of oil and gas, regardless of sector/application, is readily available from the U.S. Environmental Protection Agency.²⁶ Additionally, the 5-Year Program estimates how much oil and gas would be produced as a result of the Program. With these two data sets, calculating GHG emissions under the Proposed Action is a straightforward matter, as demonstrated by the Oceana analysis below. While this simplified calculation provides a much more accurate picture of the environmental impacts of the Proposed Action than no calculation, BOEM should undertake an appropriately-detailed analysis that takes into account all GHGs and black carbon, not just CO₂, and divides oil and gas combustion by sector/application.

Table 1: Projected emissions of CO₂ from the combustion of oil and gas resources that would be developed as a result of the Proposed 5-Year Program, i.e. the Proposed Action.

Resource	CO₂ Emissions Factor^a	Production Estimates (Low/High)^b	CO₂ Emissions Estimate (million metric tons CO₂)
Crude Oil	0.43 metric tons CO ₂ per barrel oil	3.6 billion barrels	1,550
		8.13 billion barrels	3,500
Natural Gas	120,000 lb CO ₂ per 10 ⁶ scf gas	12.1×10 ¹² scf	660
		34.7×10 ¹² scf	1,890
Total CO₂ Emissions (Low):			2,210
Total CO₂ Emissions (High):			5,390

^a Emissions factors estimated by the EPA.²⁷

^b Given values are for the sum of the low and high production estimates from Table 11 of the Proposed 5-Year Program²⁸ across all planning areas.

²⁵ Environmental Protection Agency. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008*. 15 Apr. 2010. Annex 2, Table A-36.

²⁶ Crude oil emissions factor: “Green Power Equivalency Calculator Methodologies.” EPA. Apr 2011. <http://www.epa.gov/greenpower/pubs/calcmeth.htm>.

Natural gas emissions factor: “AP-42, Vol. 1, CH1.4: Natural Gas Combustion.” EPA. July 1998. Page 1.4-6, Table 1.4-2. <http://www.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf>.

²⁷ Id.

²⁸ U.S. Department of the Interior, Bureau of Ocean Energy Management. *Proposed Outer Continental Shelf Oil & Gas Leasing Program 2012-2017*. Nov. 2011.

IV. THE DRAFT PEIS DOES NOT ACCURATELY PORTRAY THE RELATIONSHIP BETWEEN SHORT- AND LONG-TERM TRADEOFFS IN VIOLATION OF NEPA

NEPA requires EISs to contain “a detailed statement... on the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity...” (42 USC Sec. 4223(C)(iv)). Chapter 6 of the Draft PEIS, which discusses that relationship, does not adequately meet this requirement because it contains erroneous claims about the impact of oil spills, and entirely overlooks the issues of climate change and ocean acidification.

Discussion Does Not Include Climate Change or Ocean Acidification

The Draft PEIS’s discussion of the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity does not include any discussion whatsoever of climate change or ocean acidification. The Proposed Action would exacerbate climate change and ocean acidification via direct and indirect greenhouse gas emissions, which the Draft PEIS already (if imperfectly) acknowledges will result from the Proposed Action (see pg. 4-138, Table 4.4.4-2). The failure to mention the long-term impacts of climate change or ocean acidification in Chapter 6 of the Draft PEIS is a large oversight that needs to be corrected.

Climate change and ocean acidification will play major roles in shaping the long-term productivity of the United States’ coastal regions, including the Gulf of Mexico and Arctic offshore and shoreline environments.²⁹ A modeling study of the Northeast Atlantic showed that the impacts of ocean acidification and climate change on biogeochemical cycles and ranges of important animals could lower their estimated catch potentials³⁰ by 20–30%.³¹ An additional change in plankton communities due to ocean acidification and climate change could further reduce catch potentials by 10%.³² Climate change and ocean acidification also threaten the world’s tropical coral reefs through the combined stresses of warming sea surface temperatures and reduced carbonate accretion. Harm to coral reefs, in turn, threatens reef-associated fisheries, tourism, coastal protection and people within the U.S. Exclusive Economic Zone (“EEZ”) offshore Hawaii, Florida, the U.S. Virgin Islands and U.S. flagged islands.³³ In the state of Hawaii alone, the net present value of the state’s coral reefs is \$9.7 billion over 50 years at a 3% discount rate.³⁴

²⁹ E.g.: Sumaila, U.R., W.W.L. Cheung, V.W.Y. Lam, D. Pauly and S. Herrick. (2011). Climate change impacts on the biophysics and economics of world fisheries. *Nature Climate Change*. Advanced Online.

Turner, R.E. “Chapter 6: Coastal Ecosystems of the Gulf of Mexico and Climate Change.” *Integrated Assessment of the Climate Change Impacts on the Gulf Coast Region*. June 2003.

Fabry, V. J., Seibel, B. A., Feely, R. A., and Orr, J. C. 2008. Impacts of ocean acidification on marine fauna and ecosystem processes. *ICES Journal of Marine Science* **65**, 414–432.

³⁰ Specifically, 10-year average catch potential of 2050 relative to 2005.

³¹ Cheung W. W. L., Dunne J., Sarmiento J. L. & Pauly, D. 2011. Integrating ecophysiology and plankton dynamics into projected maximum fisheries catch potential under climate change in the Northeast Atlantic. *ICES Journal of Marine Science*. doi:10.1093/icesjms/fsr012.

³² Id.

³³ Hoegh-Guldberg, O. et al. 2007. Coral reefs under rapid climate change and ocean acidification. *Science* **318** (5857), 1737-1742.

³⁴ Cesar, H., et al. 2002. Economic valuation of the coral reefs of Hawaii, final report. NOAA Coastal Ocean Program. Available at: http://www.coralreef.gov/meeting18/evhcri_samoa_2007.pdf

Discussion Does Not Accurately Reflect Impacts of Oil Spills

Chapter 6 of the Draft PEIS incorrectly gauges the impacts of oil spills - and consequently the impacts of offshore drilling - in two ways. First, the Draft PEIS states, “[t]o date, there has been no discernible decrease in [biological] productivity in U.S. offshore areas where oil and gas have been produced for many years” (6-1 to 6-2). First of all, there is no analysis cited to support the suggestion that the pre-2010 impacts of decades of oil and gas industrialization in the Gulf of Mexico have not had an impact on biological productivity. That aside, however, the effects of the Deepwater Horizon oil spill alone are sufficient to disprove this statement, for the spill had obvious short- and long-term impacts on the Gulf of Mexico.

Whitehead et al., for instance, found adult Gulf killifish that were exposed to oil from the Deepwater Horizon spill exhibited genomic and physiological changes for over two months following exposure.³⁵ How these genomic and physiological changes will affect the adult killifish and, in turn, the killifish population as a whole, or even whether similar other species are similarly affected, has yet to be determined, but this evidence suggests the spill may have long-term impacts on the Gulf ecosystem. As Whitehead et al. state:

“[m]arsh contamination with Deepwater Horizon oil coincided with the spawning season for many marsh animals, including killifish, and reproductive effects are predictive of long-term population-level impacts from oil spills.” (3)

Furthermore, at the height of the Deepwater Horizon spill, 36% of federal waters in the Gulf of Mexico were closed to commercial and recreational fishing, representing an area of 86,985 square miles.³⁶ Fisheries closures triggered by the Deepwater Horizon spill are estimated to have caused a 20% loss in average annual U.S. commercial catch in the Gulf of Mexico, with a potential minimum loss in annual landed value of \$248 million.³⁷ Such revenue losses and long-term effects of spill-induced fishery closures on fishing communities must be recognized in Chapter 6 of the Draft PEIS.

Chapter 6 of the Draft PEIS also errs by stating, “... the consequences of oil spills all contain the potential for disrupting coastal communities in the short term” (6-2). That statement ignores long-term impacts. Preliminary findings from the Deepwater Horizon spill as well as observations since the Exxon Valdez spill indicate that oil spills have the potential to disrupt coastal communities and the productivity and viability of fisheries in the long-term as well. Four years after the Exxon Valdez spill, the Pacific herring population in Prince William Sound collapsed, and it has not recovered after more than twenty years³⁸ (see Figure 1). About half of the egg biomass of Pacific herring was deposited within the oil trajectory, and an estimated 40% to 50% sustained oil exposure during early development. The resulting 1989 year-class (the year of the Exxon Valdez spill) displayed sublethal

³⁵ Whitehead, A., et al. (2011). Genomic and physiological footprint of the *Deepwater Horizon* oil spill on resident marsh fishes. *Proc. Natl. Acad. Sci.* Early Edition.

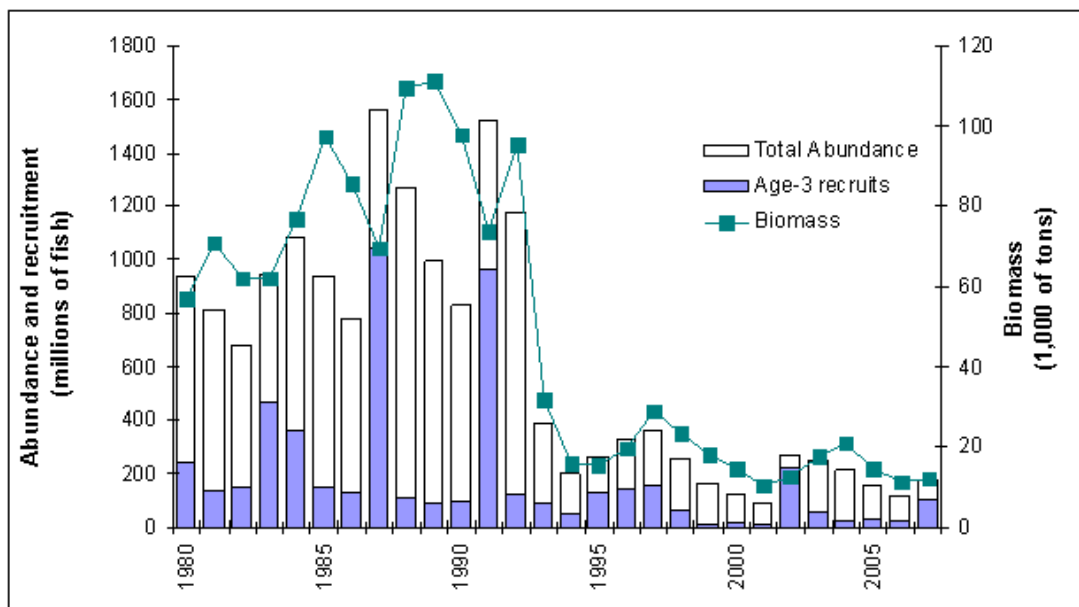
³⁶ NOAA. “NOAA Expands Fishing Closed Area in Gulf of Mexico. 21 June 2010. http://www.noaa.gov/stories/2010/20100621_closure.html.

³⁷ McCrea-Strub, A., et al. (2011) Potential impact of the Deepwater Horizon oil spill on commercial fisheries in the Gulf of Mexico. *Fisheries* 32: 332-336. available at <http://www.searounds.org/researcher/dpauly/PDF/2011/JournalArticles/PotentialImpactoftheDeepwaterHorizonOilSpill1.pdf>

³⁸ “Pacific Herring.” *Exxon Valdez Oil Spill Trustee Council*. Accessed 20 Dec. 2011. http://www.evostc.state.ak.us/recovery/status_herring.cfm.

effects in newly hatched larvae, primarily premature hatch, low weights, reduced growth, and increased morphologic and genetic abnormalities.³⁹ The adult herring population that returned to spawn four years later was reduced by 75%,⁴⁰ and the fishery has been closed for 15 of the 21 years since the spill.⁴¹ Chapter 6 must be revised to reflect the fact that oil activities and subsequent accidents can impact the long-term productivity of marine resources.

Figure 1. Age-3 recruitment, total prefishery abundance and run biomass (metric tons) of Pacific herring in Prince William Sound, 1980-2008. The Exxon Valdez spill occurred in 1989 with a drastic drop in biomass of herring four years after the spill.



Source: Brown, E.D. et al 1996. Injury to the early life stages of Pacific herring in Prince William Sound after the Exxon Valdez oil spill. *Proceedings of the Exxon Valdez oil spill symposium. American Fisheries Society Symposium*. 18, 448-462.

The Deepwater Horizon spill also triggered several long-term threats to target fishery species and trophic levels in the Gulf of Mexico. Target species may be directly impacted by physical contact with oil contaminants, as well as indirectly affected via the degradation of important nursery and spawning habitats and disruption of trophic interactions.⁴² These impacts can last up to 40 years or longer.⁴³

³⁹ Brown, E.D. et al 1996. Injury to the early life stages of Pacific herring in Prince William Sound after the Exxon Valdez oil spill. *Proceedings of the Exxon Valdez Oil Spill Symposium. American Fisheries Society*, 18, 448-462.

⁴⁰ Id.

⁴¹ “Commercial Fishing.” *Exxon Valdez Oil Spill Trustee Council*. Accessed 20 Dec. 2011. Online at: http://www.evostc.state.ak.us/recovery/status_human_fishing.cfm

⁴² Peterson, C. H., S. D. Rice, J. W. Short, D. Esler, J. L. Bodkin, B. E. Ballachey, and D. B. Irons. (2003). Long-term ecosystem response to the *Exxon Valdez* oil spill. *Science* 302:2082–2086.

⁴³ Culbertson, J.B. et al. (2007). Long term biological effects of petroleum residues on fiddler crabs in salt marshes. *Marine Pollution Bulletin*, 54: 955-962.

The persistence of polycyclic aromatic hydrocarbons (“PAHs”) has been shown to accumulate in American oysters near the Ixtoc-1 oil spill site, over twenty years after that spill ended.⁴⁴ After Ixtoc-1, there was also a decrease in biomass levels of zooplankton by a magnitude of four fold, which is a marked decline in productivity.⁴⁵ Although studies on Ixtoc 1 are largely lacking, the Final PEIS must acknowledge that significant long-term impacts have occurred from oil and gas activities in the Gulf of Mexico whether the drilling was in U.S. waters or not. Ixtoc 1 should serve as an indicator about how the Gulf of Mexico may have been altered after the Deepwater Horizon spill, and show that long-term risks are apparent for marine productivity.

Moreover, oil from the spill persists in the deep sea water column,⁴⁶ in mats on the seafloor,⁴⁷ and in sediments of coastal marshes,⁴⁸ further increasing the likelihood of long-term impacts on a variety of species, and indirectly on coastal communities. The persistence of oil in these environments could adversely impact ecosystems for years to come. While it may be too early to determine definitively the long-term impacts of the Deepwater Horizon spill, BOEM can not simply ignore the potential and early evidence for such impacts in the Final PEIS. The Final PEIS must consider these potential long-term impacts to some extent, even if they cannot be quantified. Furthermore, BOEM needs to acknowledge that spills can and often do have long-term impacts, as early data from the Deepwater Horizon spill suggest.

Ultimately, the Deepwater Horizon disaster threatens the long-term productivity of over 100 species of fish, crustaceans, mollusks and invertebrates that are commercially fished in the Gulf of Mexico. Fishing in the Gulf of Mexico has been a long-term driver of the Gulf economy; between 2000 and 2005, total annual commercial landings represented an average value of \$1.38 billion.⁴⁹ With sustainable fisheries management and no sources of severe stress such as oil spills and climate change - both of which the Proposed Action would contribute to - this revenue stream could continue to drive part of the Gulf of Mexico economy. However, as demonstrated above, oil and gas drilling threatens the long-term integrity of Gulf of Mexico species. This tradeoff needs to be acknowledged in Chapter 6 of the Draft PEIS.

V. THE DRAFT PEIS RELIES ON AN OVERLY-SIMPLISTIC OIL SPILL RISK ANALYSIS THAT UNDERESTIMATES THE RISK OF LARGE AND CATASTROPHIC SPILLS

The Draft PEIS underestimates the risk of accidental oil spills in the Gulf of Mexico, summarized in Table 4.4.2-1 (pg. 4-109), by failing to take into account different spill rates across

⁴⁴ Norena-Borroso, et al., (1999) Polynuclear aromatic hydrocarbons in American oysters *Crassostrea virginica* from the Terminos Lagoon, Campeche, Mexico. *Marine Pollution Bulletin*, 38(8), 637-645.

⁴⁵ Guzman, S.A. (1986) The impact of the Ixtoc-1 oil spill on zooplankton. *Journal of Plankton Research*, 8(3), 557-581.

⁴⁶ Reddy, C.M., et al. (2011). Composition and fate of gas and oil released to the water column during the *Deepwater Horizon* oil spill. *Proc. Natl. Acad. Sci.* Early Edition.

⁴⁷ Clement, T.P., Hayworth, J.S., and V. Mulabagal. Comparison of the chemical signatures of tar mat samples deposited by Tropical Storm Lee in September 2011 with oil mousse samples collected in June 2010. *Auburn University*. 20 Sept. 2011.

⁴⁸ Whitehead, A., et al. (2011). Genomic and physiological footprint of the *Deepwater Horizon* oil spill on resident marsh fishes. *Proc. Natl. Acad. Sci.* Early Edition. Pg. 4.

⁴⁹ McCrea-Strub, A., et al. (2011) Potential impact of the Deepwater Horizon oil spill on commercial fisheries in the Gulf of Mexico. *Fisheries* 32: 332-336. available at <http://www.searoundus.org/researcher/dpauly/PDF/2011/JournalArticles/PotentialImpactoftheDeepwaterHorizonOilSpill1.pdf>

drilling depths and well types. Ultimately, this leads to an underestimation, and a biased discussion, of the risk of large spills (i.e., greater than 1,000 barrels) and of the environmental impacts such spills would have. This does not constitute a “full and fair discussion of significant environmental impacts” (40 C.F.R. § 1502.1). BOEM must take into account relevant variables, such as water depth, and their impact on the risk of spills during drilling and production.

The oil spill risk analysis used in the Draft PEIS hinges on historical spill rates classified by spill size. As presented in Table 4.4.2-1, the spill rates seem to be calculated based on the assumption that spills occur in direct proportion to the volume of oil handled, an approach that pools data across all other variables (e.g., water depth). This is the same methodology that BOEM has employed in previous EISs.⁵⁰ However, the Draft PEIS does not fully describe the methodology used to calculate spill risk (see, for instance, 4-109). Rather, it references an unpublished paper “Anderson (in preparation)” (id.), which presumably updates the 2000 spill risk analysis by Anderson and LaBelle.⁵¹ Because the Anderson paper is in preparation, it is premature to cite it and since it is not publically available, its use effectively nullifies the public’s ability to corroborate its methodology and spill risk calculations. This is a major oversight. Because oil spills can have significant impacts on biological resources and the environment,⁵² having an accurate spill risk analysis is crucial to the overall integrity of the Draft PEIS and its ability to provide a “full and fair discussion of significant environmental impacts” (40 C.F.R. § 1502.1). Despite its importance, and even though the updated analysis was under development as far back as April 19, 2011,⁵³ BOEM failed to complete the Anderson paper prior to issuing the Draft PEIS for reasons that are not clear. BOEM must make this paper publically available prior to issuing the Final PEIS and improve its methods to look at other risk factors if it has not done so.

In the absence of a copy of the Anderson paper relied on by BOEM, it appears likely to us that the methodology for estimating the number of spills mimics that employed in previous offshore drilling EISs. As previously stated, this methodology pools oil spill and production data across all variables, including drilling depth, to calculate a ratio for the number of oil spills per barrel of oil produced. This ratio is then multiplied by the total projected volume of oil to be produced under the Proposed Action to calculate a total number of projected spills and volume of spilled oil that will occur due to the Proposed Action. For instance, Table 4.4.2-1 of the Draft PEIS estimates that there will be 1-2 “large” oil spills from platforms in the Gulf of Mexico due to the Proposed Action.

Grouping projected spill rates by spill size only and not by other variables assumes that the oil produced across all water depths, environments, well types and other factors has an equal spill risk. However, this is not true. Deepwater and ultra-deepwater wells pose significantly greater risks than shallow wells due to increased complexity and harsher environments, making deepwater operations

⁵⁰ E.g., Bureau of Ocean Energy Management. *Final Supplemental Environmental Impact Statement, Western Planning Area Lease Sale 218*. Aug. 2011. Vol I, pg. 3-33.

⁵¹ Anderson, C.M., and R.P. LaBelle. 2000. “Update of Comparative Occurrence Rates for Offshore Oil Spills.” *Spill Science and Technology Bulletin*, 6: 303-321.

⁵² E.g., “incremental impacts of accidental spills associated the proposed action on marine mammals would be small to large” (Draft PEIS 4-590).

⁵³ Bureau of Ocean Energy Management. *Final Supplemental Environmental Impact Statement, Western Planning Area Lease Sale 218*. Aug. 2011. Vol I, pg. 3-33.

inherently riskier, as discussed in Section II of this document.⁵⁴ Consequently, one barrel of oil produced in deepwater has a greater spill risk than one barrel of oil produced in shallow water. BOEM's own preliminary statistics corroborate this claim. According to BOEM, since 2006 the rate of loss of well control events ("LWC") per well drilled has been higher in deepwater⁵⁵ (1 LWC per 192 wells drilled) than in all water depths (1 LWC per 273 wells drilled).⁵⁶ In other words, the risk of losing well control, which can lead to a blowout and spill, is greater in deepwater than shallow water. This is likely true for all frontier areas, including the Arctic OCS. Yet, the Draft PEIS fails to include drill depth as a variable in its analysis of spill risk even though much of the area covered by the Proposed Action is deepwater. As a result of this omission, the spill risk analysis in the Draft PEIS (e.g., in Table 4.4.2-1) does not accurately estimate the number of spills that will likely occur as a result of the Proposed Action, prohibiting a "full and fair discussion" (40 C.F.R. § 1502.1) and thereby violating NEPA. To improve its spill risk analysis, at the very least BOEM must incorporate in the Final PEIS the increased risk of spills at deeper water depths. This could be done by dividing exploration and production activities by water depth and then estimating the number of spills from those activities with historical spill frequency data from different water depth classes, i.e. deepwater versus non-deepwater. Ultimately, though, BOEM must utilize a more advanced risk analysis methodology.

VI. THE CUMULATIVE IMPACTS ANALYSIS IN THE DRAFT PEIS HAS MULTIPLE SHORTCOMINGS THAT VIOLATE NEPA

Discussion of Cumulative Climate Change Impacts on Marine Mammals in Gulf of Mexico is Insufficient

In describing the cumulative impacts of climate change on marine mammals in the Gulf of Mexico, the Draft PEIS does not handle incomplete and unavailable information in the manner required by NEPA. The Draft PEIS states that "[i]t is not possible at this time to identify the likelihood, direction, or magnitude of any changes in the environment of the GOM due to changes in the climate, so it is too speculative to further discuss climate change impacts on marine mammals" (4-588). In other words, the Draft PEIS uses a claim of incomplete or unavailable information to entirely avoid discussing what impacts climate change will have on marine mammals in the region. That approach is contrary to clear NEPA requirements for the handling of incomplete or unavailable information.

NEPA requires that, when information that is "essential to a reasoned choice among alternatives" (40 C.F.R. § 1502.22(a)) is incomplete or unavailable and "the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include... a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment" (40 C.F.R. § 1502.22(b)). In the case of cumulative climate impacts on marine mammals in the Gulf of Mexico, BOEM engages in no such

⁵⁴ E.g., "Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling." *National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling*. Jan 2011. Page vii.

⁵⁵ Deepwater is defined as greater than 1,000 feet.

⁵⁶ Izon, David. Presentation at the Offshore Energy Safety Advisory Committee Meeting. 7 Nov. 2011. Department of the Interior, Washington DC.

endeavor. Information on the effects of climate change on marine mammals is essential to a reasoned choice among alternatives, as climate change poses a suite of threats to marine mammals, from shifting distribution and abundance of prey⁵⁷ to spreading the extent of low oxygen dead zones.⁵⁸ The Draft PEIS contains no summary of existing scientific evidence that could inform what impacts climate change will have on marine mammals, even though papers have been published on the effects of climate change on the Gulf of Mexico and on marine mammals in general.⁵⁹

How BOEM Estimated the Total Effect of Cumulative Impacts on Each Resource is Not Discernible

The method by which BOEM synthesized the effects of various cumulative impacts and estimated a total potential cumulative effect on each resource is not apparent. In the Draft PEIS, BOEM simply lists the effects of various cumulative impacts, and then states what the combined effect of these impacts would be without explaining how it synthesized the effects of all of the cumulative impacts. In the Final PEIS, BOEM should clarify how it drew such conclusions. Doing so would allow for much better public engagement, as the current Draft PEIS prevents the public from determining whether the aggregate effect of many cumulative impacts is accurate. In part, the lack of transparency is due to the Draft PEIS not discussing whether cumulative impacts are additive or multiplicative in nature (discussed at length below), which greatly alters their aggregate potential cumulative effect on a given resource. The Draft PEIS also lacks adequate discussion of how uncertainties regarding the impacts of past and future activities are handled, further hampering the transparency of BOEM's cumulative impacts analysis.

The Draft PEIS's lack of discussion of the cumulative effect of multiple oil spills illustrates its failure to clearly show how it synthesized the effects of various cumulative impacts. The Draft PEIS states that “[t]he incremental impacts of accidental spills associated with the proposed action on marine mammals would be small to large” (4-590), but also states that “[t]he cumulative impacts of past, present, and future oil spills on marine mammals would be minor to moderate” (4-590). These two statements seem to conflict. If great uncertainty surrounds the effect of one accidental spill, the uncertainty surrounding the aggregate effect of multiple accidental spills must be even greater. Knowing this, it is puzzling how multiple events each with potentially large effects on marine mammals could not potentially have a “major” cumulative effect on marine mammals.⁶⁰ Similar conflicts appear in the discussion of oil spill impacts on birds (4-595 and 4-596). In both cases, BOEM does not explain how it arrived at its “minor to moderate” conclusions, nor does it illustrate how it grappled with major uncertainty in the effects of cumulative impacts. Both processes should be described more clearly in the Final PEIS.

⁵⁷ E.g., Cheung, W.W.L., V.W.Y. Lam, J.L. Sarmiento, K. Kearney, R. Watson., and D. Pauly. (2009). Projecting global marine biodiversity impacts under climate change scenarios. *Fish and Fisheries* **10**: 235-251.

⁵⁸ Diaz, R.J. and Rosenberg, R. 2008. Spreading dead zones and consequences for marine ecosystems. *Science*, 321 (5891): 926-929.

⁵⁹ See, e.g., Justic, D., Rabalais, N.N., and Tuner, R.E. (1996). Effects of climate change on hypoxia in coastal waters: a doubled CO2 scenario for the northern Gulf of Mexico. *Limnol. Oceanogr.* 41(5) 992-1003.
Cheung, W.W.L., V.W.Y. Lam, J.L. Sarmiento, K. Kearney, R. Watson., and D. Pauly. (2009). Projecting global marine biodiversity impacts under climate change scenarios. *Fish and Fisheries* **10**: 235-251.

⁶⁰ Where “major” is defined per the criteria on page 4-10 of the Draft PEIS.

Synergistic and Multiplicative Interactions between Cumulative Impacts are Not Considered

The Draft PEIS does not consider the potential for synergistic or multiplicative interactions between cumulative impacts in violation of NEPA. Guidance for considering cumulative impacts issued by the Council on Environmental Quality (“CEQ”) highlights how some cumulative impacts may be synergistic or multiplicative rather than simply additive.⁶¹ Rather than analyzing the potential for multiplicative/synergistic impacts, the Draft PEIS only lists the incremental effects of various cumulative impacts. Its analysis of the cumulative impact of vessel trips on marine mammals is representative of the type of analysis employed throughout the cumulative impacts section. The Draft PEIS states, “[t]he addition of up to 600 OCS vessel trips per week under the proposed actions could result in minor to moderate incremental impacts to marine mammals, be largely short term, and not result in population-level effects” (4-586). Nowhere in the marine mammals section does BOEM consider possible multiplicative/synergistic effects of increased vessel traffic with other cumulative impacts. For instance, as climate change shifts the ranges of marine mammal species,⁶² more marine mammals could be exposed to and consequently collide with vessel traffic in the Gulf of Mexico, an impact that is not currently captured by the Draft PEIS. This problem is not unique to the marine mammal section; in reviewing the cumulative impacts discussion for the Gulf of Mexico (Section 4.6) of the Draft PEIS, Oceana found no mention at all of potential synergistic/multiplicative effects. BOEM must strengthen its cumulative impact analysis in the Final PEIS by considering such effects.

Climate change, in particular, is a cumulative impact for which synergistic/multiplicative interactions with other impacts must be considered. While the exact impacts of climate change on the nation’s coasts and oceans are not fully known at this time, it is clear that climate change may adversely affect species and even entire ecosystems,⁶³ making them more susceptible to future impacts from oil and gas activities like catastrophic spills or even routine operations. The Draft PEIS discusses some climate change effects in Section 3.3, but does not link this discussion to the cumulative impacts analysis. The Draft PEIS needs to consider the synergistic/multiplicative effects of climate change and other cumulative impacts, as well as synergistic/multiplicative impacts among all other cumulative impacts.

The Draft PEIS Incorrectly Claims that Missing Information Pertaining to Climate Change Impacts is Not Essential to a Reasoned Choice among Alternatives

The Draft PEIS wrongly claims that missing information pertaining to the impacts of climate change on marine and coastal birds is not essential to a reasoned choice among alternatives. BOEM’s rationale for reaching this conclusion is that, because the information is missing for all alternatives, it is irrelevant in choosing among them (4-594). That suggestion is flawed for one simple reason: the Proposed Action and alternatives would affect climate change differently and so lead to different impacts on birds.

⁶¹ Council on Environmental Quality. *Considering Cumulative Effects Under the National Environmental Policy Act*. Jan. 1997. Id. Pg. 42.

⁶² Learmonth, J.A., C.D. Macleod, M.B. Santos, G.J. Pierce, H.Q.P. Crick and R.A. Robinson. (2006.) Potential effects of climate change on marine mammals. *Oceanography and Marine Biology: An Annual Review* **44**: 431-464.

⁶³ U.S. Global Change Research Program. *Global Climate Change Impacts in the United States*. June 2009. Pg. 79-88.

The effects of climate change may not be entirely clear, but the impacts of climate change would be different under the different alternatives considered in the Draft PEIS. Better information on the effects of climate change on birds, which does exist in the literature, would allow for a more accurate understanding of the differential impacts of the alternatives, and thus allow for a more reasoned choice among alternatives. BOEM should correct its erroneous statement that missing information pertaining to the impacts of climate change is not essential to a reasoned choice among alternatives, and modify its Final PEIS to reflect this correction accordingly.

VII. THE DRAFT PEIS FAILS TO ACKNOWLEDGE PERSISTENT SHORTCOMINGS IN THE REGULATION AND SAFETY OF OFFSHORE OIL AND GAS DRILLING THAT IMPACT SPILL RISK

Since the Deepwater Horizon spill, BOEM and BSEE have promulgated new regulations in an attempt to make offshore drilling safer. These new regulations are discussed at length in Section 4.3.4.3.4 of the Draft PEIS. We support and applaud ongoing efforts to make offshore drilling safer, but Oceana has identified numerous problems in the regulations of the offshore industry in its report *False Sense of Safety*.⁶⁴ These problems fall into two categories: shortcomings in the new safety measures implemented since the Deepwater Horizon spill; and persistent overarching problems in the regulation of offshore activities, such as insufficient inspection and oversight capabilities and inadequate penalties for violations. As a result, BOEM and BSEE have failed to make offshore drilling substantially safer since the Deepwater Horizon disaster.

The Draft PEIS does not acknowledge any problems in the regulation of offshore oil and gas activities, despite its ten-page discussion of newly implemented regulations and their purported positive effect on offshore safety (4-90 to 4-99). For instance, the Draft PEIS highlights how BSEE now requires multi-person inspection teams, which are supposed to improve oversight by leading to more and better inspections of facilities (4-99). Yet, the Draft PEIS does not mention that funding for BSEE remains inadequate for BSEE to, as stated by former Director Michael Bromwich himself, “do the job the public deserves.”⁶⁵

Furthermore, the claims in the Draft PEIS regarding the positive safety effects of new regulations are largely unsubstantiated. For instance, the Draft PEIS states, “[the new regulations] create a more robust regulatory system that strikes the right balance to ensure that energy development is conducted safely and in an environmentally responsible manner, ...” (4-99). But the claim that these measures now ensure that energy development is “conducted safely” is never substantiated; no formal analysis is performed in the Draft PEIS, nor was one completed in the rulemakings promulgating the new safety regulations. We don’t believe that such a statement could be substantiated given the weaknesses in the regulations. Either way, BOEM should not make the claim without providing any evidence of it being true.

⁶⁴ *False Sense of Safety*, Oceana’s report on persistent shortcomings in the regulation of offshore drilling, is available online at <http://www.oceana.org/safetyreport>.

⁶⁵ Bromwich, Michael R. “Criticizing the inspectors.” *The White House Blog*. 3 Nov. 2010. <http://www.whitehouse.gov/blog/2010/11/03/criticizing-inspectors>.

These imbalanced and unsupported claims of positive safety effects violate NEPA guidelines as well as the Department of the Interior's new scientific integrity policy. NEPA requires an EIS to "provide full and fair discussion of environmental impacts" (40 C.F.R. § 1502.1). While the new regulations themselves are not environmental impacts, they directly affect the impact analysis and hence affect BOEM's discussion of the new regulations. A discussion of environmental impacts that is predicated upon an imbalanced, unsubstantiated and incomplete set of factors that drive those impacts will itself be imbalanced, unsubstantiated and incomplete. Thus, it is crucial for a full and fair discussion of environmental impacts that the discussion of new regulations (and other factors influencing environmental impacts) be full and fair as well, which they are not. An objective analysis of the weaknesses and insufficiencies in the regulations is called for here.

The Department's new scientific integrity policy similarly demands a more balanced discussion of the new safety regulations. The policy requires science to be communicated "clearly, honestly, objectively, thoroughly, [and] accurately" (Section 3.7.2). As previously explained, the current communication of the new safety measures, and consequently the risks and effects of oil spills and other impact factors, is not balanced or objective. This directly violates the Department's new scientific integrity policy. This PEIS provides an ideal and timely opportunity for the Department to demonstrate its commitment to transparency and clarity in its scientific communications, but the Draft PEIS has failed to meet that promise.

In order to comply with NEPA and to satisfy the Department of the Interior's scientific integrity policy, the Final PEIS must present a more balanced discussion of new regulations and other safety measures implemented since the Deepwater Horizon spill. To do so, the Final PEIS should discuss persistent safety concerns in offshore drilling that have not yet been addressed, as well as shortcomings in the new regulations. It also must present detailed analyses to support its claim that the new regulations and other measures have improved offshore safety. We have submitted with this letter a copy of our analysis and report on the subject for your consideration.

VIII. THE DRAFT PEIS DOES NOT ADEQUATELY ACCOUNT FOR THE IMPACTS OF THE DEEPWATER HORIZON SPILL

The Draft PEIS makes several misleading claims about the impacts of the Deepwater Horizon spill. It has also not updated several parts of its analysis to acknowledge the risks of expanded offshore oil and gas drilling in the Gulf of Mexico that were brought to light by the disaster. NEPA requires that an EIS provides "a full and fair discussion of environmental impacts" (40 C.F.R. § 1502.1) and that its "[environmental] information must be of high quality" (40 C.F.R. § 1500.1). Thus, if BOEM does not update its analysis of offshore drilling risks and correct its misleading claims about the Deepwater Horizon spill in the Final PEIS, it will be in violation of NEPA.

The ecological baseline of the Gulf of Mexico has changed due to the Deepwater Horizon spill and the Draft PEIS must fully address these impacts, especially for protected and endangered species such as sea turtles, marine mammals and migratory birds as well as commercially important species. Acknowledging the small amount of information that has been published outside of the Natural Resources Damage Assessment ("NRDA") process is not an adequate measure of the impacts of the

Deepwater Horizon spill. Rather, BOEM must seek its own independent studies and consultation to address the long-term impacts to marine resources.

Overall, there are few attempts to project or scale stranding and carcass data acquired by the National Marine Fisheries Service (“NFMS”) and Fish and Wildlife Service (“FWS”) in order to estimate the true long-term effects of the Deepwater Horizon spill on populations of marine animals.

Furthermore, there are no projections about the persistence of polycyclic aromatic hydrocarbons (“PAHs”) in deep sea plumes and sediments, which is relevant in that it results in continued, longer-term exposure and potentially ongoing impacts. There are also no attempts to explain the limitations of the NRDA sampling process, both in terms of sampling frequency and approaches, in characterizing the cumulative long-term exposure and resulting effects of PAH exposure on Gulf species (i.e., limited resources for sampling and use of grab samples versus Semi Permeable Membrane Devices [“SPMDs”], which better assess long-term exposure to PAHs). The Draft PEIS also ignores long-term datasets like NOAA’s Mussel Watch Program, which employs the use of shellfish to test for ambient contamination. Their published data about the impacts of the Deepwater Horizon spill should soon be available and will provide a good indicator of the health of important commercial fisheries as well as the bioaccumulation of oil in benthic species. Explaining the extent of contamination that was created by the Deepwater Horizon spill is necessary because past studies have shown that the presence of PAHs at levels even as low as 1 part per billion present chronic threats to marine species such as fish larvae.⁶⁶

The Draft PEIS states:

[t]he few initial studies suggest that, despite occurring during the spawning period for many GOM fishes, the Deepwater Horizon event did not have an immediate negative impact on fish populations (including juvenile age classes [*sic*], although there remains the potential for long-term population impacts from sublethal and chronic exposure (Fodrie and Heck 2011). (3-147)

NOAA has created two different computer models that predict up to a 4% loss in the future spawning biomass of bluefin tuna if catch levels remain static and no other large scale disturbances occur.⁶⁷ Although these are models and the true impacts to adult fish as well as the 2010 year class of bluefin tuna larvae remain unknown, this 4% loss represents an immediate negative effect on fish populations that is higher than the largest predictions made by BOEM in previous multi-year lease sales that predicted a maximum of 1% loss in fish populations from any sized oil spill. Additionally, although the 4% loss in larvae may fall into levels of natural variation, additional sublethal impacts to developing larvae such as impacts to reproduction as seen in killifish could greatly impact future populations which are already struggling from overfishing.⁶⁸ The true impact to recruitment and the overall population of bluefin due to the Deepwater Horizon will not be realized for years, but there are still legitimate reasons for concern.

⁶⁶ Marty, G.D. et al., (1997). Ascites, premature emergence, increased gonadal cell apoptosis, and cytochrome P4501A induction in pink salmon larvae continuously exposed to oil-contaminated gravel during development. *Canadian Journal of Zoology*, 1997, 75:(6) 989-1007, 10.1139/z97-120

⁶⁷ Borenstein, Seth. “Bluefin tuna probably OK after BP oil spill.” *The Miami Herald*. 15 Dec. 2011. <http://www.miamiherald.com/2011/12/15/2546144/noaa-bluefin-tuna-probably-ok.html>.

⁶⁸ Whitehead, A., et al. (2011). Genomic and physiological footprint of the *Deepwater Horizon* oil spill on resident marsh fishes. *Proc. Natl. Acad. Sci.* Early Edition.

The Draft PEIS also inaccurately states that the “landings of shrimp also do not suggest any reduction in shrimp populations” (3-147). The Draft PEIS cites data that was taken from the Gulf of Mexico Large Marine Ecosystem and not the specific areas that were most impacted by the Deepwater Horizon oil spill, such as Louisiana. An Oceana analysis of recent versus historical landings data of brown shrimp caught in Louisiana shows that the peak brown shrimp fishing months of May and June were significantly lower in 2010 and 2011 (see table below).

Table 2: Louisiana Brown Shrimp Landings Data for Peak Months in Relation to Deepwater Horizon Oil Spill

Temporal Relation to Deepwater Horizon Spill	Year	Month	Catch Landing (lbs.)	Catch Value (\$)
Pre-Spill	Average 1990-2009	May	17,830,428	15,131,364
During Spill	2010	May	5,500,179	5,779,231
Post Spill	2011	May	12,533,571	8,966,593
Pre-Spill	Average 1990-2009	June	17,641,275	18,826,222
During Spill	2010	June	7,210,117	9,614,227
Post Spill	2011	June	15,082,113	10,385,926

Source: 2010-2011 data requested from Louisiana Department of Wildlife and Fisheries, analyzed by Oceana. 1990-2009 data from NOAA Fisheries, Annual Commercial Landings Statistics. Available online at: http://www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html

The Draft PEIS also does not take into account recent reports from shrimp fishermen, seafood distributors, and shrimp fishing associations in Louisiana that claim that they are witnessing craniofacial disorders in shrimp such as no eyes,⁶⁹ and that historically abundant shrimp fishing grounds are 80% or more below normal catch levels.⁷⁰ Although freshwater input and temperature variations may have also influenced shrimp populations, there is still reason for concern that persistent PAH levels have stunted the growth and/or reproduction of shrimp and may continue to impact their populations and the fishery. Indeed, the white shrimp season has been dubbed by many as the worst in memory.⁷¹ Further analysis of annual data from brown and white shrimp landings in Louisiana for 2011 alongside Catch Per Unit Effort (“CPUE”) data of shrimp fishing in regions that were impacted by the oil spill will provide a better indicator of the health of shrimp populations after the Deepwater Horizon spill. Currently, it is premature for the Draft PEIS to claim that no impacts to shrimp populations or shrimp fisheries have occurred from the Deepwater Horizon spill.

The Draft PEIS also does not fully evaluate the risks of ‘reiling’ events from Deepwater Horizon oil that remains in or beneath sediment. Recent events such as Tropical Storm Lee revealed miles of tar mats that remain underneath the surface sand as well as abandoned cleanup equipment that

⁶⁹ CNN Interview with Clint Guidry, President of the Louisiana Shrimpers Association. Originally aired on 23 November 2011 12:00 ET. Transcript Available at: <http://edition.cnn.com/TRANSCRIPTS/1111/23/cnr.04.html>

⁷⁰ “Gulf shrimp are scarce this season.” New York Times, 10 Oct. 2011. <http://www.nytimes.com/2011/10/11/us/gulf-shrimp-are-scarce-this-season.html>

⁷¹ “Gulf shrimp are scarce this season.” New York Times, 10 Oct. 2011. <http://www.nytimes.com/2011/10/11/us/gulf-shrimp-are-scarce-this-season.html>

was left behind after the initial spill cleanup.⁷² The erosion and human-caused disturbance to coastal areas from oil cleanups can be equal to, if not more harmful than, the oil itself. The subsequent environmental and social costs of future cleanups should be accounted for as a significant and long-term impact of the Deepwater Horizon spill and a direct consequence of oil and gas activities in the region.

Due to the lack of information being provided by the NRDA process in a timeframe relevant to the Final PEIS and 5-Year Program, BOEM needs to conduct its own independent studies using its Environmental Studies Program (“ESP”). These studies need to examine the true impacts of the Deepwater Horizon spill and give a full and fair description of the risks of continued oil and gas activities in the Gulf of Mexico, as required by NEPA.

Modeling Environmental Sensitivity of the Gulf of Mexico in Light of the Deepwater Horizon Spill

It is necessary for BOEM to analyze the degree to which resources have been affected by the Deepwater Horizon spill and use the findings to model the impacts of potential oil and gas activities at the programmatic level. This information is necessary for BOEM to provide “a full and fair discussion of environmental impacts” (40 C.F.R. § 1502.1) based on high quality environmental information (40 C.F.R. § 1500.1), as required by NEPA. Without this information, BOEM and the public are unable to make a reasoned choice among alternatives for the Gulf of Mexico (40 C.F.R. § 1502.1).

Environmental sensitivity and marine productivity analysis should be top considerations for a reasoned choice among the alternatives for the Secretary. There are a variety of methodologies available that could be utilized in the Final PEIS that would weigh the predicted impacts of oil and gas activities on biodiversity and marine resources that were already impacted by the Deepwater Horizon spill. The Draft PEIS does not present solutions for ways to incorporate uncertainties and risks posed by the Deepwater Horizon spill into further analysis about how expanded offshore oil and gas drilling in the region could impact endangered or commercially important species. The following models and methodologies could be used to create an adequate environmental sensitivity analysis. This analysis should then be incorporated into the Final PEIS in order for a fair decision to be made regarding programmatic oil and gas activities in the Gulf of Mexico.

Ecosystem based models are needed to predict how expanded offshore oil and gas drilling in the Gulf of Mexico would impact the marine environment and resources. Fulton et al. 2011 demonstrates an ecosystem based model called the Atlantis modeling framework which has been used for decades for marine management decisions making.⁷³ This modeling framework is being coupled to climate, biophysical and economic models to help consider climate change impacts, monitoring schemes and multiple use management.⁷⁴ This model could be utilized in the Final PEIS to give a comprehensive view of the impacts of oil and gas activities on water quality, air quality, greenhouse gas emissions, oil spill risk, affected habitats, subsistence communities and other resources. Using this

⁷² Clement, T.P., Hayworth, J.S., and V. Mulabagal. Comparison of the chemical signatures of tar mat samples deposited by Tropical Storm Lee in September 2011 with oil mousse samples collected in June 2010. *Auburn University*. 20 Sept.

⁷³ Fulton, E. A. et al (2011). Lessons in modeling of marine ecosystems: the Atlantis experience. *Fish and Fisheries*, 12(2), 171-188.

⁷⁴ Id.

model would greatly improve the PEIS by giving it a more encompassing view of oil and gas activities weighed against affected environments and the multiple long-term uses that have been described within the lease sale areas in the 5-Year Program.

Another good example of an applied environmental sensitivity index is Grilli et al. 2011,⁷⁵ which was used for offshore wind site assessment in the Rhode Island Special Area Management Plan. This model incorporates fisheries, recreation and biodiversity to weigh the impacts of siting offshore wind in certain locations off Rhode Island. This model could be further scaled up to give an impact index for the 5-Year Program's proposed oil and gas activities in the Gulf of Mexico Large Marine Ecosystem by incorporating multiple uses and biodiversity. The creation of the Grilli et al. 2011 model was built upon ecosystem based management concepts developed by McLeod and Leslie 2009.⁷⁶

These modeling studies will require consultation from NOAA and FWS about endangered species and commercially important species. In light of such a large stressor like the Deepwater Horizon spill it is even more imperative that the Final PEIS adequately model how the Gulf of Mexico has changed and how it could be further impacted by offshore oil and gas activities in the 5-Year Program in order to make a reasoned decision amongst the alternatives.

The Draft PEIS for the Proposed 5-Year Program suffers from serious flaws and omissions that must be addressed in the Final PEIS in order to comply with NEPA and OCSLA. Based on the Draft PEIS, it appears that BOEM has not learned from the Deepwater Horizon spill or the many decades of impacts on the Gulf of Mexico, and that the bureau is continuing to prioritize oil and gas development over environmental and human protection. Such a path will lead to another human and environmental tragedy.

Fortunately, the Final PEIS offers BOEM an opportunity to fundamentally change course and reassess its prioritization of oil and gas development over environmental protection. In so doing, BOEM should address the omissions and flaws discussed above, and ultimately select an alternative in its Final PEIS that does not simply continue failed policies that have led to tragedies and massive environmental degradation in the Gulf of Mexico. Such an alternative may involve the development of alternate/renewable energy sources. We appreciate the opportunity to submit comments on this important document, and look forward to reviewing the Final PEIS.

⁷⁵ Grilli, A. R. et al. (2011). Ecosystem services typology: a wind farm siting tool. *International Society of Offshore and Polar Engineers (ISOPE)*. Submitted to Journal of Environmental Engineering.

⁷⁶ Mcleod, K., and Leslie, H. (2009). *Ecosystem based management for the oceans*. Island Press, Washington, D.C.

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