CENTER for BIOLOGICAL DIVERSITY Because life is good.

April 14, 2016

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Via Overnight Mail and electronic mail: blm_nv_bmdo_2016_OG_ea@blm.gov
Aldine Reynolds - aldinereynolds@blm.gov

RE: Center for Biological Diversity Protest of the June 2016 Competitive Oil and Gas Lease Sale, Battle Mountain District - DOI-BLM-NV-B000-2016-0002-EA

Dear Ms. Reynolds:

The Center for Biological Diversity (the "Center") hereby files this Protest of the Bureau of Land Management's ("BLM") planned June 2016 Competitive Oil and Gas Lease Sale and Environmental Assessment DOI-BLM-NV-B000-2016-0002-EA, pursuant to 43 C.F.R. § 3120.1-3. We formally protest the inclusion of each of the 42 parcels, covering 74,701.61 acres in the Battle Mountain District Office in Lander and Nye Counties:

NV-16-06-001	NV-16-06-025	NV-16-06-044
NV-16-06-003	NV-16-06-026	NV-16-06-045
NV-16-06-007	NV-16-06-027	NV-16-06-046
NV-16-06-008	NV-16-06-030	NV-16-06-047
NV-16-06-009	NV-16-06-031	NV-16-06-049
NV-16-06-010	NV-16-06-032	NV-16-06-050
NV-16-06-017	NV-16-06-033	NV-16-06-055
NV-16-06-018	NV-16-06-036	NV-16-06-056
NV-16-06-019	NV-16-06-037	NV-16-06-057
NV-16-06-020	NV-16-06-038	NV-16-06-058
NV-16-06-021	NV-16-06-040	NV-16-06-059
NV-16-06-022	NV-16-06-041	NV-16-06-060
NV-16-06-023	NV-16-06-042	NV-16-06-061
NV-16-06-024	NV-16-06-043	NV-16-06-072

PROTEST

I. Protesting Party: Contact Information and Interests:

This Protest is filed on behalf of the Center for Biological Diversity, Progressive Leadership Alliance of Nevada, and Great Basin Resource Watch by:

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The Center is a non-profit environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center also works to reduce greenhouse gas emissions to protect biological diversity, our environment, and public health. The Center has over 991,000 members and on-line activists, including those living in Nevada who have visited these public lands in the Battle Mountain District ("BMD") for recreational, scientific, educational, and other pursuits and intend to continue to do so in the future, and are particularly interested in protecting the many native, imperiled, and sensitive species and their habitats that may be affected by the proposed oil and gas leasing.

The Progressive Leadership Alliance of Nevada ("PLAN") was founded in 1994 to bring together diverse and potentially competing organizations into one cohesive force for social and environmental justice in Nevada. Since 1994, PLAN has grown from 12 original founding member groups to a current membership of over 30 organizations.

Great Basin Resource Watch ("GBRW") was founded in 1994 by a coalition of environmental, Native American and scientific community representatives. GBRW is a regional

environmental justice organization dedicated to protecting the health and well being of the land, air, water, wildlife, and human communities of the Great Basin from the adverse effects of resource extraction and use.

II. Statement of Reasons as to Why the Proposed Lease Sale Is Unlawful:

BLM's proposed decision to lease the parcels listed above is substantively and procedurally flawed for the reasons discussed below, as well as those discussed in our comments on the Preliminary Environmental Assessment (PEA) and in our scoping comments. This protest incorporates both of our previous letters by reference herein. The proposed lease sale is unlawful for the following additional reasons.

A. BLM's EA Violates the National Environmental Policy Act ("NEPA")

Despite NEPA's requirement that agencies undertake environmental analysis at the earliest possible time and prior to irretrievable commitment of resources, as well as our requests for an adequate environmental analysis, BLM "has chosen to move forward with the Oil and Gas Lease Sale EA" because BLM believes "the combination of stipulations consistent with current RMPs and parcels proposed for deferral afford sufficient protection to important wildlife and water resources."[1] With the exception of last year's amendments for greater sage-grouse management, however, these "current" RMPs, with which these stipulations are in accordance, date from 1986 and 1997 respectively.

With the exception of the September 2015 Nevada and Northeastern California Greater Sage-Grouse Record of Decision and Approved Resource Management Plan Amendment ("2015 GRSG RMP"), which covers only issues relating to greater sage-grouse, these RMPs have not been revised in decades and therefore do not address the emergence of new and significant information, including but not limited to that relating to the new and dangerous extraction methods of fracking and horizontal drilling, or the increased seismic risks from such extraction methods. Nor do the RMPs include any analysis of the foreseeable indirect impacts of greenhouse gas ("GHG") emissions from extraction, transport, and combustion of leasing federal fossil fuels on climate, public health, and wildlife resources.

i. It is Unlawful to Proceed with the Lease Sale without Undertaking a Site-Specific Environmental Assessment.

BLM's deferral of site-specific analysis until the APD stage is unlawful under NEPA, its implementing regulations, and legal precedents. Courts have repeatedly rejected BLM's claim that it is not required to conduct any site-specific environmental review until after the parcels are leased and a proposal is submitted by industry. See, e.g., Center for Biological Diversity & Sierra Club v. BLM, 937 F. Supp. 2d 1140, 1158 (N.D. Cal. 2013) (". . . BLM asserts the now-familiar argument that there is no controversy because any degradation of the local environment from fracking should be discussed, if ever, when there is a site-specific proposal. But the Ninth Circuit has specifically disapproved of this as a reason for holding off on preparing an EIS."); and

[1] EA, Appendix H, at 253.

Conner v. Burford, 848 F.2d 1441, 1450 (9th Cir. 1988) ("The government's inability to fully ascertain the precise extent of the effects of mineral leasing … is not, however, a justification for failing to estimate what those effects might be before irrevocably committing to the activity.").

BLM is required under NEPA to perform and disclose an analysis of environmental impacts of the 42 parcels offered for lease *before* there are any "irreversible and irretrievable commitments of resources." Center for Biological Diversity, 937 F. Supp. 2d at 1152 (citing Conner v. Burford, 848 F.2d 1441, 1446 (9th Cir. 1988) ("Our circuit has held that an EIS must be prepared *before* any irreversible and irretrievable commitment of resources.") (emphasis added). "[N]on-NSO leases, even if subject to substantial government regulation, do constitute an 'irretrievable commitment of resources.' As a result, unless the lease reserves to the agencies an '*absolute right* to deny exploitation of those resources,' the sale of [] non-NSO leases … constitutes the go or no-go point where NEPA analysis becomes necessary." Id at 1152. In other words, the specific environmental effects of oil and gas leasing in the project area must be analyzed and disclosed now, at the leasing stage.

Rather than perform the environmental review as required, BLM tiers to the 1997 Tonopah and 1986 Shoshone-Eureka Resource Management Plans ("RMPs") and defers the site-specific analysis until after the parcels are leased. We stated in our previous comment letter, and cited to the proper case law on the matter, that this is unlawful. BLM's response to our comment reiterates the same grounds for this failure as in its draft EA:

> The action of leasing a parcel for potential Oil and Gas exploration does not involve any further action than the issuance of the lease itself. Should any of the lease parcels be pursued for exploration, a site-specific environmental document would be prepared to discuss the particular proposed action, and potential impacts as derived from the site specific information which would include conducting resource surveys/inventories (such as sensitive species, cultural, and water resources) for the potentially impacted areas.[2]

We commented that BLM is required to analyze human health and safety risks, and any seismic risks, posed by unconventional extraction techniques. BLM's response to nearly every issue we have raised has been the same:

> Hydraulic Fracturing is a specific development scenario that will be analyzed at their appropriate APD or project stage with the necessary NEPA document. The impacts to resources affected will also be analyzed under that site specific NEPA document. See page 12, Section 2.4.2 of the lease sale EA, for a general discussion of development in relations to leasing. Since development cannot be reasonably determined at the leasing stage, any site specific impacts cannot realistically be analyzed at this time. At the time of APD proposal, should the parcels be sold and development proposed, an analysis of these resources will be completed.

EA, Appendix H, at 252.

[2] EA, Appendix H, at 248.

This is the same approach the court rejected in Center for Biological Diversity & Sierra Club v. BLM, 937 F. Supp. 2d 1140, 1152 (N.D. Cal. 2013). In that case, BLM attempted to defer NEPA analysis of hydraulic fracturing ("fracking") on the parcels at issue until it received a site-specific proposal, because the exact scope and extent of drilling that would involve fracking was unknown. The district court held BLM's "unreasonable lack of consideration of how fracking could impact development of the disputed parcels went on to unreasonably distort BLM's assessment," and explained:

> "[T]he basic thrust" of NEPA is to require that agencies consider the range of possible environmental effects before resources are committed and the effects are fully known. "Reasonable forecasting and speculation is thus implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as 'crystal ball inquiry.'"

Center for Biological Diversity, 937 F. Supp. 2d at 1157 (citing City of Davis v. Coleman, 521 F.2d 661, 676 (9th Cir. 1975)).

NEPA requires that "assessment of all 'reasonably foreseeable' impacts must occur at the earliest practicable point, and must take place before an 'irretrievable commitment of resources' is made." N.M. ex rel. Richardson v. BLM, 565 F.3d 683, 717-18 (10th Cir. 2009) (citing 42 U.S.C. § 4332(2)(C)(v)); compare with Center for Biological Diversity, 937 F. Supp. 2d at 1152 (N.D. Cal. 2013) ("Agencies are required to conduct this review at the 'earliest possible time' to allow for proper consideration of environmental values. . . A review should be prepared at a time when the decisionmakers 'retain a maximum range of options.'"). In Richardson, BLM argued there also that it was not required to conduct any site-specific environmental reviews until the issuance of an APD. The court looked to the Ninth and D.C. Circuits in concluding that "NEPA requires BLM to conduct site-specific analysis before the leasing stage." Richardson, 565 F.3d at 688. Richardson then offered a two-part test to determine whether NEPA has been satisfied: First we must ask whether the lease constitutes an "irretrievable commitment of resources." The Tenth Circuit, again citing to the Ninth and D.C. Circuits, concluded that issuing an oil and gas lease without an NSO stipulation constitutes such a commitment. Second, the agency must ask whether all "foreseeable impacts of leasing" have been taken into account before leasing can proceed. Id. Given the utter lack of any site-specific review of the present surface-occupancy-permitting parcels, for this lease sale, such impacts have not been taken into account.

BLM must take a hard look at the specific parcels that it is offering for oil and gas leasing, and the foreseeable impacts to the resources on these parcels. BLM insists, however, on postponing any such analysis until it has already signed over drilling rights and is unable to preclude all surface disturbing activities to prevent critical environmental impacts that may arise after a proper NEPA analysis.

ii. BLM Failed to Issue a Finding of "No Significant Environmental Impact" or any Convincing Statement of Reasons as to why the Project's Impacts are Insignificant

As the time for NEPA analysis was triggered by the proposal for the sale of the lease, BLM had to analyze whether the proposal might have significant environmental impact. Center for Biological Diversity, 937 F. Supp. 2d at 1153. If BLM finds based on the EA that the proposed actions will not significantly affect the environment, BLM can issue a finding of No Significant Impact ("FONSI") in lieu of the EIS. Id. The FONSI must contain a "convincing statement of reasons" why the project's impacts are insignificant. Id. "The statement of reasons is crucial to determining whether the agency took a 'hard look' at the potential environmental impact of a project." Id. Standing together, the FONSI and EA must be "sufficient to establish the reasonableness of th[e] decision not to prepare an EIS." Id.

BLM never issued a FONSI or any convincing statement of reasons as to why the project's impacts are insignificant. The only mention of such is in BLM's response to our comments, in Appendix H of the EA, that "the BLM determined that the proposed action with the lease stipulations and lease notices identified in the EA is not a major federal action and will not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as described in 40 CFR 1508.27. Therefore, preparation of an Environmental Impact Statement is not required per section 102(2)(c) of the National Environmental Policy Act."[3]

In evaluating the significance of the impact of the proposed action, the agency must consider both the context of the action as well as the intensity. The several contexts in which the significance of an action must be analyzed includes: "society as a whole (human, national), the affected region, the affected interests, and the locality." 40 C.F.R. § 1508.27. For site-specific actions, significance usually depends on the impact of the action on the locale, id., but in light of the recent Paris Agreement, it also depends on the impact on the world as a whole. Thus, to determine the significance of the action, BLM needed to look at not only the environmental impacts on the area to be leased, but also the analysis of the cumulative effects of oil and gas leasing on climate change.

Intensity is determined by scrutinizing the ten factors described in 40 C.F.R. § 1508.27:

> (1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.
>
> (2) The degree to which the proposed action affects public health or safety.
>
> (3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
>
> (4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.

[3] EA, Appendix H, at 247.

(5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

(6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

(7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

(8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

(9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

(10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The presence of any *one* of these factors may be sufficient to require an EIS. Id. As we explained in our previous comment letter, several of these factors are implicated in the lease sale. The one we highlight here in this protest, as an example of BLM's erroneous conclusion that the leases would have no significant impact, is the clear "controversy" regarding the nature of the drilling to occur on the leases and the potential impacts drilling would impose on air, water, soil, and wildlife resources among other things. A proposal is highly controversial when "substantial questions are raised as to whether a project... may cause significant degradation" of a resource. Northwest Envtl. Def. Ctr. v. Bonneville Power Admin., 117 F.3d 1520, 1536 (9th Cir. 1997). A substantial dispute may concern the "size, nature, or effect" of the action. Blue Mts. Biodiversity Project v. Blackwood, 161 F.3d 1208, 1212 (9th Cir. 1998).

We requested in scoping, and again in commenting on the PEA, that BLM take a "hard look" at the potential impacts that leasing these parcels would have on water resources especially. The EA admits that "Hydraulic Fracturing is one of these methods that may be reasonably foreseeable for leases proposed for this sale"[4] and provides very general information on the controversial method, yet failed to provide any analysis of the impacts that the use of such methods in the areas to be leased would have on the water resources specific to that area. BLM's reason for providing "generic," rather than site-specific, analysis of the environmental

[4] EA at 23.

consequences to water resources is that it "cannot determine exactly where a well or wells may be drilled or what technology may be used to drill and produce wells, so the impacts listed below are generic, rather than site-specific. Subsequent development of a lease may result in long-and short term alterations to the hydrologic regime depending upon the location and intensity of development. Clearing, grading, and soil stockpiling activities associated with exploration and development actions could alter short term overland flow and natural groundwater recharge patterns."[5]

As we explained before, unconventional extraction methods such as hydraulic fracturing and horizontal drilling (hereinafter referred to as "fracking") requires the use of tremendous amounts of freshwater. Typically between 2 and 5.6 million gallons of water are required to frack each well.[6] These volumes far exceed the amounts used in conventional natural gas development.[7] Such high levels of water use are unsustainable. Nevada is the driest state in the Union, and water is often in short supply, which makes this a highly controversial matter. Water used in large quantities may lead to several kinds of critically harmful environmental impacts. The extraction of water for fracking can, for example, lower the water table, affect biodiversity, harm local ecosystems, and reduce water available to communities.[8]

However, BLM's generic analysis resulted in the arbitrary conclusion that although "potential exploration and development would likely result in additional water diversion" and "surface water quality could be affected by development," the "incremental increase in these impacts is small when compared to the level of impacts that already exist in the sub-basins as described above in the Affected Environment section. With the relatively small amount of surface disturbance associated with the RFD and through the implementation of site-specific mitigation measures, COAs, and BMPs, the incremental cumulative impacts on water quality and quantity, in combination with past and present actions and RFFAs, would not be significant. This has been confirmed from past experience."[9]

The claim that "the incremental increase in these impacts is small when compared to the level of impacts that already exist in the sub-basins" is not a convincing basis for a finding of no significant impact. The argument that greater impacts already exist does not negate the potential impacts of leasing the parcels at issue.

Furthermore, "the relatively small amount of surface disturbance associated with the RFD" is based on "historic information" which apparently does not take into account the recent sharp increase in leasing nominations and initial instances of fracking use in Nevada.[10] BLM

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[5] EA at 51.
[6] U.S. Government Accountability Office, Unconventional Oil and Gas Development – Key Environmental and Public Health Requirements at 17, GAO 12-874 (2012), http://www.gao.gov/products/GAO-12-874.
[7] *See* Clark, Corrie E. et al., Life Cycle Water Consumption for Shale Gas and Conventional Natural Gas, Environ. Sci. Technol., 2013, 47 (20), pp 11829–11836, abstract available at http://pubs.acs.org/doi/abs/10.1021/es4013855.
[8] International Energy Agency, Golden Rules for the Golden Age of Gas at 31-32 (2012).
[9] EA at 105.
[10] *See* BLM Nevada, 2015 and 2016 Expressions of Interest, *available at* *http://www.blm.gov/nv/st/en/prog/minerals/leasable_minerals/oil___gas/oil_and_gas_leasing.*html; Jeff DeLong, "Fracking Hits Home in Nevada," *Reno Gazette-Journal* (April 15, 2014)

should have considered in its EA the increased industry interest in Nevada oil and gas, and the potential for drilling levels to increase, should oil prices rise or well stimulation techniques change the production potential of Nevada hydrocarbon-bearing formations. By methods which are unclear, BLM approximates in the RFD developed for this lease sale EA a maximum of 25 "exploration wells" drilled within the parcels in the Battle Mountain District and no "production wells."[11] However, this is nonsense as there are no such things as exploration-only permits that preclude production. BLM does not sell leases that are limited to exploration. The leases for auction are for oil and gas production. BLM's conclusion that there are no significant impacts is erroneous or otherwise arbitrary and capricious, which shows that BLM failed to take a hard look at the issues that NEPA requires.

iii. BLM Violated its Statutory Duty to Prepare an Environmental Impact Statement ("EIS") under NEPA.

"[T]o prevail on a claim that the agency violated its statutory duty to prepare an EIS, a plaintiff need not show that significant effects will in fact occur. It is enough for the plaintiff to raise substantial questions whether a project may have a significant effect on the environment." Ctr. for Biological Diversity & Sierra Club v. BLM, 937 F. Supp. 2d 1140, 1154 (N.D. Cal. 2013). The significance of the impact of the proposed action depends on both the context of the action as well as the intensity. Id.

We noted in our comments on the PEA the environmental harms that may result from unconventional methods used by the industry to extract oil and gas, including hydraulic fracturing and horizontal drilling, as well as concerns relating to climate change. BLM has asserted either the issues went beyond the scope of the EA or that BLM was not required to look at these issues until it received an APD proposal from the industry. As we have already explained above, this is unlawful. The impact of fracking alone raises substantial questions on whether the proposed project may have significant effects on the environment. Additionally, we raised several highly controversial issues in our comments on the PEA which BLM still has not considered, and which we expand upon below. BLM therefore has a duty to prepare an EIS on the issues required by NEPA, including the issues we raised in scoping and in commenting on the EA.

B. BLM Failed to Take a Hard Look at any of the Potential Impacts of the Proposed Action Raised in our February 5, 2016 Comment Letter

As BLM has not provided any environmental review of the parcels at issue or any site-specific analysis of the potential environmental impacts from the proposed action, we incorporate by reference herein our comments on the PEA, which discuss BLM's failure to take a hard look at the foreseeable impacts from the lease sale, oil and gas development, and the use of hydraulic fracking technologies. In particular, BLM failed to take a hard look at the potential impacts of the proposed action on water resources, air quality, climate change, human health and safety, seismicity, and sensitive species of plants and wildlife. We expand upon the following issues:

[11] EA at 34.

i. BLM does not Consider Potential Impacts to Greater Sage-Grouse Populations and Habitat in the EA

The greater sage-grouse is a BLM sensitive species. In September 2015, all BLM resource management plans for Nevada and Northeastern California, including Battle Mountain, were amended as part of an effort to secure adequate regulatory mechanisms to prevent the listing of the greater sage-grouse under the Endangered Species Act.[12] Because oil and gas development and associated infrastructure has numerous well-documented adverse effects on GRSG survival, breeding, and behavior, these plan amendments prescribe management measures for BLM-permitted activities, including oil and gas leasing, within various categories (Sagebrush Focal Areas ("SFAs"), Priority Habitat Management Areas ("PHMAs"), General Habitat Management Areas ("GHMAs") and Other Habitat Management Areas ("OHMAs")) of sage-grouse habitat,[13] and prescribed stipulations for all new fluid mineral leases within those designated habitats.[14]

Given the significance of the potential impacts that oil and gas development could have on the species, proper investigation here is crucial. BLM is required under NEPA to collect data particular to the region affected by the leases.[15] Summarizing general data about greater sage-grouse before dismissing the issue as insignificant does not provide the "hard look" that NEPA requires.[16] We pointed out in our previous comment letter that the Preliminary EA contained only the most cursory mention of the presence of greater sage-grouse within the Battle Mountain District and requested discussion of the impacts of oil and gas development on the species, its behavior, survival, and persistence.[17] The Final EA, however, includes three sentences providing only very general information about where greater sage-grouse "are known to occur," and no discussion of the specific concerns relating to the species in the areas to be leased here. BLM then concludes that:

> The proposed action is also in conformance with the 2015 Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment (ARMPA). The management direction for mineral resources under the heading Unleased Fluid Minerals states, MD MR 1: Review Objective SSS 4 and apply MDs SSS 1 through SSS 4 when reviewing and analyzing projects and activities proposed in GRSG habitat.
>
> Specifically, it is in conformance with MD SSS-1:

[12] See BLM, Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment (Sept. 2015) ("NV/NE CA RMPA").
[13] NV/NE CA RMPA at 2-29 to 2-30.
[14] NV/NE CA RMPA Appendix G.
[15] See Center. for Biological Diversity, 937 F. Supp. 2d at 1159 (Preparation of an EIS "is mandated where uncertainty may be resolved by further collection of data, or where collection of such data may prevent speculation on potential effects.").
[16] Id. (Held BLM did not provide the "hard look" that NEPA requires because it "never collected any data particular to the region affected by the leases, instead opting to summarize general data.").
[17] Center for Biological Diversity EA Comments for the June 2016 Competitive Oil and Gas Lease Sale, Battle Mountain District, February 5, 2016.

"In PHMAs and GHMAs, work with the proponent/applicant, whether in accordance with a valid existing right or not, and use the following screening criteria to avoid effects of the proposed human activity on GRSG habitat."[18]

It is not sufficient to merely state that the proposed action is in conformance with an RMP that covers two states. Even assuming for the sake of argument that the plan amendments may, across the entire two-state region, mitigate some adverse impacts to greater sage-grouse, they do not, and cannot, assess the immediate impacts on local, site-dependent breeding populations from a particular set of leases.

The EA could have, and should have, provided site-specific analysis based on information regarding the greater-sage population and habitat in or surrounding the area to be leased that may be affected by the oil and gas development on these parcels.[19] It could also have disclosed the substantive science regarding effects of oil and gas development on greater sage-grouse, including discussion of the need for buffers around leks, nesting areas, and winter range. BLM admits that the parcels are within 3.1 miles of leks, and then vaguely promises that BLM will "work with the proponent/applicant" but provides absolutely no information as to what that, practically speaking, entails. A vague assertion that BLM will "work with the proponent/applicant" provides neither a clear and binding lease condition, nor any reasonable basis for assessing the localized impacts of infrastructure and activity on particular lease parcels. Although it is possible that some lease parcels might contain topographic or other features that could allow for mitigation of adverse affects through particularized siting, BLM cannot reasonably make such a determination because the EA does not take a look at any of these site-specific considerations.

BLM's conclusion of no significant impact is based on the unreasonable lack of consideration of how fracking could impact the population and habitat of the GRSG on and surrounding the parcels that are being offered for lease sale, and is therefore arbitrary and capricious.

ii. BLM does not Consider Potential Impacts to Any of the Other Sensitive Species in the EA

In our previous comment letter, we identified in particular several sensitive species occurring on the parcels for lease, including:

- Big Smokey Valley speckled dace, which occur on Parcels NV-16-06-031, -032, and -033;
- Big Smokey Valley tui chub, which occur on Parcels NV-16-06-003, -031, -032, and -033;
- Big Smokey Valley wood nymph, which occur on Parcels NV-16-06-024, -030, and -031;
- Currant milkvetch, which occur on Parcel NV-16-06-072;
- Pallid skipper, which occur on Parcels NV-16-06-030 and -031;

[18] EA at 12.
[19] See Center for Biological Diversity, Map of Greater Sage-Grouse Habitat within 3.1 Miles of Lease Sale Parcels.

- Beatley buckwheat, which occur on the foothills leading out of marshy areas to the mountain bases

All of these species are characterized by the Nevada Natural Heritage Program as "critically imperiled and especially vulnerable to extinction or extirpation due to extreme rarity, imminent threats." As such they should be surveyed for before any ground disturbing activities and protected with appropriate stipulations.

Neither the Final EA nor BLM's response to our comments address our concerns raised with respect to these species. BLM failed to provide any analysis of the foreseeable impacts to these populations or wildlife resources. Instead, BLM argues in its response that:

> Special Status and Sensitive Species were addressed in both chapter 3 of the EA and also in Appendix B, where there are stipulations to protect the species in the event a parcel is leased and an APD is received.
>
> Issuance of an oil and gas lease does not authorize operations on the lease. The possibility or nature of lease development operations cannot be reasonably determined at the leasing stage, nor can impacts realistically be analyzed in more detail at this time. If a lease is issued and development proposed, additional permits will be submitted to the BLM and analyzed in a site specific NEPA document, which will address resource concerns. The impacts to local communities will be analyzed at that time.

EA, Appendix H, at 251

Chapter 3 of the EA and Appendix B do not contain any convincing statement of reasons as to why the potential impacts are insignificant. Rather BLM's argument assumes that the act of leasing is merely administrative paperwork and that BLM is not required to address any resource concerns until the lease is already issued and development proposed. The stipulations BLM relies upon to protect these imperiled species will not allow BLM to deny drilling rights. The courts have already explained this. See Center for Biological Diversity, 937 F. Supp. 2d at 1153 ("[A]lthough BLM retains authority to enforce existing laws to protect T&E species, BLM does not retain absolute authority to preclude any surface disturbing activities that do not protect T&E species.").

As we explained in prior comments, the expansion of oil and gas development activities will harm wildlife through habitat destruction and fragmentation, stress and displacement caused by development-related activities (e.g., construction and operation activities, truck traffic, noise and light pollution), surface water depletion leading to low stream flows, water and air contamination, introduction of invasive species, and climate change. These harms can result in negative health effects and population declines. Studies and reports of observed impacts to wildlife from unconventional oil and gas extraction activities are summarized in the Center's "Review of Impacts of Oil and Gas Exploration and Development on Wildlife," submitted

prior.[20] Because the allowance of destructive oil and gas extraction runs contrary to BLM's policy of managing resources in a manner that will protect the quality of ecological values and provide habitat for wildlife, [21] a no-fracking alternative minimizing industrial development and its harmful effects on wildlife must be considered. At the very least, BLM must take a hard look at the imminent threats to the critically imperiled species in the area before dismissing the proposed action as "not a significant federal action."

iii. BLM Must Consider Long-Term Impacts of Oil Infrastructure on Pronghorn

The final EA improperly discounts foreseeable impacts to pronghorn antelope found in the lease area by erroneously assuming both minimal development and a lack of long-term behavioral and population impacts from the oil infrastructure and continuing activity that would remain in place following initial drilling. The EA asserts:

> Direct and indirect effects on specific wildlife species cannot be determined until site specific project proposals are analyzed at the Application for Permit to Drill (APD) stage of development. In general, mammals such as pronghorn antelope would avoid and move away from oil drilling activities. Based on the Reasonable Future Development scenario, oil and gas exploration and production activities are expected to disturb a total of 100 acres over the course of a ten year period. These activities are temporary in nature and wildlife would move back into the area after successful reclamation.[22]

These assumptions are untenable for several significant reasons. First, BLM ignores the well-established scientific evidence that pronghorn avoidance of oil and gas activity and infrastructure can have effects on migration, seasonal nutrition, and reproductive success. For example, the Jonah and PAPA (Pinedale Anticline Project Area) gas fields occur in the wintering home range of the pronghorn — the country's longest terrestrial migrant. The habitat choices of female pronghorn demonstrated a fivefold decrease in the use of high-quality habitat patches and the abandonment of areas with the greatest habitat loss and industrial footprint. These results indicate a decline in the availability of high-quality habitat for pronghorn due to the behavioral impacts of habitat alteration associated with gas field development.[23]

Second, BLM unreasonably assumes, without citing any evidence, that "successful reclamation" of pronghorn habitats is both possible and assured. The EA asserts that "Reclamation includes removal of all manmade objects and restoration of surface disturbance."[24] It offers no specific reclamation standards or evidence, however, that such reclamation can or will actually restore

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[20] *See* Center for Biological Diversity, Review of Impacts of Oil and Gas Exploration and Development on Wildlife (June 20, 2015). This review presents the findings of numerous studies and reports on the impacts of hydraulic fracturing on wildlife.
[21] 43 U.S. Code § 1701(a)(8).
[22] EA at 47.
[23] Beckmann, J.P., K. Murray, R.G. Seidler, and J. Berger. (2012). Human-mediated shifts in animal habitat use: Sequential changes in pronghorn use of a natural gas field in Greater Yellowstone. Biological Conservation 147(1): 222-3
[24] EA at 24.

usable vegetation or habitat function for wildlife species including pronghorn. Moreover, the EA's claims regarding reclamation stem from the untenable assumption, discussed above, that leasing will result only in 20 exploratory wells and no-long term production. Because the act of leasing authorizes much higher levels of development, for a period as long as the wells are held by production, BLM must consider the full effects, including the long-term impacts of only partial reclamation should lessees elect to operate producing wells.

C. BLM Must End All New Fossil Fuel Leasing and Hydraulic Fracturing.

BLM argues that it is required by law to "consider" leasing areas that have been nominated for leasing if leasing is in conformance with the BLM LUP. However, as BLM states and we agree, "[i]f there are known resource conflicts that cannot be addressed using a stipulation, then the parcel may be deferred until the known resource conflict is resolved." In this case, BLM has already demonstrated and exercised its authority to ban leasing by permanently removing from future lease sales several parcels due to resource conflicts. [25] In our comment letter we raised several more conflicts that require these parcels be deferred until such conflicts are resolved.

For one, and as we have already explained, climate change is a problem of global proportions resulting from the cumulative greenhouse gas emissions of countless individual sources. A comprehensive look at the impacts of fossil fuel extraction, and especially fracking, across all of the planning areas affected by the leases in updated RMPs is absolutely necessary. BLM has *never* thoroughly considered the cumulative climate change impacts of *all* potential fossil fuel extraction and fracking (1) within each of the planning areas, (2) across the state, and (3) across all public lands. Proceeding with new leasing proposals *ad hoc* in the absence of a comprehensive plan that addresses climate change and fracking is premature and risks irreversible damage before the agency and public have had the opportunity to weigh the full costs of oil and gas and other fossil fuel extraction and consider necessary limits on such activities. Therefore BLM must defer all new leasing at least until the issue is adequately analyzed in a programmatic review of all U.S. fossil fuel leasing, or at least within amended RMPs. BLM's argument, in response to our comments, that a permanent cessation of leasing would require RMP amendment beyond the scope of the leasing decision ignores the established principle that agencies are obligated to consider all reasonable alternatives. Considering a no-leasing alternative would allow the agency to preserve the status quo and avoid irretrievable commitment of resources until such time as it can consider the regional and national impacts of fossil fuel leasing and undertake appropriate land use plan amendments or other actions.

i. BLM Must Limit Greenhouse Gas Emissions By Keeping Federal Fossil Fuels In the Ground

Expansion of fossil fuel production will substantially increase the volume of greenhouse gases emitted into the atmosphere and jeopardize the environment and the health and well being of future generations. BLM's mandate to ensure "harmonious and coordinated management of the various resources *without permanent impairment of the productivity of the land and the*

[25] EA at 14.

quality of the environment" requires BLM to limit the climate change effects of its actions.[26] Keeping all unleased fossil fuels in the ground and banning fracking and other unconventional well stimulation methods would lock away millions of tons of greenhouse gas pollution and limit the destructive effects of these practices.

A ban on new fossil fuel leasing and fracking is necessary to meet the U.S.'s greenhouse gas reduction commitments. On December 12, 2015, 197 nation-state and supra-national organization parties meeting in Paris at the 2015 United Nations Framework Convention on Climate Change Conference of the Parties consented to an agreement (Paris Agreement) committing its parties to take action so as to avoid dangerous climate change.[27] As the Paris Agreement opens for signature in April 2016[28] and the United States is expected to sign the treaty[29] as a legally binding instrument through executive agreement,[30] the Paris Agreement commits the United States to critical goals—both binding and aspirational—that mandate bold action on the United States' domestic policy to rapidly reduce greenhouse gas emissions.[31]

The United States and other parties to the Paris Agreement recognized "the need for an effective and progressive response to the urgent threat of climate change on the basis of the best available scientific knowledge."[32] The Paris Agreement articulates the practical steps necessary to obtain its goals: parties including the United States have to "reach global peaking of greenhouse gas emissions *as soon as possible* . . . and to *undertake rapid reductions* thereafter in accordance *with best available science*,"[33] imperatively commanding that developed countries specifically "should continue taking the lead by undertaking economy-wide absolute emission reduction targets"[34] and that such actions reflect the "highest possible ambition."[35]

The Paris Agreement codifies the international consensus that climate change is an "urgent threat" of global concern,[36] and commits all signatories to achieving a set of global goals. Importantly, the Paris Agreement commits all signatories to an articulated target to hold the long-term global average temperature "to *well below 2°C* above pre-industrial levels and to *pursue efforts to limit the temperature increase to 1.5°C* above pre-industrial levels"[37] (emphasis added).

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[26] *See* 43 U.S.C. §§ 1701(a)(7), 1702(c), 1712(c)(1), 1732(a) (emphasis added); *see also id*. § 1732(b) (directing Secretary to take any action to "prevent unnecessary or undue degradation" of the public lands).
[27] U.N. Framework Convention on Climate Change, Paris Agreement ("Paris Agreement"), Art. 2.
[28] Paris Agreement, Art. 20(1).
[29] For purposes of this Petition, the term "treaty" refers to its international law definition, whereby a treaty is "an international law agreement concluded between states in written form and governed by international law" pursuant to article 2(a) of the Vienna Convention on the Law of Treaties, 1155 U.N.T.S. 331, 8 I.L.M. 679 (Jan. 27, 1980).
[30] *See* U.S. Department of State, Background Briefing on the Paris Climate Agreement, (Dec. 12, 2015), http://www. state.gov/ r/pa/prs/ps/2015/12/250592.htm.
[31] Although not every provision in the Paris Agreement is legally binding or enforceable, the U.S. and all parties are committed to perform the treaty commitments in good faith under the international legal principle of *pacta sunt servanda* ("agreements must be kept"). Vienna Convention on the Law of Treaties, Art. 26.
[32] *Id.*, Recitals.
[33] *Id.*, Art. 4(1).
[34] *Id.*, Art. 4(4).
[35] *Id.*, Art. 4(3).
[36] *Id.*, Recitals.
[37] *Id.*, Art. 2.

In light of the severe threats posed by even limited global warming, the Paris Agreement established the international goal of limiting global warming to 1.5°C above pre-industrial levels in order to "prevent dangerous anthropogenic interference with the climate system," as set forth in the UNFCCC, a treaty which the United States has ratified and to which it is bound.[38] The Paris consensus on a 1.5°C warming goal reflects the findings of the IPCC and numerous scientific studies that indicate that 2°C warming would exceed thresholds for severe, extremely dangerous, and potentially irreversible impacts.[39] Those impacts include increased global food and water insecurity, the inundation of coastal regions and small island nations by sea level rise and increasing storm surge, complete loss of Arctic summer sea ice, irreversible melting of the Greenland ice sheet, increased extinction risk for at least 20-30% of species on Earth, dieback of the Amazon rainforest, and "rapid and terminal" declines of coral reefs worldwide.[40] As scientists noted, the impacts associated with 2°C temperature rise have been "revised upwards, sufficiently so that 2°C now more appropriately represents the threshold between 'dangerous' and 'extremely dangerous' climate change."[41] Consequently, a target of 1.5 ºC or less temperature rise is now seen as essential to avoid dangerous climate change and has largely supplanted the 2°C target that had been the focus of most climate literature until recently.

Immediate and aggressive greenhouse gas emissions reductions are necessary to keep warming below a 1.5º or 2°C rise above pre-industrial levels. Put simply, there is only a finite amount of CO_2 that can be released into the atmosphere without rendering the goal of meeting the 1.5°C target virtually impossible. A slightly larger amount could be burned before meeting a 2°C became an impossibility. Globally, fossil fuel reserves, if all were extracted and burned, would release enough CO_2 to exceed this limit several times over.[42]

The question of what amount of fossil fuels can be extracted and burned without negating a realistic chance of meeting a 1.5 or 2°C target is relatively easy to answer, even if the answer is

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[38] *See* U.N. Framework Convention on Climate Change, Cancun Agreement. Available at http://cancun.unfccc.int/ (last visited Jan 7, 2015); United Nations Framework Convention on Climate Change, Copenhagen Accord. Available at http://unfccc.int/meetings/copenhagen_dec_2009/items/5262.php (last accessed Jan 7, 2015). The United States Senate ratified the UNFCC on October 7, 1992. *See* https://www.congress.gov/treaty-document/102nd-congress/38.

[39] *See* Paris Agreement, Art. 2(1)(a); U); U.N. Framework Convention on Climate Change, Subsidiary Body for Scientific and Technical Advice, Report on the structured expert dialogue on the 2013-15 review, No. FCCC/SB/2015/INF.1 at 15-16 (June 2015);IPCC AR5 Synthesis Report at 65 & Box 2.4.

[40] *See* Jones, C. et al, Committed Terrestrial Ecosystem Changes due to Climate Change, 2 Nature Geoscience 484, 484–487 (2009); Smith, J. B. *et al.*, Assessing Dangerous Climate Change Through an Update of the Intergovernmental Panel on Climate Change (IPCC) 'Reasons for Concern', 106 Proceedings of the National Academy of Sciences of the United States of America 4133, 4133–37 (2009); Veron, J. E. N. *et al.*, The Coral Reef Crisis: The Critical Importance of <350 ppm CO2, 58 Marine Pollution Bulletin 1428, 1428–36, (2009); Warren, R. J. *et al.*, Increasing Impacts of Climate Change Upon Ecosystems with Increasing Global Mean Temperature Rise, 106 Climatic Change 141–77 (2011); Hare, W. W. *et al.*, Climate Hotspots: Key Vulnerable Regions, Climate Change and Limits to Warming, 11 Regional Environmental Change 1, 1–13 (2011); Frieler, K. M. *et al.*, Limiting Global Warming to 2ºC is Unlikely to Save Most Coral Reefs, Nature Climate Change, Published Online (2013) doi: 10.1038/NCLIMATE1674; M. Schaeffer *et al.*, Adequacy and Feasibility of the 1.5°C Long-Term Global Limit, Climate Analytics (2013).

[41] Anderson, K. and A. Bows, Beyond 'Dangerous' Climate Change: Emission Scenarios for a New World, 369 Philosophical Transactions, Series A, Mathematical, Physical, and Engineering Sciences 20, 20–44 (2011).

[42] Cimons, M., Keep It In the Ground 6 (Sierra Club *et al.*, Jan. 25, 2016).

framed in probabilities and ranges. The IPCC Fifth Assessment Report and other expert assessments have established global carbon budgets, or the total amount of remaining carbon that can be burned while maintain some probability of staying below a given temperature target. According to the IPCC, total cumulative anthropogenic emissions of CO_2 must remain below about 1,000 gigatonnes ($GtCO_2$) from 2011 onward for a 66% probability of limiting warming to 2°C above pre-industrial levels.[43] Given more than 100 $GtCO_2$ have been emitted since 2011,[44] the remaining portion of the budget under this scenario is well below 900 $GtCO_2$. To have an 80% probability of staying below the 2°C target, the budget from 2000 is 890 $GtCO_2$, with less than 430 $GtCO_2$ remaining.[45]

To have even a 50% probability of achieving the Paris Agreement goal of limiting warming to 1.5°C above pre-industrial levels equates to a carbon budget of 550-600 $GtCO_2$ from 2011 onward, [46] of which more than 100 $GtCO_2$ has already been emitted. To achieve a 66% probability of limiting warming to 1.5°C requires adherence to a more stringent carbon budget of only 400 $GtCO_2$ from 2011 onward, [47] of which less than 300 $GtCO_2$ remained at the start of 2015. An 80% probability budget for 1.5°C would have far less that 300 $GtCO_2$ remaining. Given that global CO_2 emissions in 2014 alone totaled 36 $GtCO_2$,[48] humanity is rapidly consuming the remaining burnable carbon budget needed to have even a 50/50 chance of meeting the 1.5°C temperature goal.[49]

According to a recent report by EcoShift Consulting commissioned by the Center and Friends of the Earth, unleased (and thus unburnable) federal fossil fuels represent a significant source of potential greenhouse gas emissions:

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[43] IPCC, 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change; Summary for Policymakers at 27; IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at 64 & Table 2.2 [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)] at 63-64 & Table 2.2 ("IPCC AR5 Synthesis Report").

[44] From 2012-2014, 107 GtCO2 was emitted (*see* Annual Global Carbon Emissions at http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html).

[45] Carbon Tracker Initiative, Unburnable Carbon – Are the world's financial markets carrying a carbon bubble? available at http://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf; Meinshausen, M. *et al.*, Greenhouse gas emission targets for limiting global warming to 2 degrees Celsius, 458 Nature 1158, 1159 (2009).

[46] Intergovernmental Panel on Climate Change, Climate Change 2014: Synthesis Report, Summary for Policy Makers IPCC Fifth Assessment Synthesis Report, 18 (2014), available at http://ar5-syr.ipcc.ch/ipcc/ipcc/resources/pdf/IPCC_SynthesisReport.pdf.

[47] *Id.*

[48] *See* Global Carbon Emissions, http://co2now.org/Current-CO2/CO2-Now/global-carbon-emissions.html

[49] In addition to limits on the *amount* of fossil fuels that can be utilized, emissions pathways compatible with a 1.5 or 2°C target also have a significant temporal element. Leading studies make clear that to reach a reasonable likelihood of stopping warming at 1.5° or even 2°C, global CO2 emissions must be phased out by mid-century and likely as early as 2040-2045. *See, e.g.* Joeri Rogelj *et al.*, Energy system transformations for limiting end-of-century warming to below 1.5°C, 5 Nature Climate Change 519, 522 (2015). United States focused studies indicate that we must phase out fossil fuel CO2 emissions even earlier—between 2025 and 2040—for a reasonable chance of staying below 2ºC. *See, e.g.* Climate Action Tracker, http://climateactiontracker.org/countries/usa. Issuing new legal entitlements to explore for and extract federal fossil fuels for decades to come is wholly incompatible with such a transition.

- Potential GHG emissions of federal fossil fuels (leased and unleased) if developed would release up to 492 gigatons (Gt) (one gigaton equals 1 billion tons) of carbon dioxide equivalent pollution (CO2e); representing 46 percent to 50 percent of potential emissions from all remaining U.S. fossil fuels.
- Of that amount, up to 450 Gt CO2e have not yet been leased to private industry for extraction;
- Releasing those 450 Gt CO2e (the equivalent annual pollution of more than 118,000 coal-fired power plants) would be greater than any proposed U.S. share of global carbon limits that would keep emissions below scientifically advised levels.

Fracking has also opened up vast reserves that otherwise would not be available, increasing the potential greenhouse gas emissions that can be released into the atmosphere. BLM must consider a ban on this dangerous practice and a ban on new leasing to prevent the worst effects of climate change.

Based on our review and analysis of the BLM's proposed lease sale parcels, recoverable oil and gas volumes in BLM's EPCA Phase III inventory, and life-cycle greenhouse gas emissions models developed by EcoShift consulting, the proposed lease sale would make available for extraction and combustion the equivalent of approximately 419,983 tons CO_2.[50] Despite the availability of this BLM data, the EA makes no effort whatsoever to calculate the full climate impacts of leasing[51] – impacts that must include not just on-site emissions from development, but the full life-cycle emissions of processing, transporting, and ultimately burning the oil. Over a ten-year lease term, the emissions of full development of the recoverable reserves proposed for lease would greatly exceed the EPA and CEQ significance threshold of 25,000 tons/year CO_2e. requiring quantitative analysis.[52] Because the lease sale is the final decision-making point at which BLM can avoid irretrievably conveying a right to extract oil and gas, it is impermissible to consider only the effects of 20 exploratory wells. Instead, BLM must consider and quantify now, prior to lease issuance, the full GHG impacts of irretrievable commitment to lease issuance.

ii. BLM Must Consider A Ban on New Oil and Gas Leasing and Fracking in a Programmatic Review and Halt All New Leasing and Fracking in the Meantime.

Development of unleased oil and gas resources will fuel climate disruption and undercut the needed transition to a clean energy economy. As BLM has not yet had a chance to consider

[50] Oil and gas volume estimates were generated in a geographic information system by clipping technically recoverable oil and gas volumes in the Bureau of Land Management's EPCA Phase III spatial data with lease parcel boundaries provided by Bureau of Land Management. Potential lifecycle greenhouse gas emissions for resultant oil and gas volumes were generated using a carbon calculator and lifecycle greenhouse gas emissions models developed by EcoShift consulting. Methods for those models are described in the report. *See* EcoShift Consulting et al., The Potential Greenhouse Gas Emissions of U.S. Federal Fossil Fuels (Aug. 2015), available at http://www.ecoshiftconsulting.com/wp-content/uploads/Potential-Greenhouse-Gas-Emissions-U-S-Federal-Fossil-Fuels.pdf.

[51] *See* EA at 36-37.

[52] *See* Council on Environmental Quality, Draft Guidance on Consideration of Greenhouse Gas Emissions 18 (Dec. 2014).

no leasing and no-fracking alternatives as part of any of its RMP planning processes or a comprehensive review of its federal oil and gas leasing program, BLM should suspend new leasing until it properly considers this alternative in updated RMPs or a programmatic EIS for the entire leasing program. BLM demonstrably has tools available to consider the climate consequences of its leasing programs, and alternatives available to mitigate those consequences, at either a regional or national scale.[53]

BLM would be remiss to continue leasing when it has never stepped back and taken a hard look at this problem at the programmatic scale. Before allowing more oil and gas extraction in the planning area, BLM must: (1) comprehensively analyze the total greenhouse gas emissions which result from past, present, and potential future fossil fuel leasing and all other activities across all BLM lands and within the various planning areas at issue here, (2) consider their cumulative significance in the context of global climate change, carbon budgets, and other greenhouse gas pollution sources outside BLM lands and the planning area, and (3) formulate measures that avoid or limit their climate change effects. By continuing leasing and allowing new fracking in the absence of any overall plan addressing climate change BLM is effectively burying its head in the sand.

A programmatic review and moratorium on new leasing would be consistent with the Secretary of Interior's recent order to conduct a comprehensive, programmatic EIS (PEIS) on its coal leasing program, in light of the need to take into account the program's impacts on climate change, among other issues, and "the lack of any recent analysis of the Federal coal program as a whole." *See* Secretary of Interior, Order No. 3338, § 4 (Jan. 15, 2016). Specifically, the Secretary directed that the PEIS "should examine how best to assess the climate impacts of continued Federal coal production and combustion and how to address those impacts in the management of the program to meet both the Nation's energy needs and its climate goals, as well as how best to protect the public lands from climate change impacts." Id. § 4(c).

The Secretary also ordered a moratorium on new coal leasing while such a review is being conducted. The Secretary reasoned:

> Lease sales and lease modifications result in lease terms of 20 years and for so long thereafter as coal is produced in commercial quantities. Continuing to conduct lease sales or approve lease modifications during this programmatic review risks locking in for decades the future development of large quantities of coal under current rates and terms that the PEIS may ultimately determine to be less than optimal. This risk is why, during the previous two programmatic reviews, the Department halted most lease sales with limited exceptions…. Considering these factors and given the extensive recoverable reserves of Federal coal currently under lease, I have decided that a similar policy is warranted here. A pause on leasing, with limited exceptions, will allow future leasing decisions to

[53] *See, e.g.*, BLM Montana, North Dakota and South Dakota, Climate Change Supplementary Information Report (updated Oct. 2010) (conducting GHG inventory for BLM leasing in Montana, North Dakota and South Dakota); BLM, Proposed Rule: Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. 6615 (Feb. 8, 2016) (proposing BLM-wide rule for prevention of methane waste).

> benefit from the recommendations that result from the PEIS while minimizing any economic hardship during that review.

Id. § 5.

The Secretary's reasoning is also apt here. A programmatic review assessing the climate change effects of public fossil fuels is long overdue. And there is no shortage of oil and gas that would preclude a moratorium while such a review is conducted, as evidenced by very low natural oil and gas prices. More importantly, BLM should not "risk[] locking in for decades the future development of large quantities of [fossil fuels] under current…terms that a [programmatic review] may ultimately determine to be less than optimal." Id. BLM should cancel the sale and halt all new leasing and fracking until a programmatic review is completed.

BLM claims that in order to halt all leasing, it would have to amend the "current" RMPs through a public process which is beyond the scope of the EA. The Shoshone-Eureka RMP is 30 years old – it should have expired and been replaced with an amended RMP many years ago. The 1997 Tonopah RMP, which states that it "will guide management for the next 10-20 years," is similarly due for a replacement. Nevertheless, BLM is only required to "consider" leasing of areas that have been nominated for lease. As BLM explained in its EA, "[i]f there are known resource conflicts that cannot be addressed using a stipulation, then the parcel may be deferred until the known resource conflict is resolved."

iii. BLM Must Study the Greenhouse Gas Impacts of New Leasing

As explained in the Center's comment PEA, social cost of carbon analysis is an appropriate tool for analyzing the cumulative impacts of greenhouse gas emissions, which the EA inexplicably fails to perform and BLM's response to comments fails to address. The effects of cumulative greenhouse gas emissions will have far-reaching impacts on natural and social systems, but the EA fails to provide any meaningful analysis of the proposed action's contribution to these effects.

1. *The effects of cumulative GHG emissions will inflict extraordinary harm to natural systems and communities*

The Paris Agreement codified the international consensus that the climate crisis is an urgent threat to human societies and the planet, with the parties recognizing that:

> Climate change represents an *urgent and potentially irreversible threat to human societies and the planet* and thus requires the widest possible cooperation by all countries, and their participation in an effective and appropriate international response, with a view to accelerating the reduction of global greenhouse gas emissions.[54]

Numerous authoritative scientific assessments have established that climate change is causing grave harms to human society and natural systems, and these threats are becoming

[54] Paris Agreement, Decision, Recitals. (emphasis added)

increasingly dangerous. The Intergovernmental Panel on Climate Change (IPCC), in its 2014 Fifth Assessment Report, stated that: "Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased" and that "[r]ecent climate changes have had widespread impacts on human and natural systems."[55]

The 2014 Third National Climate Assessment, prepared by a panel of non-governmental experts and reviewed by the National Academy of Sciences and multiple federal agencies similarly stated that "That the planet has warmed is 'unequivocal,' and is corroborated though multiple lines of evidence, as is the conclusion that the causes are very likely human in origin"[56] and "[i]mpacts related to climate change are already evident in many regions and are expected to become increasingly disruptive across the nation throughout this century and beyond."[57] The United States National Research Council similarly concluded that: "[c]limate change is occurring, is caused largely by human activities, and poses significant risks for—and in many cases is already affecting—a broad range of human and natural systems."[58]

The IPCC and National Climate Assessment further decisively recognize the dominant role of fossil fuels in driving climate change:

> While scientists continue to refine projections of the future, observations unequivocally show that climate is changing and that the warming of the past 50 years is primarily due to human-induced emissions of heat-trapping gases. These emissions come mainly from burning coal, oil, and gas, with additional contributions from forest clearing and some agricultural practices.[59]
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>
> CO_2 emissions from fossil fuel combustion and industrial processes contributed about 78% to the total GHG emission increase between 1970 and 2010, with a contribution of similar percentage over the 2000–2010 period (*high confidence*).[60]

These impacts ultimately emanating from the extraction and combustion of fossil fuels are harming the United States in myriad ways, with the impacts certain to worsen over the coming decades absent deep reductions in domestic and global GHG emissions. EPA recognized these threats in its 2009 Final Endangerment Finding under Clean Air Act Section 202(a),

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[55] IPCC AR5 Synthesis Report at 2.
[56] Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: Climate Change Impacts in the United States: The Third National Climate Assessment(U.S. Global Change Research Program). doi:10.7930/J0Z31WJ2 ("Third National Climate Assessment") at 61 (quoting IPCC, 2007:. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor, and H. L. Miller, Eds., Cambridge University Press, 1-18.).
[57] Third National Climate Assessment at 10.
[58] National Research Council, Advancing the Science of Climate Change (2010), available at www.nap.edu. ("Advancing the Science of Climate Change") at 2.
[59] Third National Climate Assessment at 2.
[60] IPCC AR5 Synthesis Report at 46.

concluding that greenhouse gases from fossil fuel combustion endanger public health and welfare: "the body of scientific evidence compellingly supports [the] finding" that "greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare."[61] In finding that climate change endangers public health and welfare, EPA has acknowledged the overwhelming evidence of the documented and projected effects of climate change upon the nation:

*Effects on air quality: "*The evidence concerning adverse air quality impacts provides strong and clear support for an endangerment finding. Increases in ambient ozone are expected to occur over broad areas of the country, and they are expected to increase serious adverse health effects in large population areas that are and may continue to be in nonattainment. The evaluation of the potential risks associated with increases in ozone in attainment areas also supports such a finding*."*[62]

*Effects on health from increased temperatures: "*The impact on mortality and morbidity associated with increases in average temperatures, which increase the likelihood of heat waves, also provides support for a public health endangerment finding*."*[63]

Increased chance of extreme weather events: "The evidence concerning how human induced climate change may alter extreme weather events also clearly supports a finding of endangerment, given the serious adverse impacts that can result from such events and the increase in risk, even if small, of the occurrence and intensity of events such as hurricanes and floods. Additionally, public health is expected to be adversely affected by an increase in the severity of coastal storm events due to rising sea levels."[64]

Impacts to water resources: "Water resources across large areas of the country are at serious risk from climate change, with effects on water supplies, water quality, and adverse effects from extreme events such as floods and droughts. Even areas of the country where an increase in water flow is projected could face water resource problems from the supply and water quality problems associated with temperature increases and precipitation variability, as well as the increased risk of serious adverse effects from extreme events, such as floods and drought. The severity of risks and impacts is likely to increase over time with accumulating greenhouse gas concentrations and associated temperature increases."[65]

Impacts from sea level rise: "The most serious potential adverse effects are the increased risk of storm surge and flooding in coastal areas from sea level rise and more intense storms. Observed sea level rise is already increasing the risk of storm surge and flooding in some coastal areas. The conclusion in the assessment literature that there is the potential for hurricanes to become more intense (and even some evidence that Atlantic hurricanes have already become more intense) reinforces the judgment that coastal communities are now endangered by human-induced climate change, and may face substantially greater risk in the future. Even if there is a

[61] Final Endangerment Finding, 74 Fed. Reg. at 66,497.
[62] *Id.*
[63] *Id.*
[64] *Id.* at 66,497-98.
[65] *Id.* at 66,498.

low probability of raising the destructive power of hurricanes, this threat is enough to support a finding that coastal communities are endangered by greenhouse gas air pollution. In addition, coastal areas face other adverse impacts from sea level rise such as land loss due to inundation, erosion, wetland submergence, and habitat loss. The increased risk associated with these adverse impacts also endangers public welfare, with an increasing risk of greater adverse impacts in the future."[66]

Impacts to energy, infrastructure, and settlements: "Changes in extreme weather events threaten energy, transportation, and water resource infrastructure. Vulnerabilities of industry, infrastructure, and settlements to climate change are generally greater in high-risk locations, particularly coastal and riverine areas, and areas whose economies are closely linked with climate-sensitive resources. Climate change will likely interact with and possibly exacerbate ongoing environmental change and environmental pressures in settlements, particularly in Alaska where indigenous communities are facing major environmental and cultural impacts on their historic lifestyles."[67]

Impacts to wildlife: "Over the 21st century, changes in climate will cause some species to shift north and to higher elevations and fundamentally rearrange U.S. ecosystems. Differential capacities for range shifts and constraints from development, habitat fragmentation, invasive species, and broken ecological connections will likely alter ecosystem structure, function, and services, leading to predominantly negative consequences for biodiversity and the provision of ecosystem goods and services."[68]

In addition to these acknowledged impacts on public health and welfare more generally, climate change is causing and will continue to cause serious impacts on natural resources that the Department of Interior is specifically charged with safeguarding.[69]

Impacts to Public Lands: Climate change is causing and will continue to cause specific impacts to public lands ecosystem services. Although public lands provide a variety of difficult-to-quantify public benefits, one recent Forest Service attempt at quantification estimates the public land ecosystem services at risk from climate change at between $14.5 and $36.1 billion annually.[70] In addition to the general loss of ecosystem services, irreplaceable species and aesthetic and recreational treasures are at risk of permanent destruction. High temperatures are causing loss of glaciers in Glacier National Park; the Park's glaciers are expected to disappear entirely by 2030, with ensuing warming of stream temperatures and adverse effects to aquatic ecosystems.[71] With effects of warming more pronounced at higher latitudes, tundra ecosystems on Alaska public lands face serious declines, with potentially serious additional climate

[66] *Id.*
[67] *Id.*
[68] *Id.*; *see also* Third National Climate Assessment at 195-219.
[69] *See* Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1701(a)(8), 1712(c)(1); Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. § 528; National Environmental Policy Act of 1969, 42 U.S.C. §§ 4331-4332.
[70] Esposito, Valerie et al., Climate Change and Ecosystem Services: The Contribution and Impacts on Federal Public Lands in the United States, USDA Forest Service Proceedings RMRS-P-64 at 155-164 (2011).
[71] U.S. Environmental Protection Agency, Climate Change and Public Lands (1999).

feedbacks from melting permafrost.[72] In Florida, the Everglades face severe ecosystem disruption from already-occurring saltwater incursion.[73] Sea level rise will further damage freshwater ecosystems and the endangered species that rely on them.

Impacts to Biodiversity and Ecosystems: Across the United States ecosystems and biodiversity, including those on public lands, are directly under siege from climate change—leading to the loss of iconic species and landscapes, negative effects on food chains, disrupted migrations, and the degradation of whole ecosystems.[74] Specifically, scientific evidence shows that climate change is already causing changes in distribution, phenology, physiology, genetics, species interactions, ecosystem services, demographic rates, and population viability: many animals and plants are moving poleward and upward in elevation, shifting their timing of breeding and migration, and experiencing population declines and extirpations.[75] Because climate change is occurring at an unprecedented pace with multiple synergistic impacts, climate change is predicted to result in catastrophic species losses during this century. For example, the IPCC concluded that 20% to 30% of plant and animal species will face an increased risk of extinction if global average temperature rise exceeds 1.5°C to 2.5°C relative to 1980-1999, with an increased risk of extinction for up to 70% of species worldwide if global average temperature exceeds 3.5°C relative to 1980-1999.[76]

In sum, climate change, driven primarily by the combustion of fossil fuels, poses a severe and immediate threat to the health, welfare, ecosystems and economy of the United States. These impacts are felt across the nation, including upon the public lands the Secretary of the Interior is charged with safeguarding. A rapid and deep reduction of emissions generated from fossil fuels is essential if such threats are to be minimized and their impacts mitigated.

2. *The EA ignores the social cost of carbon tool to analyze the cumulative contribution of increased oil and gas development on climate change*

[72] *See* National Climate Assessment at 48; MacDougall, A. H., et al., Significant contribution to climate warming from the permafrost carbon feedback, 5 Nature Geoscience 719-721 (2012), doi:10.1038/ngeo1573.
[73] *See* National Climate Assessment at 592; Foti, R., Met al., Signs of critical transition in the Everglades wetlands in response to climate and anthropogenic changes, 110 Proceedings of the National Academy of Sciences6296-6300, (2013), doi:10.1073/pnas.1302558110.
[74] National Climate Assessment at 13.
[75] *See* Parmesan, C. and G. Yohe, A globally coherent fingerprint of climate change impacts across natural systems, 421 Nature 37–42 (2003); Root, T. et al., Fingerprints of global warming on wild animals and plants, 421 Nature 57–60 (2003); Chen, I. et al., Rapid range shifts of species associated with high levels of climate warming, 333 Science 1024–1026 (2011).
[76] IPCC, 2007: Synthesis Report: An Assessment of the Intergovernmental Panel on Climate Change. Other studies have predicted similarly severe losses: 15%-37% of the world's plants and animals committed to extinction by 2050 under a mid-level emissions scenario, s*ee* Thomas et al., Extinction risk from climate change, 427 Nature 145–8 (2004)); the potential extinction of 10% to 14% of species by 2100 if climate change continues unabated, *see* Maclean, I. M. D. and R. J. Wilson, Recent ecological responses to climate change support predictions of high extinction risk, 108 Proceedings of the National Academy of Sciences of the United States of America 12337-12342 (2011); and the loss of more than half of the present climatic range for 58% of plants and 35% of animals by the 2080s under the current emissions pathway, in a sample of 48,786 species, *see* Warren, R. J. et al., Increasing Impacts of Climate Change Upon Ecosystems with Increasing Global Mean Temperature Rise, 106 Climatic Change 141–77 (2011).

As explained in the Center's comment on the PEA, although cost-benefit analysis is not necessarily the ideal or exclusive method for assessing contributions to an adverse effect as enormous, uncertain, and potentially catastrophic as climate change, BLM does have tools available to provide one approximation of external costs and has previously performed a "social cost of carbon" analysis in prior environmental reviews.[77] Its own internal memo identifies one available analytical tool: "For federal agencies the authoritative estimates of [social cost of carbon] are provided by the 2013 technical report of the Interagency Working Group on Social Cost of Carbon, which was convened by the Council of Economic Advisers and the Office of Management and Budget."[78] As explained in that report:

> The purpose of the "social cost of carbon" (SCC) estimates presented here is to allow agencies to incorporate the social benefits of reducing carbon dioxide (CO_2) emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions. The SCC is an estimate of the monetized damages associated with an incremental increase in carbon emissions in a given year. It is intended to include (but is not limited to) changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change.[79]

Further, other analytical tools exist to evaluate the cost of methane emissions.[80] EPA has peer reviewed and employed such a tool in its "Regulatory Impact Analysis of the Proposed Emission Standards for New and Modified Sources in the Oil and Natural Gas Sector."[81]

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[77] *See High Country Conserv'n Advocates v. United States Forest Serv.*, 2014 U.S. Dist. Lexis 87820 (D. Colo. 2014) (invalidating environmental assessment ["EA"] for improperly omitting social cost of carbon analysis, where BLM had included it in preliminary analysis); Taylor, P., "BLM crafting guidance on social cost of carbon -- internal memo," Greenwire, April 15, 2015, *available at* http://www.eenews.net/greenwire/stories/1060016810/; BLM Internal Memo from Assistant Director of Resources and Planning Ed Roberson ("Roberson Internal Memo"), April 2015, *available at* http://www.eenews.net/assets/2015/04/15/document_gw_01.pdf (noting "some BLM field offices have included estimates of the [social cost of carbon] in project-level NEPA documents") (accessed July 29, 2015); *see also* Council on Environmental Quality, Revised Draft Guidance for Greenhouse Gas Emissions and Climate Change Impacts, p. 18, *available at* www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/ghg-guidance (accessed Jul 29, 2015) (quantitative analysis required if GHGs > 25k tons/yr).

[78] BLM, Roberson Internal Memo.

[79] *See* Interagency Working Group on Social Cost of Carbon, United States Government, Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis - Under Executive Order 12866, May 2013, *available at* https://www.whitehouse.gov/sites/default/files/omb/inforeg/social_cost_of_carbon_for_ria_2013_update.pdf (accessed July 29, 2015); *see also* Interagency Working Group on Social Cost of Carbon, United States Government, Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, Feb. 2010, *available at* http://www.epa.gov/otaq/climate/regulations/scc-tsd.pdf (accessed July 29, 2015).

[80] *See* Marten A.L., Kopits K.A., Griffiths C.W., Newbold S.C., Wolverton A. 2014, online publication (2015, print publication). "Incremental CH4 and N2O mitigation benefits consistent with the US Government's SC-CO2 estimates," Climate Policy 15(2):272-298, abstract available at http://www.tandfonline.com/doi/abs/10.1080/14693062.2014.912981.

[81] *See* USEPA, Social Cost of Carbon, *available at* http://www3.epa.gov/climatechange/EPAactivities/economics/scc.html (noting application of social cost of methane supported by peer review); USEPA, Regulatory Impact Analysis of the Proposed Emission Standards for New and

Leasing and development of unconventional wells could exact extraordinary financial costs to communities and future generations, setting aside the immeasurable loss of irreplaceable, natural values that can never be recovered. BLM's environmental review must provide an accounting of these potential harms and costs. The EA and BLM's response to comments fail to adequately respond to our comments on this issue.

iv. The Significant Public Health Impacts of Increased Fracking Compel Consideration of No-Leasing and No-Fracking Alternatives

In addition to climate change effects, oil and gas leasing and fracking entail significant public health risks that should compel BLM to consider a ban on these practices in a programmatic review and in the current leasing proposal. The EA fails to study these public health risks, precluding meaningful review of the proposed action. BLM's refusal to look at these impacts is grounded on the claim that "The June 2016 Oil and Gas Lease Sale is an administrative leasing action. The act of leasing land for oil and gas development in itself does not directly cause a risk to human health and safety."[82] Our discussion above on the case law explains why BLM's claim is incorrect.

Ample scientific evidence indicates that well development and well stimulation activities have been linked to an array of adverse human health effects, including carcinogenic, developmental, reproductive, and endocrine disruption effects. The EA does not consider how close development could potentially take place to schools, residences, and businesses under BLM's proposed leasing decision. Just as troubling, is how much is *unknown* about the chemicals used in well stimulation activities.[83] The potential human health dangers and the precautionary principle should further compel BLM to consider not allowing further development of oil and gas minerals in the areas for lease. In comparing the no-leasing and no-fracking alternatives to leasing and continued unconventional well development scenarios, BLM should include a health impact assessment, or equivalent, of the aggregate impact that unconventional extraction techniques, including fracking, will have on human health and nearby communities.

Due to the heavy and frequent use of chemicals, proximity to fracked wells is associated with higher rates of cancer, birth defects, poor infant health, and acute health effects for nearby residents who must endure long-term exposure:

- In one study, residents living within one-half mile of a fracked well were significantly more likely to develop cancer than those who live more than one-half mile away, with exposure to benzene being the most significant risk.[84]

Modified Sources in the Oil and Natural Gas Sector, Ch. 4, available at http://www3.epa.gov/airquality/oilandgas/pdfs/og_prop_ria_081815.pdf.

[82] EA, Appendix H, at 252.

[83] *See, e.g.* U.S. Environmental Protection Agency, Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources, External Review Draft at 5-73, 10-7 (June 2015) available at http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=523539 ("EPA 2015").

[84] McKenzie, L. et al., Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources, 424 Science of the Total Environment 79 (2012) ("McKenzie 2012").

- Another study found that pregnant women living within 10 miles of a fracked well were more likely to bear children with congenital heart defects and possibly neural tube defects.[85] A separate study independently found the same pattern; infants born near fracked gas wells had more health problems than infants born near sites that had not yet conducted fracking.[86, 87]

- A study analyzed Pennsylvania birth records from 2004 to 2011 to assess the health of infants born within a 2.5-kilometer radius of natural-gas fracking sites. They found that proximity to fracking increased the likelihood of low birth weight by more than half, from about 5.6 percent to more than 9 percent.[88] The chances of a low Apgar score, a summary measure of the health of newborn children, roughly doubled, to more than 5 percent.[89] Another recent Pennsylvania study found a correlation between proximity to unconventional gas drilling and higher incidence of lower birth weight and small-for-gestational-age babies.[90]

- A recent study found increased rates of cardiology-patient hospitalizations in zip codes with greater number of unconventional oil and gas wells and higher well density in Pennsylvania.[91] The results suggested that if a zip code went from having zero wells to well density greater than 0.79 wells/km^2, the number of cardiology-patient hospitalizations per 100 people (or "cardiology inpatient prevalence rate") in that zip code would increase by 27%. If a zip code went from having zero wells to a well density of 0.17 to 0.79 wells/km^2, a 14% increase in cardiology inpatient prevalence rates would be expected. Further, higher rates of neurology-patient hospitalizations were correlated with zip codes with higher well density.

- Recently published reports indicate that people living in proximity to fracked gas wells commonly report skin rashes and irritation, nausea or vomiting, headache, dizziness, eye irritation and throat irritation.[92]

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[85] McKenzie, L. et al., Birth Outcomes and Maternal Residential Proximity to Natural Gas Development in Rural Colorado, Advance Publication Environmental Health Perspectives (Jan. 28, 2014), http://dx.doi.org/10.1289/ehp.1306722 ("McKenzie 2014").

[86] Hill, Elaine L., Unconventional Natural Gas Development and Infant Health: Evidence from Pennsylvania, Cornell University (2012).

[87] Whitehouse, Mark, *Study Shows Fracking is Bad for Babies*, Bloomberg View, Jan. 4, 2014, *available at* http://www.bloombergview.com/articles/2014-01-04/study-shows-fracking-is-bad-for-babies.

[88] *Id*., citing Janet Currie of Princeton University, Katherine Meckel of Columbia University, and John Deutch and Michael Greenstone of the Massachusetts Institute of Technology.

[89] *Id.*

[90] Stacy, Shaina L. et al. (2015) Perinatal Outcomes and Unconventional Natural Gas Operations in Southwest Pennsylvania. PLoS ONE 10(6): e0126425. doi:10.1371/journal.pone.0126425, *available at* http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0126425.

[91] Jemielital, T. et al. Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates. PLoS ONE 10(7): e0131093, *available at* http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0131093.

[92] Rabinowitz, P.M. et al., Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania. Environmental Health Perspectives Advance Publication (2014); Bamberger, Michelle and R.E. Oswald, Impacts of Gas Drilling on Human and Animal Health, 22 New Solutions 51

- In Texas, a jury awarded nearly $3 million to a family who lived near a well that was hydraulically fractured.[93] The family complained that they experienced migraines, rashes, dizziness, nausea and chronic nosebleeds. Medical tests showed one of the plaintiffs had more than 20 toxic chemicals in her bloodstream.[94] Air samples around their home also showed the presence of BTEX — benzene, toluene, ethylbenzene and xylene —colorless but toxic chemicals typically found in petroleum products.[95]

Chemicals used for fracking also put nearby residents at risk of endocrine disruption effects. A study that sampled water near active wells and known spill sites in Garfield County Colorado found alarming levels of estrogenic, antiestrogenic, androgenic, and antiandrogenic activities, indicating that endocrine system disrupting chemicals (EDC) threaten to contaminate surface and groundwater sources for nearby residents.[96] The study concluded:

> [M]ost water samples from sites with known drilling-related incidents in a drilling-dense region of Colorado exhibited more estrogenic, antiestrogenic, and/or antiandrogenic activities than the water samples collected from reference sites[,] and 12 chemicals used in drilling operations exhibited similar activities. Taken together, the following support an association between natural gas drilling operations and EDC activity in surface and ground water: [1] hormonal activities in Garfield County spill sites and the Colorado River are higher than those in reference sites in Garfield County and in Missouri, [2] selected drilling chemicals displayed activities similar to those measured in water samples collected from a drilling-dense region, [3] several of these chemicals and similar compounds were detected by other researchers at our sample collection sites, and [4] known spills of natural gas fluids occurred at these spill sites.

The study also noted a linkage between EDCs and "negative health outcomes in laboratory animals, wildlife, and humans":

> Despite an understanding of adverse health outcomes associated with exposure to EDCs, research on the potential health implications of exposure to chemicals used in hydraulic fracturing is lacking. Bamberger and Oswald (26) analyzed the health consequences associated with exposure to chemicals used in natural gas operations and found respiratory, gastrointestinal, dermatologic, neurologic, immunologic, endocrine, reproductive, and other negative health outcomes in humans, pets, livestock, and wildlife species.

(2012); Steinzor, N. et al., Gas Patch Roulette: How Shale Development Risks Public Health in Pennsylvania, Earthworks Gas & Oil Accountability Project (2012).

[93] *Parr v. Aruba Petroleum, Inc*., Case No. 11-01650-E (Dallas Cty., filed Sept.13, 2013).

[94] Deam, Jenny, *Jury Awards Texas family Nearly $3 million in Fracking Case*, Los Angeles Times (Apr. 3, 2014) http://www.latimes.com/nation/la-na-fracking-lawsuit-20140424-story.html.

[95] *Id*.

[96] Kassotis, Christopher D. et al., Estrogen and Androgen Receptor Activities of Hydraulic Fracturing Chemicals and Surface and Ground Water in a Drilling-Dense Region. Endocrinology, March 2014, 155(3):897–907, pp. 905-906, *available at* http://press.endocrine.org/doi/full/10.1210/en.2013-1697.

> Of note, site 4 in the current study was used as a small-scale ranch before the produced water spill in 2004. This use had to be discontinued because the animals no longer produced live offspring, perhaps because of the high antiestrogenic activity observed at this site. There is evidence that hydraulic fracturing fluids are associated with negative health outcomes, and there is a critical need to quickly and thoroughly evaluate the overall human and environmental health impact of this process. It should be noted that although this study focused on only estrogen and androgen receptors, there is a need for evaluation of other hormone receptor activities to provide a more complete endocrine-disrupting profile associated with natural gas drilling.[97]

Operational accidents also pose a significant threat to public health. For example in August 2008, Newsweek reported that an employee of an energy-services company got caught in a fracking fluid spill and was taken to the emergency room, complaining of nausea and headaches.[98] The fracking fluid was so toxic that it ended up harming not only the worker, but also the emergency room nurse who treated him. Several days later, after she began vomiting and retaining fluid, her skin turned yellow and she was diagnosed with chemical poisoning.[99]

Harmful chemicals are also found in the flowback fluid after well stimulation events. Flowback fluid is a key component of oil-industry wastewater from stimulated wells. A survey of chemical analyses of flowback fluid dating back to April 2014 in California revealed that concentrations of benzene, a known carcinogen, were detected at levels over 1,500 times the federal limits for drinking water.[100] Of the 329 available tests that measured for benzene, the chemical was detected at levels in excess of federal limits in 320 tests (97 percent).[101] On average, benzene levels were around 700 times the federal limit for drinking water.[102]Among other carcinogenic or otherwise dangerous chemicals found in flowback fluid from fracked wells are toluene and chromium-6.[103] These hazardous substances were detected in excess of federal limits for drinking water in over one hundred tests. This dangerous fluid is commonly disposed of in injection wells, which often feed into aquifers, including some that could be used for drinking water and irrigation.

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[97] *Id.*, p. 905.
[98] Wiserman, Hannah, Untested Waters: the Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation, Fordham Envtl. Law Rev. 115 (2009),138-39.
[99] *Id.*
[100] California Department of Conservation Division of Oil, Gas, & Geothermal Resources, California Well Stimulation Public Disclosure Report, *available at* http://www.conservation.ca.gov/dog/Pages/WellStimulationTreatmentDisclosure.aspx. The highest concentration was 7,700 parts per billion (ppb) for a well with API number 03052587. The US EPA's maximum contaminant level for benzene is 5 ppb.
[101] *Id*.
[102] *Id*., *see also* Cart, J., High Levels of Benzene Found in Fracking Wastewater, Los Angeles Times, Feb. 11, 2015, http://www.latimes.com/local/california/la-me-fracking-20150211-story.html#page=1.
[103] *Id*.; *see also* Center for Biological Diversity, Cancer-causing Chemicals Found in Fracking Flowback from California Oil Wells (2015) Feb. 11, 2015, *available at* http://www.biologicaldiversity.org/news/press_releases/2015/fracking-02-11-2015.html.

Acidizing presents similarly alarming risks to public health and safety. In acidizing operations, large volumes of hydrochloric and hydrofluoric acid are transported to the site and injected underground. These chemicals are highly dangerous due to their corrosive properties and ability to trigger tissue corrosion and damage to sensory organs through contact.

While many risks are known, much more is unknown about the hundreds of chemicals used in fracking. The identity and effects of many of these additives is unknown, due to operators' claims of confidential business information. But, as the EPA recognizes, chemical identities are "necessary to understand their chemical, physical, and toxicological properties, which determine how they might move through the environment to drinking water resources and any resulting effects."[104] Compounds in mixtures can have synergistic or antagonistic effects, but again, it is impossible to know these effects without full disclosure.[105] The lack of this information also precludes effective remediation: "Knowing their identities would also help inform what chemicals to test for in the event of suspected drinking water impacts and, in the case of wastewater, may help predict whether current treatment systems are effective at removing them."[106]

Even where chemical identities are known, chemical safety data may be limited. In EPA's study of the hazards of fracking chemicals to drinking water, EPA found that "[o]ral reference values and oral slope factors meeting the criteria used in this assessment were not available for the majority of chemicals used in hydraulic fracturing fluids [87%], representing a significant data gap for hazard identification."[107] Without this data, EPA could not adequately assess potential impacts on drinking water resources and human health.[108] Further, of 1,076 hydraulic fracturing fluid chemicals identified by the EPA, 623 did not have estimated physiochemical properties reported in EPA's toxics database, although this information is "essential to predicting how and where it will travel in the environment."[109] The data gaps are actually much larger, because EPA excluded 35% of fracking chemicals reported to FracFocus from its analysis because it could not assign them standardized chemical names.[110]

The EA fails to incorporate a literature review of the harmful effects of each of the chemicals known to be used in fracking and other unconventional oil and gas extraction methods. Without knowing the effects of each chemical, the EA cannot accurately project the true impact of unconventional oil and gas extraction.

The EA also fails to study the human health and safety impacts of noise pollution, light pollution, and traffic accidents resulting from oil and gas development. A recent study found that automobile and truck accident rates in counties in Pennsylvania with heavy unconventional oil and gas extraction activity were between 15 and 65 percent higher than accident rates in counties

[104] EPA 2015 at 10-18.
[105] Souther, Sara et al. Biotic Impacts of Energy Development from Shale: Research Priorities and Knowledge Gaps, Front Ecol Environ 2014; 12(6): p. 334.
[106] EPA 2015 at 10-18.
[107] *Id*. at 10-7, 9-7.
[108] *Id*. at 9-37-38.
[109] *Id*. at 5-73.
[110] *Id*. at 9-38.

without unconventional oil and gas extraction activities.[111] Rates of traffic fatalities and major injuries may be higher in areas with heavy drilling activity than areas without.[112]

IV. Conclusion

Unconventional oil and gas development and coal extraction not only fuel the climate crisis but entail significant public health risks and harms to the environment. Accordingly, the EIS should thoroughly analyze the alternative of no new fossil fuel leasing and no fracking or other unconventional well stimulation methods within the BMD planning area. Thank you for consideration of these comments. The Center trusts that you will take our requests for deferrals to protect species and wetlands seriously and in addition will issue a legally adequate EIS for this proposed oil and gas leasing action.

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[111] Graham, J., Irving et al., Increased Traffic Accident Rates Associated with Shale Gas Drilling in Pennsylvania. 74 Accident Analysis and Prevention 203 (2015).
[112] *Id.*