

**December 10, 2021**

Via eplanning, and via first class mail to:

Tracy Stone Manning, Director  
Nada Culver, Deputy Director of Policy and Programs  
Nicholas Douglas, Assistant Director, Office of Energy, Minerals, and Realty Management  
Bureau of Land Management, National Office  
1849 C Street NW  
Washington, DC 20240  
[ndouglas@blm.gov](mailto:ndouglas@blm.gov)

Jamie Connell, State Director  
Benjamin E. Gruber, Deputy State Director, Energy Lands and Minerals  
Other Responsible Officials  
Bureau of Land Management, Colorado State Office  
2850 Youngfield St.  
Lakewood, CO 80215  
[blm\\_co\\_statedirector@blm.gov](mailto:blm_co_statedirector@blm.gov)  
[begruber@blm.gov](mailto:begruber@blm.gov)  
[kshedlowski@blm.gov](mailto:kshedlowski@blm.gov)

Greg Sheehan, State Director  
Kent Hoffman, Deputy State Director, Lands & Minerals  
Other Responsible Officials  
Bureau of Land Management, Utah State Office  
440 West 200 South, Ste. 500  
Salt Lake City, UT 84101  
[blm\\_ut\\_so\\_public\\_room@blm.gov](mailto:blm_ut_so_public_room@blm.gov)  
[blm\\_ut\\_state\\_director@blm.gov](mailto:blm_ut_state_director@blm.gov)  
[khoffman@blm.gov](mailto:khoffman@blm.gov)

Kim Liebhauser, Acting State Director  
Duane Spencer, Deputy State Director, Minerals & Lands  
Other Responsible Officials  
Bureau of Land Management, Wyoming State Office  
5353 Yellowstone Road  
Cheyenne, WY 82009  
[blm\\_wy\\_copywork@blm.gov](mailto:blm_wy_copywork@blm.gov)  
[blm\\_wy\\_state\\_office\\_wymail@blm.gov](mailto:blm_wy_state_office_wymail@blm.gov)  
[blm\\_wy\\_state\\_office\\_wymail@blm.gov](mailto:blm_wy_state_office_wymail@blm.gov)

Re: Comments on Draft Environmental Assessments and Findings of No Significant Impact for First Quarter 2022 Competitive Oil and Gas Lease Sales Proposed in Bureau of Land Management's Colorado, Utah, and Wyoming State Offices

Responsible Officials:

The Center for Biological Diversity (“the Center”), Citizens for a Healthy Community, Earthjustice, Friends of the Earth, Great Old Broads for Wilderness, Southern Utah Wilderness Alliance, Waterkeeper Alliance, Western Environmental Law Center, Western Watersheds Project, WildEarth Guardians, and Wilderness Workshop (collectively “Conservation Groups”) submit these comments in response to the Bureau of Land Management’s (“BLM”) draft environmental assessments and findings of no significant impact for proposed first quarter 2022 competitive oil and gas lease sales (“lease sales”) and their respective proposed parcels:

Colorado: <https://eplanning.blm.gov/eplanning-ui/project/2016475/510>  
Utah: <https://eplanning.blm.gov/eplanning-ui/project/2015573/510>  
Wyoming: <https://eplanning.blm.gov/eplanning-ui/project/2015621/510>

For reasons explained below and in scoping comments, BLM must defer all parcels proposed for lease pending completion of programmatic analysis and review under the National Environmental Policy Act, Federal Land Policy and Management Act, and other laws of the federal fossil fuel programs’ cumulative greenhouse gas pollution, their associated climate impacts, and their compatibility with BLM’s public-lands statutory mandates and the U.S. goal of limiting global warming to 1.5 Celsius. Importantly, that analysis is both legally required and has never been adequately done. Moreover, to the extent that the first quarter leasing Draft Environmental Assessments (“ Draft EAs”) and BLM’s recent specialist report offering a cumulative assessment of the greenhouse gas emissions of the fossil fuel leasing programs do acknowledge the catastrophic harm from foreseeable emissions, BLM has failed to meet its mandatory obligations under FLPMA and other statutes to act on these findings and prevent unnecessary and undue degradation to the climate, land, water, and other resources.

Each sold lease parcel would lock in more future greenhouse gas pollution at a time when it is imperative for the U.S. to reduce emissions. That pollution will worsen climate and extinction crises and their associated harm to people and the environment. Multiple studies show that there is simply no room left in the global carbon budget for new commitments of fossil fuel development. The world’s already producing oil and gas fields, if fully developed, will by themselves push global warming past the 1.5 Celsius limit (not accounting for emissions from coal production). Thus, we again urge BLM, and by extension the Department of Interior, to exercise their full authority under federal law to end new federal fossil fuel leasing and enact a managed decline of production consistent with the U.S. goal of limiting global warming to 1.5 Celsius.

These comments are supplemental to, and incorporate by reference the October 1, 2021, scoping comments of the Center for Biological Diversity *et al.* on the BLM’s proposed leasing action, as well as the comments of the Center for Biological Diversity *et al.* on the BLM’s proposed First Quarter 2022 fluid mineral lease sales for Montana, Nevada, New Mexico, and Eastern States. Media containing electronic copies of all referenced exhibits accompany the mailed submissions.

## I. *Louisiana v. Biden* Does Not Require Holding a Lease Sale or Issuing Any Leases

The Interior Department announced that it would proceed with the current lease sales in response to a June 15 preliminary injunction order issued by the U.S. District Court for the Western District of Louisiana. *Louisiana v. Biden*, No. 2:21-cv-778-TAD-KK, 2021 WL 2446010 (W.D. La. June 15, 2021). That rationale is arbitrary and capricious because the June 15 order does not require holding any lease sales.

The *Louisiana* order enjoined implementation of a nationwide “Pause” on offshore and onshore oil and gas leasing contemplated by President Biden’s Executive Order 14008. *Id.* The Louisiana court, however, did not rule that BLM must hold lease sales every three months in every state office. Instead, while enjoining a nationwide “Pause” directed by the President, the Louisiana court distinguished lease sale postponements for NEPA or other environmental concerns.

The court stated that “[t]he agencies could cancel or suspend a lease sale due to problems with that specific lease [sale], but not as to eligible lands for no reason other than to do a comprehensive review pursuant to Executive Order 14008.” *Id.* at \*14. The court added: “there is a huge difference between the discretion to stop or pause a lease sale because the land has become ineligible for a reason such as an environmental issue,” and halting lease sales “with no such issues and only as a result of Executive Order 14008.” *Id.* at \*13. The *Louisiana* ruling found that the plaintiffs had shown a likelihood of success on the merits of the case because BLM’s postponement of some sales expressly relied on Executive Order 14008 or did not identify any NEPA concerns. *Id.* at \*16; *see also id.* at \*21 (“at least some of the onshore lease [sale]s were cancelled due to the Pause, without any other valid reason. Some were cancelled to do additional environmental analysis . . . but the Pause has obviously been implemented by Agency Defendants for some of the lease sales”).

The Louisiana court’s reasoning thus supports BLM’s continued authority to postpone lease sales to address NEPA and similar concerns tied to a given sale. Indeed, the Interior Department has recognized this point. In its appeal of the *Louisiana* ruling, the Department noted that: “the district court did not dispute that Interior retains discretion to insist on compliance with NEPA and other statutory prerequisites before finding that ‘eligible lands are available’ under the [Mineral Leasing Act] (and its injunction does not prevent Interior from doing so).” Appellants’ Open. Br. at 32-33, *State of Louisiana v. Biden*, Fifth Cir. No. 21-30505 (Nov. 16, 2021); *see also id.* at 14 n. 1 (similar).

As discussed elsewhere in these comments, there are numerous NEPA, FLPMA and other issues that require postponement or deferral of any and all additional leasing, and the *Louisiana* order presents no obstacle to doing so. Especially in light of the Interior Department’s recent statement to the Fifth Circuit, it would be arbitrary and capricious to rely on the *Louisiana* order as a justification for the proposed lease sales, or for failure to consider no-leasing or deferral of leasing alternatives.

## II. Adequate NEPA Review Under Secretarial Order 3399 Is Required Prior To Offering These Leases for Sale

Many or most of the parcels currently being scoped were originally slated to be auctioned in the March 2021 lease sales. BLM postponed those lease sales due to concerns that, in light of recent NEPA case law and other court decisions, the analyses for the March 2021 sales were inadequate. Those same concerns still apply and require additional analysis before offering any parcels for lease. As discussed in detail below, the November 2021 Environmental Assessments, and “2020 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends from Coal, Oil, and Gas Exploration and Development on the Federal Mineral Estate, (hereinafter “Specialist Report”).<sup>1</sup>” do not adequately cure these deficiencies. Under the plain terms of the National Environmental Policy Act and Department of Interior Secretarial Order 3399, the BLM’s NEPA processes must take place under the Council on Environmental Quality’s pre-2020 regulations implementing the National Environmental Policy Act.

On July 16, 2020, the Council of Environmental Quality (CEQ) published in the Federal Register its final rule to revise the NEPA regulations (2020 Rule), which went into effect on September 14, 2020. The 2020 Rule immediately drew five lawsuits challenging the 2020 Rule on a variety of grounds, including under the Administrative Procedures Act, NEPA, and the Endangered Species Act, contending that the 2020 Rule exceeded CEQ’s authority and that the related rulemaking process was procedurally and substantively defective. *Wild Va. v. Council on Env’t Quality*, No. 3:20cv45 (W.D. Va. 2020); *Env’tl. Justice Health All. v. Council on Env’t Quality*, No. 1:20cv06143 (S.D.N.Y. 2020); *Alaska Cmty. Action on Toxics v. Council on Env’t Quality*, No. 3:20cv5199 (N.D. Cal. 2020); *California v. Council on Env’t Quality*, No. 3:20cv06057 (N.D. Cal. 2020); *Iowa Citizens for Cmty. Improvement v. Council on Env’t Quality*, No 1:20cv02715 (D.D.C. 2020).

Following the inauguration of President Biden in January 2021, CEQ moved the courts to stay the litigation mentioned above, pending the new administration’s review of the 2020 Rule. In response to CEQ and joint motions, the districts courts have issued temporary stays in each of the cases, except for *Wild Virginia v. Council on Environmental Quality*, which the district court dismissed without prejudice on June 21, 2021 and is currently on appeal to the U.S. Court of Appeals for the Fourth Circuit. To the extent BLM relied on or applied the 2020 Rule for purposes of administering the lease sales proposed in 2022, we find that reliance on and application of the 2020 Rule unlawful for the reasons explained in the stayed litigation of the 2020 Rule referenced above, including but not limited to the following reasons:

- Neither an EA nor EIS were prepared pursuant to NEPA to evaluate the environmental impacts of the 2020 Rule.
- The 2020 Rule was not analyzed for its potential impact on the directive in Executive Order 12898 and CEQ’s longstanding policy and practice of fully analyzing the environmental justice impacts of its actions.

---

<sup>1</sup> See Department of the Interior, Bureau of Land Management, 2020 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends (2020).

- The 2020 Rule is inconsistent with the statutory purpose and language of NEPA.
- The 2020 Rule was issued by CEQ and the Chair of CEQ in excess of their statutory authority.

However, BLM’s FONSI for the lease sales proposed in 2022 apply the Significance Criteria described in 40 CFR §1508.27, which implies that BLM is applying the CEQ NEPA regulations that were in effect prior to the 2020 Rule. To our knowledge, only the FONSI for the 2022 lease sale in New Mexico explicitly states that BLM is applying the CEQ NEPA regulations that were in effect prior to the 2020 Rule. For the reasons explained in the bullets above and pending CEQ’s review of the environmental impacts of the 2020 Rule, BLM should apply the CEQ NEPA regulations that were in effect prior to the 2020 Rule for purposes of administering the lease sales proposed in 2022, including in BLM’s cumulative impact analysis of GHG emissions in the 2020 BLM Specialist Report. Applying the CEQ NEPA regulations that were in effect prior to the 2020 Rule also aligns with the Department of Interior Secretarial Order No. 3399 (April 16, 2021).

### **III. BLM Must Prepare an EIS To Address the Cumulative Impacts of All Lease Sales Announced August 31**

The current lease sale process in each state is part of a national Interior Department decision to proceed with oil and gas leasing in light of the *Louisiana* litigation. On August 24, the Interior Department reported to the Louisiana court that BLM offices across the country had been directed “to finalize parcel lists for upcoming sales, in order to publicly post those parcel lists for NEPA scoping by August 31, 2021.” ECF No. 155 at 5, *Louisiana v. Biden*. As directed by the Department, notices of scoping in each state were posted on August 31. Also on August 31, the Interior Department announced that it would proceed with offshore lease sale 257, which covers over 80 million acres in the Gulf of Mexico. That sale took place on November 17. Each of the proposed lease sales here are plainly part of a larger national initiative and must be analyzed as such under NEPA.

That means preparing an environmental impact statement (EIS) to address the cumulative impacts of the tens of millions of acres that may be leased both onshore and offshore. Cumulative impacts include not only those related to climate and greenhouse gases, but also environmental justice, wildlife habitat and population, water pollution, air pollution, impacts to recreation and other uses of these lands and waters, and the combined costs to taxpayers and the public from issuing new leases. NEPA’s cumulative impacts requirement means BLM must evaluate impacts “result[ing] from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.” 40 C.F.R. § 1508.7 (2019); see 46 C.F.R. §§ 46.30 (definition of reasonably foreseeable future actions), 46.115. BLM’s cumulative effects analysis “must give a realistic evaluation of the total impacts and cannot isolate a proposed project, viewing it in a vacuum.” *Grand Canyon Trust v. Fed. Aviation Admin.*, 290 F.3d 339, 342 (D.C. Cir. 2002); see also *Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 973-74 (9th Cir. 2006) (holding agency’s cumulative impacts analysis insufficient based on failure to discuss

other mining projects in the region); *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1214-16 (9th Cir. 1998) (overturning Forest Service EA that analyzed impacts of only one of five concurrent logging projects in the same region); *see also Kern v. BLM*, 284 F.3d 1062, 1078 (9th Cir. 2002) (holding that BLM arbitrarily failed to include cumulative impacts analysis of reasonably foreseeable future timber sales in the same district as the current sale).

Analyzing those impacts will require an EIS. NEPA requires an agency to prepare an EIS for any major federal action that may significantly affect the quality of the human environment. 42 U.S.C. § 4332(2)(C). An agency can rely on an environmental assessment (EA) only if it makes an affirmative finding that environmental impacts will not be significant (a FONSI). If there are “substantial questions” whether leasing may have a significant effect on the environment, an EIS is required. *Anderson v. Evans*, 371 F.3d 475, 488 (9th Cir. 2004); *Ctr. for Biological Diversity v. BLM*, 937 F. Supp. 2d 1140, 1154 (N.D. Cal. 2013). Here, the Interior Department announced potential leasing covering nearly 1,200 square miles (more than 740,000 acres) onshore, and 125,000 square miles of the Gulf of Mexico. It would be arbitrary and capricious to conclude that leasing on that scale will not be significant, or to fail to consider the direct, indirect, and cumulative effects of this single unified decision to resume leasing without emissions safeguard.

BLM’s claim that analyzing the cumulative carbon emissions from these lease sales would be inaccurate and not useful, *see, e.g.*, Montana Draft EA at 43, is arbitrary and capricious. The EA for each proposed lease sale provides a similar analysis of the reasonably foreseeable GHG emissions from that sale, *see, e.g.*, Wyoming Draft EA at 27-37; Colorado Draft EA at 30-40; Montana Draft EA at 33-44, making it entirely feasible to aggregate and assess their cumulative impacts. Even if such an estimate would be conservative, *e.g.*, Wyoming EA at 36; Colorado draft EA at 37-38; Montana Draft EA at 43, that does not excuse BLM from providing any forecast of cumulative emissions from the lease sales.<sup>2</sup>

#### **IV. BLM must prepare a programmatic environmental impact statement to take a hard look at climate impacts of the resumption of federal oil and gas leasing and to avoid any new greenhouse gas pollution.**

The proposed lease sale in this state thus is plainly part of a larger national initiative and must be analyzed as such under NEPA. There is no remaining room in the carbon budget for new commitments of future greenhouse gas (GHG) pollution. Greenhouse gas pollution resulting from the lease sales and subsequent development, considered alongside existing federal fossil fuel development and potential development from leases previously issued but not yet under production, would contribute to catastrophic climate change and unnecessary and undue

---

<sup>2</sup> The respective EAs cite to projected estimates from the recently-released BLM Specialist Report on Annual GHG Emissions for all federal oil and gas development in 2021 across different states. *E.g.*, Wyoming draft EA at 36-37; Colorado draft EA at 37-38; Montana draft EA at 43-44. This estimate, however, covers existing and already-permitted production, and thus does not inform BLM or the public as to the cumulative impacts of the new leasing the agency is currently considering. Indeed, the EA’s description only addresses emissions from 2021, a period before the first quarter 2022 lease sales are even held. *Id.*

degradation to the atmosphere and other public lands values that BLM is legally obligated to protect.

BLM must therefore take a hard and comprehensive look at the cumulative climate change impacts of authorizing new leasing, together with committed emissions under lease, and immediately defer ANY sale of new leases and APD approvals pending demonstration of compatibility with U.S. and global climate goals and completion of the comprehensive review and reconsideration of Federal oil and gas permitting and leasing practices called for by Executive Order 14008.<sup>3</sup> fuel program review. BLM must also consider, as proposed in Conservation Groups' scoping comments, a reasonable alternative of managed decline of GHG emissions from the already-leased federal fossil fuel estate.

The climate crisis is fundamentally an incremental problem and the contribution of individual oil and gas development actions on the part of the BLM to climate change are difficult to assess precisely because it is rare that such actions will be truly significant at a national or global scale. This is particularly true at the level of an individual lease sale, where the projected development of mineral resources on a given lease or set of leases will reduce the remaining global and national carbon budgets by vanishingly small fractions. Yet it is this creeping normalcy that results in fossil fuel development on BLM administered lands being responsible for 14% of total U.S. GHG emissions, 1.6 % of global emissions, and nearly 20% of all emissions in the U.S. from fossil fuel production.<sup>4</sup> With respect to carbon dioxide, emissions from fossil fuels produced on federal lands represent a quarter of *all* CO<sub>2</sub> emissions in the U.S.<sup>5</sup>

It is precisely because of this incrementally small but collectively mammoth impact on the climate crisis that BLM must prepare a programmatic EIS for the federal oil and gas leasing program. The “comprehensive review and reconsideration of the Federal oil and gas permitting and leasing practices” called for in Executive Order 14008<sup>6</sup> demands no less.<sup>7</sup> Conservation Groups discuss below the necessity for an EIS to collectively analyze the first quarter 2022 lease sales, which constitute part of a focused action in response to the *Louisiana v. Biden* litigation. At the outset, however, Conservation Groups stress that BLM should conduct a programmatic EIS for the entire federal oil and gas leasing program before holding another lease sale. The purpose of a programmatic EIS or other programmatic NEPA review is to:

---

<sup>3</sup> Executive Order 14008 of January 27, 2020, *Tackling the Climate Crisis at Home and Abroad*, Fed. Reg. Vol. 86, No. 19.

<sup>4</sup> Department of the Interior, Bureau of Land Management, 2020 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends at Section 9.1 (Representative Concentration Pathways), (“Climate change is fundamentally a cumulative phenomenon, global in scope, and all GHGs contribute incrementally to climate change regardless of scale or origin.”); Section 7.1. (Emissions Comparisons), Table 7-1 (2020).

<sup>5</sup> Exhibit 1, Merrill, M.D., Sleeter, B.M., Freeman, P.A., Liu, J., Warwick, P.D., and Reed, B.C., Federal lands greenhouse gas emissions and sequestration in the United States—Estimates for 2005–14: U.S. Geological Survey Scientific Investigations Report 2018–5131, 31 (2018).

<sup>6</sup> Executive Order 14008 of January 27, 2020, *Tackling the Climate Crisis at Home and Abroad*, Fed. Reg. Vol. 86, No. 19.

<sup>7</sup> Exhibit 2, Members of petitioner groups made this point initially in their comments submitted in response to Secretarial Orders 3998 and 3999 (April 16, 2021).

[A]ddress the general environmental issues relating to broad decisions, such as those establishing policies, plans, *programs*, or suite of projects, and can effectively frame the scope of subsequent site-and project-specific federal actions . . . [o]ne advantage of preparing a programmatic NEPA review *for repetitive agency activities* is that the programmatic NEPA review can provide a starting point for analyzing direct, indirect, and cumulative impacts.<sup>8</sup>

A programmatic approach is compelled for the following reasons: 1) the fundamentally incremental nature of the climate crisis; 2) Executive Order 14008 recognizes the small and shrinking window that remains to avoid the most catastrophic effects of climate change; 3) BLM should complete the analysis it started with its issuance of the “2020 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends” (hereinafter the “Report”), by conducting a PEIS; and 4) the need for consistency with the pending federal coal review.

#### **A. The incremental nature of climate change requires a Programmatic EIS.**

The Council on Environmental Quality (CEQ) has provided guidance on how federal agencies should address climate change in their NEPA analyses through its “Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews” (hereafter “Final Climate Guidance”).<sup>9</sup> The Final Climate Guidance applies to all proposed federal agency actions, “including land and resource management actions.” In its Final Climate Guidance, the CEQ recognizes that:

Climate change results from the incremental addition of GHG emissions from millions of individual sources, which collectively have a large impact on a global scale. CEQ recognizes that the totality of climate change impacts is not attributable to any single action but is exacerbated by a series of actions including actions taken pursuant to decisions of the Federal Government. Therefore, a statement that emissions from a proposed Federal action represent only a small fraction of global emissions is essentially a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether or not to what extent to consider climate change impacts under NEPA. Moreover, these comparisons are also not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigations because this approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each make a relatively small addition to global atmospheric GHG concentrations that collectively have a large impact.

---

<sup>8</sup> Exhibit 3, Memorandum for Heads of Federal Departments and Agencies, *Effective Use of Programmatic NEPA Reviews*, Counsel on Environmental Quality, December 18, 2014 (emphasis added).

<sup>9</sup> Exhibit 4, See CEQ, Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews (Aug. 2016).

BLM has struggled in the past to comply with this guidance and frame the requisite “hard look” required by NEPA with regard to the climate impacts of individual oil and gas lease sales. The agency has run afoul of NEPA in the past precisely because it has been unable or unwilling to articulate the ways in which individual lease sales and subsequent site-specific decisions contribute to climate change.<sup>10</sup> Importantly, courts have held BLM accountable by recognizing that “the impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct.” *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008).

These past failings argue for a comprehensive, programmatic approach to provide context for subsequent leasing and drilling stage actions. NEPA, by its plain language, demands a comprehensive analysis of the impacts of the federal oil and gas leasing program—including, but not limited to the climate impacts.<sup>11</sup> Indeed, the 1978 regulations promulgated by the Council on Environmental Quality appear prescient in this respect; the cumulative impact and effects analyses might have been drafted as tools to help describe climate change. “Cumulative Impact” is “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.” 40 C.F.R. § 1508.7. “Indirect Effects” encompass such indicia as “effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems.” 40 C.F.R. § 1508.8.

If these sections, combined with the fundamentally cumulative nature of climate change, do not themselves compel a programmatic EIS, they certainly provide logistical support for one. As noted, BLM has been faulted in the past for not taking into consideration the cumulative and downstream impacts of its lease sales on climate change.<sup>12</sup> Yet the necessarily broad scale of an

---

<sup>10</sup> See, e.g., *WildEarth Guardians v. Bernhardt*, 501 F. Supp. 3d 1192, 1209 (D.N.M. 2020) (acknowledging minimal impact of local actions but questioning BLM assertion that *de minimis* site specific decision would have *no* impact on climate change); *Wildearth Guardians v. U.S. Bureau of Land Mgmt.*, 457 F. Supp. 3d 880, 894 (D. Mont. 2020) (noting that “the global nature of climate change and greenhouse-gas emissions means that any single lease sale or BLM project likely will make up a negligible percent of state and nation-wide greenhouse gas emissions. Thus, if BLM ever hopes to determine the true impact of its projects on climate change, it can do so only by looking at projects in combination with each other, not simply in the context of state and nation-wide emissions.”); *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 69 (D.D.C. 2019) (NEPA requires BLM to quantify GHG emissions of leased parcels in the aggregate); *San Juan Citizens All. v. United States Bureau of Land Mgmt.*, 326 F. Supp. 3d 1227 (D.N.M. 2018) (recognizing impact of challenged action alone may be significant only in combination with other actions).

<sup>11</sup> See, e.g. 42 U.S.C. § 4332(C) (requiring “a detailed statement . . . on—(i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, (iii) alternatives to the proposed action, (iv) the relationship between local short-term use of man’s environment and the maintenance and enhancement of long-term productivity, and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.”).

<sup>12</sup> Exhibit 5, *E.g. San Juan Citizens All. v. United States Bureau of Land Mgmt.*, 326 F. Supp. 3d 1227, 1248 (D.N.M. 2018); *Wildearth Guardians v. U.S. Bureau of Land Mgmt.*, 457 F. Supp. 3d 880, 894 (D. Mont. 2020).

adequate analysis is indubitably best done once, and done at the programmatic level, allowing the agency to tier to and place its subsequent, site-specific analyses within the context of the larger framework.<sup>13</sup> In short, preparing a programmatic NEPA analysis will help the Agency to reduce or eliminate redundant and duplicative analyses and effectively address cumulative impacts, substantially reducing the administrative burden and economic costs to the Agency and assisting the Agency in formulating comprehensive mitigation measures that apply at the national level.

- 1) There is a small remaining window to avoid the most catastrophic effects of climate change and a programmatic review is necessary to inform future action.

The science is clear: there is simply no room for continuation of a “business as usual” approach on the federal mineral estate if humanity is to have a meaningful chance of curtailing truly catastrophic warming. Global fossil fuel production must decrease by approximately 6% per year between 2020 and 2030 if we hope to limit warming to 1.5°C.<sup>14</sup> Even this type of managed decline of fossil fuel production may yet be insufficient to achieve this goal. According to a recent study, to maintain a coin-flip chance of holding warming at 1.5°C, approximately 60% of global oil and gas must be left in the ground.<sup>15</sup>

BLM has yet to complete either a project level or broader NEPA document that analyzes the federal oil and gas program in light of these scientific conclusions and with an eye to developing alternatives that respond to them. A programmatic review is the ideal setting for such an analysis. NEPA requires analysis *before* making decisions with potentially irreversible effects: “the appropriate time for preparing an EIS is *prior* to a decision, when the decisionmaker retains a maximum range of options.” *Sierra Club v. Peterson*, 717 F.2d 1409, 1414 (D.C. Cir. 1983). While this is of course true at the project level, it is no less true at the programmatic level when each project comprises an incremental part of the overall impact.

The leasing process “is the point of no return with respect to emissions,” and it is therefore not only appropriate but critical that the Agency take not only a hard look but a comprehensive one before crossing that threshold. *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 66 (D.D.C. 2019). At this moment in time, we have very nearly reached the point of no return, not only with regard to the projected lease sales at issue here, but with regard to the ability to avert the worst impacts of climate change. President Biden recognized this in Executive Order 14008: “The United States and the world face a profound climate crisis. We have a narrow moment to pursue action at home and abroad in order to avoid the most catastrophic impacts of that crisis and to seize the opportunity that tackling climate change presents.”

The issuance of EO 14008 and its implementing secretarial orders represents both an opportunity and a demand for comprehensive action by the Department of Interior and BLM. The “comprehensive review and reconsideration” of the federal leasing program called for in

---

<sup>13</sup> See, *Effective Use of Programmatic NEPA Reviews*.

<sup>14</sup> Exhibit 6, SEI, IISD, ODI, E3G, and UNEP, *The Production Gap Report: 2020 Special Report* (2021).

<sup>15</sup> Exhibit 7, Welsby, D., Price, J., Pye, S. et al. Unextractable fossil fuels in a 1.5 °C world. *Nature* 597, 230–234 (2021) (if 60% of remaining oil and gas is left in situ, we will retain a 50% chance of limiting warming to 1.5°C).

Section 208 requires a hard and wholistic look not only at emissions from federal fossil fuels but at how the program contributes to the climate crisis and what must be done to help the United States achieve and contribute to global climate security—not merely by compliance with international agreements but in a way that meaningfully reduces programmatic emissions.

2) BLM must complete the analysis it has begun in the “2020 BLM Specialist Report.”

A programmatic review is particularly critical following release of the “2020 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends from Coal, Oil, and Gas Exploration and Development on the Federal Mineral Estate,” (hereinafter the “Report”) This report constitutes—in large part—the quantification and context of federal mineral estate-associated GHG emissions courts have faulted BLM for not providing in the past. BLM must now take the logical next step, by completing the programmatic NEPA analysis it has effectively begun with the Report. Failure to do so will represent not only a derogation of the action called for by EO 14008, but also a lost opportunity to meaningfully evaluate the outsized role the federal oil and gas leasing program plays in the climate crisis, and to explore alternatives to reduce its impacts.

BLM has, with the Report, fulfilled the lowest common denominator of quantifying federal emissions against the backdrop of federal laws and climate science. It must now meaningfully analyze those emissions in light of remaining national and global carbon budgets, and must apply tools such as the Social Cost of Greenhouse Gases to describe the actual economic, ecologic, and human costs of the program at national and global scales. Section 7.2 of the Report briefly describes federal fossil fuel emissions in the context of various carbon budgeting mechanisms and global emissions commitments (such as under the Paris Agreement). However, more is required by NEPA, and it must be done at a programmatic level, as the quantification of GHGs was done. Just as uncertainty about the effects of an individual sale or permitted development does not absolve BLM from its duty to attempt to analyze those effects,<sup>16</sup> uncertainty about the United States’ equitable share of the remaining carbon budget, or variability in carbon budgeting methods does not justify a failure to analyze meaningful ways to address climate change and the oil and gas program’s contributions to it.

3) A PEIS for the federal oil and gas program is consistent with the Department’s Review of the Federal Coal Leasing Program

A final factor weighing in favor of the completion of a programmatic EIS is the Federal Coal Program Review. Originally initiated in response to Secretarial Order 3338 (January 15, 2016), the intent was to conduct a programmatic EIS and review of the federal coal program designed to address a range of concerns, including but not limited to questions as to the fair return to American taxpayers from federal coal royalties, market fluctuations and resultant impacts to coal-dependent communities, and the more fundamental question of whether the leasing and production of federal coal is consistent with the Nation’s domestic and international

---

<sup>16</sup> *Wildearth Guardians v. U.S. Bureau of Land Mgmt.*, 457 F. Supp. 3d 880, 894 (D. Mont. 2020) (The global nature of climate change complicates an assessment of the exact climate change impacts from the lease sales. This complication does not preclude BLM from complying with the Ninth Circuit’s mandate to catalogue past, present, and reasonably foreseeable projects).

goals to preserve a livable climate and meet international commitments to maintain global warming below certain critical thresholds, namely 1.5°C. Secretarial Order 3338 was rescinded by former Interior Secretary Ryan Zinke through Secretarial Order 3348, which also lifted the federal coal leasing pause that had been implemented by SO 3338. On August 20, 2021, the BLM issued a Federal Register notice in response to Secretarial Order 3398 (issued by Interior Secretary Deb Haaland), which in turn rescinded the Zinke Order.

While SO 3398 did not reinstate SO 3338 or explicitly revive the PEIS, it did reinstate review of the federal coal leasing program. The appropriate course for both that review and the “comprehensive review and reconsideration” called for by EO 14008 is one or more programmatic NEPA processes analyzing the climate, fiscal, and taxpayer impacts of all federal fossil fuel development. Until those analyses occur, no additional fossil fuel leasing should occur. As explained below, such a course is entirely within the Department and Bureau’s legal discretion.

## **V. BLM Has Failed to Consider an Adequate Range of Alternatives**

### **A. No-Leasing Alternative**

BLM’s analysis of the no-leasing or no action alternative is incomplete and insufficient to adequately inform the public and the decision maker. The impacts to GHG emissions and climate according to the no action alternatives considered in each EA are brief and fail to indicate the difference in estimated GHG emissions between the proposed alternatives and the no action alternatives. The 2016 CEQ GHG Guidance indicates that in the alternatives analysis, agencies should compare anticipated levels of GHG emissions from each alternative, including the no-action alternative, and mitigation actions to provide information to the public and enable the decision maker to make an informed decision.<sup>17</sup> In addition, the analyses of the no-action alternatives implies a “perfect substitution” argument regarding GHG emissions that the Interior Department’s Bureau of Ocean Energy Management recently disavowed. We request BLM evaluate and discuss BOEM’s NEPA analysis of GHG emissions from recent offshore lease sales in its NEPA analysis of the proposed 2022 lease sales.<sup>18</sup>

As we discussed above, BLM should have developed a single NEPA document analyzing all seven proposed 2022 lease sales to better evaluate the cumulative GHG emissions estimated from the proposed lease sales and their impact on climate change. Likewise, the no-action alternative should evaluate and discuss the cumulative effect of not leasing any of the proposed 2022 parcels proposed for oil and gas development. This analysis should not only quantify the total GHG emissions that would be avoided as a result of not leasing but should also quantify and evaluate the co-benefits of not leasing, including the benefits of avoided air pollution, avoided water use, avoided produced water disposal.<sup>19</sup> The co-benefits analysis should also reflect the cumulative value of the renewable energy-generating capacity of the federal lands and mineral estate that would be preserved under the no-action alternative.

---

<sup>17</sup> 2016 CEQ GHG Guidance at 15.

<sup>18</sup> Exhibit 8, Bureau of Ocean Energy Management, Draft Environmental Impact Statement for Cook Inlet Planning Area Oil and Gas Lease Sale 258 in Cook Inlet, Alaska (October 2021) at 32-42, 45-48.

<sup>19</sup> 2016 CEQ GHG Guidance at 23.

## **B. BLM Failed to Consider Proposed Alternatives.**

In our scoping comments, we requested BLM include an alternative that considers adopting a policy of managed decline of fossil fuel production from the entire federal mineral estate. The EA for the proposed lease sale in Utah considered this alternative, but the remaining EAs evaluating the seven other proposed lease sales did not. In fact, the EAs for the Alabama, New Mexico, and Oklahoma proposed lease sales evaluated only the proposed action alternative and no action alternative without consideration of other alternatives. Many of the EAs provide no discussion of the alternatives proposed during the scoping period and the basis for BLM's determination to consider some alternatives and not others. The inconsistencies among the BLM offices in determining the alternatives to consider is another example of the need to consider the proposed lease sales in a single impact statement rather than through individual EAs. It also underscores the need for a programmatic review of the BLM fossil fuel program. We request BLM explain the basis for how and why it determined whether to consider proposed alternatives, and we renew our request that BLM consider an alternative involving a policy of managed decline of fossil fuel production from the entire federal mineral estate.

Additionally, none of the BLM EAs addressed the other alternatives we proposed in our scoping comment, including:

- An alternative that imposes a minimum bonus bid higher than \$2.00 per acre;
- An alternative that defers offering the proposed lease parcels for sale until at least 50% of all leased federal oil and gas acres in each of the state for which a Q1 2022 sale is proposed are put into production; and
- An alternative that analyzes and applies best available methane reduction technologies as a stipulation attached to all parcels in the lease sale.

We renew our request that BLM consider these alternatives or, at minimum, explain the basis for its determination not to consider these alternatives.

## **C. BLM Should Consider an Alternative that Protects Groundwater**

BLM must consider alternatives that would protect usable groundwater. *See WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, 457 F.Supp.3d 880, 890 (D. Mont. 2020). Specifically, BLM should consider not leasing parcels within areas where there is less than 2,000 feet of vertical separation between the oil and gas formations likely to be targeted and any groundwater aquifer with 10,000 ppm TDS or less. BLM should also analyze an alternative whereby parcels would not be leased in areas overlying usable groundwater and surface water, and an alternative that includes other measures to ensure that all usable groundwater zones are protected. This might involve pre-leasing groundwater testing and adding a lease stipulation or lease notice requiring specified casing and cementing depths. Alternatively or additionally, BLM should consider requiring a lease stipulation or lease notice requiring the lessee to perform groundwater

testing prior to drilling to identify all usable water, and consultation with the U.S. Geological Survey and other agencies to identify those waters with up to 10,000 ppm TDS.

**D. BLM Must Consider an Alternative that Prioritizes Conservation of All Greater Sage-Grouse Priority and General Habitat**

See Section IX, *infra*.

**VI. The BLM Has Failed to Take a “Hard Look” at Reasonably Foreseeable Environmental Consequences**

**A. The EAs and 2020 BLM Specialist Report Fail NEPA’s “Hard Look” Test with Regard to Analyzing Climate Impacts of Resuming Federal Oil and Gas Leasing**

**1. BLM improperly segmented its NEPA analysis of the proposed lease sales.**

BLM improperly segmented its decision to offer portions of the federal mineral estate for fossil fuel development. According to BLM, the agency offered the 2022 lease sales consistent with the federal district court’s order in *Louisiana v. Biden*.<sup>20</sup> Rather than evaluate the proposed lease sales and their associated environmental impacts in a single NEPA analysis, BLM separated environmental analysis despite the connected nature of the leasing actions and the reasonably foreseeable cumulative climate impacts associated with the potential GHG emissions from authorized leases.

To assess the effects of a proposed action, BLM should account for the proposed action – including “connected” actions – subject to reasonable limits based on feasibility and practicality.<sup>21</sup> “Connected actions” are actions that are closely related and therefore should be discussed in the same impact statement.<sup>22</sup> Actions are connected if, among other circumstances, the actions are interdependent parts of a larger action and depend on the larger action for their justification.<sup>23</sup> Other types of actions that should be considered in a single impact statement also include “cumulative actions,” actions which when viewed with other proposed actions have cumulatively significant impacts, and “similar actions,” actions which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography.<sup>24</sup> Agencies should analyze similar actions in the same impact statement when the best way to

---

<sup>20</sup> Department of Interior, Interior Department Issues Statement on Oil and Gas Leasing Program (last edited 8/26/2021), available at [www.doi.gov/pressreleases/interior-department-issues-statement-oil-and-gas-leasing-program](http://www.doi.gov/pressreleases/interior-department-issues-statement-oil-and-gas-leasing-program).

<sup>21</sup> Council on Environmental Quality. 2016. *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* (“2016 CEQ GHG Guidance”) at 13.

<sup>22</sup> 40 CFR 1508.25(a)(1).

<sup>23</sup> *Id.* at (a)(1)(iii).

<sup>24</sup> *Id.* at (a)(2) and (3).

assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement.<sup>25</sup>

Rather than segment the NEPA analysis according to individual oil and gas lease sales, the CEQ NEPA regulations regarding connected actions, cumulative actions, and similar actions suggest BLM should analyze the environmental impacts of the proposed lease sales in a single NEPA analysis. The proposed 2022 lease sales meet the definition of “connected action” because according to BLM, the agency offered the eight 2022 lease sales pursuant to the same overarching statutory obligation – the Mineral Leasing Act and associated laws – to hold quarterly lease sales for oil and gas development. The proposed 2022 lease sales also qualify as “cumulative actions” based on their cumulatively significant emissions of GHGs and their impacts on climate change. In addition, the proposed 2022 lease sales are properly understood as “similar actions” because the NEPA analysis and proposed sale dates are common in time and the best way to adequately assess their cumulative GHG emissions is through a single impact statement.

BLM claims that the “dynamic nature of the lease sale process” and “independence of each administrative unit for constructing its lease sales” precludes BLM from analyzing potential GHG emissions that could occur from other lease sales.<sup>26</sup> But this is a nonsensical statement in light of the fact that BLM estimated the emissions from all the parcels being offered in each of the proposed 2022 lease sales in the EA associated with each sale.<sup>27</sup> BLM plainly can analyze the potential GHG emissions of all of the actions and should do so in a single impact statement.

## **2. Federal fossil fuel emissions are significant under NEPA.**

### *EPA GHG Equivalency Calculator*

BLM evaluated GHG emissions estimated from the proposed lease sales and from the cumulative GHG emissions from BLM’s onshore federal fossil fuel program using several analytical tools, all of which indicate federal fossil fuel emissions of GHGs are significant under NEPA. BLM used EPA’s greenhouse gas equivalency calculator to express the estimated annual GHG emissions from each lease sale in terms of the GHG emissions produced from gas-fueled vehicles driven for one year. As we explained above, BLM improperly segmented its NEPA

---

<sup>25</sup> *Id.* at (a)(3).

<sup>26</sup> Draft Environmental Assessment, First Quarter 2022, DOI-BLM-Eastern States-J000-2021-0037-EA (“Alabama EA”) at 25; Draft Environmental Assessment, First Quarter 2022, DOI-BLM-CO-0000-2022-0001-EA (“Colorado EA”) at 37; Draft Environmental Assessment, First Quarter 2022, DOI-BLM-MT-0000-2021-0006-EA (“Montana EA”) at 43; Draft Environmental Assessment, First Quarter 2022, DOI-BLM-NV-B000-2021-0007-Other (“Nevada EA”) at 28; Draft Environmental Assessment, First Quarter 2022, DOI-BLM-NM-P000-2021-0001-EA (“New Mexico EA”) at 74; Draft Environmental Assessment, First Quarter 2022, DOI-BLM-NM-0040-2021-0033-EA (“Oklahoma EA”) at 30; Draft Environmental Assessment, First Quarter 2022, DOI-BLM-UT-0000-2021-0007-EA (“Utah EA”) at 50; Draft Environmental Assessment, First Quarter 2022, DOI-BLM-WY-0000-2021-0003-EA (“Wyoming FONSI”) at 36.

<sup>27</sup> Alabama EA at 25; Colorado EA at 37; Montana EA at 43; Nevada EA at 28; New Mexico EA at 74; Oklahoma EA at 30; Utah EA at 50; Wyoming EA at 36.

analysis and only analyzed GHG emissions using EPA’s GHG equivalency calculator according to individual lease sales. However, the total annual GHG emissions from the proposed lease sales are equivalent to 524,886 gasoline-fueled passenger vehicles driven for one year. We request BLM further contextualize these GHG emissions by using the EPA GHG equivalency calculator to consider the GHG emissions over the average 30-year production life of the leases.

<b>2022 Lease Sale EAs</b>	<b>Equivalent of Total Annual GHG Emissions from the Proposed Lease Sales in Number of Gas-fueled vehicles driven for (1) year</b>
Alabama	669
Colorado	104,368
Montana/Dakotas	6,030
Nevada	707
New Mexico	7,096
Oklahoma	1,885
Utah	3,205
Wyoming	400,926
<b>TOTAL</b>	<b>524,886</b>

BLM did not use EPA’s GHG equivalency calculator to conduct a similar analysis of the cumulative GHG emissions from the federal fossil fuel program in the 2020 BLM Specialist Report, and BLM failed to explain the basis for its decision to omit this analysis. We request BLM contextualize the cumulative GHG emissions from the federal fossil fuel program using EPA’s GHG equivalency calculator as well.

*Social Cost of Greenhouse Gases*

BLM also used the social cost of greenhouse gases (SC-GHG) as another tool to assess GHG emissions and climate change effects from the proposed lease sales. The social cost of greenhouse gases provides an estimate of the monetized global damages associated with the incremental increases of GHGs. Again, because BLM improperly segmented its NEPA analysis of the proposed lease sales the EAs only provide the social cost of GHGs for each individual lease sale rather than a cumulative total. However, the combined total social cost of GHGs for all

seven proposed lease sales ranges between \$1,111,091,000 (in 2020 dollars) and \$12,643,190,000 (in 2020 dollars), depending on the discount rate.

<b>2022 Lease Sale EAs</b>	<b>Average Value, 5% Discount Rate (2020 Dollars)</b>	<b>95<sup>th</sup> Percentile Value, 3% Discount Rate (2020 Dollars)</b>
Alabama	\$1,105,000	\$12,208,000
Colorado	\$240,456,000	\$2,638,532,000
Montana/Dakotas	\$11,445,000	\$131,626,000
Nevada	\$1,616,000	\$16,968,000
New Mexico	\$9,222,000	\$97,768,000
Oklahoma	\$2,350,000	\$25,030,000
Utah	\$6,191,000	\$67,235,000
Wyoming	\$838,706,000	\$9,654,093,000
<b>TOTAL</b>	<b>\$1,111,091,000</b>	<b>\$12,643,190,000</b>

BLM did not use the social cost of GHGs tool to assess the impacts of the cumulative cost of global damages from BLM’s fossil fuel program in the 2020 BLM Specialist Report, and BLM failed to explain the basis for its decision to omit this analysis. We request BLM contextualize the cumulative GHG emissions from the federal fossil fuel program using the social cost of GHGs. The cumulative costs of the federal fossil fuel program is an important consideration for BLM to weigh, as it is many orders of magnitude greater than the already significant costs of just the seven proposed 2022 lease sales.

As a final comment on BLM’s use of the social cost of GHGs, we are concerned by the way BLM frames its understanding and weight of the social cost of GHG analysis. BLM states: “[The SC-GHG] numbers were monetized; however, they do not constitute a complete cost-benefit analysis...SC-GHG is provided only as a useful measure of the benefits of GHG emissions reductions to inform agency decision-making.” However, BLM must be clear that the SC-GHG is a measure of impacts to the human environment (reflected in 2020 U.S. dollars) that BLM is obligated to evaluate pursuant to NEPA regardless of whether or not BLM conducts a complete or partial cost cost-benefit analysis of the proposed lease sales.

### *Carbon Budgeting*

In addition to SC-GHG, BLM used carbon budgeting to evaluate the impact of GHG emissions associated with BLM’s onshore fossil fuel authorizations on the remaining atmospheric capacity to take on further GHG emissions without exceeding different degrees of additional warming. As we discuss below, BLM improperly omitted carbon budget analysis of the United States’ share of the global carbon budget. Nonetheless, GHG emissions from the onshore federal fossil fuel program consume a tremendous amount of the global budget – 1.47% of the budget consistent with a 66% chance of limiting warming to 1.5 C. And, this analysis omits GHG emissions from federal offshore oil and gas leasing.

	<b>Metric</b>	<b>66% Chance of Limiting Warming to 1.5 Degree C</b>
	Carbon Budget (GtCO <sub>2</sub> )	420
<b>GHG Emissions from Onshore Federal Oil, Gas, and Coal</b>	Federal Emissions During Budget Timeframe (GtCO <sub>2</sub> ) <sup>28</sup>	6.16
	Federal Consumption of Carbon Budget	1.47%

In addition to the tools BLM used to contextualize and evaluate federal fossil fuel GHG emissions, we request BLM evaluate and consider the impacts of climate change that have already occurred as a result of the cumulative emissions of GHGs. BLM’s NEPA analysis of GHGs and climate change tends to frame the impacts of climate change as long-term impacts, estimated to be realized at some future point in time. However, the climate has already changed as a result of anthropogenic GHG emissions and the consequences of global climate change are already being realized.

BLM’s NEPA analyses of the proposed lease sales acknowledge that anthropogenic GHG emissions over the past 60 years have resulted in impacts associated with the change in global climate.<sup>29</sup> In fact, the 2020 BLM Specialist Report refers to the IPCC climate assessment report, which states: “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 concentration of greenhouse gases have increased.”<sup>30</sup> The IPCC AR5 report indicates that the globally averaged combined land and ocean surface temperature data, as calculated by a linear trend, show warming of 0.85 +/- 0.2 C over the period 1880 to 2012.<sup>31</sup> Warming of 0.85 C is only a little over half the warming the 1.5 C of warming the U.S. has committed to avoid and yet scientists are increasingly able to show the significant impacts of just 0.85 C of warming in terms of the intensification of wildfires, hurricanes, drought, and other weather-related phenomena.<sup>32</sup>

<sup>28</sup> It is unclear why BLM did not conduct its carbon budget analysis according to CO<sub>2</sub>e.

<sup>29</sup> Alabama EA at 19; Colorado EA at 31; Montana EA at 35; Nevada EA at 22; New Mexico EA at 68; Oklahoma EA at 24; Utah EA at 41; Wyoming EA at 28.

<sup>30</sup> 2020 BLM Specialist Report at Section 8.3.

<sup>31</sup> *Id.*

<sup>32</sup> Every extreme-weather attribution peer-reviewed study published to date is tracked and available at Carbon Brief, *Mapped: How climate change affects extreme weather around the world*, <https://www.carbonbrief.org/mapped-how-climate-change-affects-extreme-weather-around-the-world> (last visited Nov. 29, 2021); *see also* Exhibit 9, Intergovernmental Panel on Climate Change, *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (2021); Exhibit 10, Swain, Daniel L. et al., *Attributing Extreme Events to Climate Change: A New Frontier in a Warming World*, One Earth (Jun. 2, 2020); Exhibit 11, Reed, Kevin A. et al., *Forecasted Attribution of the Human Influence on Hurricane Florence*, Science Advances 6 (1): eaaw9253, <https://doi.org/10.1126/sciadv.aaw9253>.

We request BLM consider, discuss, and evaluate the climate science regarding past and present impacts from climate change to further contextualize the climate impacts from the cumulative emissions of GHGs associated with the proposed lease sales and the federal fossil fuel program.

Despite using these tools to contextualize and evaluate the significance of GHG emissions from the proposed lease sales and the cumulative emissions of the federal fossil fuel program, BLM determined the emissions and associated climate impacts are insignificant. Based on the information presented in BLM's NEPA analyses, some of which is summarized above, it is unclear how BLM reached this determination. Moreover, BLM never explained its rationale or decisionmaking process for assessing the significance of GHG emissions and their climate impacts. We request BLM clarify and explain in detail how, based on the SC-GHG, carbon budgeting, and other analytical tools, it concluded the GHG emissions from the lease sales proposed in 2022 and the cumulative GHG emissions from the federal fossil fuel program do not significantly impact the human environment.

### **3. BLM has the ability to provide for meaningful and measurable mitigation actions in the context of cumulative climate change resulting from global emissions.**

Throughout the 2020 BLM Specialist Report and the EAs for the proposed lease sales, BLM mischaracterizes its duty and authority to address climate change programmatically and in the context of project level actions. BLM's mischaracterizations misinform the public and decision makers and prejudice its NEPA analysis and conclusions. Examples of BLM's mischaracterizations include:

- BLM “has limited ability to provide for meaningful or measurable mitigations actions in the context of cumulative climate change resulting from global emissions.”<sup>33</sup>
- The BLM's decision space for mitigating climate impacts from fossil fuels development is currently limited by authorization in statutes such as FLPMA and the MLA.<sup>34</sup>
- No single authorized project level action can produce emissions with such significance that the action could be perceived as influencing the climate. However, all GHG emissions (big and small) contribute to changes in atmospheric radiative forcing and ultimately climate change.<sup>35</sup>

Under FLPMA, BLM, has array of responsibilities, implicated by the impacts of climate change, when deciding whether to approve new oil and gas lease sales, including to:

---

<sup>33</sup> 2020 BLM Specialist Report at Section 10.0.

<sup>34</sup> *Id.*

<sup>35</sup> *Id.*

- Protect public land values including air and atmospheric, water resource, ecological, environmental, and scenic values, and to preserve and protect “certain public lands in their natural condition,” and “food and habitat for fish and wildlife”;<sup>36</sup>
- Account for “the long-term needs of future generations”;<sup>37</sup>
- Prevent “permanent impairment of the productivity of the land and quality of the environment”;<sup>38</sup>
- “[T]ake any action necessary to prevent unnecessary or undue degradation of the lands”;<sup>39</sup> and
- Manage public lands on the basis of multiple use and sustained yield.<sup>40</sup>

To carry out these responsibilities in the context of oil and gas leasing, BLM has a corresponding array of authorities to address the impacts of oil and gas leasing and development. These authorities include choosing not to lease the federal mineral estate for oil and gas development, withdrawing federal minerals from leasing; prohibiting leasing in resource management plans and through resource management plan amendments, requiring conditions of approval in new authorizations of oil and gas leases, as well as managing the rate of oil and gas production in federal leases.

To BLM’s authority to choose not to lease the federal mineral estate, development of public lands is not required but must instead be weighed against other possible uses, including conservation to protect environmental values. *See, e.g., New Mexico ex rel. Richardson v. BLM*, 565 F.3d 683, 710 (10th Cir. 2009) (“BLM’s obligation to manage for multiple use does not mean that development *must* be allowed. . . . Development is a *possible* use, which BLM must weigh against other possible uses—including conservation to protect environmental values, which are best assessed through the NEPA process.” (emphasis in original)); *Wilderness Workshop v. BLM*, 342 F. Supp. 3d 1145, 1166 (D. Colo. 2018) (“[T]he principle of multiple use does not require BLM to prioritize development over other uses” (internal quotations and citations omitted)). As we indicated above, the court in *Louisiana v. Biden* confirmed that BLM is authorized to postpone lease sales to address NEPA and similar concerns tied to particular lease proposals. *Louisiana v. Biden*, No. 2:21-cv-778-TAD-KK at \*14.

Just as BLM can deny a project outright to protect the environmental uses of public lands, it can also condition a project’s approval on the commitment to mitigation measures that lessen environmental impacts. *See, e.g., Pub. Lands Council v. Babbitt*, 167 F.3d 1287, 1300–01 (10th Cir. 1999) (“FLPMA unambiguously authorizes the Secretary to specify terms and conditions in livestock grazing permits in accordance with land use plans.”); *Grynberg Petro*, 152 IBLA 300, 307–08 (2000) (describing how appellants challenging conditions of approval bear the burden of establishing that they are “unreasonable or not supported by the data”).

---

<sup>36</sup> 43 U.S.C. §1701(a)(8).

<sup>37</sup> 43 U.S.C. § 1702(c).

<sup>38</sup> 43 U.S.C. § 1702(c).

<sup>39</sup> 43 U.S.C. § 1732(b).

<sup>40</sup> 43 U.S.C. § 1732(a).

BLM's authority to mitigate environmental impacts is importantly related to BLM's NEPA obligations to consider ways to avoid, minimize, and mitigate impacts in accordance with the mitigation hierarchy.<sup>41</sup> Specifically, BLM must "include appropriate mitigation measures not already included in the proposed action or alternatives."<sup>42</sup> Thus, based on site-specific NEPA reviews that rationally connect to FLPMA's mandates, BLM must impose constraints on new well approvals to avoid catastrophic climate change and protect and advance the public interest.<sup>43</sup> This includes the robust use by BLM of conditions of approval to, in sequenced priority, avoid, mitigate, or compensate for climate, public lands, or community impacts.<sup>44</sup>

The Mineral Leasing Act (MLA) also authorizes BLM to reduce the rate production over a defined period of time, limiting the amount of extraction and greenhouse gas pollution that would result. The MLA authorizes the Secretary of the Interior to "alter or modify from time to time the rate of prospecting and development and the quantity and rate of production under such a plan."<sup>45</sup> Likewise, nearly all BLM leases for onshore oil and gas contain a clause which states that "Lessor reserves the right to specify rates of development and production in the public interest." See U.S. Department of the Interior, Offer to Lease and Lease for Oil and Gas, Form 3100-11 (Oct. 2008). According to these authorizations, the Secretary and BLM could set a declining rate of production over time that provides for an orderly phase-out of onshore fossil fuel production.

BLM's legal duty and authority provide a variety of mitigation actions BLM could take to meaningfully and measurably to address cumulative climate change resulting from global emissions. We request BLM revise its NEPA analyses to correctly reflect its legal duties and authorities.

#### **4. The EAs and the 2020 BLM Specialist Report omit an analysis of the compatibility of new commitments of federal fossil fuels with the U.S. goal of avoiding 1.5 C warming.**

Neither the EAs for the proposed lease sales nor the 2020 BLM Specialist Report analyze whether the estimated GHG emissions associated with the proposed lease sales and the cumulative GHG emissions from the federal fossil fuel program are compatible with the U.S. goal of avoiding 1.5 C of warming. The United States is a signatory to the United Nations' Paris Agreement, which seeks to keep global temperatures within 2 C of the pre-industrial climate, and preferably within 1.5 C. Among other pledges and commitments, the United States has pledged to reduce its emissions by filing an intended nationally determined contribution with the United Nations to reduce net GHG emissions by 17 percent below 2005 levels by 2020, and by 26-28

---

<sup>41</sup> 40 C.F.R. §§ 1508.8, 1502.14, 1502.16, 1508.20.

<sup>42</sup> *Id.* §§ 1502.14(f), 1502.16(h).

<sup>43</sup> See Bruce M. Pendery, *BLM's Retained Rights: How Requiring Environmental Protection Fulfills Oil and Gas Lease Obligations*, 40 *Env'tl. L.* 599 (2010).

<sup>44</sup> See 43 U.S.C. §§ 1701(a)(8), 1702(c), 1732(b); 43 C.F.R. § 3101.1-2; *Yates Petroleum Inc.*, 176 I.B.L.A. 144, 154 (2008) (upholding conditions of approval more stringent than provisions contained in the overarching resource management plan).

<sup>45</sup> 30 USCA § 226(m).

percent by 2025. However, BLM's NEPA analyses fail to analyze the compatibility of cumulative federal fossil fuel program emissions with the United States' commitments to avoid 1.5 C of warming. This is despite federal agencies including the Bureau of Ocean Energy Management having conducted this type of analysis in the context of reviewing other federal projects pursuant to NEPA.<sup>46</sup> We request BLM conduct this analysis.

**5. The EAs and the 2020 BLM Specialist Report omit an analysis of the global and national over-commitment of fossil fuels relative to global carbon budgets necessary to avoid 1.5 C warming.**

BLM's EAs for the proposed 2022 lease sales omit analyzing and evaluating the estimated GHG emissions from the lease sales and cumulative GHG emissions within the context of the widening production gap. The production gap is the difference between global fossil fuel production projected by governments and fossil fuel production consistent with the 1.5 C-warming pathway and other pathways. In 2019, the Stockholm Environment Institute (SEI) released a report on the production gap with grave findings that the world's projected fossil fuel production was seriously out of sync with the level of fossil fuel production consistent with limiting warming to 1.5 C.<sup>47</sup> The subsequent 2020 *Production Gap Report* warned that:

the world must decrease fossil fuel production by roughly 6% per year between 2020 and 2030 to limit warming to 1.5°C, but fossil fuel producers are planning and projecting an average annual increase of 2%, which by 2030 would result in more than double the production consistent with the 1.5°C limit.<sup>48</sup>

This year the United Nations, in collaboration with SEI and other academic institutions, issued the first comprehensive update to the 2019 production gap analysis.<sup>49</sup> The 2021 UN Production Gap Report raises more alarm that despite the most recent IPCC findings that the world is running out of time to limit long-term global warming to 1.5 C that the world's governments continue to plan to produce more than double the amount of fossil fuels in 2030 than would be consistent with a 1.5 C-warming pathway. The report's main findings include:

- In spite of net-zero emission targets, countries have not explicitly recognized or planned for the rapid reduction in fossil fuel production that these targets require;
- Global fossil fuel production must start declining immediately and steeply to be consistent with limiting long-term warming to 1.5 C;

---

<sup>46</sup> Exhibit 12, Bureau of Ocean Energy Management, Outer Continental Shelf Oil and Gas Leasing Program: 2017-2022, Final Programmatic Environmental Statement, Volume I (Nov. 2016) at 4-8 to 4-10.

<sup>47</sup> Exhibit 13, Stockholm Environment Institute, *The Production Gap: The Discrepancy Between Countries' Planned Fossil Fuel Production and Global Production Levels Consistent with Limiting Warming to 1.5°C or 2.0°C* (2019), <https://www.sei.org/publications/the-production-gap-report/>.

<sup>48</sup> Exhibit 14, SEI, IISD, ODI, E3G, and UNEP. (2020). *The Production Gap Report: 2020 Special Report*, <http://productiongap.org/2020report>

<sup>49</sup> Exhibit 15, SEI, IISD, ODI, E3G, and UNEP. (2021). *The Production Gap Report 2021*, <http://productiongap.org/2021report>.

- Governments’ production plans and projections would lead to around 240% more coal, 57% more oil, and 71% more gas than would be consistent with limiting global warming to 1.5 C;
- Projections from the US Energy Information Administration show US oil and gas production increasing to 17% and 12% above 2019 levels by 2030, respectively.<sup>50</sup>

We request BLM consider the production gap reports discussed above, which indicate an imperative to rapidly transition away from fossil fuels using supply side policies.

**6. The EAs and 2020 BLM Specialist Report fail to adequately quantify and assess all related past, present, and reasonably foreseeable GHG emissions.**

The BLM failed to properly complete a cumulative impacts analysis of the proposed lease sales, including an assessment of the cumulative impact of greenhouse gas emissions from the federal fossil fuel program.<sup>51</sup> BLM must analyze greenhouse gas emissions from any and all federal, state, and private fossil fuel leasing and development projects. As we discussed above, BLM improperly segmented its NEPA analysis of the proposed lease sales and could more effectively conduct an analysis of the cumulative impacts of fossil fuel leasing and development in the context of a programmatic review of the federal fossil fuel program. Should BLM choose to carry on without a programmatic review, it must still comprehensively analyze cumulative GHG emissions pursuant to its statutory obligations under NEPA. The applicable CEQ NEPA regulations define “cumulative impacts” as:

the impact on the environment which results from the incremental impact the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.<sup>52</sup>

***GHG Emissions from Federal Offshore Oil and Gas Leasing***

BLM failed to assess the cumulative greenhouse gas emissions from recent and reasonably foreseeable federal offshore oil and gas lease sales. Recent and reasonably foreseeable federal offshore oil and gas lease sales, whose GHG emissions and the cumulative impacts must be assessed include:

**Recent and Pending Federal Offshore Oil and Gas Lease Sales<sup>53</sup>**

---

<sup>50</sup> *See id.*

<sup>51</sup> 40 C.F.R. §§ 1502.14, 1508.7; *Center for Biological Diversity v. National Highway Traffic Admin.*, 538 F.3d 1172, 1215 (9<sup>th</sup> Cir. 2008).

<sup>52</sup> 40 C.F.R. § 1508.7 (2005).

<sup>53</sup> *See* Bureau of Ocean Energy Management, Oil and Gas Lease Sales 2017-2022, available at <https://www.boem.gov/oil-gas-energy/lease-sales>.

Year	Sale Number	Area
2021	257	Gulf of Mexico
2021	259	Gulf of Mexico
2022	258	Cook Inlet
2022	261	Gulf of Mexico

The U.S. Bureau of Ocean Energy Management produced a Programmatic Environmental Impact Statement, analyzing the estimated GHG emissions that would potentially be produced if the 2017-2022 Outer Continental Shelf (OCS) Oil and Gas Leasing Program were implemented. The four offshore oil and gas lease sales identified above are among the lease sales studied in the PEIS for the 2017-2022 OCS Oil and Gas Leasing Program. That PEIS estimated that if the 2017-2022 OCS program were implemented, the estimated future lifecycle GHG emissions from that program would be 7,886,680,000 metric tons of CO<sub>2</sub>e.<sup>54</sup>

**Table 4.2-3. Estimated Future Lifecycle GHG Emissions from the Proposed Action in Thousands of Metric Tons of CO<sub>2</sub>e**

Program Area	Proposed Action (Low-Price Scenario)	No Action Alternative (Low-Price Scenario)	Proposed Action (High-Price Scenario)	No Action Alternative (High-Price Scenario)
Beaufort Sea	120	0	1,985,070	2,019,670
Chukchi Sea	20	0	1,943,310	2,043,210
Cook Inlet	39,480	40,620	156,820	240,930
GOM	1,245,920	1,258,110	3,801,480	3,719,880
<b>Total</b>	<b>1,285,540</b>	<b>1,298,730</b>	<b>7,886,680</b>	<b>8,020,550</b>

Source: Wolvovsky and Anderson 2016  
Key: CO<sub>2</sub>e = carbon dioxide equivalent

Bureau of Ocean Energy Management, Outer Continental Shelf Oil and Gas Leasing Program: 2017-2022, Final Programmatic Environmental Impact Statement, Volume I (Nov. 2016) at 4-8.

### *GHG Emissions from Federal Fossil Fuel Projects*

BLM also failed to assess the cumulative greenhouse gas emissions from recent and reasonably foreseeable federal fossil fuel lease sales and similar federal actions, as required by NEPA. *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 63 (D.D.C. 2019). Examples of pending coal lease applications that, if authorized, would contribute to GHG emissions include:

Applicant	Mine Name	Application Date	Application Tonnage	Application Acreage
-----------	-----------	------------------	---------------------	---------------------

<sup>54</sup> Exhibit 12, Bureau of Ocean Energy Management, Outer Continental Shelf Oil and Gas Leasing Program: 2017-2022, Final Programmatic Environmental Statement, Volume I (Nov. 2016) at 4-8.

Coteau Properties Co. <sup>55</sup>	Freedom Mine	May 17, 2019	19.2 M tons	1,119.89 acres
Falkirk Mining Co. <sup>56</sup>	Falkirk Mine	January 28, 2021	11.96 M tons	800 acres
Spring Creek Coal, LLC <sup>57</sup>	Spring Creek Mine	July 3, 2017	170.2 M tons	1,262.57 acres
Spring Creek Coal, LLC <sup>58</sup>	Spring Creek Mine	May 11, 2016	7.9 M tons	150 acres
UtahAmerican Energy, Inc. <sup>59</sup>	Not provided	December 13, 2017	1.34 M tons	317.84 acres
UtahAmerican Energy, Inc. <sup>60</sup>	Not provided	December 13, 2017	7.55 M tons	954.80 acres
Canyon Fuel Co., LLC <sup>61</sup>	Not provided	July 10, 2019	3.3 M tons	120 acres
UtahAmerican Energy, Inc. <sup>62</sup>	Not provided	March 1, 2002	Not provided	4,192 acres
Bronco Utah Reserves, Inc. <sup>63</sup>	Not provided	March 28, 2018	Not provided	2,956 acres
Antelope Coal LLC <sup>64</sup>	Antelope Mine	August 20, 2015	441 M tons	3,508 acres

### ***GHG Emissions from Non-Federal Oil and Gas Leasing***

BLM continues to fail to assess cumulative greenhouse gas emissions from recent and reasonably foreseeable non-federal oil and gas leasing and development projects. For example, just this year five states have held 13 lease sales, selling tens of thousands of acres for oil and gas development.<sup>65</sup> In addition, as of the date of this comment Oklahoma currently has an oil and gas lease sale open to bid, and North Dakota, New Mexico, Wyoming, and Colorado each have additional oil and gas lease sales tentatively scheduled for early 2022.<sup>66</sup>

### **Colorado State Land Board**

<sup>55</sup> Exhibit 16, Coteau Properties Co. Leasing Application, Freedom Mine (May 17, 2019).

<sup>56</sup> Exhibit 17, Falkirk Mining Company Leasing Application, Falkirk Mine (Amended: January 28, 2021).

<sup>57</sup> Exhibit 18, Spring Creek Coal, LLC Leasing Application, Spring Creek Mine (Modified: July 3, 2017).

<sup>58</sup> Exhibit 19, Spring Creek Coal, LLC Leasing Application, Spring Creek Mine (Modified: May 11, 2016).

<sup>59</sup> Exhibit 20, UtahAmerican Energy, Inc. Leasing Application, UTU-014218 (December 13, 2017).

<sup>60</sup> Exhibit 21, UtahAmerican Energy, Inc. Leasing Application, UTU-0126947 (December 13, 2017).

<sup>61</sup> Exhibit 22 Canyon Fuel Company LLC, Leasing Application (July 10, 2019).

<sup>62</sup> Exhibit 23, UtahAmerican Energy, Inc., Leasing Application, UTU-80043 (March 1, 2002).

<sup>63</sup> Exhibit 24, Bronco Utah Reserves, Inc., Leasing Application (March 28, 2018).

<sup>64</sup> Exhibit 25, Antelope Coal LLC, Leasing Application, Antelope Mine (August 20, 2015).

<sup>65</sup> Past state oil and gas lease sale data available at [https://www.energynet.com/page/Government\\_Sales\\_Results](https://www.energynet.com/page/Government_Sales_Results).

<sup>66</sup> Planned state oil and gas lease sales may be evaluated at [https://energynet.com/govt\\_listing.pl](https://energynet.com/govt_listing.pl).

- May 20, 2021 Oil and Gas Lease Sale<sup>67</sup>
- August 18, 2021 Oil and Gas Lease Sale<sup>68</sup>

#### **North Dakota Department of Trust Lands**

- August 3, 2021 Oil and Gas Lease Sale<sup>69</sup>
- November 2, 2021 Oil and Gas Lease Sale<sup>70</sup>

#### **New Mexico Stand Land Office**

- June 15, 2021 Oil and Gas Lease Sale<sup>71</sup>
- July 20, 2021 Oil and Gas Lease Sale<sup>72</sup>
- August 17, 2021 Oil and Gas Lease Sale<sup>73</sup>
- September 21, 2021 Oil and Gas Lease Sale<sup>74</sup>
- October 19, 2021 Oil and Gas Lease Sale<sup>75</sup>
- November 16, 2021 Oil and Gas Lease Sale<sup>76</sup>

#### **Utah School and Institutional Trust Lands Administration**

- July 23, 2021 Oil and Gas Lease Sale<sup>77</sup>

#### **Wyoming Office of State Lands and Investments**

- July 14, 2021 Oil and Gas Lease Sale<sup>78</sup>
- November 3, 2021 Oil and Gas Lease Sale<sup>79</sup>

### **7. The emissions comparisons in the EAs fail NEPA’s “hard look” standard.**

BLM continues to improperly frame and weigh the context and intensity factors for assessing the significance of reasonably foreseeable GHG emissions from the proposed lease sales and their cumulative climate impacts. Although BLM acknowledges that all GHGs contribute incrementally to the climate change phenomenon, BLM persists in comparing the estimated emissions associated with the proposed actions to the total global, national, state, and other categories of GHG emissions to support its finding that the GHG emissions from the proposed actions are insignificant. BLM’s attempt to minimize the estimated GHG emissions

---

<sup>67</sup> Exhibit 26, EnergyNet, Colorado State Land Board Lease Sale Results (May 20, 2021).

<sup>68</sup> Exhibit 27, EnergyNet, Colorado State Land Board Lease Sale Results (August 18, 2021).

<sup>69</sup> Exhibit 28, EnergyNet, State of North Dakota Oil and Gas Lease Sale Results (August 3, 2021).

<sup>70</sup> Exhibit 29, EnergyNet, State of North Dakota Oil and Gas Lease Sale Results (November 2, 2021).

<sup>71</sup> Exhibit 30, EnergyNet, New Mexico State Land Office Lease Sale Results (June 15, 2021).

<sup>72</sup> Exhibit 31, EnergyNet, New Mexico State Land Office Lease Sale Results (July 20, 2021).

<sup>73</sup> Exhibit 32, EnergyNet, New Mexico State Land Office Lease Sale Results (August 17, 2021).

<sup>74</sup> Exhibit 33, EnergyNet, New Mexico State Land Office Lease Sale Results (September 21, 2021).

<sup>75</sup> Exhibit 34, EnergyNet, New Mexico State Land Office Lease Sale Results (October 19, 2021).

<sup>76</sup> Exhibit 35, EnergyNet, New Mexico State Land Office Lease Sale Results (November 16, 2021).

<sup>77</sup> Exhibit 36, EnergyNet, Utah School and Institutional Trust Lands Lease Sale Results (July 23, 2021).

<sup>78</sup> Exhibit 37, EnergyNet, Wyoming Office of State Lands and Investments Lease Sale Results (July 14, 2021).

<sup>79</sup> Exhibit 38, EnergyNet, Wyoming Office of State Lands and Investments Lease Sale Results (Nov. 3, 2021).

from the proposed actions in this way is precisely how the 2016 CEQ GHG Guidance directed federal agencies *not* to limit assessments of the significance of GHG emissions.<sup>80</sup> This method of analysis doesn't reveal anything beyond the nature of the climate change challenge itself.<sup>81</sup>

Moreover, BLM's analysis of GHG emissions from the proposed lease sales in comparison with global, national, state, and other categories of emissions is incomplete and fails to inform the public and decision maker of comparisons that would more effectively reveal the context and intensity of the reasonably foreseeable GHG emissions. BLM correctly points out that GHGs have a long atmospheric lifetime, which allows them to become well mixed and uniformly distributed over the entirety of the Earth's surface, no matter their point of origin. However, BLM's EAs for the 2022 lease sales never explain why this aspect of GHGs should limit BLM's comparison of potential emissions from the proposed actions to global, national, and state emission totals for purposes of providing context of their significance and potential contribution to climate change impacts. In other words, BLM never compares or explains why it would be inappropriate to compare potential GHG emissions from one proposed lease sale to the potential GHG emissions from another past or present lease sale. Similarly, why not compare the potential GHG emissions from one proposed lease sale with another past or present federal (or non-federal) fossil fuel action or project? Why not compare the potential emissions to different individual sources of GHG emissions, such as a gas-fired power plant? A dairy operation? A landfill?

BLM never explains the basis for its decision to limit its GHG emission comparisons to the global, national, and state levels, even though the examples of other comparisons mentioned above would provide valuable context and intensity information to the public and the decision maker. We request BLM include a more comprehensive comparison of the estimated GHG emissions associated with the lease sales proposed in 2022 and the cumulative GHG emissions from the federal fossil fuel program to other emissions source, including but not limited to other individual federal and non-federal fossil fuel leases, individual coal-fired and natural gas electric generating facilities, and individual concentrated animal feeding operations (CAFOs).

#### **8. BLM's analysis of cumulative GHG emissions in the 2020 BLM Specialist Report fails NEPA's "hard look" standard.**

Neither the EAs nor the FONSI for the proposed 2022 lease sales clearly or properly assess the significance of the cumulative impacts of the potential emissions of GHGs and their impact on climate change. To start, no EA analyzing any of the proposed lease sales includes a section analyzing and explaining BLM's assessment of significance of the cumulative impacts of GHG emissions and their impact on climate change. The EAs refer the public and decision maker to a discussion of past, current, and projected future climate change impacts in Chapters 8 and 9 of the 2020 BLM Specialist Report. However, nothing in those chapters or the remainder of the 2020 BLM Specialist Report ever provides BLM's basis for assessing significance of GHG emissions or its ultimate conclusion on significance. Moreover, only the FONSI for the Wyoming 2022 lease sale includes a discussion of the NEPA intensity factor for cumulative impacts. Even the discussion of cumulative impacts from GHG emissions in the Wyoming

---

<sup>80</sup> 2016 CEQ GHG Guidance at 10-11.

<sup>81</sup> *Id.*

FONSI is unclear as to how exactly BLM evaluated the significance of the cumulative impact from potential GHG emissions, stating:

This EA is tiered to the information and analysis and conforms to the decisions contained in the applicable Record of Decisions (RODs) and RMPs for each planning area with lands considered in this EA, and associated FEISs. The RODs and RMPs are in compliance with all Federal laws, regulations, and policy. The direct, indirect, and cumulative effects of oil and gas leasing were considered at the appropriate scale for the full Reasonably Foreseeable Development Scenario (RFD) for the Field Offices in the FEISs for the RMPs. The decisions on what areas to not lease, lease with standard, moderate, or major stipulations is done at the RMP level in order to look at the larger picture of impacts (including cumulative impacts). The EA did not reveal any cumulative effects beyond those already analyzed in the applicable RMPs/FEISs. The interdisciplinary team evaluated the possible actions in context of past, present and reasonably foreseeable actions. Significant cumulative effects are not expected.<sup>82</sup>

As we mentioned above, this conclusion contradicts earlier statements in BLM's FONSI, claiming that BLM could not determine the significance or non-significance of GHG emissions. Regardless, it's impossible to understand how BLM reached this conclusion related in this brief statement in the FONSI because BLM failed to discuss how it assessed the significance of GHG emissions in the EAs, as well as in the 2020 BLM Specialist Report.

In addition, although the 2020 BLM Specialist Report provided a discussion of cumulative GHG emissions from the BLM fossil fuel leasing program and future climate change impacts, the 2020 BLM Specialist Report failed to analyze these cumulative impacts using the SC-GHG and failed to assess carbon budgets according to historic GHG contribution and equitable apportionment. BLM estimated the monetized net harm to society associated with incremental increases in GHG emissions for each individual lease sale proposed in 2022, but without explanation, BLM chose not to conduct the same analysis of cumulative GHG emissions in the 2020 BLM Specialist Report. We request BLM conduct a social cost analysis of the cumulative GHG emissions attributable to federal fossil fuel development and production in accordance with the Interim Estimates of the Social Cost of Carbon, Methane, and Nitrous Oxide.<sup>83</sup> This analysis must include the monetized net harm to society of reasonably foreseeable emissions according to the increasing social cost of greenhouse gases, which reflects the expectation that the net harm to society will increase as the impacts of climate change accumulate over time.

BLM's 2020 BLM Specialist Report must also further contextualize its carbon budget analysis by evaluating carbon budgets according to the United States' historic contributions. It is

---

<sup>82</sup> Draft FONSI for the 2022 First Quarter Competitive Lease Sale, DOI-BLM-WY-0000-2021-0003-EA (2021) ("Wyoming FONSI") at 5-6.

<sup>83</sup> Exhibit 39, U.S. Government Interagency Working Group on Social Cost of Greenhouse Gases, Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990 (February 2021).

well-documented that the United States is the world's largest historic contributor of GHG emissions and, thus, bears a greater global responsibility to more quickly reduce the quantity of its GHG emissions.<sup>84</sup> The 2020 BLM Specialist Report attempts to cast doubt on the utility of assessing GHG emissions according to carbon budgets, stating: "Carbon budgets have not yet been established on a national or subnational scale, primarily due to the lack of consensus on how to allocate the global budget to each nation, and as such the global budgets that limit warming to 1.5 C or 2.0 C are not useful for BLM decisionmaking as it is unclear what portion of the budget applies to emissions occurring in the United States."<sup>85</sup> However, uncertainty in other contexts of GHG and climate change analysis has not prevented BLM from using averages, estimates, and models to address uncertainty and provide the public and decision makers helpful information.<sup>86</sup> As such, BLM should consult the best scientific reports and data available to determine a representative carbon budget that reasonably applies to emissions in the United States, given its historic contributions.<sup>87</sup> The carbon budget analysis in the 2020 BLM Specialist Report, as currently drafted, is misleading because it inappropriately compares GHG emissions from the BLM federal fossil fuel program to the remaining global carbon budget. To the public or a decision maker, this analysis minimizes the GHG emissions from the BLM federal fossil fuel program and implies the emissions are insignificant to the global carbon budget, comparatively.

## **B. BLM Must Take a Hard Look at Impacts to Human Health**

BLM must include an analysis of reasonably foreseeable direct, indirect, and cumulative human health impacts resulting from oil and gas leasing and development. 40 C.F.R. § 1506.6. Protecting public health is fundamental to NEPA's underlying purpose. NEPA was enacted in part to "stimulate the health and welfare of man," 42 U.S.C § 4321, and mandates that agencies consider the degree to which their proposed actions affect public health or safety. 40 C.F.R § 1508.27(b)(2). NEPA requires federal agencies "to use all practicable means, consistent with other essential considerations of national policy" to "assure for all Americans safe, healthful, productive and aesthetically and culturally pleasing surroundings." 42 U.S.C 4331(b). "Effects" that agencies must analyze include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or *health*, whether direct, indirect, or cumulative." 40 C.F.R § 1508.8 (emphasis added). In addition, NEPA's use of the term "human environment" expressed Congressional intent that NEPA should promote public policy attentive to the inexorable link

---

<sup>84</sup> Evans, Simon, *Analysis: Which countries are historically responsible for climate change?* Carbon Brief, <https://www.carbonbrief.org/analysis-which-countries-are-historically-responsible-for-climate-change> (last visited Nov. 29, 2021).

<sup>85</sup> 2020 BLM Specialist Report at Section 7.2.

<sup>86</sup> See, e.g., 2020 BLM Specialist Report at Section 3.4 (estimating global warming potentials), Section 4.0 (using various methods and assumptions to estimate emission factors for coal, oil, and gas and short- and long-term fossil fuel emissions projections), Sections 6.2-6.4 (projecting global and U.S. emissions).

<sup>87</sup> See, e.g., Exhibit 40, Van den Berg, Nicole et al., *Implications of various effort-sharing approaches for national carbon budgets and emission pathways*, *Climatic Change* 162: 1805-1822 (2020), <https://link.springer.com/article/10.1007%2Fs10584-019-02368-y>; Dooley, Kate et al., *Ethical choices behind quantifications of fair contributions under the Paris Agreement*, *Nature Climate Change* 11: 300-305 (2021), available at <https://www.nature.com/articles/s41558-021-01015-8>.

between human well-being and environmental integrity.<sup>88</sup> Senator Henry Jackson, the key author of NEPA, expressed this intent by stating: “When we speak of the environment, basically, we are talking about the relationship between man and these physical and biological and social forces that impact upon him.”<sup>89</sup>

To protect public health and promote informed agency decision-making, transparency, and public participation, NEPA imposes “action-forcing procedures ... requir[ing] that agencies take a hard look at environmental consequences.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989). Such consequences include all “reasonably foreseeable” direct, indirect, and cumulative effects, including health effects. *See, e.g., Middle Rio Grande Conserv. Dist. v. Norton*, 294 F.3d 1220, 1229 (10th Cir. 2002). An effect is “reasonably foreseeable” if it is “sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision.” *Sierra Club v. Marsh*, 976 F.2d 763, 767 (1st Cir.1992). An agency’s hard look “must be taken objectively and in good faith, not as an exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made.” *Forest Guardians v. U.S. Fish & Wildlife Serv.*, 611 F.3d 692, 712 (10th Cir. 2010).

Courts have recognized BLM’s obligation to take a hard look at health impacts in its NEPA analyses at the oil and gas leasing stage. *See Wilderness Workshop v. Bureau of Land Mgmt.*, 342 F. Supp. 3d 1145 (D. Colo. 2018). In *Wilderness Workshop*, the court reasoned that it was premature to consider health effects at the planning stage, but, “in the context of oil and gas leasing, the site-specific impacts occur in the later stages of leasing and development,” and therefore, health impacts should be considered at those stages. *Id.* at 1163 (citing *Pennaco Energy v. U.S. Dep’t of Interior*, 377 F. 3d 1147, 1151-1152 (10th Cir. 2004)).

Yet, in its NEPA documentation for these lease sales, BLM fails to analyze several important issues related to health and safety risks and impacts—whether direct, indirect, or cumulative. In the Pecos District Office (“PDO”) EA, for example, BLM generally lists some historic health and safety-related *risks* that “have resulted” in the *past* from development of 41,006 active wells across the 20-million-acre PDO, but does not actually analyze any present or reasonably foreseeable future health and safety *impacts* that could result from the lease sale. *See, e.g., Pecos District Office EA* at 48-49. Merely listing historical risks simply establishes background information—it tells the decision-maker and the public nothing about impacts from this leasing decision. NEPA and its implementing regulations require BLM to do more than list generalized categories of risks: the agency must analyze and take a hard look at those risks and their *effects*. *See* 40 C.F.R. § 1508.8 (requirement to analyze direct and indirect *effects*, synonymous with impacts); *see also* 40 C.F.R. § 1508.7 (defining cumulative *impacts*, which include past, *present*, and *reasonably foreseeable future* actions); *see also* 40 C.F.R. § 1508.25

---

<sup>88</sup> Exhibit 41, Rajiv Bhatia and Aaron Wernham, *Integrating Human Health into Environmental Impact Assessment: An Unrealized Opportunity for Environmental Health and Justice*, 116 ENVIRONMENTAL HEALTH PERSPECTIVES 991 (Apr. 16, 2008) (Noting that “the statutory and procedural requirements of EIA provide a powerful and underutilized mechanism to institutionalize a holistic, cross-sectoral approach to addressing health in public policy” and describing the then-emerging and now well-established practice of health impact assessment as a “catalyst” for integrating health considerations into environmental assessments under NEPA and its state analogs).

<sup>89</sup> *Id.*

(c) (stating that, in determining scope of environmental impact statements, agencies shall consider direct, indirect, and cumulative impacts). Here, BLM’s “[g]eneral statements about ‘possible’ effects and ‘some risk’ do not constitute a ‘hard look’ absent a justification regarding why more definitive information could not be provided.” *Kern v. United States BLM*, 284 F.3d 1062, 1075 (9th Cir. 2002). Moreover, in the Montana EA, BLM does not analyze health and safety impacts *at all*, instead dismissing them as “NI”—that is, “present, but not affected to a degree that detailed analysis is required.” Montana EA at 96-97, Table 6. The only explanation BLM offers for its omission of health and safety concerns from the Montana analysis is that there will be “no issues from the act of leasing. Stipulation application and regulatory requirements will adequately mitigate impacts at the APD stage.” Montana EA at 96, Table 6. But BLM cannot defer NEPA’s requisite hard look at health impacts to the APD stage. The intent of NEPA is for agencies to study the impact of their actions on the environment—here, leasing—*before* the action is taken. *See Conner v. Burford*, 848 F.2d 1441, 1452 (9th Cir. 1988) (NEPA requires that agencies prepare an EIS before there is “any irreversible and irretrievable commitment of resources”); *see also Upper Pecos Ass’n v. Stans*, 500 F.2d 17 (10th Cir. 1974) (concluding that “consideration of environmental factors should come in the early stages of program and project formulation”).

### **1. Overview of Human Health Impacts and Sources of Peer-Reviewed Literature Related to Proximity to Oil and Gas Development**

An extensive and ever-growing body of peer-reviewed research has shown what people living near oil and gas operations already know firsthand—that proximity to drilling and fracking operations and other oil and gas facilities is linked to adverse health risks and impacts. These risks and impacts are discussed in further detail throughout this section, and in the numerous accompanying exhibits, but in general, they include (but are not limited to):

- Reproductive harms – including birth defects, low birth weight, preterm births, and miscarriages;
- Respiratory health effects – including asthma, lung disease, breathing difficulty, and, most recently, increased vulnerability to COVID-19;
- Eye, skin, and throat irritation and rashes;
- Cardiovascular effects – including higher blood pressure and other indicators of, or precursors to, heart disease;
- Possible disruption of the endocrine system (a system of glands producing hormones that regulate a variety of functions in the body, including metabolism, growth and development, reproduction, sleep, and mood);
- Cancer (lung cancer and other types of cancer);
- Motor vehicle injuries and fatalities, and other health and safety risks associated with increased vehicle traffic (and the air pollutants it emits) from oil and gas development;
- Injuries and fatalities from explosions, fires, spills, and leaks; and
- Trauma and psychological stress.

One excellent, frequently updated, and easy-to-use resource for keeping up with this growing body of peer-reviewed research is the Physicians, Scientists, and Engineers for Healthy Energy (“PSE Healthy Energy”) database, the Repository for Oil and Gas Energy Research, or “ROGER.”<sup>90</sup> ROGER is an extensive repository of peer-reviewed literature, “a near-exhaustive collection of bibliographic information, abstracts, and links to many of [sic] journal articles that pertain to shale and tight gas development.”<sup>91</sup> This database is organized into several categories, and for the “Health” category alone, there are over 250 studies listed, including several recent studies from 2019-2021. BLM should avail itself of this invaluable resource in order to take NEPA’s requisite hard look at health impacts.

There are several other notable scientific papers BLM should consider in order to analyze and disclose to the public the health risks and impacts associated with its leasing decisions.<sup>92</sup> Multiple peer-reviewed papers have identified adverse health effects and risks arising from exposure to unconventional oil and gas drilling operations, even within a large radius of

---

<sup>90</sup> See Physicians, Scientists, and Engineers for Healthy Energy (“PSE Healthy Energy”), “The ROGER Citation Database,” <https://www.psehealthyenergy.org/our-work/shale-gas-research-library/> (last visited November 19, 2021).

<sup>91</sup> *Id.*

<sup>92</sup> See, e.g., Exhibit 42, R.Z. Witter, et al., *Occupational exposures in the oil and gas extraction industry: state of the science and research recommendations*, AMERICAN JOURNAL OF INDUSTRIAL MEDICINE (2014); Exhibit 43, Jessica Gilman, et al., *Source signature of volatile organic compounds (VOCs) from oil and natural gas operations in northeastern Colorado*, ENVIRONMENTAL SCIENCE & TECHNOLOGY (2013); Exhibit 44, Roxana Z. Witter, et al., *The Use of Health Impact Assessment for a Community Undergoing Natural Gas Development*, FRAMING HEALTH MATTERS (2013); Exhibit 45, Nadia Steinzor, et al., *Investigating links between shale gas development and health impacts through a community survey project in Pennsylvania*, NEW SOLUTIONS, vol. 23 iss. 1. (2013); Exhibit 46, John L. Adgate, et al., *Potential Public Health Hazards, Exposures and Health Effects from Unconventional Natural Gas Development*, ENVIRONMENTAL SCIENCE & TECHNOLOGY (2014); Exhibit 47, Christopher W. Moore, et al., *Air Impacts of Increased Natural Gas Acquisition, Processing, and Use: A Critical Review*, ENVIRONMENTAL SCIENCE & TECHNOLOGY (2014); Exhibit 48, Avner Vengosh, et al., *The effects of shale gas exploration and hydraulic fracturing on the quality of water resources in the United States*, PROCEDIA EARTH AND PLANETARY SCIENCE (2014); Exhibit 49, Christopher D. Kassotis, et al., *Estrogen and Androgen Receptor Activities of Hydraulic Fracturing Chemicals and Surface and Ground Water in a Drilling-Dense Region*, ENDOCRINOLOGY (2014); Exhibit 50, Brian E. Fontenot, et al., *An Evaluation of Water Quality in Private Drinking Water Wells Near Natural Gas Extraction Sites in the Barnett Shale Formation*, ENVIRONMENTAL SCIENCE & TECHNOLOGY (2013); Exhibit 51, Sherilyn A. Gross, et al., *Analysis of BTEX Groundwater Concentrations from Surface Spills Associated with Hydraulic Fracturing Operations*, JOURNAL OF THE AIR & WASTE MANAGEMENT ASSOCIATION (2013); Exhibit 52 K.D. Retzer, et al., *Motor vehicle fatalities among oil and gas extraction workers*, ACCIDENT ANALYSIS & PREVENTION (2013); Gayathri Vaidyanathan, *Fracking Can Contaminate Drinking Water*, Climate Wire (April 4, 2016), available at: <https://www.scientificamerican.com/article/fracking-can-contaminate-drinking-water/>; Exhibit 53, A. Austin, et al., *Associations Between Unconventional Natural Gas Development and Nasal and Sinus, Migraine Headache, and Fatigue Symptoms in Pennsylvania*, ENVIRONMENTAL HEALTH PERSPECTIVES (July 31, 2016), available at: <http://ehp.niehs.nih.gov/wp-content/uploads/advpub/2016/8/EHP281.acco.pdf>

residences—potentially up to ten miles.<sup>93</sup> For example, one study found that babies whose mothers lived in close proximity to multiple oil and gas wells were 30% more likely to be born with heart defects than babies born to mothers who did not live close to oil and gas wells.<sup>94</sup> Other adverse health impacts documented among residents living near drilling and fracking operations include increased reproductive harms, asthma attacks, higher rates of hospitalization, ambulance runs, emergency room visits, self-reported respiratory problems and rashes, motor vehicle fatalities, trauma, and drug abuse. Moreover, one recent study found that fracking and drilling near people’s homes “drives stress experiences that go beyond the mere presence of industrial land uses in neighborhoods,” and identified

two key institutional barriers driving negative mental health impacts for people living near UOG [unconventional oil and gas] production – namely: 1) uncertainty, due to inaccessible, transparent information about environmental and public health risks and 2) powerlessness to meaningfully impact regulatory or zoning processes.<sup>95</sup>

In turn, “these institutional barriers make UOG production a chronic stressor – which can be more insidious, negative, and, significantly, can generate longer- term mental health impacts such as self-reported depression.”<sup>96</sup>

A 2020 review of literature on health impacts of fracking by Physicians for Social Responsibility (“PSR”) concluded that:

By several measures, evidence for fracking-related health problems has emerged across the United States and Canada....Drilling and fracking operations in multiple states are variously correlated with increased rates of asthma; increased hospitalizations for pneumonia and kidney, bladder, and skin problems; high blood pressure and signs of cardiovascular disease; elevated motor vehicle fatalities; symptoms of depression and anxiety; ambulance runs and emergency room visits; and incidence of sexually

---

<sup>93</sup> See, e.g., Exhibit 54, Lisa M. McKenzie *et al.*, *Birth Outcomes and Maternal Resident Proximity to Natural Gas Development in Rural Colorado*, 122 ENVIRONMENTAL HEALTH PERSPECTIVES 412 (April 2014) [Hereinafter McKenzie *et al.*, *Birth Outcomes*] (Finding an increased risk of congenital heart and neural tube defects in babies born to mothers living within 10 miles of a natural gas well); Exhibit 55, Janet Currie *et al.*, *Hydraulic Fracturing and Infant Health: New Evidence from Pennsylvania*, 3 SCIENCE ADVANCES e1603021(Dec. 13, 2017) (Finding evidence of negative health effects of in utero exposure to fracking sites within 3 km, or about 1.86 miles, of a mother’s residence, with the largest health impacts seen within 1 km, or about 0.62 miles); Exhibit 56 Ellen Webb *et al.*, *Potential Hazards of Air Pollutant Emission from Unconventional Oil and Natural Gas Operations on the Respiratory Health of Children and Infants*, 31 REV. ENVIRONMENTAL HEALTH 225-243 (Jun. 1, 2016), at 236 [hereinafter Webb *et al.*] (Noting that many unconventional oil and gas setback rules, for setbacks of 1000 feet or less, do not adequately protect health, especially children’s respiratory health, that “the majority of municipal setback ordinances are not supported by empirical data,” and calling for a one-mile minimum for setbacks between drilling facilities and schools, hospitals, and occupied dwellings).

<sup>94</sup> See McKenzie *et al.*, *Birth Outcomes*, *supra* Note 93.

<sup>95</sup> See Exhibit 57, Stephanie A. Malin, *Depressed democracy, environmental injustice: Exploring the negative mental health implications of unconventional oil and gas production in the United States*, 70 Energy Research & Social Science, 101720 at 2 (2020).

<sup>96</sup> *Id.*

transmitted diseases...Benzene levels in ambient air surrounding drilling and fracking operations are sufficient to elevate risks for future cancers in both workers and nearby residents, according to studies. Animal studies show numerous threats to fertility and reproductive success from exposure to various concentrations of oil and gas chemicals at levels representative of those found in drinking water. At least 43 chemicals used in drilling and fracking operations are classified as known or presumed human reproductive toxicants... Two dozen chemicals commonly used in fracking operations are endocrine disruptors that can variously disrupt organ systems, lower sperm counts, and cause reproductive harm...<sup>97</sup>

“No Surface Occupancy” (NSO) stipulations could be implemented within a certain distance of residences, schools, or other occupied areas that might mitigate some of these effects, but they do not eliminate BLM’s obligation to take a hard look at health effects at the leasing stage, as NEPA requires. Stipulations and notices are used to comply with FLPMA and the MLA, and are not a substitute for a NEPA analysis. *See, e.g.*, 43 C.F.R. § 3101.1-3; 43 U.S.C. § 1732(a). Moreover, most existing oil and gas setbacks or NSO stipulations (typically < 1000 feet) are likely inadequate to protect people and communities against health and safety risks and adverse effects. At minimum, some health experts have called for a one-mile minimum distance between drilling facilities and schools, hospitals, and occupied dwellings, in light of the heightened health risks of residing within close proximity to unconventional oil and gas drilling sites.<sup>98</sup> Many others call for setbacks of even greater distances. One study found adverse health impacts at distances of six miles.<sup>99</sup> Another study found increased risk of congenital heart and neural tube defects in babies born to mothers living within 10 miles of natural gas wells.<sup>100</sup> Even larger setbacks may not protect against certain health hazards, especially for people already facing disproportionate health risks due to cumulative social, structural, and environmental factors, or for children and the elderly. For example, a 2016 study and Health Impact Assessment (“HIA”) in Maryland’s Marcellus Shale Basin found that, even with a setback of 2000 feet from residential property as a “mitigating factor,” Air Quality was a fracking-related hazard of High concern for its potential negative health impacts after taking into account additional evaluation criteria, such as presence of vulnerable populations, duration and frequency of exposure, and

---

<sup>97</sup> Exhibit 58, Physicians for Social Responsibility and Concerned Health Professionals of NY, *Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking*, Seventh Edition (Dec. 2020). [Hereinafter PSR 2020].

<sup>98</sup> *See Webb et al., supra* Note 93.

<sup>99</sup> Exhibit 59, Kathy V. Tran et al., *Residential Proximity to Oil and Gas Development and Birth Outcomes in California: A Retrospective Cohort Study of 2006–2015 Births*, 128 *Environmental Health Perspectives*, 067001 (2020)

<sup>100</sup> McKenzie et al., *Birth Outcomes, supra* Note 93.

likelihood and severity/magnitude of health effects.<sup>101</sup> BLM must take a hard look at the adverse health risks and effects associated with proximity to oil and gas activity and facilities and disclose them to the public.

## **2. Cumulative Health Risks and Impacts to Social and Structural Factors Affecting Health**

BLM must take a hard look not only at direct health impacts and proximity-related health impacts of oil and gas development, but also at cumulative health risks and impacts. *See* 40 C.F.R. § 1508.7 (defining cumulative impacts); *see also* 40 C.F.R. § 1508.25(c) (stating that, in determining scope of environmental impact statements, agencies shall consider direct, indirect, and cumulative impacts); 40 C.F.R. § 1508.27(b)(7) (stating that one of the factors agencies must consider in assessing the significance of an action is “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...”). Cumulative health risks and impacts can arise not only from multiple pollutant exposures, and cumulative pollution exposures over time, but also from compounding structural, social, and economic factors, many of which are rooted in systemic inequities and injustices. Researchers have begun to apply a growing body of evidence documenting how social and environmental

---

<sup>101</sup> *See, e.g.*, Exhibit 60, Meleah D. Boyle et al., Hazard Ranking Methodology for Assessing Health Impacts of Unconventional Natural Gas Development and Production: The Maryland Case Study, 11 PLOS ONE e0145368 (Jan. 4, 2016) [Hereinafter Boyle et al.](Assigning setback effectiveness a “positive” value of 1 if it is anticipated to minimize health effects, and a “negative” value of 2 if it is not anticipated to minimize health effects, in evaluating the “hazard rankings” for a variety of unconventional natural gas drilling impacts. Notably, there is no “zero” value by which setbacks eliminate health risks or health effects. And, for effects related to water quality, seismic activity, social determinants of health, healthcare infrastructure, cumulative exposures/risks, and occupational health and safety, the authors determined that, at least in that study area (Marcellus Shale in Maryland), setbacks were not anticipated to minimize or mitigate health risks at all. *See* Table 3).

stressors lead to health inequities and cumulative impacts<sup>102</sup> specifically in the oil and gas drilling context.<sup>103</sup> For example, the aforementioned 2016 Marcellus Shale study and Health Impact Assessment (“HIA”) ranked “social determinants of health,” (in this study, social determinants included crime, injuries, mental health, sexually transmitted infections, and substance abuse) as a fracking-related hazard of the highest concern with respect to public health impacts, along with air quality and health care infrastructure.<sup>104</sup> Cumulative risks, too, were considered their own category of fracking-related public health hazard, and ranked as a “moderately high” concern (along with water quality, noise, and traffic).<sup>105</sup>

In general, the research indicates that the potential cumulative effects of social and environmental stressors and “social determinants of health” in the context of oil and natural gas

---

<sup>102</sup> See, e.g., Exhibit 61, Rachel Morello-Frosch et al., *Understanding the Cumulative Impacts of Inequalities in Environmental Health: Implications for Policy*, 30 HEALTH AFFAIRS 879 (May 2011) (Identifying four key concepts underlying the emerging knowledge about cumulative impacts of environmental and social stressors: “First, health disparities between groups of different racial or ethnic makeup or socioeconomic status are significant and persistent, and exist for diseases that are linked to social and environmental factors. Second, inequalities in exposures to environmental hazards are also significant and persistent, and are linked to adverse health outcomes. Third, intrinsic biological and physiological factors—for example, age—can modify the effects of environmental factors and contribute to differences in the frequency and severity of environmentally related disease. And fourth, extrinsic social vulnerability factors at the individual and community levels—such as race, sex, and socioeconomic status—may amplify the adverse effects of environmental hazards and can contribute to health disparities.”). In addition, the U.S. EPA and numerous states have called for, and developed guidance on, cumulative impact analyses, including cumulative risk assessments and health impact assessments (HIAs), that analyze multiple environmental stressors in conjunction with social stressors, environmental justice considerations, and social determinants of health. See, e.g., Exhibit 62, U.S. ENVIRONMENTAL PROTECTION AGENCY, FRAMEWORK FOR CUMULATIVE RISK ASSESSMENT (May), Available at [https://www.epa.gov/sites/production/files/2014-11/documents/frmwrk\\_cum\\_risk\\_assmnt.pdf](https://www.epa.gov/sites/production/files/2014-11/documents/frmwrk_cum_risk_assmnt.pdf); Exhibit 63, MINNESOTA POLLUTION CONTROL AGENCY, CUMULATIVE IMPACT ANALYSIS Available at <https://www.pca.state.mn.us/air/cumulative-impact-analysis> (Noting that “People’s health is affected by many outside factors including multiple sources of pollution and other social conditions and stressors. Some people and communities are burdened by higher levels of pollution and more social stressors than others.”; Exhibit 64, CUMULATIVE IMPACTS SUBCOMMITTEE, ENVIRONMENTAL JUSTICE ADVISORY COUNCIL TO THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION, STRATEGIES FOR ADDRESSING CUMULATIVE IMPACTS IN ENVIRONMENTAL JUSTICE COMMUNITIES (March 2009), Available at [https://www.nj.gov/dep/ej/docs/ejac\\_impacts\\_report200903.pdf](https://www.nj.gov/dep/ej/docs/ejac_impacts_report200903.pdf) (Identifying adverse cumulative impacts of exposures to multiple environmental burdens in “environmental justice” communities as one of “the most critical and pertinent Environmental Justice issues requiring state action and attention”).

<sup>103</sup> See, e.g., Exhibit 65, Susan Kinnear et al., *The Need to Measure and Manage the Cumulative Impacts of Resource Development on Public Health: An Australian Perspective* (May 15, 2013), Available at <https://www.intechopen.com/books/current-topics-in-public-health/the-need-to-measure-and-manage-the-cumulative-impacts-of-resource-development-on-public-health-an-au> (<https://www.intechopen.com/books/current-topics-in-public-health/the-need-to-measure-and-manage-the-cumulative-impacts-of-resource-development-on-public-health-an-au>; See also Exhibit 66, Jill Johnston & Lara Cushing, *Chemical Exposures, Health, and Environmental Justice in Communities Living on the Fenceline of Industry*, 7 Current Environmental Health Reports, 48-57 (2020).

<sup>104</sup> Boyle et al., *supra* Note 101.

<sup>105</sup> *Id.*

activity are as follows: (1) they can increase the *risk or magnitude of exposure* and the *number and/or severity of adverse health impacts* of oil and gas drilling (e.g. pollution sources are often located closer to “environmental justice” communities; underlying health conditions can increase vulnerability to pollution-related health impacts; and pollution-related risks and impacts can exacerbate existing health, social, and economic stressors and vice versa); and (2) they can present obstacles to diagnosing, managing, treating, and mitigating adverse health impacts (e.g. lack of access to health care providers makes it more difficult to manage asthma). BLM must take a hard look at the reasonably foreseeable cumulative health impacts of its actions, including cumulative impacts as they relate to social and structural factors—often referred to as social determinants of health—and environmental justice. These “social determinants” can include both positive and negative factors. Most broadly, “social determinants of health” that BLM should consider are:

conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks. Conditions (e.g., social, economic, and physical) in these various environments and settings (e.g., school, church, workplace, and neighborhood) have been referred to as ‘place.’ In addition to the more material attributes of ‘place,’ the patterns of social engagement and sense of security and well-being are also affected by where people live. Resources that enhance quality of life can have a significant influence on population health outcomes. Examples of these resources include safe and affordable housing, access to education, public safety, availability of healthy foods, local emergency/health services, and environments free of life-threatening toxins.<sup>106</sup>

Moreover, the CEQ guidance on environmental justice in the NEPA process specifically directs agencies to incorporate relevant underlying health data, and what amounts to social determinants of health, into their NEPA analyses, and to use this data to identify cumulative risks and reasonably foreseeable cumulative effects.<sup>107</sup> It emphasizes the importance of using public health data to identify “the potential for multiple or cumulative exposure to human health or environmental hazards in the affected population and historical patterns of exposure to environmental hazards, to the extent such information is reasonably available...”<sup>108</sup> and notes that “[a]gencies should consider these multiple, or cumulative effects, even if certain effects are not within the control or subject to the discretion of the agency proposing the action.”<sup>109</sup> It also embraces a broad, socio-ecological model of health that is consistent with the language and purpose of NEPA. An additional guiding principle is that “[a]gencies should recognize the interrelated cultural, social, occupational, historical, or economic factors that may amplify the natural and physical environmental effects of the proposed agency action. These factors should include the physical sensitivity of the community or population to particular impacts; the effect

---

<sup>106</sup> Office of Disease Prevention and Health Promotion, *Healthy People 2020: Social Determinants of Health*, Available at <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>.

<sup>107</sup> Exhibit 67, Council on Environmental Quality, ENVIRONMENTAL JUSTICE: GUIDANCE UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT (December 10, 1997) at 9 [Hereinafter CEQ EJ and NEPA Guidance].

<sup>108</sup> *Id.*

<sup>109</sup> *Id.*

of any disruption of the community structure associated with the proposed action; and the nature and degree of impact on the physical and social structure of the community.”<sup>110</sup>

BLM’s full analysis and disclosure of health and safety risks and impacts, including cumulative impacts, is particularly important given that typical methods of collecting and analyzing emissions data have often underestimated health risks by failing to adequately measure the intensity, frequency, and duration of community exposure to toxic chemicals from fracking and drilling; failing to examine the effects of chemical mixtures; and failing to consider vulnerable populations.<sup>111</sup> Of high concern, numerous studies highlight that health assessments of drilling and fracking emissions often fail to consider impacts on vulnerable populations including environmental justice communities<sup>112</sup> and children.<sup>113</sup> For example, a recent analysis of oil and gas development in California found that 14 percent of the state’s population totaling 5.4 million people live within a mile of at least one oil and gas well. More than a third of these residents, totaling 1.8 million people, also live in areas most burdened by environmental pollution.<sup>114</sup>

The existing health status and pollution burdens experienced by individuals and populations in the lease sale areas, and the disproportionate health risks they face in light of social determinants of health and environmental justice concerns, are precisely the kinds of “incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions” that NEPA requires BLM to analyze here. 40 C.F.R. § 1508.7. BLM cannot simply dismiss the “incremental” addition of wells from a particular lease sale (or the “incremental” increase in air pollution from those wells) as insignificant merely because they constitute a small “percent increase” *compared to* state, regional/basin-wide, or national well counts or emissions. *See, e.g.*, Pecos District Office EA at 49 (describing the estimated new wells to be developed from the lease sale as a 0.012% increase over existing active well numbers in the PDO); Pecos District Office EA at 62 (Table 3.16, calculating lease sale air pollutant emissions as a “percent increase” compared to emissions projected for wells across the PDO). This misses the entire point of NEPA’s requisite cumulative impacts analysis—it is not to determine what *fraction* of regional, state, or national wells and emissions the wells and emissions from a particular lease sale make up. Quite the opposite—rather than breaking emissions from an individual

---

<sup>110</sup> *Id.*

<sup>111</sup> Exhibit 68, Brown, David et al., *Understanding Exposure From Natural Gas Drilling Puts Current Air Standards to the Test*. 29 REVIEWS ON ENVIRONMENTAL HEALTH 277 (2014).

<sup>112</sup> Exhibit 69, NRDC [Natural Resources Defense Council], *Drilling in California: Who’s At Risk?*, October 2014 (“NRDC 2014”); Exhibit 70, Clough, Emily & Derek Bell, *Just Fracking: A Distributive Environmental Justice Analysis of Unconventional Gas Development in Pennsylvania, USA*, 11 Environmental Research Letters 025001 (2016); Exhibit 71, McKenzie, Lisa M. et al., *Population Size, Growth, and Environmental Justice Near Oil and Gas Wells in Colorado*, 50 ENVIRONMENTAL SCIENCE & TECHNOLOGY 11471 (2016).

<sup>113</sup> Exhibit 72 Webb, Ellen et al., *Potential Hazards of Air Pollutant Emissions From Unconventional Oil and Natural Gas Operations on The Respiratory Health of Children And Infants*. 31 REVIEWS ON ENVIRONMENTAL HEALTH 225 (2016).

<sup>114</sup> NRDC 2014, *supra* Note 112.

lease sale down into annual fractions or “component parts” in attempt to dismiss them as insignificant, BLM must analyze *additive short and long-term emissions and their direct, indirect, and cumulative health effects* from these lease sales—the impacts which result “from the incremental impact of the action when *added* to past, present, and reasonably foreseeable future actions” (and impacts). 40 C.F.R. § 1508.7. *See also* 40 C.F.R. § 1508.27 (discussing cumulative impacts in evaluating significance).

In addition, BLM must not summarily dismiss health and safety *impacts* as temporary simply because some *exposures* (e.g., to emissions and fugitive dust from construction) are temporary. It is arbitrary, and contrary to scientific understanding, to assume that just because an exposure is temporary, so too are the effects resulting from that exposure. The health effects that can arise from environmental exposures, especially in conjunction with social determinants of health and environmental justice issues, may endure long after the acute exposure source is gone.<sup>115</sup> Indeed, NEPA requires BLM to consider, in assessing the significance of an action, “[w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts.” 40 C.F.R. § 1508.27(b)(7). Indeed, “[s]ignificance cannot be avoided by *termining an action temporary* or by breaking it down into small component parts.” 40 C.F.R. § 1508.27(b)(7) (emphasis added). *See also* 40 C.F.R. § 1508.27(a) (requiring consideration of both short *and* long-term *effects*).

BLM also cannot dismiss health impacts as “temporary,” and thus avoid taking a hard look at cumulative health impacts, by simply stating that wells will be properly plugged and reclaimed “at the end of their useful lives,” and thus cease to cause unspecified “aggregate” health risks and impacts at that time. *See, e.g.,* Pecos District Office at 49. For one, a well’s “useful life” can span decades. BLM must analyze cumulative emissions and their impacts over the full life course of a well, in conjunction with other wells in the lease sale area *and* other past, present, and reasonably foreseeable future actions and emissions. Moreover, information from several states, and nationally, indicates that wells often are *not* properly plugged and reclaimed at the end of their “useful lives.” For example, while it is sometimes difficult to obtain an exact count of “orphaned” or improperly plugged and abandoned wells, reports indicate that there are hundreds, even thousands, of such wells across private, state, and federal lands in New Mexico alone,<sup>116</sup> and in nearby Western states such as Colorado and Wyoming.<sup>117</sup> These wells can leach toxic chemicals and contaminate water supplies, posing direct and cumulative health risks to nearby communities.<sup>118</sup> State and BLM bonding requirements are usually insufficient to meet the

---

<sup>115</sup> *See, e.g.,* Morello-Frosch et al, *supra* Note 102; Some specific examples include birth defects arising from prenatal exposures, enduring cognitive difficulties arising from prenatal or early childhood exposures, or asthma that develops in childhood, affects school attendance (and health outcomes related to it), and endures into adulthood.

<sup>116</sup> *See, e.g.,* Exhibit 73, Adrian Hedden, *State Agencies Grapple With Abandoned Oil Wells*, Carlsbad Current-Argus, Feb. 9, 2018, *Available at* <https://www.currentargus.com/story/news/local/2018/02/09/unplugged-state-agencies-grapple-abandoned-oil-wells/324990002/>.

<sup>117</sup> *See, e.g.,* Exhibit 74, Joshua Zaffos, ‘Orphaned’ Oil and Gas Wells are on the Rise.” High Country News, Jan. 16, 2018. *Available at* <https://www.hcn.org/issues/50.3/energy-industry-orphaned-oil-and-gas-wells-are-on-the-rise>.

<sup>118</sup> *Id.*

costs associated with plugging and abandoning these wells, retiring other equipment, and cleaning up the well sites. Thus, idle or orphaned wells and abandoned well sites pose not only health risks and impacts, but also financial ones,<sup>119</sup> which can further compound existing health impacts, including cumulative impacts, and related health inequities.<sup>120</sup>

### 3. Health and Environmental Justice

BLM also fails to take a hard look at the inexorable relationship between health and environmental justice. Executive Order 12898 (“EO 12898”) on environmental justice requires each federal agency to make the achievement of “environmental justice part of its mission by identifying *and addressing*, as appropriate, disproportionately high and adverse *human health* or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”<sup>121</sup> EO 12898, Section 1-101 (emphasis added). The Montana EA exemplifies BLM’s failure to link health and environmental justice for these lease sales, despite the clear mandate of EO 12898. As mentioned above, BLM does not analyze health and safety impacts at all in the Montana EA, instead dismissing them as “present, but not affected to a degree that detailed analysis is required.” Montana EA at 96-97, Table 6. Yet BLM identifies environmental justice impacts as “present” effects that “will be analyzed” in the Montana EA. *Id.* It is difficult to see how BLM can possibly analyze, let alone take NEPA’s requisite hard look at, environmental justice impacts without analyzing health and safety impacts, particularly cumulative and disproportionate risks and impacts.

As noted above, the CEQ guidance on environmental justice in the NEPA process specifically directs agencies to incorporate relevant underlying health data, and social and structural factors, into their NEPA analyses, and to use this data to identify cumulative risks and reasonably foreseeable cumulative effects.<sup>122</sup> Yet, the environmental justice “analysis” in the Montana EA contains little more than a textbook citation to Executive Order 12898, and tables listing demographic data and identifying the general existence of “environmental justice” populations of concern in the lease sale area, with no discussion of actual risks and impacts to those populations. Montana EA at 69-71; 75-76. The Montana EA does include a short section entitled “Cumulative Impacts and Environmental Justice” but it contains no actual analysis of the nature or magnitude of such cumulative impacts, does not analyze environmental justice impacts, and does not discuss health impacts at all. Montana EA at 75. Merely providing a textbook citation to the requirements of Executive Order 12898, and *listing* environmental justice populations in the lease sale area, without engaging in any further analysis or public disclosure of

---

<sup>119</sup> *Id.*; See also Exhibit 75, U.S. Gov’t Accountability Office, Oil and Gas Wells: Bureau of Land Management Needs to Improve its Data and Oversight of Its Potential Liabilities 1, GAO-18-250 (May 2018), available at: <https://www.gao.gov/assets/700/691810.pdf>; Exhibit 76, U.S. Gov’t Accountability Office, Bureau of Land Management Should Address Risks from Insufficient Bonds to Reclaim Wells, GAO-19-615 (Sept. 2019).

<sup>120</sup> PSR 2020 at 50-51.

<sup>121</sup> Executive Order 12898, 59 Fed. Reg. 7629 (Feb. 11, 1994) Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, available at <https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf>.

<sup>122</sup> CEQ EJ and NEPA Guidance, *supra* Note 107, at 9.

the *impacts* of its leasing decisions on these populations, is arbitrary and capricious and fails to satisfy NEPA’s hard look mandate. *Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers*, 255 F. Supp. 3d 101, 140 (D.D.C. 2017), is instructive here. In this case, concerning the Dakota Access Pipeline (DAPL), the court looked to the CEQ Guidance on Environmental Justice in the NEPA processes and ruled that it was not enough for the Army Corps EA merely to acknowledge that the Standing Rock community had a high percentage of “minorities” and “low-income individuals,” and could be affected by an oil spill. The court noted that the EA was silent on “the distinct cultural practices of the Tribe and the social and economic factors that might amplify its experience of the environmental effects of an oil spill” and that in order to meet its NEPA “hard look” obligations, the Army Corps “needed to offer more than a bare-bones conclusion that Standing Rock would not be disproportionately harmed.” *Standing Rock Sioux Tribe*, 255 F. Supp. 3d at 140; *see also Friends of Buckingham v. State Air Pollution Control Board*, 947 F.3d 68, 92 (4th Cir. 2020) (finding that the agency’s failure to consider disproportionate impacts on those closest to a Compressor Station resulted in a “flawed analysis.”). “In sum, NEPA requires more. BLM cannot discount the localized impacts to people for whom the public health impacts are of clear significance.” *California v. Bernhardt*, 472 F. Supp. 3d 573, 622 (N.D. Cal. 2020) (citing *Anderson v. Evans*, 371 F.3d 475, 490 (9th Cir. 2004)).

The inequities at which BLM must take a hard look in an environmental justice analysis are not incidental, nor are they biologically determined—they are structural, systemic, and part of an unjust historical and ongoing pattern and practice of environmental racism, settler colonialism, and treatment of communities in the leasing areas as energy sacrifice zones. And, as discussed throughout these comments, there are several other health risks and impacts BLM should also analyze in the context of health and environmental justice, particularly in light of social and structural factors that affect health. BLM must engage in a thorough analysis of these and other inequities that NEPA requires, apply this analysis to its decision-making, and articulate a “rational connection between the facts found and the choices made” in coming to its ultimate conclusions in light of that analysis. *Motor Vehicle Mfr. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43, 52 (1983). In conducting this analysis, BLM can and should synthesize existing local health, socioeconomic, and other data in the lease sale areas—for example, county health statistics and reports, locally-conducted health impact assessments,<sup>123</sup> where available, or mapping of pollution exposure risks and demographic data through tools like U.S. EPA’s “EJ Screen”<sup>124</sup>—and the best available science, including but not limited to the peer-reviewed studies and sources mentioned in these comments.

#### **4. Air Pollution and Health Impacts**

---

<sup>123</sup> Health Impact Assessment, or HIA, is a process that helps evaluate the potential health effects of a plan, project, or policy before it is built or implemented. HIA brings potential positive and negative public health impacts and considerations to the decision-making process for plans, projects, and policies that fall outside traditional public health arenas, such as transportation and land use. An HIA provides practical recommendations to increase positive health effects and minimize negative health effects.” Centers for Disease Control and Prevention (CDC), “Health Impact Assessment” (Sept. 19, 2016), <https://www.cdc.gov/healthyplaces/hia.htm>.

<sup>124</sup> *See* <https://www.epa.gov/ejscreen>.

Air pollution is of particular concern with respect to health impacts of these lease sales, including not only direct impacts, but also cumulative risks and impacts and historical patterns of multiple and cumulative exposures. The potential harms resulting from exposure to dangerous air pollutants associated with fracking and drilling are serious and wide-ranging. A growing body of scientific research has documented adverse health impacts from air pollution related to unconventional oil and gas development or fracking, including studies showing air pollutants at levels associated with reproductive and developmental harms and increased risk of morbidity and mortality.<sup>125</sup> A comprehensive review of the risks and harms of fracking to human health came to several key findings, including: (1) “drilling and fracking contribute to toxic air pollution and smog (ground-level ozone) at levels known to have health impacts,” (2) “public health problems associated with drilling and fracking include poor birth outcomes, reproductive and respiratory impacts, cancer risks, and occupational health and safety problems”; and (3) “fracking infrastructure poses serious potential exposure risks to those living near it.”<sup>126</sup>

The range of illnesses that can result from the wide array of air pollutants from fracking were summarized in a study by Dr. Theo Colburn, which charts which fracking chemicals have been linked to certain illnesses.<sup>127</sup> This study analyzed air samples taken during drilling operations near natural gas wells and residential areas in Garfield County, Colorado, and detected 57 chemicals between July 2010 and October 2011, including 44 with reported health effects.<sup>128</sup> For example:

Thirty-five chemicals were found to affect the brain/nervous system, 33 the liver/metabolism, and 30 the endocrine system, which includes reproductive and developmental effects. The categories with the next highest numbers of effects were the immune system (28), cardiovascular/blood (27), and the sensory and respiratory systems (25 each). Eight chemicals had health effects in all 12 categories. There were also several chemicals for which no health effect data could be found.<sup>129</sup>

The study found extremely high levels of methylene chloride, which may be used as cleaning solvents to remove waxy paraffin that is commonly deposited by raw natural gas in the region. These deposits solidify at ambient temperatures and build up on equipment.<sup>130</sup> While none of the detected chemicals exceeded governmental safety thresholds of exposure, the study noted that such thresholds are typically based on “exposure of a grown man encountering relatively high

---

<sup>125</sup> Exhibit 77, Hays, Jake & Seth B.C. Shonkoff, *Towards an Understanding of the Environmental and Public Health Impacts of Unconventional Natural Gas Development: A Categorical Assessment of the Peer-Reviewed Scientific Literature*, 11 PLoS ONE e0154164 (2016); Exhibit 78, Webb, Ellen et al., *Developmental and reproductive effects of chemicals associated with unconventional oil and natural gas operations*, 29 REV ENVIRON HEALTH 307 (2014); Exhibit 79, Clean Air Task Force, *Fossil Fumes: A Public Health Analysis of Toxic Air Pollution From the Oil and Gas Industry*, June 2016, available at <http://www.catf.us/resources/publications/files/FossilFumes.pdf>.

<sup>126</sup> PSR 2020, *supra* Note 97, at 34-41.

<sup>127</sup> Exhibit 80, Theo Colborn et al., *An exploratory study of air quality near natural gas operations*, HUM. ECOL. RISK ASSESS (Nov. 9, 2012) [Hereinafter Colborn 2012].

<sup>128</sup> Colborn 2012 at pp. 21-22 (pages refer to page numbers in attached manuscript and not journal pages).

<sup>129</sup> Colborn 2012 at 11.

<sup>130</sup> *Id.* at 10.

concentrations of a chemical over a brief time period, for example, during occupational exposure.”<sup>131</sup> Consequently, such thresholds may not apply to individuals experiencing “chronic, sporadic, low-level exposure,” including sensitive populations such as children, the elderly, and pregnant women.<sup>132</sup> For example, the study detected polycyclic aromatic hydrocarbon (PAH) levels that could be of “clinical significance,” as recent studies have linked low levels of exposure to lower mental development in children who were prenatally exposed.<sup>133</sup> In addition, government safety standards do not take into account “the kinds of effects found from low-level exposure to endocrine-disrupting chemicals..., which can be particularly harmful during prenatal development and childhood.”<sup>134</sup>

A rigorous study by Johns Hopkins University, which examined 35,000 medical records of people with asthma in Pennsylvania, found that people who live near a higher number of, or larger, active gas wells were 1.5 to 4 times more likely to suffer from asthma attacks than those living farther away, with the closest groups having the highest risk.<sup>135</sup> Relatedly, a 2018 study of pediatric asthma-related hospitalizations found that children and adolescents exposed to newly spudded unconventional natural gas development wells within their zip code had 1.25 times the odds of experiencing an asthma-related hospitalization compared to children who did not live in these communities. Furthermore, children and adolescents living in a zip code with any current or previous drilling activity had 1.19 times the odds of experiencing an asthma-related hospitalization compared to children who did not live in these communities. Amongst children and adolescents (ages 2-18), children between 2 and 6 years of age had the greatest odds of hospitalization in both scenarios.<sup>136</sup>

BLM should analyze these asthma-related effects in relation to existing asthma rates and related impacts in the communities adjacent to and counties encompassing the proposed lease sales. For example, Eddy County and Chaves County, New Mexico, within the analysis area for the Pecos District Office, have the highest adult asthma emergency department visit crude rates in the state, more than double the state average.<sup>137</sup> Eddy County also has the second highest crude rate of child asthma emergency department visits in New Mexico (a very close second), and Lea County the third highest. The rate in Eddy County is well over twice the state average (150.1 per 10,000 population vs. a state average of 62.7 per 10,000 population).<sup>138</sup> And air

---

<sup>131</sup> *Id.* at 11-12.

<sup>132</sup> *Id.* at 12.

<sup>133</sup> *Id.* at 10-11.

<sup>134</sup> *Id.* at 12.

<sup>135</sup> Exhibit 81, Rasmussen, Sara G. et al., *Association Between Unconventional Natural Gas Development in the Marcellus Shale and Asthma Exacerbations*, 176 JAMA INTERNAL MEDICINE 1334 (2016)

<sup>136</sup> Exhibit 82, Willis, Mary D. et al., *Unconventional natural gas development and pediatric asthma hospitalizations in Pennsylvania*, 166 ENVIRONMENTAL RESEARCH 402 (2018)

<sup>137</sup> Based on most recent, 2014-2016 data on NM Dept. of Health IBIS Database. For Eddy County 2014-2016: 69.5/10k population. For Chaves County, 69/10k population. For NM overall 2014-2016: 31.2. See Exhibit 83, New Mexico Department of Health, *Health Indicator Report of Asthma Emergency Department Visits Among Adults* (Last Visited November 18, 2021). Available at <https://ibis.health.state.nm.us/indicator/view/AsthmaEDAdult.Cnty.html>.

<sup>138</sup> See Exhibit 84, New Mexico Department of Health, *Health Indicator Report of Asthma Emergency Department Visits Among Children* (Last Visited November 18, 2021). Available at [https://ibis.health.state.nm.us/indicator/complete\\_profile/AsthmaEDChild.html](https://ibis.health.state.nm.us/indicator/complete_profile/AsthmaEDChild.html).

pollution-related asthma, in particular, can exert profound and widespread cumulative health effects throughout a person's life course, especially when combined with social determinants of health. For example, children with asthma are much more likely to miss school, hurting their educational prospects as well as their health (with some adverse health effects enduring into adulthood), and resulting in significant funding losses for local schools.<sup>139</sup> As the New Mexico Department of Health has noted,<sup>140</sup> and nationwide studies confirm,<sup>141</sup> “low-income” populations and “environmental justice” populations face not only disproportionate asthma risks, but also significant difficulty managing their asthma, in part due to lack of access to health care.

Ozone is a criteria pollutant of particular concern in the region that contributes to asthma and missed school days (and one that can, in general, adversely affect health, especially for “sensitive groups” such as children, the elderly, and those with pre-existing health issues). In New Mexico, over 12,000 children suffer asthma attacks annually due to oil and gas ozone smog.<sup>142</sup> Smog is also responsible for almost 9,000 missed school days in New Mexico.<sup>143</sup> And Eddy County New Mexico, specifically, received a failing grade of “F” from the American Lung Association for high ozone days (based on data collected from 2016–2018).<sup>144</sup> Background concentrations of ozone in some of the lease sale areas are already at or exceed the National Ambient Air Quality Standards (“NAAQS”), leaving virtually no room for growth in emissions. Several studies that measured and/or modeled gas-related air emissions in various states have identified significant increases in ground level ozone as a result of natural gas development.<sup>145</sup> Ozone was once a summertime urban phenomenon but is now being seen increasingly in western rural areas during the winter due to the natural gas boom, so much so that some relatively small cities are no longer in compliance with the federal regulations that set allowable ozone levels.<sup>146</sup>

Ozone can cause difficulty breathing, coughing and sore throat. It can also inflame and damage the airways. It aggravates lung diseases like asthma, emphysema, and chronic bronchitis.

---

<sup>139</sup> See Exhibit 85, Attendance Works, *Mapping the Early Attendance Gap* (2017). Available at [http://www.attendanceworks.org/wp-content/uploads/2017/05/Mapping-the-Early-Attendance-Gap\\_Final-4.pdf](http://www.attendanceworks.org/wp-content/uploads/2017/05/Mapping-the-Early-Attendance-Gap_Final-4.pdf).

<sup>140</sup> Exhibit 86, New Mexico Dept. of Health, *The Burden of Asthma in New Mexico: 2014 Epidemiology Report* (Jan. 2014), at 41. Available at <https://nmhealth.org/data/view/environment/54/>.

<sup>141</sup> See, e.g., Exhibit 87, Tim Kelley and Gregory D. Kearney, *Insights Into the Environmental Health Burden of Childhood Asthma*, 12 ENVIRONMENTAL HEALTH INSIGHTS doi: [10.1177/1178630218757445](https://doi.org/10.1177/1178630218757445) (Feb. 20, 2018).

<sup>142</sup> Oil and Gas Threat Map (2018). New Mexico. Available at <http://oilandgasthreatmap.com/threat-map/new-mexico/>; Western Environmental Law Center, *Reducing Oil and Gas Exploitation in the San Juan Basin*. Available at <https://westernlaw.org/safeguarding-climate/reforming-oil-gas-operations/reducing-oil-and-gas-exploitation-in-the-san-juan-basin/>.

<sup>143</sup> *Id.*

<sup>144</sup> Exhibit 88, American Lung Association, *State of the Air 2020* at 123, <http://www.stateoftheair.org/assets/SOTA-2020.pdf>.

<sup>145</sup> See, e.g., Exhibit 89, Seth Lyman and Howard Shorthill, *Final Report: 2012 Uintah Basin Winter Ozone & Air Quality Study*, UTAH STATE UNIVERSITY, February 1, 2013.

<sup>146</sup> Exhibit 90, Gabrielle Pétron, *et al.*, *Estimation of emissions from oil and natural gas operations in northeastern Colorado*, Power Point available at: [http://www.epa.gov/ttnchie1/conference/ei20/session6/gpetron\\_pres.pdf](http://www.epa.gov/ttnchie1/conference/ei20/session6/gpetron_pres.pdf)

It can make the lungs more susceptible to infection and it can continue to damage the lungs even when the symptoms have disappeared.<sup>147</sup> Children are particularly vulnerable because their lungs are still developing until about age 18.<sup>148</sup> As their lungs grow in the presence of ozone, their alveoli production is reduced, and they can end up with smaller, more brittle lungs. Women exposed during pregnancy deliver preterm, low birth weight babies with a high probability of developing asthma. In a letter to former EPA Administrator Lisa Jackson, a group of five national medical and public health groups wrote that the most vulnerable individuals, including children, teens, senior citizens, people who exercise or work outdoors, and people with chronic lung diseases like asthma, COPD, and emphysema, are most in danger of being sickened by ozone and that children who grow up in areas of high ozone pollution may never develop their full lung capacity as adults, which can put them at greater risk of lung disease throughout their lives.<sup>149</sup>

In addition, oil and gas air pollution exacerbates cancer risks. A recent Yale University study identified numerous fracking chemicals that are known, probable, or possible human carcinogens (20 air pollutants) and/or are linked to increased risk for leukemia and lymphoma (11 air pollutants), including benzene, 1,3-butadiene, cadmium, diesel exhaust, and polycyclic aromatic hydrocarbons.<sup>150</sup> And a 2018 study by McKenzie et al. conducted in the Denver Julesberg Basin on the Colorado Northern Front Range (CNFR) found that the established setback distance of 152 m (500 ft) did little to protect people in that proximity. In analyses of nonmethane concentrations from 152 to >1600 meters from oil and gas facilities, the study found that the EPA's minimum cumulative lifetime excess cancer risk benchmark of 1 in a million was exceeded. Cumulative lifetime excess cancer risk increased with decreasing distance from the nearest oil and gas facility. Residents living within 610 meters of an oil and gas facility had an overall cancer risk in excess of the EPA's upper bound for remedial action of 1 in 10,000. Furthermore, residents within 152 meters of an oil and gas facility had an overall excess cancer risk of 8.3 in 10,000, along with an increased likelihood of neurological, hematological, and developmental health effects. Over 95% of the total risk was due to benzene, with additional risk due to the presence of toluene, ethylbenzene, xylene, and alkanes.<sup>151</sup> Other studies have found

---

<sup>147</sup> See EPA, *Ozone – Good Up High Bad Nearby*, available at: <http://www.epa.gov/oar/oaqps/gooduphigh/bad.html#7>.

<sup>148</sup> See U.S. EPA, “Children are Not Little Adults,” <https://www.epa.gov/children/children-are-not-little-adults>

<sup>149</sup> See Exhibit 91, Letter from American Lung Association to U.S. EPA (November 30, 2011).

<sup>150</sup> Exhibit 92, Elliot, Elise G. et al., *A Systematic Evaluation of Chemicals in Hydraulic-Fracturing Fluids and Wastewater for Reproductive and Developmental Toxicity*, 27 JOURNAL OF EXPOSURE SCIENCE AND ENVIRONMENTAL EPIDEMIOLOGY 90 (2016).

<sup>151</sup> Exhibit 93, McKenzie, Lisa et al., *Ambient Nonmethane Hydrocarbon Levels Along Colorado's Northern Front Range: Acute and Chronic Health Risks*, 52 ENVIRONMENTAL SCIENCE & TECHNOLOGY 4514 (2018).

that residents living closer to drilling and fracking operations had higher hospitalization rates<sup>152</sup> and reported more health symptoms including upper respiratory problems and rashes.<sup>153</sup>

## 5. Maternal, Prenatal and Child Health Impacts

Numerous studies also suggest that higher maternal exposure to fracking and drilling can increase the incidence of high-risk pregnancies, premature births, low-birthweight babies, and birth defects.<sup>154</sup> A study of more than 1.1 million births in Pennsylvania found evidence of a greater incidence of low-birth-weight babies and significant declines in average birth weight among pregnant women living within 3 kilometers of fracking sites.<sup>155</sup> The study estimated that about 29,000 U.S. births each year occur within 1 kilometer of an active fracking sties and “that these births therefore may be at higher risk of poor birth outcomes.” A study of 9,384 pregnant women in Pennsylvania found that women who live near active drilling and fracking sites had a 40 percent increased risk for having premature birth and a 30 percent increased risk for having high-risk pregnancies.<sup>156</sup> Another Pennsylvania study found that pregnant women who had greater exposure to gas wells—measured in terms of proximity and density of wells—had a much higher risk of having low-birthweight babies; the researchers identified air pollution as the likely route of exposure.<sup>157</sup> In rural Colorado, mothers with greater exposure to natural gas wells had a higher risk of having babies with congenital heart defects and possibly neural tube defects.<sup>158</sup> A July 2020 study found that residential proximity to flaring (the open combustion of natural gas) from oil and gas development was associated with an increased risk of preterm birth, specifically for “Hispanic” women, in the Eagle Ford Shale of Texas.<sup>159</sup> Here, again, these documented risks are of particular concern in certain communities near the proposed lease sales in light of environmental justice concerns, like proximity of homes to multiple wells<sup>160</sup> (an exacerbating factor in the Eagle Ford Shale study), and social and structural inequities, such as limited access to prenatal care. (For example, in Chaves County, NM (within the Pecos District

---

<sup>152</sup> Exhibit 94, Jemielita, Thomas et al., *Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates*. 10 PLoS ONE e0131093 (2015).

<sup>153</sup> Exhibit 95, Rabinowitz, Peter M. et al., *Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania*, 123 ENVIRONMENTAL HEALTH PERSPECTIVES 21.

<sup>154</sup> See, e.g., PSR 2020 at 187-189.

<sup>155</sup> Exhibit 96, Currie, Janet et al., *Hydraulic fracturing and infant health: New evidence from Pennsylvania*, 3 SCIENCE ADVANCES E1603021 (2017).

<sup>156</sup> Exhibit 97, Casey, Joan A., *Unconventional Natural Gas Development and Birth Outcomes in Pennsylvania, USA*, 27 EPIDEMIOLOGY 163 (2016).

<sup>157</sup> Exhibit 98, Stacy, Shaina L. et al., *Perinatal Outcomes and Unconventional Natural Gas Operations in Southwest Pennsylvania*. 10 PLoS ONE e0126425 (2015).

<sup>158</sup> McKenzie, *Birth Outcomes* (2014).

<sup>159</sup> Exhibit 99, Lara J. Cushing et al., *Flaring from Unconventional Oil and Gas Development and Birth Outcomes in the Eagle Ford Shale in South Texas*, 128 ENVIRONMENTAL HEALTH PERSPECTIVES , 077003 (2020).

<sup>160</sup> See EDF, New Mexico Oil and Gas Data tool, available at <https://www.edf.org/nm-oil-gas/>, for one excellent resource for mapping proximity of homes to wells, along with other environmental-justice-relevant data, specifically in New Mexico. We recommend that BLM use this and other available tools for taking a hard look at cumulative health impacts and environmental justice impacts.

Office) in 2017, nearly half of mothers lacked access to prenatal care during the first trimester of their pregnancies.)<sup>161</sup> BLM should have taken local health data like this into account as part of its “hard look” at health impacts, especially as they relate to social determinants of health and environmental justice.

## 6. Occupational Health and Safety Impacts

Those *living* near oil and gas development aren’t the only ones at risk. Oil and gas *workers* also suffer high risks from toxic exposure and accidents.<sup>162</sup> One study of the occupational inhalation risks caused by emissions from chemical storage tanks associated with fracking wells found that chemicals used in 12.4 percent of wells posed acute non-cancer risks, chemicals used in 7.5 percent of wells posed acute cancer risks, and chemicals used in 5.8 percent of wells posed chronic cancer risks.<sup>163</sup> As summarized below:

Drilling and fracking jobs are among the most dangerous jobs in the nation with a fatality rate that is four to seven times the national average. Irregularities in reporting practices mean that counts of on-the-job fatalities among oil and gas workers are likely underestimates...Occupational hazards in the fracking industry include head injuries, traffic accidents, blunt trauma, burns, inhalation of hydrocarbon vapors, toxic chemical exposures, heat exhaustion, dehydration, and sleep deprivation. An investigation of occupational exposures found high levels of benzene in the urine of wellpad workers, especially those in close proximity to flowback fluid coming up from wells following fracturing activities. Exposure to silica dust, which is definitively linked to silicosis and lung cancer, was singled out by the National Institute for Occupational Safety and Health as a particular threat to workers in fracking operations where silica sand is used. At the same time, research shows that many gas field workers, despite these serious occupational hazards, are uninsured or underinsured and lack access to basic medical care.<sup>164</sup>

## 7. Naturally Occurring Radioactive Materials and Technologically Enhanced Naturally Occurring Radioactive Materials

---

<sup>161</sup> Exhibit 100, New Mexico Department of Health, *Health Indicator Report of Prenatal Care in the First Trimester*, available at <https://ibis.health.state.nm.us/indicator/view/PrenCare.Cnty.html>.

<sup>162</sup>Exhibit 101, Esswein, Eric J. et al., *Occupational Exposures to Respirable Crystalline Silica During Hydraulic Fracturing*, 10 JOURNAL OF OCCUPATIONAL AND ENVIRONMENTAL HYGIENE 347 (2013); Exhibit 102, Esswein, Eric et al., *Evaluation of Some Potential Chemical Exposure Risks during Flowback Operations in Unconventional Oil and Gas Extraction: Preliminary Results*, 11 JOURNAL OF OCCUPATIONAL AND ENVIRONMENTAL HYGIENE D174 (2014); Exhibit 103, Harrison, Robert J. et al., *Sudden Deaths Among Oil and Gas Extraction Workers Resulting from Oxygen Deficiency and Inhalation of Hydrocarbon Gases and Vapors — United States, January 2010–March 2015*, 65 MMWR MORB MORTAL WKLY REP 6 (2016); PSR 2020.

<sup>163</sup> Exhibit 104, Chen, Huan & Kimberly E. Carter, *Modeling potential occupational inhalation exposures and associated risks of toxic organics from chemical storage tanks used in hydraulic fracturing using AERMOD*, 224 ENVIRONMENTAL POLLUTION 300 (2017).

<sup>164</sup> PSR 2020 at 162.

Radioactive wastes from oil and gas production can be found in produced water, flowback water from hydraulic fracturing, drilling waste including cuttings and mud, and/or sludge. This material can concentrate in pipes, storage tanks and facilities, and on other extraction equipment, and may be left on site or be emitted into the environment. Some of these materials, such as Radium, can penetrate the skin and raise the risk of cancer.<sup>165</sup> The NEPA analysis conducted for this plan amendment must consider the potential health impacts of radioactive materials, as well as all other potential health effects discussed herein.

Processes used to produce oil and gas often generate radioactive waste containing concentrations of naturally occurring radioactive materials (NORM) and Technologically Enhanced Naturally Occurring Radioactive Materials (TENORMS). The geological formations to be drilled will result in radioactive waste, containing both NORMS and TENORMs. The radioactive materials will show up in formation drilling, production wastes, and operations. Every single shale well that uses an on-site pit for disposal of drill cuttings and/or fluids likely will leave behind some amount of concentrated radioactive materials.<sup>166</sup> Further, Alpha-emitting radioactive decay elements concentrate at the pipe scale, so the waste is much more radioactive than any of the constituent parts.<sup>167</sup> BLM must also evaluate radiation exposure risks as part of its obligation to take a hard look at public health and safety. Further, BLM should conduct a baseline groundwater analysis in the lease sale areas before any more leasing and development occurs, to ensure that no environmental contamination occurs from disposal of radioactive sludge/scale.

### **C. BLM Must Take a Hard Look at Environmental Justice**

BLM must also take a hard look at environmental justice—not just in relation to health, but also in its own right. As defined by the U.S. Environmental Protection Agency, “environmental justice” means “the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, in the development, implementation, and enforcement of environmental laws, regulations, and policies.”<sup>168</sup> Executive Order 12898 (EO 12898) requires each Federal agency to “make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”<sup>169</sup> Even more recently, President Biden’s January 27, 2021 “Executive Order on Tackling the Climate Crisis at Home and Abroad” (EO 14008)

---

<sup>165</sup> See, e.g., Exhibit 105, Agency for Toxic Substances and Disease Registry (ASTDR). *Radium*. (July 1999), Available at <https://www.atsdr.cdc.gov/toxfaqs/tfacts144.pdf>; (Beta and gamma particles can penetrate the skin).

<sup>166</sup> See Exhibit 106, Occupational Health and Safety (Oct. 01, 2012) “Radiation Sources in Natural Gas Well Activities,” <https://ohsonline.com/Articles/2012/10/01/Radiation-Sources-in-Natural-Gas-Well-Activities.aspx?Page=2>.

<sup>167</sup>Exhibit 107, USGS (1999) Naturally Occurring Radioactive Materials (NORM) in Produced Water and Oil-Field Equipment— An Issue for the Energy Industry <https://pubs.usgs.gov/fs/fs-0142-99/fs-0142-99.pdf>.

<sup>168</sup> See U.S. Environmental Protection Agency, *Environmental Justice*, [www.epa.gov/environmentaljustice](http://www.epa.gov/environmentaljustice).

<sup>169</sup> Exec. Order No. 12,898, 59 Fed. Reg. 32 (Feb. 11, 1994), available at: <https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf>.

explicitly recognizes the inexorable links among climate, health, and environmental justice (which includes social and economic justice), and the corresponding need to address all of them in concert, with a whole-of-government approach.<sup>170</sup>

Environmental Justice is a “relevant factor” for which federal agencies must take a hard look under NEPA, made reviewable under the APA’s arbitrary and capricious standard. *See Latin Ams. for Social & Econ. Dev. v. Fed. Highway Admin.*, 756 F.3d 447, 465 (6th Cir. 2014); *Coliseum Square Ass’n, Inc. v. Jackson*, 465 F.3d 215, 232 (5th Cir. 2006); *Cmtys. Against Runway Expansion, Inc. v. FAA*, 355 F.3d 678, 689 (D.C. Cir. 2004); *Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers*, 440 F. Supp. 3d 1, 9 (D. D.C. 2020), *vacated by, in part, affirmed by, in part, Standing Rock Sioux Tribe v. United States Army Corp of Eng’rs*, 985 F.3d 1032 (D.C. Cir. 2021); *Friends of Buckingham v. State Air Pollution Control Bd.*, 947 F.3d 68, 87 (4th Cir. 2020). While we appreciate that BLM has at least *included* subsections discussing environmental justice in its NEPA documentation for the proposed lease sales, they fall far short of NEPA’s requirements for a “hard look” at environmental justice.

As EO 12898, EO 14008, and related agency guidance documents state,<sup>171</sup> and as courts have affirmed specifically with regard to the NEPA process, BLM *must* take environmental justice seriously. As the court stated in *Standing Rock*, 440 F. Supp. 3d 1, 9:

in this Circuit, NEPA creates, through the Administrative Procedure Act, a right of action deriving from Executive Order 12,898. This order requires federal agencies to ‘make achieving environmental justice part of their mission’—‘[t]o the greatest extent practicable and permitted by law’—‘by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of [their] programs, policies, and activities on minority populations and low-income populations.’

---

<sup>170</sup>See Executive Order 14008, 86 Fed. Reg. 7619-7633, Tackling the climate crisis at home and abroad (January 27, 2021), available at <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/> Section 201 (Policy), for example, recognizes the threat to public health posed by the climate crisis and the need to “deliver environmental justice in communities all across America.” Another part of the EO is expressly dedicated to “Securing Environmental Justice and Spurring Economic Opportunity,” and Section 219 expands on the language of EO 12898, directing agencies to make environmental justice part of their mission, to expressly include climate, cumulative impacts, and “accompanying economic challenges.” Section 221 creates the “White House Environmental Justice Advisory Council” (WHEJAC), which has since submitted draft recommendations to CEQ on an environmental justice screening tool and on updates to EO 12898.

<sup>171</sup> For example, CEQ’s 2016 Final Guidance on climate change, Exhibit 108, has also recommended that federal agencies should incorporate environmental justice principles into their programs, policies, and activities. The 2016 Final Guidance further recommended that agencies consider whether the effects of climate change, in association with the effects of a proposed agency action, may result in a disproportionate effect on minority and low-income populations. And, as mentioned throughout these comments, CEQ’s Guidance on Environmental Justice in the NEPA process directs agencies to identify and address disproportionate and cumulative risks and impacts; *See also* Exhibit 109, U.S. EPA (2016), “Promising Practices for EJ Methodologies in NEPA Review” available at [https://www.epa.gov/sites/default/files/2016-08/documents/nepa\\_promising\\_practices\\_document\\_2016.pdf](https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf).

(citing 59 Fed. Reg. 7629 (Feb. 11, 1994), § 1-101; *Cmtys. Against Runway Expansion, Inc.*, 355 F.3d at 688–89 (recognizing right to environmental-justice review under NEPA and APA)).

According to EPA Guidance on environmental justice in the NEPA process, an environmental justice analysis must also include “the cultural values that the community and/or Indian Tribe may place on a natural resource at risk.”<sup>172</sup> The Guidance also states that it is “essential” for the “NEPA analyst to consider the cumulative impacts from the perspective of these specific resources or ecosystems which are vital to the communities of interest.”<sup>173</sup> Yet BLM has failed to incorporate Tribes’ and community members’ knowledge of, and concerns about, such cultural values and cumulative impacts in its NEPA analyses for the lease sales. It is arbitrary and capricious, a failure to “articulate a rational connection between the facts found and the choices made,” *Motor Vehicle Mfr. Ass’n*, 463 U.S. at 43, for BLM to acknowledge that there are “environmental justice populations” in the lease sale areas who could experience adverse and disproportionate risks or impacts, without actually *analyzing*, or in some cases even mentioning, the risks and impacts of its leasing decisions on these populations, let alone taking them into account in its decision-making. “Where BLM has acknowledged increased risk, it cannot then conclude impacts are not significant absent a comprehensive analysis.” *State of California*, 472 F. Supp. 3d at 622.

BLM must also adhere to the “process” requirements of environmental justice—fair treatment and *meaningful involvement*. If BLM ignores or excludes the very people and communities who are most affected by its leasing decisions, BLM is not only denying them fair treatment and meaningful involvement in decision-making—and, in the case of indigenous peoples and Tribes, abrogating the right to self-determination and free prior and informed consent<sup>174</sup>—but also depriving itself, and the general public, of invaluable knowledge and expertise that would enable better-informed and more transparent decision-making. “Better decisions” are indeed a fundamental goal of NEPA, and they require extensive, meaningful public involvement throughout an agency’s decision-making process—not just “input” on pre-determined agendas.<sup>175</sup> Indeed, “environmental justice is not merely a box to be checked.” *Friends of Buckingham*, 947 F.3d at 92.

---

<sup>172</sup> Exhibit 110, 1998 EPA NEPA Final Guidance [https://www.epa.gov/sites/production/files/2015-02/documents/ej\\_guidance\\_nepa\\_epa0498.pdf](https://www.epa.gov/sites/production/files/2015-02/documents/ej_guidance_nepa_epa0498.pdf).

<sup>173</sup> Exhibit 111, 1998 EPA NEPA Final Guidance [https://www.epa.gov/sites/production/files/2015-02/documents/ej\\_guidance\\_nepa\\_epa0498.pdf](https://www.epa.gov/sites/production/files/2015-02/documents/ej_guidance_nepa_epa0498.pdf).

<sup>174</sup> The duty to obtain free prior and informed consent (FPIC) from indigenous peoples is recognized by the International Labour Organization Convention (“ILO”) 169 and the U.N. Declaration on the Rights of Indigenous Peoples (“UNDRIP”), Articles 10, 11, 19, 28, 29, and 32. See Exhibit 112, UN General Assembly, *United Nations Declaration on the Rights of Indigenous Peoples*. FPIC is embedded in the right to self-determination. “The duty of States to obtain Indigenous Peoples’ FPIC entitles Indigenous people to effectively determine the outcome of decision-making that affects them, *not merely a right to be involved*.” Exhibit 113, UN Expert Mechanism on the Rights of Indigenous Peoples, *Final report of the study on indigenous peoples and the right to participate in decision-making* (August 17, 2011), see especially para. 21.

<sup>175</sup> See 40 C.F.R. § 1500.1(c).

## **VII. BLM's Conclusions Regarding GHGs and Climate in its Proposed Findings of No Significant Impact are not Adequately Supported by NEPA Analysis in the EAs**

### **A. BLM's FONSI for the proposed lease sales are inconsistent and fail to properly address the NEPA intensity factors.**

As an initial matter, the eight FONSI associated with the proposed lease sales in 2022 significantly differ from one another, especially with regard to their findings related to GHG emissions and climate change, without explaining a sufficient basis for these discrepancies. For example, some of the FONSI only evaluate four of the NEPA intensity factors,<sup>176</sup> while others evaluate ten.<sup>177</sup> Further confounding things, the publicly available FONSI for the proposed lease sale in Utah is less than half a page in length and includes no evaluation of context or intensity according to NEPA.<sup>178</sup> The inconsistent method of impact analysis displayed in these FONSI, particularly with regard to the impacts of GHGs and climate change, is improper and absent further explanation from BLM, arbitrary. These unjustified discrepancies provide yet another reason for BLM to analyze and evaluate the environmental impacts of these oil and gas leasing proposals in a single impact statement, as well as evaluate the BLM federal fossil fuel program pursuant to a programmatic EIS. Further, to fully inform the public we request BLM explicitly evaluate and discuss the impacts of GHG emissions estimated from the proposed lease sales, cumulative GHG emissions, and their impact on climate change according to all the NEPA intensity factors. We request this evaluation be done in the context of a single EIS for all seven proposed lease sales.

### **B. BLM's Assessment of the Significance of Impacts from GHG Emissions and Climate Change is Improper and Unjustified.**

In each of the FONSI, BLM states that it cannot determine the significance of GHG emissions from the proposed lease sales, but ultimately concludes, anyway, that the GHG emissions from the proposed lease sales, and the cumulative emissions from the federal fossil fuel program, are insignificant. This is a text book example of an arbitrary and capricious determination, which must be remedied.

Based on its NEPA analysis in the EAs for the proposed lease sales, BLM concludes:

---

<sup>176</sup> See Draft FONSI for Environmental Assessment for the BLM Colorado 2022 First Quarter Competitive Oil and Gas Lease Sale, DOI-BLM-CO-0000-2022-0001-EA (2021) ("Colorado FONSI"), Draft FONSI for First Quarter 2022 Oil and Gas Lease Sale Parcel Sale, DOI-BLM-MT-0000-2021-0006-EA (2021) ("Montana FONSI"), Draft FONSI for the 2022 First Quarter Competitive Oil and Gas Lease Sale, DOI-BLM-NV-B000-2021-0007-Other (2021) ("Nevada FONSI"), Draft FONSI for the Quarter 1 2022 Competitive Oil and Gas Lease Sale Environmental Assessment, DOI-BLM-NM-P000-2021-0001-EA (2021) ("New Mexico FONSI"), Draft FONSI for the Quarter 1 2022 Competitive Oil and Gas Lease Sale Environmental Assessment, DOI-BLM-NM-0040-2021-0033-EA (2021) ("Oklahoma FONSI").

<sup>177</sup> See Wyoming FONSI.

<sup>178</sup> Draft FONSI for Environmental Assessment for the BLM Utah 2022 1<sup>st</sup> Quarter Competitive Oil and Gas Lease Sale, DOI-BLM-UT-0000-2021-0007-EA (2021) ("Utah FONSI").

Due to the cumulative and global nature of climate change, it is not possible for the BLM to determine whether the emissions associated with [a proposed action] would have a “significant” or “non-significant” effect on the human environment.”<sup>179</sup>

As an initial matter, neither the EAs for the 2022 proposed lease sales nor the 2020 BLM Specialist Report provide a basis or rationale for BLM’s conclusion that it cannot determine the significance of GHG emissions for a proposed action. We request BLM clarify and further explain precisely why the agency cannot make a judgment based on the best available science and its own expertise as to the significance of its GHG emissions.

In each of the proposed FONSI, BLM determines that no environmental effects, including the cumulative effects of GHG emissions on climate change, meet the NEPA definition of significance. Should BLM wish to maintain this conclusion, it must provide the basis and rationale that support the conclusion to inform and be evaluated by the public and decision makers.

Despite indicating that it cannot make a significance determination with regard to GHGs and climate, BLM in fact proposes to issue FONSI for each lease sale proposed in 2022, determining that the impacts associated with the leases sales, including the cumulative impacts of GHG emissions from the federal fossil fuel program, are insignificant. BLM reaches this conclusion despite neither its EAs nor its FONSI clearly articulating the basis for making this decision. The EAs, FONSI, and 2020 BLM Specialist Report discussion of GHG emissions and climate change use comparisons with global, national, and state level GHG emissions to imply that the potential emissions from the proposed lease sales are insignificant. But these NEPA documents never clearly articulate whether this proxy comparison to global, national, and state level emissions is the basis on which BLM determined the GHG emissions from the proposed lease sales are insignificant. BLM’s clearest articulation of how it determined the significance of GHG emissions is in the FONSI for the proposed lease sale in Wyoming, where BLM states “[the proposed action is] not expected to significantly affect the rate of change in those effects, bring forth impacts that are not already identified in existing literature, or cause a change in the magnitude of those impacts at the local, state, regional, national, or global scale.”<sup>180</sup> This statement is not reflected in the other seven FONSI associated with the 2022 lease sales, but it seems to be implied in the NEPA analyses of the other proposed lease sales. Importantly, the 2016 CEQ GHG Guidance specifically instructs federal agencies not to limit their analysis of GHG emissions to this type of proxy analysis.<sup>181</sup>

---

<sup>179</sup> Draft FONSI, EOI ES3321 Part 1 (1835a), Covington County, Alabama, DOI-BLM-Eastern States-J000-2021-0037-EA\_FONSI (2021) (“Alabama FONSI”) at 3; Colorado FONSI at 3; Montana FONSI at 3; Nevada FONSI at 3; New Mexico FONSI at 4; Oklahoma FONSI at 3-4; Wyoming FONSI at 5.

<sup>180</sup> Wyoming FONSI at 4.

<sup>181</sup> See CEQ, *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* (Aug. 2016) (“2016 CEQ GHG Guidance”) at 10-11.

Beyond the contradiction in each of BLM’s FONSI, BLM attempts to avoid making a significance determination regarding the GHG emissions from the proposed lease sales is an improper dereliction of the agency’s duty under NEPA and FLPMA. BLM’s NEPA analyses and FONSI for the proposed lease sales include the statement: “There are no established thresholds for NEPA analysis to contextualize the quantifiable GHG emissions or social cost of an action in terms of the action’s propensity to affect the climate, incrementally or otherwise.”<sup>182</sup> While this may be true, it is also true that there are no established specific or particularized thresholds that determine whether other types of environmental impacts are significant for purposes of NEPA analysis. Significance determinations are made according to the potentially affected environment (or the relative context in which the action would occur) and the degree of the effects of the proposed action (or the intensity of the effects of the proposed action). At the end of the day, weighing these factors to make a significance determination requires an agency to make a judgment call based on the best science available. We request BLM clearly articulate the basis for its significance determination of the estimated GHG emissions from the proposed lease sales and the cumulative GHG emissions from the federal fossil fuel program and their associated impacts related to climate change.

### **C. BLM Improperly Limits the Context of Significance Analysis**

BLM’s FONSI for the proposed 2022 lease sales improperly limit the context and scope of the potentially affected environment in which the proposed leasing actions, and their cumulative impacts, will occur. Significance assessments under NEPA require consideration of “context,” meaning the significance of the proposed action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality.<sup>183</sup> Significance varies with the setting of the proposed action.<sup>184</sup> Despite these requirements for considering the context of the proposed lease sales and despite the global nature and impacts of cumulative GHG emissions and climate change, BLM’s FONSI generally limit the consideration of context to the localities wherein the oil and gas development would take place, if authorized, and find that the impacts of oil and gas development would not have international, nation, regional, or state-wide importance.<sup>185</sup> We request BLM consider a far wider array of contexts, including society as whole, global, national, and regional contexts, that reflect the cumulative and global nature of climate change impacts.

### **D. BLM’s Analysis of Public Health and Safety Impacts from GHG Emissions and Climate Change is Absent or Unsupported**

BLM’s FONSI vary widely in how they evaluate and discuss the impacts of GHG emissions and climate change on public health and safety, and we request BLM more clearly

---

<sup>182</sup> 2020 BLM Specialist Report at Section 7.0; *see also* Alabama FONSI at 3; Colorado FONSI at 3; Montana FONSI at 3; Nevada FONSI at 3; New Mexico FONSI at 4; Oklahoma FONSI at 3; Wyoming FONSI at 5.

<sup>183</sup> 40 CFR 1508.27(a).

<sup>184</sup> *Id.*

<sup>185</sup> Alabama FONSI at 1-2; Colorado FONSI at 2; Montana FONSI at 1-2; Nevada FONSI at 1-2; New Mexico FONSI at 2; Oklahoma FONSI at 2; Wyoming FONSI at 2.

address these impacts in a single EIS. For example, with regard to public health and safety impacts some of the FONSI s do not mention climate change at all, even though the 2020 BLM Specialist Report describes both the existing health threats caused by climate change and the predicted intensification and new emerging health threats caused by continued GHG emissions.<sup>186</sup> Other FONSI s, such as the FONSI for the proposed lease sale in Wyoming, fail to clearly explain or justify how, given the analysis of public health impacts presented in the 2020 BLM Specialist Report, BLM concluded that both the current impacts of climate change and the predicted impacts of increasing climate change do not significantly affect public health and safety.<sup>187</sup>

### **E. BLM's Analysis of Uncertainty is Contradictory**

Similar to other NEPA intensity factors, BLM's consideration of uncertainty varies widely among the eight FONSI s for the proposed 2022 lease sales. The FONSI s range from not considering the uncertainty of the possible effects on the human environment to outright contradicting the myriad statements BLM makes regarding the uncertainty of different aspects GHG emissions and climate change. Only the FONSI for the Wyoming proposed lease sale discusses how the proposed action may result in uncertain effects or involve unique or unknown risks. Yet, the Wyoming FONSI suggests that with regard to GHG emissions and climate change the uncertainty of effects and any unique or unknown risks was adequately addressed in the EA. Specifically, the Wyoming FONSI states that the predicted effects on the human environment described in the EA, such as temperature and precipitation change, are not highly uncertain, nor do they involve unique or unknown risks.<sup>188</sup> This conclusion is patently false and particularly so based on BLM's own claim that it lacks the certainty and information necessary to determine whether the GHG emissions associated with the proposed actions are significant or not. Moreover, both the EAs for the proposed lease sales and the 2020 BLM Specialist Report identify countless areas of uncertainty regarding the analysis of GHGs and climate change, including:

- [Global warming potentials] have a large uncertainty: +/- 30 percent and +/-39 percent for the 20-year and 100-year CH<sub>4</sub> GWPs, respectively, and +/-21 percent and +/-29 percent for the 20-year and 100-year N<sub>2</sub>O GWPs, respectively.<sup>189</sup>
- Earth's climate system is complex and interwoven in ways that are not yet fully understood. There are several known climate feedback mechanisms that add uncertainty in terms of timing (fast and slow feedbacks) and overall sensitivity within the evaluation of the climate system.<sup>190</sup>

---

<sup>186</sup> 2020 BLM Specialist Report at Section 9.5.

<sup>187</sup> Wyoming FONSI at 5.

<sup>188</sup> Wyoming FONSI at 4.

<sup>189</sup> 2020 BLM Specialist Report at Section 3.4.

<sup>190</sup> *Id.* at Section 8.2.

- As with the forcing components, there are also positive and negative feedback mechanisms, and there is a relatively large range of uncertainty concerning estimates of the climate sensitivity that leaves the subject open to further investigation.<sup>191</sup>
- Melting glaciers are likely to produce uncertainties for hydrologic power generation, which is an important resource in Alaska.<sup>192</sup>
- The IPCC [carbon] budget suggests a range of approximately 420 GtCO<sub>2</sub> for a 66% chance of limiting warming to 1.5 C to 840 GtCO<sub>2</sub> for a 33% chance. Similarly, estimates for the 2 C probabilities range from 1,170 to 2,030 GtCO<sub>2</sub>. These estimates contain uncertainties that are characteristic of scientists' current understanding of the Earth's climate influencing systems, such as feedbacks and the forcing and response associated with the non-CO<sub>2</sub> GHG species, and historical emissions accounting. The uncertainty range associated with the new estimates is approximately +/- 400 Gt CO<sub>2</sub>.<sup>193</sup>
- As expected with such a complex model, there are multiple sources of uncertainty inherent in the SC-GHG estimates. Some sources of uncertainty relate to physical effects of GHG emissions, human behavior, future population growth and economic changes, and potential adaptation.<sup>194</sup>

Well-documented scientific research and BLM's own analysis demonstrate that the potential effects of climate change are highly uncertain and involve unique and unknown risks. BLM must properly address this NEPA intensity factor in light of these impacts, and we request BLM do so in a single EIS.

#### **F. BLM's Analysis of Controversy Over Impacts from GHGs is Absent or Unsupported**

Only the FONSI for the proposed lease sales in Alabama and Wyoming address the NEPA intensity factor regarding controversy. BLM's discussion of the controversy intensity factor in the Alabaman and Wyoming FONSI is incorrect, and BLM's omission of this intensity factor in the FONSI associated with the other lease sales is improper.

As this public comment submission reflects, as well as the global body of scientific research and understanding of climate change, there is controversy concerning critical aspects of the nature and effect of GHG emissions and their impact on climate change. This controversy is exemplified by the BLM's conclusions that the emissions from the proposed lease sales and the cumulative emissions from the federal fossil fuel program are not significant as compared to a robust scientific literature, indicating current and foreseeable fossil fuel development is not

---

<sup>191</sup> *Id.*

<sup>192</sup> *Id.* at Section 8.4.

<sup>193</sup> *Id.* at Section 7.2.

<sup>194</sup> Alabama EA at 24; Colorado EA at 36; Montana EA at 41-42; Nevada EA at 27; New Mexico EA at 73; Oklahoma EA at 29; Utah EA at 40; Wyoming EA at 35.

aligned GHG reductions necessary to prevent warming exceeding 1.5 C.<sup>195</sup> The issue of the cumulative impacts of climate change is so controversial BLM cannot even agree with itself because despite its findings of no significant impact as they relate to the proposed lease sales, BLM also concludes that it is incapable of determining whether the emissions associated with the proposed lease sales would significantly affect the human environment, as we discussed above. We request BLM revise and address its discussion and determination of the NEPA intensity factor for controversy and do so in a single EIS.

### **G. BLM's Analysis of the Cumulative Impacts of GHG Emissions is Absent or Unsupported**

BLM's evaluation of the estimated GHG emissions from the proposed lease sales is another NEPA intensity factor that receives little to no consideration in the associated FONSI. This is astounding given the seriousness and cumulative nature of climate change. Considering both the impacts of climate change that are already occurring as a result of historic anthropogenic emissions of GHGs and forecast impacts of continued GHG emissions, it is challenging to understand the basis for BLM's conclusion that significant cumulative effects are not expected from the proposed oil and gas lease sales. We request BLM fully inform the public and the decision makers by providing a complete and comprehensive justification for how the agency reached its significance determination on this NEPA intensity factor.

### **H. BLM's Analysis of Federal or State Law and Policy is Absent**

Not one of the FONSI for the proposed lease sales indicate the lease actions will violate federal or state law and policy, but there are several federal and state government laws and policies that set GHG emission reduction targets or commitments, which authorization of the proposed leases will likely threaten. On the federal side, President Biden announced a goal to achieve net-zero emissions by 2050,<sup>196</sup> as well as a target to reduce GHG emissions by 50-52% by 2030, compared to 2005 levels.<sup>197</sup> In addition, the United States is a signatory to the 2015 Paris Agreement, committing to a goal of limiting global temperature increase well below 2 C, pursuing efforts to limit the increase to 1.5 C, and committing to reaching global peaking of GHGs as soon as possible.

On the state side, both Colorado and New Mexico have statutes and executive orders setting emission reduction goals. In Colorado, HB19-1261 requires the state to reduce GHG emissions by at least 26 percent in 2025, at least 50 percent by 2030, and at least 90 percent by 2050, relative to 2005 pollution levels. In New Mexico, Executive Order 2019-003 declares the state's support of the 2015 Paris Agreement goals and orders the state to achieve statewide reduction of GHG emissions of at least 45% by 2030, relative to 2005 levels.

BLM's EAs and FONSI must discuss and evaluate how the proposed lease sales and their estimated GHG emissions may threat violation of these federal and state laws and policies.

---

<sup>195</sup> See, e.g., Exhibit 13, SEI, IISD, ODI, E3G, and UNEP. (2021). The Production Gap Report 2021, <http://productiongap.org/2021report>

<sup>196</sup> Exhibit 114, Executive Order 13990 (January 20, 2021).

<sup>197</sup> Exhibit 115, Executive Order 14008 (January 27, 2021).

## VIII. Leasing new federal fossil fuels for development would cause unnecessary and undue degradation that is prohibited under FLPMA

The Federal Land Policy and Management Act (“FLPMA”), 43 U.S.C. § 1701 *et seq.*, directs that “the public lands be managed in a manner that will protect the quality of [critical resource] values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use.” 43 U.S.C. § 1701(a)(8). This substantive mandate requires that BLM not elevate the development of oil and gas resources above other critical resource values in the planning area. To the contrary, FLPMA requires that where oil and gas development would threaten the quality of critical resources, conservation of these resources should be the preeminent goal.

Congress has declared through FLPMA that it is the policy of the United States that “the public lands [shall] be managed in a manner that will protect the quality of ... air and atmospheric ... values.” 43 U.S.C. § 1701(a)(8). Under FLPMA’s “multiple use and sustained yield” management directive, *id.* § 1701(a)(7), the federal government must manage public lands and resources in a manner that “takes into account the *long-term needs of future generations* for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and *harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land[.]*” *Id.* § 1702(3) (emphasis added). BLM’s obligation to manage for multiple use does not mean that development *must* be allowed. Rather, [d]evelopment is a *possible* use, which BLM must weigh against other possible uses—including conservation to protect environmental values[.]” *New Mexico ex rel. Richardson v. Bureau of Land Mgmt.*, 565 F.3d 683, 710 (10th Cir. 2009) (emphasis original). Under these authorities, BLM is required not only to evaluate the impacts that federal fossil fuel leasing has on public lands, waters, and wildlife resources, but to avoid harm to those resources whenever possible.

These directives are not simply aspirational, but grounded in the substantive requirements of FLPMA. “In managing the public lands,” the agency “shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands.” 43 U.S.C. § 1732(b). Written in the disjunctive, BLM must prevent degradation that is “unnecessary” and degradation that is “undue.” *Mineral Policy Ctr. v. Norton*, 292 F.Supp.2d 30, 41-43 (D.D.C. 2003). This protective mandate applies to BLM planning and management decisions, and should be considered in light of its overarching mandate that the agency employ “principles of multiple use and sustained yield.” 43 U.S.C. § 1732(a); *see also, Utah Shared Access Alliance v. Carpenter*, 463 F.3d 1125, 1136 (10th Cir. 2006) (finding that BLM’s authority to prevent degradation is not limited to the RMP planning process). While these obligations are distinct, they are interrelated and highly correlated. The Bureau must balance multiple uses in its management of public lands, including “recreation, range, timber, minerals, watershed, wildlife and fish, and [uses serving] natural scenic, scientific and historical values.” 43 U.S.C. § 1702(c). It must also plan for sustained yield— “control [of] depleting uses over time, so as to ensure a high level of valuable uses in the future.” *Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 58 (2004).

“Application of this standard is necessarily context-specific; the words ‘unnecessary’ and ‘undue’ are modifiers requiring nouns to give them meaning, and by the plain terms of the statute, that noun in each case must be whatever actions are causing ‘degradation.’” *Theodore Roosevelt Conservation Partnership v. Salazar*, 661 F.3d 66, 76 (D.C. Cir. 2011) (citing *Utah v. Andrus*, 486 F. Supp. 995, 1005 n. 13 (D. Utah 1979) (defining “unnecessary” in the mining context as “that which is not necessary for mining”—or, in this context, “for oil and gas development”—and “undue” as “that which is excessive, improper, immoderate or unwarranted.”)); *see also Colorado Env’t Coalition*, 165 IBLA 221, 229 (2005) (concluding that in the oil and gas context, a finding of “unnecessary or undue degradation” requires a showing “that a lessee’s operations are or were conducted in a manner that does not comply with applicable law or regulations, prudent management and practice, or reasonably available technology, such that the lessee could not undertake the action pursuant to a valid existing right.”).

Here, the actions that BLM must determine meet the substantive requirements of FLPMA as outlined above include: (1) the programmatic resumption of oil and gas leasing on federal lands; and (2) the decision of whether or not to offer to sell and issue oil and gas leases on each of the specific parcels identified. Critically, however, BLM’s consideration of these substantive requirements must not be viewed in the abstract, but within the specific “context” of the agency’s analysis and the scientific information available to it. 40 C.F.R. §§ 1502.24 (requiring “scientific integrity” of analysis), 1508.27(a) (requiring consideration of “both short and long-term effects” (1978)).<sup>198</sup> Accordingly, and of foundational importance, is whether the continued leasing and development of oil and gas will result in unnecessary and undue degradation to lands, resources, and species as a result of climate impacts.

Courts have recognized, “[t]he impact of [GHG] emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct.” *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008); *see also San Juan Citizens Alliance v. Bureau of Land Mgmt.*, 326 F. Supp. 3d 1227, 1248 (D.N.M. 2018); 40 C.F.R. § 1508.7 (1978) (“Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.”). Moreover, BLM has a duty to “consider the cumulative impact of GHG emissions generated by past, present, or reasonably foreseeable BLM lease sales in the region and nation.” *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 77 (D.D.C. 2019). This consideration must be contextual. An “agency’s [environmental analysis] must give a realistic evaluation of the total impacts and cannot isolate a proposed project, viewing it in a vacuum.” *Grand Canyon Trust v. F.A.A.*, 290 F.3d 339, 342 (D.C. Cir. 2002). In other words, it is not sufficient to simply list estimated emissions in a table, without relating those emissions to other BLM decisions and without “analysis of that catalogue and ‘their combined environmental impacts.’” *WildEarth Guardians v. Bureau of Land Mgmt.*, 457 F. Supp. 3d 880, 892 (D. Mont. 2020).

As discussed above, BLM has endeavored to satisfy the requirement to consider the cumulative climate impacts of its leasing decisions by preparing the “2020 BLM Specialist

---

<sup>198</sup> *See* Section II, *infra* (discussing applicability of CEQ NEPA regulations).

Report on Annual Greenhouse Gas Emissions and Climate Trends” (hereinafter “Report”).<sup>199</sup> Setting aside any potential deficiencies of the Report, the underlying conclusions are chilling. Annual greenhouse gas emissions from *existing* federal fossil fuel production totals 918.6 MTCO<sub>2</sub>e, with total projected cumulative “life-of-project” emissions of 3,682.7 MTCO<sub>2</sub>e over the next 12 months. Report at Executive Summary, Table ES-1, Table ES-2; Table ES-3; 7.0 Emissions Analysis, Table 7-1. Already permitted but not yet producing leases add 656.2 MTCO<sub>2</sub>e to this total over the next 12 months. Report at Executive Summary, Table ES-3. And the long-term onshore fossil fuel emissions projection is 24,112.35 MTCO<sub>2</sub>e. Report at Executive Summary, Table ES-4; 5.0 GHG Emissions and Projections from BLM-Authorized Actions, Table 5-18. BLM also applies these emissions in the context of the remaining Global Carbon Budget, which recognizes that there are 420 GtCO<sub>2</sub> that remain for a 66% chance to prevent warming above a 1.5C threshold. Report at 7.2 Carbon Budgets and Carbon Neutrality. With a federal fossil fuel emissions estimate of 2.24 GtCO<sub>2</sub> during that timeframe, this represents 1.47% of the total remaining global budget to avoid catastrophic warming. Report at 7.2 Carbon Budgets and Carbon Neutrality, Table 7-3. In other words, *any* additional emissions are entirely incompatible with maintaining a livable planet. The Report also details past and present climate impacts, at Section 8.3, projected future climate impacts under varying mitigation pathways, at Sections 7.2 and 9.2, as well as state specific climate projections, at Sections 8.4 and 9.4.

What the agency fails to do, however, is apply this analysis to its substantive duty to avoid unnecessary and undue degradation under FLPMA. 43 U.S.C. § 1732(b).

These requirements are distinct from BLM’s requirements under NEPA. “A finding that there will not be significant impact [under NEPA] does not mean either that the project has been reviewed for unnecessary and undue degradation or that unnecessary or undue degradation will not occur.” *Ctr. for Biological Diversity v. United States DOI*, 623 F.3d 633, 645 (9th Cir. 2010) (quoting *Kendall’s Concerned Area Residents*, 129 I.B.L.A. 130, 140 (1994)). In the instant case, the BLM’s failure to specifically account for unnecessary and undue degradation in its decision to continue the leasing and development of oil and gas—which is distinct from its compliance under NEPA—is actionable on procedural grounds and must occur before the leasing decision is approved.

The inquiry, then, is whether BLM has taken sufficient measures to prevent degradation unnecessary to, or undue in proportion to, its oil and gas leasing decisions. *See Theodore Roosevelt Conservation Partnership*, 661 F.3d at 76. BLM has neither defined what constitutes “unnecessary or undue degradation” in the context of continued oil and gas leasing and development, either at a programmatic level or within these specific sales—and with particular consideration of greenhouse gas emissions and resulting climate impacts—nor has the agency explained why its chosen alternative will not result in such degradation, as required by FLPMA, 43 U.S.C. § 1732(b). BLM’s failure to define, analyze, or take action to prevent the unnecessary or undue degradation of lands in the context of climate impacts is arbitrary and capricious agency action, an abuse of discretion, and action without observance of procedures required by

---

<sup>199</sup> See Department of the Interior, Bureau of Land Management, 2020 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends (2020).

law, pursuant to the APA. 5 U.S.C. § 706(2).

## **IX. The EAs' Treatment of Greater Sage-Grouse Violates NEPA and FLPMA**

### **A. All Parcels in Priority Habitat Management Areas And General Habitat Management Areas For Greater Sage-Grouse Should Be Deferred**

BLM should defer all parcels that contain acreage designated as a Priority Habitat Management Area (PHMA) or General Habitat Management Area (GHMA) under the 2015 Greater Sage-Grouse Resource Management Plan Amendments (the 2015 Plans). Deferral is required for at least two reasons. First, a key component of the 2015 Plans requires BLM to prioritize new oil and gas leasing outside of PHMA and GHMA, in order to protect that habitat from future disturbance. In May 2020, BLM's national policy addressing prioritization, Instruction Memorandum 2018-026, was struck down by a court. *Montana Wildlife Federation v. Bernhardt*, No. 18-cv-69-GF-BMM, 2020 WL 2615631 (D. Mont. May 22, 2020). BLM has not adopted new national guidance on the prioritization requirement, and has represented to the Montana court that the agency's previous prioritization guidance (adopted in 2016) also is not in effect. As a result, there is currently no national guidance providing direction on how prioritization is to be applied. Complying with the prioritization requirement of the 2015 Plans must be a central consideration for any lease parcels in PHMA and/or GHMA, and BLM should defer all parcels containing PHMA and/or GHMA at least until new national guidance is issued. The *Montana Wildlife Federation* ruling demonstrates the need for a well-reasoned national directive that fully complies with the purpose and language of the 2015 Plans' prioritization objective. If BLM state offices proceed with leasing in sage-grouse habitat using an ad hoc or state-by-state approach to prioritization, those decisions will inevitably fall short of what the 2015 Plans require.

Second, BLM recently announced that it will be reviewing and amending the 2015 Plans to address changed conditions and new information since 2015, as well as the impacts of climate change on the sage-grouse. See Notice of Intent To Amend Land Use Plans Regarding Greater Sage-Grouse Conservation and Prepare Associated Environmental Impact Statements, 86 Fed. Reg. 66,331 (Nov. 22, 2021). In light of this review, all parcels in sage-grouse habitat should be deferred while BLM considers revisions to the 2015 Plans.

While Instruction Memorandum 2021-027 states that "BLM will not routinely defer leasing when waiting for an RMP amendment or revision," it also recognizes that where "necessary terms and conditions under which leasing would be appropriate are not in conformance with the RMP, it will be necessary to amend the RMP before leasing is appropriate." In such cases, "the affected lease parcels must be withdrawn or deferred from leasing until a plan amendment or revision can be completed at a later date." BLM's pending RMP revision process requires deferral of parcels in sage-grouse habitat because the terms and conditions of the 2015 Plans must be strengthened to ensure protection of the grouse and avoid the need for an Endangered Species Act listing. Sage-grouse populations have continued to decline under the 2015 Plans. See e.g., Angus Thuermer, Jr, *Wyo sage grouse counts fall again, marking a 5-year trend*, Wyo File (Sept. 14, 2021) (noting that "Wyoming's 2021 count of male greater sage grouse declined 13% compared to 2020").<sup>200</sup> In addition, implementation and

---

<sup>200</sup> Available at <https://www.wyofile.com/wyo-sage-grouse-counts-fall-again-marking-a-5-year-trend/>.

enforcement of the prioritization objective and other key components of the 2015 Plans have proven very challenging.

Maintaining and increasing sage-grouse populations will require amending the 2015 Plans to add new terms and conditions, such as closing PHMA and/or GHMA to new leasing, making mineral withdrawals, establishing protected refuges and/or Areas of Critical Environmental Concern, and other measures. In the meantime, leasing in PHMA and GHMA must be deferred to avoid committing additional habitat to mineral development under terms that are inadequate to protect the sage-grouse.

## **B. The Action Alternatives in Draft EAs Fail to Prioritize Leasing Outside GHMA**

Further, the two action alternatives in the draft EAs, including Montana, *see* Montana Draft EA at 17-18,60-61, fail to comply with the 2015 Plans because they prioritize leasing only outside of PHMA, but not GHMA. Under the Federal Land Policy and Management Act (FLPMA), BLM must manage public lands “in accordance with the [applicable] land use plans . . .” 43 U.S.C. § 1732(a); *see also* 43 C.F.R. § 1610.5-3(a) (“All future resource management authorizations and actions . . . shall conform to the approved plan.”).

The Supreme Court has explained that the statutory directive that BLM manage “in accordance with” land use plans, and the regulatory requirement that authorizations and actions “conform to” those plans, prevent BLM from taking actions inconsistent with the provisions of a land use plan. Norton v. Southern Utah Wilderness Alliance, 542 U.S. 55, 68 (2004).

Here, the EA action alternatives are not consistent with the 2015 Plan requirement to prioritize leasing outside of GHMAs. BLM must:

prioritize oil and gas leasing and development outside of identified PHMAs **and GHMAs** . . . to further limit future surface disturbance and to encourage new development in areas that would not conflict with GRSG. This objective is intended to guide development to lower conflict areas and, as such, protect important habitat and reduce the time and cost associated with oil and gas leasing development. It would do this by avoiding sensitive areas, reducing the complexity of environmental review and analysis of potential impacts on sensitive species, and decreasing the need for compensatory mitigation.

Rocky Mountain Region ROD at 1-25 (emphasis added).

The 2015 Wyoming Plan echoes this directive and includes the following objective: “Priority will be given to leasing and development of fluid mineral resources, including geothermal, outside of PHMAs **and GHMAs**.” Wyoming Plan Management Objective No. 14, at 24 (emphasis added); *see also*, NW Colorado Plan, Objective MR-1 (similar). Thus, the prioritization requirement applies to both GHMA and PHMA.

The Colorado, Wyoming and Montana EAs, however, offer no explanation of how the action alternatives prioritize leasing outside GHMA. To the contrary, both alternatives offer all GHMA parcels being considered, doing nothing more than ensuring that correct stipulations are applied.

Wyoming draft EA at 52-55, Montana Draft EA at 56-61. Without applying prioritization to GHMA, the proposed lease sale would violate FLPMA. This is inconsistent with the prioritization requirement of the 2015 Plans. BLM must thoroughly analyze leasing in both PHMA and GHMA in its prioritization process, and BLM must direct new leasing away from GHMA as well as PHMA. Similarly, the Colorado EA does not appear to prioritize new leasing away from GHMA, either in the Proposed Alternative, or the Partial Leasing Alternative. See Colorado draft EA at 55-58 & Appendix D. This is inconsistent with the prioritization requirement of the 2015 Plans.

### **C. BLM Has Not Complied with the National Environmental Policy Act**

#### ***1. The EAs fail to analyze a reasonable range of alternatives.***

NEPA generally requires the BLM to conduct an alternatives analysis for “any proposal which involves unresolved conflicts concerning alternative uses of available resources.” 42 U.S.C. § 4332(2)(E). The regulations further obligate BLM to “rigorously explore and objectively evaluate all reasonable alternatives” including those “reasonable alternatives not within the jurisdiction of the lead agency,” so as to “provid[e] a clear basis for choice among options.” 40 C.F.R. § 1502.14. The range of alternatives is the heart of a NEPA document because “[w]ithout substantive, comparative environmental impact information regarding other possible courses of action, the ability of [a NEPA analysis] to inform agency deliberation and facilitate public involvement would be greatly degraded.” *New Mexico ex rel. Richardson v. BLM*, 565 F.3d 683, 708 (10th Cir. 2009). That analysis must cover a reasonable range of alternatives so that an agency can make an informed choice from the spectrum of reasonable options.

An EA offering a choice between leasing all (or almost all) proposed parcels, and leasing nothing at all, does not present a reasonable range of alternatives. *See The Wilderness Society v. Wisely*, 524 F. Supp. 2d 1285, 1312 (D. Colo. 2007) (BLM violated NEPA by failing to consider “middleground compromise between the absolutism of the outright leasing and no action alternatives”); *Muckleshoot Indian Tribe v. U.S. Forest Serv.*, 177 F.3d 800, 813 (9<sup>th</sup> Cir. 1999) (NEPA analysis failed to consider reasonable range of alternatives where it “considered only a no action alternative along with two virtually identical alternatives”).

The EAs for the February 2022 Wyoming, Colorado and Montana sales fail to consider reasonable middle-ground alternatives. For example, the EAs fail to evaluate an alternative that would defer leasing in GHMA, despite a legal obligation to do so under the 2015 Plans. BLM should consider an alternative that prioritizes leasing outside of GHMA as well as PHMA, and offers only offer non-sage-grouse habitat for lease. According to the Wyoming draft EA, for example, there are 8 parcels entirely outside GHMA and PHMA, and parts of 5 additional parcels outside GHMA and PHMA, that could be offered under such an alternative. Wyoming draft EA at 42-52. This alternative would thus provide for a sale of 8 or 13 parcels, which would be comparable in size to the lease sales BLM is proposing in every other state. Similarly, 17 of the 29 parcels considered for the Montana sale are located outside of sage-grouse habitat. Montana draft EA at 60-61.

Because BLM has not evaluated these or any other middle-ground alternatives, it has violated NEPA.

***2. BLM has failed to take the necessary “hard look” at potential environmental impacts.***

BLM has not taken the required “hard look” at potential environmental impacts, as required by NEPA. Under NEPA, BLM must evaluate the “reasonably foreseeable” site-specific impacts of oil and gas leasing prior to making an “irretrievable commitment of resources.” *New Mexico ex rel. Richardson*, 565 F.3d at 718; *see also Sierra Club v. Hodel*, 848 F.2d 1068, 1093 (10th Cir. 1988) (agencies are to perform hard look NEPA analysis “before committing themselves irretrievably to a given course of action so that the action can be shaped to account for environmental values”); *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.*, 435 U.S. 519, 553 (1978) (stating NEPA “places upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action”). Courts have held that BLM makes such a commitment when it issues an oil and gas lease without reserving the right to later prohibit all development. *New Mexico ex rel. Richardson*, 565 F.3d at 718; *Pennaco Energy, Inc. v. United States Dep’t of the Interior*, 377 F.3d 1147, 1160 (10<sup>th</sup> Cir. 2004)..

Here, BLM is in fact proposing to make an “irretrievable commitment of resources” by offering leases without reserving the right to prevent future development; the site-specific impacts are “reasonably foreseeable” and should be analyzed in this EA, rather than waiting until a leaseholder submits an application for permit to drill (APD). Unfortunately, several EAs take exactly the wrong approach and contain essentially no discussion of impacts to greater sage-grouse. The Wyoming EA claims that “it is difficult to predict exactly what impacts may occur” on the leases to be sold, but that impacts “would be similar to those discussed in the individual field office RMP and the 2015 ARPMA” Wyoming draft EA at 70. Similarly, the Colorado draft EA (a) describes existing conditions, (b) lists stipulations and other requirements of the 2015 Plans, and (c) includes boilerplate language describing categories of impacts from oil and gas operations. Colorado draft EA at 54-58. But the draft EAs contain no forecast of the impacts to sage-grouse populations from the specific leases being considered for sale under the two action alternatives. This approach violates NEPA, and BLM must take the site-specific impacts of leasing into account at this stage.

Under NEPA, “[t]he government’s inability to fully ascertain the precise extent of the effects of mineral leasing . . . is not . . . a justification for failing to estimate what those effects might be before irrevocably committing to the activity.” *Conner v Burford*, 848 F.2d 1441, 1450 (9th Cir. 1988); *see also N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1079 (9th Cir. 2011) (“NEPA requires that an EIS engage in reasonable forecasting. Because speculation is . . . implicit in NEPA, [] 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.”) (alteration in original). “General statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive

information could not be provided.” Conservation Cong. v. Finely, 774 F.3d 611, 621 (9th Cir. 2014).

Here, BLM can develop a reasonable forecast of how these leases will impact sage-grouse, just as it has done for their greenhouse gas impacts. For example, the agency can look to nearby existing development to assess where and how much drilling may occur on the proposed leases. Indeed, with regard to parcels in PHMA, BLM identified whether the lease would be adjacent to existing leases, in an area with high development potential, and how close the lease would be to a lek. Similarly, the Montana draft EA provides a site-specific analysis of specific leases in relationship to nearby sage-grouse leks. See Montana draft EA at 62-66. Failing to use this type of readily available information to forecast development would violate NEPA. See New Mexico ex rel. Richardson, 565 F.3d at 718-19 (failure to discuss impacts from developing oil and gas lease was arbitrary and capricious where “[c]onsiderable exploration has already occurred on parcels adjacent to the” proposed lease).

Moreover, BLM cannot rely for these sales on the plan-level NEPA analysis conducted for the 2015 Plans. Tiering is only appropriate when a subsequent NEPA document incorporates by reference earlier general matters into a subsequent narrower statement; but it does not allow a subsequent analysis to ignore the specific environmental issues that are presented in the later analysis. 40 C.F.R. § 1508.28. The 2015 Plan EISs do not address the site-specific impacts associated with issuing these particular lease parcels. On the contrary, by requiring a prioritization analysis the 2015 Plans contemplate that such an analysis will occur at the leasing stage. *See S. Fork Band Council of W. Shoshone of Nevada v. U.S. Dep’t of the Interior*, 588 F.3d 718, 726 (9th Cir. 2009) (holding that while tiering is sometimes permissible, “the previous document must actually discuss the impacts of the project at issue”).

#### **X. BLM May Not Arbitrarily Assume the Potential Benefits of Leasing Outweigh the Social and Environmental Costs**

We appreciate BLM’s analysis of the potential greenhouse gas emissions associated with these lease sales, including putting those emissions into context by calculating that the social cost of greenhouse gases resulting from the lease sales runs into the billions of dollars, *e.g.*, Nevada Draft EA at 25-29, Wyoming Draft EA at 36, and that for certain sales “the projected average annual GHG emissions from expected development following the proposed lease sale are equivalent to 400,926 gasoline-fueled passenger vehicles driven for one year.” Wyoming Draft EA at 32; *see also*, Colorado Draft EA at 33 (proposed alternative would be equivalent to 104,368 new automobiles, with potential social cost of carbon exceeding \$1 billion).

The EAs, however, collectively and arbitrarily ignore an important aspect of the problem: what economic benefits and revenues would result from the lease sales, and how do they compare to the enormous social and environmental costs of those sales? The draft Wyoming EA has no discussion at all of the socioeconomic impacts of the proposed sale in that state. It appears that draft EA originally included a section addressing the socioeconomic impacts of the lease sale, but it was removed prior to release of the draft EA. Compare Nov. 1, 2021 draft EA Table of Contents Section 3.7.1 (listing section addressing Socioeconomics) with id. at 94 (no socioeconomic section in the draft EA); Nov. 2, 2021 draft EA (socioeconomic section header

removed from table of contents). EAs for other state sales mention socioeconomic benefits but provide only boilerplate text describing how lease revenues are distributed, and summarizing studies that discuss various economic impacts in other geographic areas. Colorado draft EA at 44-46.<sup>201</sup>

Offering hundreds of leases that will impose billions of dollars in social and environmental harms without addressing what (if any) countervailing benefits might warrant such a decision would be arbitrary and capricious and inconsistent with FLPMA. An action is arbitrary and capricious, *inter alia*, “if the agency has . . . failed to consider an important aspect of the problem [or] offered an explanation for its decision that runs counter to the evidence before the agency.” *Motor Vehicle Mfrs. Ass’n of U.S., Inc. v. State Farm Mut. Auto Ins. Co.*, 463 U.S. 29, 43 (1983). Here, it would be arbitrary and capricious to quantify the costs of selling so many leases, but disregard the other side of the cost-benefit scale. *See High Country Conserv. Advocs. v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1191 (D. Colo. 2014) (holding it was “arbitrary and capricious to quantify the *benefits* of the lease modifications and then explain that a similar analysis of the *costs* was impossible when such an analysis was in fact possible”); *Montana Env. Info. Ctr. v. U.S. Office Surf. Mining*, 274 F. Supp. 3d 1074, 1098 (D. Mont. 2017) (ruling in favor of plaintiff’s argument that it was “arbitrary and capricious for [agency] to quantify socioeconomic benefits while failing to quantify costs”). Such a one-sided analysis also would violate NEPA. *Id.*

Here, the Wyoming draft EA provides no discussion at all of what socioeconomic benefits may result from the proposed lease sale. Nor does the EA provide any explanation—much less a factually accurate one—for failing to consider the benefits of such a large lease sale and how they compare with its costs. While the draft EAs for the Wyoming and other sales mention monetized environmental harms, *see* Wyoming Draft EA at 34-36 they also fail to quantify the potential benefits and compare them to the sale’s costs. Indeed, it appears from the Wyoming Draft EA Table of Contents, that contemplated sections on “Socioeconomics, Environmental Justice, and Public Health and Safety” were inexplicably omitted from the published Draft EA.<sup>202</sup>

Generating an estimate of the economic benefits from each lease sale is entirely feasible. For example, the Montana draft EA forecasts the bonus and rental payments resulting from that proposed sale. Montana draft EA at 72-74. It is also realistic to forecast potential oil and gas production (and thus royalties and other economic benefits) from the proposed leases. For example, BLM has prepared reasonably foreseeable development estimates in Colorado and other states, *e.g.* Colorado draft EA at 22-24, that can be used for a forecast of future production. Moreover, BLM’s estimate of GHG impacts further illustrates that the agency can make such projections. While recognizing uncertainties, the agency used “estimated well numbers based on State data for past lease development combined with per-well drilling, development, and

---

<sup>201</sup> The Montana draft EA provides an estimate of the bonus and rental payments that would be generated by the lease sale, but not the economic impacts from production. That incomplete estimate (either \$121,670 or \$256,963 (depending on alternative), Montana draft EA at 72-74), represents **only two percent or less of the social and environmental costs resulting from the sale.** *Id.* at 42-43.

<sup>202</sup> Wyoming Draft EA at 4 (listing Section 3.7 Socioeconomics, Environmental Justice, and Public Health and Safety as “Error! Bookmark not defined.”)

operating emissions data from representative wells in the area. . . . For purposes of estimating production and end-use emissions, reasonably foreseeable wells are assumed to produce oil and gas in similar amounts as existing nearby wells.” Wyoming draft EA at 31. A similar methodology could be used to estimate production royalty and related economic benefits from the leases.

The Wyoming draft EA’s silence on the relative costs and benefits from leasing is particularly glaring because of its large size and huge social and environmental costs. The number of leases proposed for the Wyoming sale, and their adverse impacts, far exceed the other lease sales BLM has proposed for early 2022. In every state other than Wyoming – Colorado, Utah, New Mexico/Oklahoma, Montana/North Dakota, Nevada and Alabama— BLM proposes to offer only a relatively discrete selection of of lease parcels following the June 2021 *Louisiana v. Biden* order. It is unclear why the Bureau is taking such a dramatically different tack in Wyoming, and the Administrative Procedure Act requires the agency to offer some explanation for why Wyoming is being treated differently. *See Chamber of Commerce v. FEC*, 69 F.3d 600, 606 (D.C. Cir. 1995) (decision was arbitrary and capricious where it provided “no explanation” for “differential treatment” of two classes of persons).

The need to consider both costs and benefits is also part of BLM’s obligation under the multiple-use mandate of FLPMA. FLPMA requires striking a balance between conflicting uses, such as oil and gas development and climate (and numerous other uses). As the Supreme Court has noted “multiple use” describes the enormously complicated task of striking a balance among the many competing uses to which land can be put, “including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and [uses serving] natural scenic, scientific and historical values.”” *Norton v. SUWA*, 542 U.S. 55, 58 (2004) (quoting 43 U.S.C. § 1702(c). BLM cannot strike that balance without even considering what it is balancing.

## **XI. The EAs Fail To Take A Hard Look At Impacts To Water Resources From Well Construction Practices And Hydraulic Fracturing.**

Several of the draft EAs violate NEPA because they contain no analysis of the reasonably foreseeable impacts to groundwater from drilling on these particular leases. The Wyoming draft EA contains three pages of generic boilerplate about potential water impacts from oil and gas development, Wyoming draft EA at 38-41, and a conclusory statement that BLM “would require full compliance with local, state, and federal directives and stipulations that relate to surface and groundwater protection and the BLM would deny any APD who proposed drilling and/or completion process was deemed to not be protective of usable water zones.” *Id.* at 39. These statements could be made about any oil and gas lease anywhere in Wyoming or nearby states— they tell the agency and the public nothing at all about the development of these leases. The Colorado draft EA declines to analyze impacts to groundwater at all. Colorado draft EA at 14-16 (including surface and groundwater resources in list of “Issues Considered but Not Analyzed in Detail,” which lists applicable regulatory and other requirements intended to protect water resources).

As federal courts have explained, the issuance of a non-NSO represents an irreversible commitment of resources because it gives the leaseholder the right to engage in ground-

disturbing activity. Accordingly, detailed environmental analysis and ESA consultation must occur at the leasing stage. *See 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.”); *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.”).

NEPA requires BLM to assess all the potential environmental impacts from oil and gas leases, before it offers those leases to operators. That responsibility includes taking a “hard look” at how ensuing development could impact groundwater. *WildEarth Guardians v. U.S. Bureau of Land Mgmt.*, 457 F. Supp. 3d 880, 886–89 (D. Mont. May 1, 2020).

Groundwater is a critical resource that supplies many communities, particularly rural ones, with drinking water. Protecting these resources is imperative to protect human health and the environment, especially because groundwater will become more important as increased aridity and higher temperatures alter water use. The U.S. Environmental Protection Agency (EPA) has noted that existing drinking water resources “may not be sufficient in some locations to meet future demand” and that future sources of fresh drinking “will likely be affected by changes in climate and water use.” U.S. Environmental Protection Agency, *Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States*, EPA/600/R-16/236F, at 2–18 (Dec. 2016) (EPA 2016 Report).<sup>203</sup> As a result, BLM must protect both aquifers currently used for drinking water, and deeper and higher-salinity aquifers that may be needed in coming decades.

Oil and gas drilling involves boring wells to depths thousands of feet below the surface, often through or just above groundwater aquifers. Without proper well construction and vertical separation between aquifers and fractured formations, oil and gas development can contaminate underground sources of water. *See, e.g.,* Gayathri Vaidyanathan, *Fracking Can Contaminate Drinking Water*, at 8, *Sci. Am.* (Apr. 4, 2016); Dominic C. DiGiulio & Robert A. Jackson, *Impact to Underground Sources of Drinking Water and Domestic Wells from Production Well Stimulation and Completion Practices in the Pavillion, Wyoming Field*, 50 *Am. Chem. Society, Env'tl. Sci. & Tech.* 4524, 4532 (Mar. 29, 2016); EPA 2016 Report. However, federal rules and regulations do not provide specific direction for BLM and operators to protect all usable water. Even rules that purport to do so, like Onshore Order No. 2’s requirement to “protect and/or isolate all usable water zones,” are inconsistently applied and often disregarded in practice. *See* BLM, *Regulatory Impact Analysis for the Final Rule to Rescind the 2015 Hydraulic Fracturing Rule*, at 44–45 (Dec. 2017).<sup>204</sup> State regulations are similarly inadequate to ensure protection of groundwater.

---

<sup>203</sup> Available at [www.epa.gov/hfstudy](http://www.epa.gov/hfstudy).

<sup>204</sup> Available at <https://beta.regulations.gov/document/BLM-2017-0001-0464>.

Moreover, industry has admitted that it often does not protect usable water in practice. Western Energy Alliance and the Independent Petroleum Association of America have told BLM that the “existing practice for locating and protecting usable water” does not measure the numerical quality of water underlying drilling locations, and therefore does not consider whether potentially usable water would be protected during drilling. Western Energy Alliance and the Independent Petroleum Association of America, Sept. 25, 2017 comments Re: RIN 1004-AE52, Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands; Rescission of a 2015 Rule (82 Fed. Reg. 34,464) (2017 WEA comments), at 59.<sup>205</sup> For example, a report studying a sample of existing oil and gas well records in Montana confirms industry admissions that well casing and cementing practices do not always protect underground sources of drinking water. Dominic DiGiulio, *Examination of Selected Production Files in Southcentral Montana to Support Assessment of the March 2018 BLM Lease Sale* (December 22, 2017).<sup>206</sup> Similarly, a study of hydraulic fracturing in Pavillion, Wyoming, confirmed that oil and gas drilling had contaminated underground sources of drinking water in that area due to lack of vertical separation between the aquifer and target formation. Dominic C. DiGiulio & Robert A. Jackson, *Impact to Underground Sources of Drinking Water and Domestic Wells from Production Well Stimulation and Completion Practices in the Pavillion, Wyoming Field*, 50 Am. Chem. Society, Env'tl. Sci. & Tech. 4524, 4532 (Mar. 29, 2016).<sup>207</sup>

In light of these risks to a critical resource, BLM must evaluate potential groundwater impairment. As a threshold matter, BLM must provide a detailed account of all regional groundwater resources that could be impacted, including usable aquifers that may not currently be used as a drinking water supply. The accounting must include, at minimum, all aquifers with up to 10,000 parts per million total dissolved solids, and it cannot substitute existing drinking water wells or any other incomplete proxy for a full description of all usable or potentially usable groundwater in the region. Second, BLM must use that accounting to assess how new oil and gas wells might impact these resources. That evaluation must assess the sufficiency of protective measures that will be employed, including wellbore casing and cementing and vertical separation between aquifers and the oil and gas formations likely to be hydraulically fractured. In assessing these protections, BLM cannot presume that state and federal regulations will protect groundwater, because of the shortcomings and industry noncompliance described above. BLM may not defer this analysis of groundwater impacts to the APD stage. *WildEarth Guardians*, 457 F. Supp. 3d at 888. Failure to conduct this analysis would violate NEPA. *Id.*

In order to adequately protect water resources and comply with NEPA, BLM must complete a detailed, project-specific analysis of water resources prior to approving each lease sale. See *Center for Biological Diversity*, 937 F. Supp. 2d at 1158; *Conner*, 848 F.2d at 1450. BLM must also consider cumulative effects of the proposed action pursuant to Secretarial Order 3399, recent case law, and BLM’s NEPA Handbook.

---

<sup>205</sup> Available at <https://www.regulations.gov/document?D=BLM-2017-0001-0412>.

<sup>206</sup> Available at [https://eplanning.blm.gov/public\\_projects/nepa/87551/136880/167234/Earthjustice\\_Protest\\_1-12-2018.pdf](https://eplanning.blm.gov/public_projects/nepa/87551/136880/167234/Earthjustice_Protest_1-12-2018.pdf). (Exhibit D to David Katz and Jack and Bonnie Martinell’s protest of the March 13, 2018 BLM Montana-Dakotas oil and gas lease sales).

<sup>207</sup> Available at <https://pubs.acs.org/doi/10.1021/acs.est.5b04970>.

On April 16, 2021, Secretary of the Interior Deb Haaland issued Secretarial Order 3399 (“Department-Wide Approach to the Climate Crisis and Restoring Transparency and Integrity to the Decision-Making Process”). Section 5(a) states:

Applying NEPA. Bureaus/Offices will not apply the 2020 [Council on Environmental Quality NEPA] Rule in a manner that would change the application or level of NEPA that would have been applied to a proposed action before the 2020 Rule went into effect on September 14, 2020. Bureaus/Offices will continue to follow the Department’s NEPA regulations at 43 C.F.R. Part 46, Department Manual procedures (516 DM Ch. 1-15), and guidance and instruction from the Office of Environmental Policy and Compliance. If Bureaus/Offices believe that the Department’s NEPA regulations irreconcilably conflict with the 2020 Rule, they will elevate issues to the relevant Assistant Secretary and to CEQ.

Secretarial Order 3399 at unnumbered pages 3-4, emphasis added. This is significant because the 2020 CEQ NEPA rule removed cumulative effects as an impact that must be analyzed during NEPA, but a detailed cumulative effects analysis is required under the prior CEQ NEPA rule.

An adequate cumulative effects analysis requires some “quantified or detailed” information. *Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 993 (9th Cir. 2004). *Cf. Sierra Club v. Bosworth*, 510 F.3d 1016, 1028-30 (9th Cir. 2007) (requiring consideration of cumulative impacts for activities covered by categorical exclusion for fuel reduction activities); *Soda Mountain Wilderness Council v. Norton*, 424 F. Supp. 2d 1241, 1266-67 (E.D. Cal. 2006) (finding one-page cumulative impact analysis inadequate). Generalized, conclusory statements about the insignificance of cumulative effects or how they will be effectively mitigated will not suffice. *Te-Moak Tribe of Western Shoshone of Nevada v. U.S. Dept. of Interior*, 608 F.3d 592, 606 (9th Cir. 2010) (failure to include quantified or detailed information on cumulative effects of past, present, and reasonably foreseeable mining activities). *See also Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 971-74 (9th Cir. 2006) (holding cumulative impact analysis for gold mining operations inadequate because it consisted of “vague and conclusory statements, without any supporting data” and lacked any explanation for why other mining projects were not explicitly discussed).

Among the projects that should be analyzed for cumulative impacts to water resources is the recent application from 3PL Operating Inc. to the State of Nevada to extract up to 101,400 acre feet of groundwater per year from Railroad Valley. This application, if approved, could alter groundwater flowpaths, reduce surface water flows and—in combination with the oil and gas development that would be authorized under the proposed lease sale—may imperil sensitive groundwater-dependent endemic species such as the Railroad Valley springfish.

## **XII. BLM Must Consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service on the Greenhouse Gas Emissions Caused by its Leasing Proposal**

For every discretionary action, Section 7(a)(2) of the Endangered Species Act (“ESA”) requires each federal agency, in consultation with the nation’s wildlife agencies, to “insure that any action authorized, funded, or carried out by such agency ... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species” using the best scientific data available.<sup>208</sup> The Supreme Court has unequivocally stated that the Act’s “language, history, and structure” made clear “beyond doubt” that “Congress intended endangered species to be afforded the highest of priorities” and endangered species should be given “priority over the ‘primary missions’ of federal agencies” especially during such consultations.<sup>209</sup> Even with a global threat to biodiversity such as climate change, “the plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, *whatever the cost.*”<sup>210</sup> Because resuming federal oil and gas leasing will have an appreciable, cumulative impact on climate-threatened species, BLM must include these species as part of its consultation with both the National Marine Fisheries Service and the U.S. Fish and Wildlife Service (collectively the “Services”).<sup>211</sup>

While many of the ESA’s provisions work to effectuate the conservation goals of the statute, the “heart of the ESA” is the interagency consultation requirements of Section 7 of the ESA.<sup>212</sup> At the first step of the consultation process, an action agency must determine if its action either “may affect” listed species or will have “no effect” on listed species within the action area. Under the ESA, “action” is broadly defined to include “all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas” and include, but are not limited to “(a) actions intended to conserve listed species or their habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air.”<sup>213</sup> Similarly, the “action area” is equally broadly defined as “all areas to be affected directly *or indirectly* by the Federal action and not merely the immediate area involved in the action.”<sup>214</sup>

For this proposed action, it is clear that the anticipated greenhouse gas pollution from federal oil and gas leasing will harm listed species far beyond the immediate area of the proposed activity in a manner that is attributable to the agency action.

#### **A. Greenhouse gas emissions have direct, predictable, and devastating effects on endangered species and habitats.**

---

<sup>208</sup> 16 U.S.C. § 1536(a)(2).

<sup>209</sup> *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 174, 185 (1978).

<sup>210</sup> *Id.* at 184 (emphasis added).

<sup>211</sup> In *Massachusetts v. EPA*, the Supreme Court found that U.S. vehicle emissions represented a “meaningful contribution” to global emissions, and even addressing a fraction of these emissions was sufficient for standing purposes and requires EPA to take action. *Massachusetts v. EPA*, 549 U.S. 497 (2007).

<sup>212</sup> *W. Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 495 (9th Cir. 2011); 16 U.S.C. § 1536.

<sup>213</sup> 50 C.F.R. § 402.02

<sup>214</sup> 50 C.F.R. § 402.02 (emphasis added).

As an initial matter, the science is overwhelmingly clear that climate change represents a stark threat to the future of biodiversity within the United States and around the world. The Fourth National Climate Assessment warns that “climate change threatens many benefits that the natural environment provides to society,” and that “extinctions and transformative impacts on some ecosystems” will occur “without significant reductions in global greenhouse gas emissions.”<sup>215</sup> The best available science shows that anthropogenic climate change is causing widespread harm to life across the planet, disrupting species’ distribution, timing of breeding and migration, physiology, vital rates, and genetics—in addition to increasing species extinction risk.<sup>216</sup> Climate change is already affecting 82% of key ecological processes that underpin ecosystem function and support basic human needs.<sup>217</sup> Climate change-related local extinctions are widespread and have occurred in hundreds of species, including almost half of the 976 species surveyed.<sup>218</sup> Nearly half of terrestrial non-flying threatened mammals and nearly one-quarter of threatened birds are estimated to have been negatively impacted by climate change in at least part of their range.<sup>219</sup> Furthermore, across the globe, populations of terrestrial birds and mammals that are experiencing greater rates of climate warming are more likely to be declining at a faster rate.<sup>220</sup> Genes are changing, species’ physiology and physical features such as body size are changing, species are moving to try to keep pace with suitable climate space, species are shifting their timing of breeding and migration, and entire ecosystems are under stress.<sup>221</sup>

Species extinction risk will accelerate with continued greenhouse gas pollution. One million animal and plant species are now threatened with extinction, with climate change as a

---

<sup>215</sup> U.S. Global Change Research Program, *Impacts, Risks, and Adaptation in the United States, Fourth National Climate Assessment, Vol. II* 42, 44 (2018), <https://nca2018.globalchange.gov/>.

<sup>216</sup> Rachel Warren et al., *Increasing impacts of climate change upon ecosystems with increasing global mean temperature rise*, 106 *Climatic Change* 141 (2011).

<sup>217</sup> Brett R. Scheffers, *The broad footprint of climate change from genes to biomes to people*, 354 *Science* 719 (2016).

<sup>218</sup> John J. Wiens, *Climate-related local extinctions are already widespread among plant and animal species*, 14 *PLoS Biology* e2001104 (2016).

<sup>219</sup> Michela Pacifici et al., *Species’ traits influenced their response to recent climate change*, 7 *Nature Climate Change* 205 (2017). The study concluded that “populations of large numbers of threatened species are likely to be already affected by climate change, and ... conservation managers, planners and policy makers must take this into account in efforts to safeguard the future of biodiversity.”

<sup>220</sup> Fiona E.B. Spooner et al., *Rapid warming is associated with population decline among terrestrial birds and mammals globally*, 24 *Global Change Biology* 4521 (2018).

<sup>221</sup> Camille Parmesan & Gary Yohe, *A globally coherent fingerprint of climate change impacts across natural systems*, 421 *Nature* 37 (2003); Terry L. Root et al., *Fingerprints of global warming on wild animals and plants*, 421 *Nature* 57 (2003); Camille Parmesan, *Ecological and evolutionary responses to recent climate change*, 37 *Annual Review of Ecology Evolution and Systematics* 637 (2006); I-Ching Chen et al., *Rapid range shifts of species associated with high levels of climate warming*, 333 *Science* 1024 (2011); Ilya M. D. Maclean & Robert J. Wilson, *Recent ecological responses to climate change support predictions of high extinction risk*, 108 *PNAS* 12337 (2011); Rachel Warren et al., *Increasing impacts of climate change upon ecosystems with increasing global mean temperature rise*, 106 *Climatic Change* 141 (2011); Abigail E. Cahill et al., *How does climate change cause extinction?*, 280 *Proceedings of the Royal Society B* 20121890 (2012).

primary driver.<sup>222</sup> At 2°C compared with 1.5°C of temperature rise, species' extinction risk will increase dramatically, leading to a doubling of the number of vertebrate and plant species losing more than half their range, and a tripling for invertebrate species.<sup>223</sup> Numerous studies have projected catastrophic species losses during this century if climate change continues unabated: 15 to 37% of the world's plants and animals committed to extinction by 2050 under a mid-level emissions scenario<sup>224</sup>; the potential extinction of 10 to 14% of species by 2100<sup>225</sup>; global extinction of 5% of species with 2°C of warming and 16% of species with business-as-usual warming<sup>226</sup>; 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<sup>227</sup>; and the loss of a third or more of animals and plant species in the next 50 years.<sup>228</sup> As summarized by the Third National Climate Assessment, "landscapes and seascapes are changing rapidly, and species, including many iconic species, may disappear from regions where they have been prevalent or become extinct, altering some regions so much that their mix of plant and animal life will become almost unrecognizable."<sup>229</sup>

Methane emissions are particularly alarming. Immediate, deep reductions in methane emissions are critical for lowering the rate of global warming in the near-term, preventing the crossing of irreversible planetary tipping points, and avoiding harms to species and ecosystems from methane's intensive near-term heating effects and ground-level ozone production.<sup>230</sup> Methane is a super-pollutant 87 times more powerful than CO<sub>2</sub> at warming the atmosphere over a 20-year period,<sup>231</sup> and is second only to CO<sub>2</sub> in driving climate change during the industrial era.<sup>232</sup> Methane also leads to the formation of ground-level ozone, a dangerous air pollutant, that harms ecosystems and species by suppressing plant growth and reducing plant productivity and

---

<sup>222</sup> IPBES, Global Assessment Report on Biodiversity and Ecosystem Services (E.S. Brondízio et al eds., 2019), <https://ipbes.net/news/Media-Release-Global-Assessment>.

<sup>223</sup> Intergovernmental Panel on Climate Change, *Summary for Policymakers*, in Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (V. Masson-Delmotte et al eds., 2021), <https://www.ipcc.ch/report/ar6/wg1/>.

<sup>224</sup> Chris D. Thomas et al., *Extinction risk from climate change*, 427 Nature 145 (2004).

<sup>225</sup> Ilya M. D. Maclean & Robert J. Wilson, *Recent ecological responses to climate change support predictions of high extinction risk*, 108 PNAS 12337 (2011).

<sup>226</sup> Mark C. Urban, *Accelerating extinction risk from climate change*, 348 Science 571 (2015).

<sup>227</sup> Rachel Warren et al., *Quantifying the benefit of early climate change mitigation in avoiding biodiversity loss*, 3 Nature Climate Change 678 (2013).

<sup>228</sup> Cristian Román-Palacios & John J. Wiens, *Recent responses to climate change reveal the drivers of species extinction and survival*, 117 PNAS 4211 (2020).

<sup>229</sup> U.S. Global Change Research Program, *Climate Change Impacts in the United States: The Third National Climate Assessment* 196 (Jerry M. Melillo et al. eds., 2014), doi:10.7930/J0Z31WJ2.

<sup>230</sup> United Nations Environment Programme & Climate and Clean Air Coalition, *Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions* 11 (2021), <https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions>.

<sup>231</sup> G. Myhre et al., *Anthropogenic and Natural Radiative Forcing*, in: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (T.F. Stocker et al. eds., 2013), <https://www.ipcc.ch/report/ar5/wg1/> at Table 8.7.

<sup>232</sup> United Nations Environment Programme & Climate and Clean Air Coalition, *supra* note 230, at 11.

carbon uptake.<sup>233</sup> Because methane is so climate-damaging but also comparatively short-lived with an atmospheric lifetime of roughly a decade, cutting methane has a relatively immediate effect in slowing the rate of temperature rise in the near-term. Critically, deep cuts in methane emissions of ~45% by 2030 would avoid 0.3°C of warming by 2040 and are considered necessary to achieve the Paris Agreement’s 1.5°C climate limit and prevent the worst damages from the climate crisis.<sup>234</sup> Deep cuts in methane emissions that reduce near-term temperature rise are also critical for avoiding the crossing of planetary tipping points—abrupt and irreversible changes in Earth systems to states wholly outside human experience, resulting in severe physical, ecological and socioeconomic harms.<sup>235</sup>

What is more, scientists can now predict specific harms to individual species from the incremental emissions increases directly attributable to the federal agency actions, and can also assess the consequences of emissions for listed species’ conservation and recovery. For example, the recovery plan for the polar bear predicts three different scenarios for polar bear populations under scenarios where emissions are abated early, emissions are abated later, and where emissions continue unabated.<sup>236</sup> Likewise, with respect to particular agency actions, scientists were able to calculate that the rollback of vehicle emissions standards by the Trump administration would have resulted in a sustained loss of more than 1,000 square miles of summer sea ice habitat for the polar bear and nearly one full additional day of ice-free conditions in Alaska and many other parts of the Arctic, which would reduce the length of the polar bear feeding season and lower reproductive success and survival.<sup>237</sup> Thus as a scientific matter, there is no basis for any federal agency to assert that climate change does not harm endangered and threatened species or that it is scientifically impossible to ascertain the particular harm caused by an agency’s contribution to greenhouse gas emissions.

Furthermore, there are no defensible legal rationales for ignoring climate-threatened species that are harmed by the emissions that will result from a proposed agency action. Since 2008, federal agencies have taken cover behind a cursory, two-page memorandum from the Fish and Wildlife Service, which asserted, without any citation or acknowledgement of the scientific literature, that the “best scientific data available today do not allow us to draw a causal connection between GHG emissions from a given facility and effects posed to listed species or their habitats, nor are there sufficient data to establish that such impacts are reasonably certain to

---

<sup>233</sup> *Id.* at 11, 69.

<sup>234</sup> *Id.* at 11.

<sup>235</sup> O. Hoegh-Guldberg et al., *Impacts of 1.5°C Global Warming on Natural and Human Systems*, in: *Global Warming of 1.5°C, An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* 262 (V. Masson-Delmotte et al. eds., 2018), <https://www.ipcc.ch/sr15/chapter/chapter-3/>.

<sup>236</sup> U.S. Fish and Wildlife Service, *Polar bear (Ursus maritimus) Conservation Management Plan, Final* (2016).

<sup>237</sup> See Exhibit 115, Declarations of Shaye Wolf and Steven Amstrup, *Competitive Enterprise Inst. et al. v. National Highway Traffic Safety Admin. et al.*, Case No. 20-1145, Document No. 1880214 (filed Jan. 14, 2021) and Dirk Notz & Julienne Stroeve, *Observed Arctic sea ice loss directly follows anthropogenic CO2 emission*, 354

SCIENCE 747 (2016), <https://science.sciencemag.org/content/354/6313/747/tab-pdf>.

occur.”<sup>238</sup> Several months later, David Bernhardt — then Department of Interior Solicitor during the George W. Bush administration—issued a five-page memorandum concurring with the FWS.<sup>239</sup> Even if these memoranda were correct at the time — and they were not — as the FWS memorandum stated: that “As new information and knowledge about emissions and specific impacts to species and their habitats is developed, we will adapt our framework for consultations accordingly. This is particularly important as more regionally-based models are developed and refined to the level of specificity and reliability needed for the Service to execute its implementation of the Act’s provisions ensuring consistency with the statute’s best available information standard.”<sup>240</sup> Thus, the FWS and Bernhardt Memoranda were never intended to provide a permanent shield to avoid consultations, and any reliance on it today would simply be arbitrary and capricious. Accordingly, all federal agencies must assess whether the emissions that result from their activities harm climate-threatened species.

### **B. The BLM’s Proposed Leasing Action Clearly Crosses the “May Affect” Threshold for Climate-Threatened Species and Requires Consultation.**

If the agency determines that an action *may affect* a species—even if the effect is small, indirect, or the result of cumulative actions—it must formally consult with the Services.<sup>241</sup> Federal courts have repeatedly held that the “may affect” threshold is “very low” and that any effect — whether “beneficial, benign, adverse or of an undetermined character” — is sufficient to cross that threshold.<sup>242</sup> Only a scientific finding of “no effect” is sufficient to avoid the consultation process altogether.<sup>243</sup> In essence, as the Joint Consultation Handbook explains, a “no effect” finding means exactly what it says, and is only properly made “when the action agency determines its proposed action will not affect a listed species or designated critical habitat”;<sup>244</sup> it cannot be employed when an agency simply believes it is too hard to determine the impacts of its actions.<sup>245</sup>

It is abundantly clear in this instance the proposed agency action will result in a significant fraction of all global greenhouse gas emissions, and consequently there are real impacts that cross the “may affect” threshold, even if some of those impacts are still of an

---

<sup>238</sup> Memorandum from H. Dale Hall, Director Fish & Wildlife Service, to Regional Directors, Regions 1-8 (May 14, 2008), <https://www.fws.gov/policy/m0331.pdf> (“FWS Memorandum”).

<sup>239</sup> Memorandum from David L. Bernhardt, Department of the Interior, Office of the Solicitor to the Secretary of the Department of the Interior Director (Oct. 3, 2008), <https://doi.opengov.ibmcloud.com/sites/doi.opengov.ibmcloud.com/files/uploads/M-37017.pdf>.

<sup>240</sup> FWS Memorandum at 2-3.

<sup>241</sup> 50 C.F.R. §§ 402.02, 402.14(a), (g) (2020).

<sup>242</sup> *Karuk Tribe of Cal. v. U.S. Forest Serv.*, 681 F.3d 1006, 1027 (9th Cir. 2012).

<sup>243</sup> U.S. Fish and Wildlife Service & National Marine Fisheries Service, *Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities under Section 7 of the Endangered Species Act* xvi (1998), [https://www.fws.gov/endangered/esa-library/pdf/esa\\_section7\\_handbook.pdf](https://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf).

<sup>244</sup> *Id.* at xvi. However, the agencies are still encouraged to obtain written concurrence from the Services. See *id.* definitions of “Formal consultation” and “Informal consultation” at xiv, xv.

<sup>245</sup> *Am. Fuel & Petrochemical Mfrs. v. EPA*, 937 F.3d 559, 598 (D.C. Cir. 2019) (A finding that “it is impossible to know” an agency action will affect listed species or critical habitat “is not the same as” a no effect determination.).

undetermined character at this point. The purpose of the consultation process, by Congressional design, is to allow the expert wildlife agencies to assess these impacts using the best available science, so that they can evaluate the harm that may be caused. Any attempt by the Bureau of Land Management (or U.S. Fish and Wildlife Service) to simply assert that it is unable to determine the impacts of greenhouse gas emissions on listed species is illegal and *ultra vires*. Only the expert wildlife agencies, with best scientific data available, can determine the effects of a federal action on species or habitat.

Indeed, the second step of the consultation process reinforces the basic notion that an action agency may not unilaterally assert that the greenhouse gases that will be emitted will not harm listed species. Once the “may affect” threshold is crossed, the action agency must then prepare a “biological assessment” to determine whether the listed species may be adversely affected by the proposed action. If the action agency believes that the impacts of its greenhouse gas emissions are not significant, it may make a finding that such impacts are “not likely to adversely affect” listed species, which is defined as all impacts being “discountable” or “insignificant.”<sup>246</sup> Critically, however, the expert wildlife agencies must themselves concur regarding whether the action agency’s scientific assessment of the impacts to climate-threatened species is correct.<sup>247</sup>

At the formal consultation phase, the Services must provide the action agency with a “biological opinion” explaining how the proposed action will affect the listed species or habitat.<sup>248</sup> If the Services conclude that the proposed action will jeopardize the continued existence of a listed species, including those that are not in the immediate project area and that are harmed by greenhouse gas emissions, or will result in the destruction or adverse modification of critical habitat, the Services must provide “reasonable and prudent alternatives” (“RPAs”) to the proposed action that they believe would address those impacts.<sup>249</sup> If the Services conclude that the proposed action will not likely to jeopardize listed species, or result in the destruction or adverse modification of critical habitat, then they must provide an “incidental take statement” (“ITS”), specifying the amount or extent of such incidental taking on the species, any “reasonable and prudent measures” (“RPMs”) that they consider necessary or appropriate to minimize such impact.<sup>250</sup>

With respect to the greenhouse gas emissions that will result from federal fossil fuel leasing, the best available science suggests that this action, along with other federal onshore mineral production will result in approximately 24,112 megatons of carbon dioxide equivalent through 2050.<sup>251</sup> These emissions are appreciable and significant, and must be assessed under the ESA’s consultation framework. This analysis is also consistent with President Biden’s “whole of government” approach to addressing the climate crisis, as well as Executive Order 13990, which

---

<sup>246</sup> U.S. Fish and Wildlife Service & National Marine Fisheries Service, *supra* note 243, at xv.

<sup>247</sup> 50 C.F.R. § 402.14(b)(1).

<sup>248</sup> 16 U.S.C. § 1536(b); 50 C.F.R. §§ 402.14(g), (h).

<sup>249</sup> 16 U.S.C. § 1536(b)(3).

<sup>250</sup> 16 U.S.C. § 1536(b)(4); 50 C.F.R. §§ 402.14(h)(4)(i).

<sup>251</sup> Specialist Report at 6 & Table ES-4.

states that all federal agencies “must be guided by the best science and be protected by processes that ensure the integrity of Federal decision-making.”<sup>252</sup>

Consultation on climate-threatened species that may be affected by cumulative impacts of emissions caused by the agency’s action is similar to many other complex consultations undertaken by the Services. The Services must first attempt to quantify any take of listed species, but if such harms cannot be quantified, the Services can qualitatively assess the harm, something Congress contemplated when it passed the 1982 amendments to the Endangered Species Act. The legislative history of those amendments reflects Congress’ recognition that a numerical determination of take would not always be obtainable— such as when the eggs of listed species are boiled alive in power plant cooling systems—and intention that such challenges not present an insurmountable barrier to completing consultations.<sup>253</sup> Furthermore, the Services have regularly relied on surrogates, such as habitat, ecological conditions, or a similarly-affected species that are easier to monitor in instances where the biology of a listed species or the nature of the proposed action makes it difficult to detect or monitor take of individual animals.

Similarly, the Services must also assess the negative impacts of greenhouse gases on critical habitat. Assessing the loss of critical habitat in a climate consultation is complex, but no more difficult than assessing critical habitat in other nationwide programmatic consultations. Under the Services’ regulations,<sup>254</sup> critical habitat is only adversely modified or destroyed when it appreciably diminishes the value of the “whole” designation. In many cases, climate impacts to critical habitat will affect the entirety of a designation — likely to the same extent in a relatively similar manner. For example, acidification impacts to a listed coral are likely to be roughly equivalent across the range of each species, and sea level rise would likely harm the habitat of Florida Keys species relatively equally across the range, making it more likely that an adverse modification determination would be needed at the end of the assessment process. But the fact that the outcome of such an analysis is a positive adverse modification or destruction determination is not a legal justification for not conducting an analysis at all. Thus, to the extent that the impacts to critical habitat are significant, the Services must develop RPAs and RPMs — including through surrogate metrics — to address the habitat degradation that climate change is bringing.

For both the jeopardy analysis and critical habitat analysis, the Services will need to develop analytical tools and methods that meet the standards of the Endangered Species Act, just as it does in traditional consultations, to address complex threats that are hard to assess quantitatively. The National Marine Fisheries Service can use the amount of sea ice lost as a surrogate for determining anticipated take of bearded seals, while the Fish and Wildlife Service can use declining stream flows and increasing water temperatures as a surrogate to infer the status of the western glacier stonefly or its critical habitat. This has been a pre-existing practice and the Services already have the knowledge and expertise to do this.

---

<sup>252</sup> Exec. Order No. 13,990, 86 Fed. Reg. 7037 (Jan 20, 2021).

<sup>253</sup> H.R. Rep. No. 97-567, at 27 (1982).

<sup>254</sup> These regulations are being challenged in federal court and the Administration has signaled it may revise them in the near future.

If the Services ultimately determine that the proposed action will result in jeopardy, the Services must provide RPAs that will allow the agency to move forward in a way that avoids jeopardy to the species or destruction or adverse modification of designated critical habitat.<sup>255</sup> While jeopardy determinations are rare, in the context of climate consultations they are all the more critical to the survival not only of listed species, but of humanity itself. If a federal agency action substantially increases the likelihood of overshooting the 1.5-degree Celsius goal of the Paris Agreement, it is likely to not only jeopardize climate-threatened species, but people everywhere. As the Endangered Species Act makes clear, the action agency must not take such an action, or it must implement RPAs that ensure that GHG emissions decrease such that they are consistent with the goals of the Paris Agreement, the reports of the Intergovernmental Panel on Climate Change, and the best available science. Thus, consultations would provide a powerful mechanism to achieve President Biden’s stated policy to “reduce climate pollution in every sector of the economy; increase resilience to the impacts of climate change; protect public health” and “conserve our lands, waters, and biodiversity.”<sup>256</sup>

In instances where the federal agency actions will not rise to the level of jeopardy but will result in incidental take in areas that are geographically remote from the agency action itself, the Services must *still* issue RPAs to minimize the take of climate-threatened species. The most durable and effective approach for climate consultations to implement RPAs would be for the Services to condition the receipt of an ITS through the implementation of RPAs within a climate-focused Section 7(a)(1) conservation program for each climate-threatened species identified in the biological opinion where the Services anticipate take.<sup>257</sup> Section 7(a)(1) requires all federal agencies to “utilize their authorities...by carrying out programs for the conservation of endangered species and threatened species.”<sup>258</sup> As the Supreme Court noted in *Tennessee Valley Authority v. Hill* noted, section 7(a)(1) is no less than “stringent, mandatory language,”<sup>259</sup> that “reveals an explicit congressional decision to require agencies to afford first priority to the declared national policy of saving endangered species.”<sup>260</sup> By requiring agencies to develop a climate-focused Section 7(a)(1) conservation program as a condition to obtaining an ITS, the Services can require agencies to finally comply with the law and ensure that their activities are consistent with the recovery of listed species and address the take they cause.

### **XIII. Conclusion**

For the aforementioned reasons, prior to any decision to resume leasing of federal public lands for fluid mineral development, the Bureau of Land Management must comply with its obligations under the National Environmental Policy Act, the Federal Land Policy and

---

<sup>255</sup> 16 U.S.C. 1536(b)(3)(A).

<sup>256</sup> Exec. Order No. 14,008, 86 Fed. Reg. 7619 (Jan. 27, 2021).

<sup>257</sup> H.R. Rep. No 97-567, at 44 (“[I]n many cases in which a proposed action will not result in jeopardy, there may be minor modifications to the project which will minimize the effects on the species and which the action agency could easily and inexpensively adopt. We believe that providing such information to the action agency is important for the continued protection of endangered species and assists other federal agencies in fulfilling their obligations under section 7(a)(1) of the Act”).

<sup>258</sup> 16 U.S.C. 1536(a)(1).

<sup>259</sup> *TVA v. Hill*, 437 U.S. at 183.

<sup>260</sup> *Id.* at 185.

Management Act, and the Endangered Species Act, to consider the impacts of that nationwide policy on resources including global climate, environmental justice, wildlife habitat, air quality, and surface and groundwater quality.

As laid forth in numerous judicial decisions, BLM's current plan- and lease-level NEPA compliance cannot possibly support a decision to lawfully resume leasing, and therefore all new leasing must be deferred until such time as comprehensive environmental review, including the cumulative impacts of past, ongoing, and reasonably foreseeable fossil fuel development can be considered. In order to comply with the United States' legal and moral obligations to its citizens, and to future generations, that review must include meaningful consideration of alternatives that could allow the Department of Interior to fulfill its role in putting the nation on a path towards an emissions future compatible with limiting warming to 1.5C and mitigating the worst effects of global climate change.

Sincerely,

**/s/ Michael A. Saul**

Michael A. Saul  
Senior Attorney  
Center for Biological Diversity  
1536 Wynkoop Street, Suite 421  
Denver CO 80202  
msaul@biologicaldiversity.org

**On behalf of:**

Michael A. Saul  
Center for Biological Diversity

Natasha Léger  
Executive Director  
Citizens for a Healthy Community  
Phone: 970-399-9700  
Direct: 303-667-1544  
Email: natasha@chc4you.org

Michael Freeman  
Senior Attorney  
Earthjustice Rocky Mountain Office  
633 17<sup>th</sup> Street, Suite 1600  
Denver, CO 80202  
T: 303.996.9615  
F: 720.550.5757

Nicole Ghio  
Friends of the Earth  
nghio@foe.org

Shelley Silbert  
Great Old Broads for Wilderness  
shelley@greatoldbroads.org

Landon Newell (he / him)  
Staff Attorney  
Southern Utah Wilderness Alliance  
425 East 100 South  
Salt Lake City, Utah 84111  
Phone: 801-428-3991  
E-mail: [landon@suwa.org](mailto:landon@suwa.org)

Kate Hudson, Esq.  
Western US Advocacy Coordinator  
Waterkeeper Alliance  
khudson@waterkeeper.org  
914-388-5016 (cell)  
970-340-5017

Melissa A. Hornbein  
Western Environmental Law Center  
103 Reeders' Alley  
Helena, MT 59601  
Ph: 406-471-3173  
Email: [mhornbein@westernlaw.org](mailto:mhornbein@westernlaw.org)

Kelly Fuller  
Energy and Mining Program Director  
Western Watersheds Project  
kfuller@westernwatersheds.org

Matthew Nykiel  
Climate & Energy Program Attorney  
(303) 501-5763  
mnykiel@wildearthguardians.org  
Peter Hart, Attorney  
Wilderness Workshop  
P.O. Box 1442  
Carbondale, CO 81623  
Office: (970) 963-3977  
Cell: (303) 475-4915  
Fax: (970) 963-8447

## List of References

- Adgate, John L. et al., *Potential Public Health Hazards, Exposures and Health Effects from Unconventional Natural Gas Development*, ENVIRONMENTAL SCIENCE & TECHNOLOGY (2014)
- American Lung Association, *State of the Air 2020*, available at <http://www.stateoftheair.org/assets/SOTA-2020.pdf>
- Antelope Coal LLC, Leasing Application, Antelope Mine (August 20, 2015)
- Attendance Works, *Mapping the Early Attendance Gap* (2017), available at [http://www.attendanceworks.org/wp-content/uploads/2017/05/Mapping-the-Early-Attendance-Gap\\_Final-4.pdf](http://www.attendanceworks.org/wp-content/uploads/2017/05/Mapping-the-Early-Attendance-Gap_Final-4.pdf)
- Austin, A. et al., *Associations Between Unconventional Natural Gas Development and Nasal and Sinus, Migraine Headache, and Fatigue Symptoms in Pennsylvania*, ENVIRONMENTAL HEALTH PERSPECTIVES (July 31, 2016), available at <http://ehp.niehs.nih.gov/wpcontent/uploads/advpub/2016/8/EHP281.acco.pdf>
- Bhatia, Rajiv and Aaron Wernham, *Integrating Human Health into Environmental Impact Assessment: An Unrealized Opportunity for Environmental Health and Justice*, 116 ENVIRONMENTAL HEALTH PERSPECTIVES 991 (Apr. 16, 2008)
- Boyle, Meleah D. et al., *Hazard Ranking Methodology for Assessing Health Impacts of Unconventional Natural Gas Development and Production: The Maryland Case Study*, 11 PLOS ONE e0145368 (Jan. 4, 2016)
- Bronco Utah Reserves, Inc., Leasing Application (March 28, 2018)
- Brown, David et al., *Understanding Exposure From Natural Gas Drilling Puts Current Air Standards to the Test*, 29 REVIEWS ON ENVIRONMENTAL HEALTH 277 (2014)
- Bureau of Ocean Energy Management, Draft Environmental Impact Statement for Cook Inlet Planning Area Oil and Gas Lease Sale 258 in Cook Inlet, Alaska (October 2021)
- Bureau of Ocean Energy Management, Oil and Gas Lease Sales 2017-2022, available at <https://www.boem.gov/oil-gas-energy/lease-sales>
- Bureau of Ocean Energy Management, Outer Continental Shelf Oil and Gas Leasing Program: 2017-2022, Final Programmatic Environmental Statement, Volume I (Nov. 2016)
- Cahill, Abigail E. et al., *How does climate change cause extinction?*, 280 Proceedings of the Royal Society B 20121890 (2012)
- Canyon Fuel Company LLC, Leasing Application (July 10, 2019)
- Carbon Brief, *Mapped: How climate change affects extreme weather around the world*, available at <https://www.carbonbrief.org/mapped-how-climate-change-affects-extreme-weather-around-the-world> (last visited Nov. 29, 2021)

- Casey, Joan A., *Unconventional Natural Gas Development and Birth Outcomes in Pennsylvania, USA*, 27 EPIDEMIOLOGY 163 (2016)
- Centers for Disease Control and Prevention, Health Impact Assessment (Sept. 19, 2016), available at <https://www.cdc.gov/healthyplaces/hia.htm>
- Chen, Huan & Kimberly E. Carter, *Modeling potential occupational inhalation exposures and associated risks of toxic organics from chemical storage tanks used in hydraulic fracturing using AERMOD*, 224 ENVIRONMENTAL POLLUTION 300 (2017)
- Chen, I-Ching et al., *Rapid range shifts of species associated with high levels of climate warming*, 333 Science 1024 (2011)
- Clean Air Task Force, *Fossil Fumes: A Public Health Analysis of Toxic Air Pollution From the Oil and Gas Industry*, June 2016, available at <http://www.catf.us/resources/publications/files/FossilFumes.pdf>
- Clough, Emily & Derek Bell, *Just Fracking: A Distributive Environmental Justice Analysis of Unconventional Gas Development in Pennsylvania, USA*, 11 Environmental Research Letters 025001 (2016)
- Colborn, Theo et al., *An exploratory study of air quality near natural gas operations*, HUM. ECOL. RISK ASSESS (Nov. 9, 2012)
- Coteau Properties Co. Leasing Application, Freedom Mine (May 17, 2019)
- Council on Environmental Quality, *Environmental justice: guidance under the National Environmental policy act* (December 10, 1997)
- Council on Environmental Quality, *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* (2016)
- Cumulative impacts subcommittee, environmental justice advisory council to the New Jersey Department of Environmental Protection, *Strategies for Addressing Cumulative Impacts in Environmental Justice Communities* (March 2009), available at [https://www.nj.gov/dep/ej/docs/ejac\\_impacts\\_report200903.pdf](https://www.nj.gov/dep/ej/docs/ejac_impacts_report200903.pdf)
- Currie, Janet et al., *Hydraulic fracturing and infant health: New evidence from Pennsylvania*, 3 SCIENCE ADVANCES E1603021 (2017)
- Cushing, Lara J. et al., *Flaring from Unconventional Oil and Gas Development and Birth Outcomes in the Eagle Ford Shale in South Texas*, 128 ENVIRONMENTAL HEALTH PERSPECTIVES, 077003 (2020)
- Declarations of Shaye Wolf and Steven Amstrup, *Competitive Enterprise Inst. et al. v. National Highway Traffic Safety Admin. et al.*, Case No. 20-1145, Document No. 1880214 (filed Jan. 14, 2021) and Dirk Notz & Julianne Stroeve, *Observed Arctic sea ice loss directly follows anthropogenic CO2 emission*, 354 SCIENCE 747 (2016), <https://science.sciencemag.org/content/354/6313/747/tab-pdf>
- DiGiulio, Dominic C. & Robert B. Jackson, *Impact to Underground Sources of Drinking Water and Domestic Wells from Production Well Stimulation and Completion Practices in the Pavillion, Wyoming, Field*, Environ. Sci. Technol., (2016), <https://doi.org/10.1021/acs.est.5b04970>, available at <https://pubs.acs.org/doi/10.1021/acs.est.5b04970>

Dooley, Kate et al., *Ethical choices behind quantifications of fair contributions under the Paris Agreement*, Nature Climate Change 11: 300-305 (2021), available at <https://www.nature.com/articles/s41558-021-01015-8>

EDF, New Mexico Oil and Gas Data tool, available at <https://www.edf.org/nm-oil-gas/>

Elliot, Elise G. et al., *A Systematic Evaluation of Chemicals in Hydraulic-Fracturing Fluids and Wastewater for Reproductive and Developmental Toxicity*, 27 JOURNAL OF EXPOSURE SCIENCE AND ENVIRONMENTAL EPIDEMIOLOGY 90 (2016)

EnergyNet, Colorado State Land Board Lease Sale Results (May 20, 2021)

EnergyNet, Colorado State Land Board Lease Sale Results (August 18, 2021)

EnergyNet, New Mexico State Land Office Lease Sale Results (June 15, 2021)

EnergyNet, New Mexico State Land Office Lease Sale Results (July 20, 2021)

EnergyNet, New Mexico State Land Office Lease Sale Results (August 17, 2021)

EnergyNet, New Mexico State Land Office Lease Sale Results (September 21, 2021)

EnergyNet, New Mexico State Land Office Lease Sale Results (October 19, 2021)

EnergyNet, New Mexico State Land Office Lease Sale Results (November 16, 2021)

EnergyNet, State of North Dakota Oil and Gas Lease Sale Results (August 3, 2021)

EnergyNet, State of North Dakota Oil and Gas Lease Sale Results (November 2, 2021)

EnergyNet, Utah School and Institutional Trust Lands Lease Sale Results (July 23, 2021)

EnergyNet, Wyoming Office of State Lands and Investments Lease Sale Results (July 14, 2021)

EnergyNet, Wyoming Office of State Lands and Investments Lease Sale Results (Nov. 3, 2021)

Esswein, Eric et al., *Evaluation of Some Potential Chemical Exposure Risks during Flowback Operations in Unconventional Oil and Gas Extraction: Preliminary Results*, 11 JOURNAL OF OCCUPATIONAL AND ENVIRONMENTAL HYGIENE D174 (2014)

Esswein, Eric J. et al., *Occupational Exposures to Respirable Crystalline Silica During Hydraulic Fracturing*, 10 JOURNAL OF OCCUPATIONAL AND ENVIRONMENTAL HYGIENE 347 (2013)

Evans, Simon, *Analysis: Which countries are historically responsible for climate change?* Carbon Brief, available at <https://www.carbonbrief.org/analysis-which-countries-are-historically-responsible-for-climate-change> (last visited Nov. 29, 2021)

Executive Order 12898 of Feb. 11, 1994, *Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations*, Fed. Reg. Vol. 59, 7629 available at <https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf>

Executive Order No. 13,990, 86 Fed. Reg. 7037 (Jan. 20, 2021)

Executive Order 14008 of January 27, 2021, *Tackling the Climate Crisis at Home and Abroad*, Fed. Reg. Vol. 86, No. 19, available at <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/>

Falkirk Mining Company Leasing Application, Falkirk Mine (Amended: January 28, 2021)

Fontenot, Brian E. et al., *An Evaluation of Water Quality in Private Drinking Water Wells Near Natural Gas Extraction Sites in the Barnett Shale Formation*, ENVIRONMENTAL SCIENCE & TECHNOLOGY (2013)

Gilman, Jessica et al., *Source signature of volatile organic compounds (VOCs) from oil and natural gas operations in northeastern Colorado*, ENVIRONMENTAL SCIENCE & TECHNOLOGY (2013)

Gross, Sherilyn A. et al., *Analysis of BTEX Groundwater Concentrations from Surface Spills Associated with Hydraulic Fracturing Operations*, JOURNAL OF THE AIR & WASTE MANAGEMENT ASSOCIATION (2013)

Harrison, Robert J. et al., *Sudden Deaths Among Oil and Gas Extraction Workers Resulting from Oxygen Deficiency and Inhalation of Hydrocarbon Gases and Vapors — United States, January 2010–March 2015*, 65 MMWR MORB MORTAL WKLY REP 6 (2016)

Hays, Jake & Seth B.C. Shonkoff, *Towards an Understanding of the Environmental and Public Health Impacts of Unconventional Natural Gas Development: A Categorical Assessment of the Peer-Reviewed Scientific Literature*, 11 PLoS ONE e0154164 (2016)

Hedden, Adrian, *State Agencies Grapple With Abandoned Oil Wells*, Carlsbad Current-Argus, Feb. 9, 2018, available at <https://www.currentargus.com/story/news/local/2018/02/09/unplugged-state-agencies-grapple-abandoned-oil-wells/324990002/>

Hoegh-Guldberg, O. et al., *Impacts of 1.5°C Global Warming on Natural and Human Systems*, in: *Global Warming of 1.5°C, An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* 262 (V. Masson-Delmotte et al. eds., 2018), available at <https://www.ipcc.ch/sr15/chapter/chapter-3/>

H.R. Rep. No. 97-567 (1982)

Independent Petroleum Association of America & Western Energy Alliance, *Technical Comments re Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands; Rescission of a 2015 Rule* (82 Fed. Reg. 34,464) (Sept. 25, 2017), available at <https://www.regulations.gov/document?D=BLM-2017-0001-0412>

Intergovernmental Panel on Climate Change, *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (2021)

Intergovernmental Panel on Climate Change, *Summary for Policymakers*, in *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (V. Masson-Delmotte et al eds., 2021), available at <https://www.ipcc.ch/report/ar6/wg1/>

IPBES, *Global Assessment Report on Biodiversity and Ecosystem Services* (E.S. Brondízio et al eds., 2019), available at <https://ipbes.net/news/Media-Release-Global-Assessment>

- Jemielita, Thomas et al., *Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates*, 10 PLoS ONE e0131093 (2015)
- Johnston, Jill & Lara Cushing, *Chemical Exposures, Health, and Environmental Justice in Communities Living on the Fenceline of Industry*, 7 Current Environmental Health Reports (2020)
- 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 (2014)
- Kelley, Tim and Gregory D. Kearney, *Insights Into the Environmental Health Burden of Childhood Asthma*, 12 ENVIRONMENTAL HEALTH INSIGHTS doi: [10.1177/1178630218757445](https://doi.org/10.1177/1178630218757445) (Feb. 20, 2018)
- Kinnear, Susan et al., *The Need to Measure and Manage the Cumulative Impacts of Resource Development on Public Health: An Australian Perspective* (May 15, 2013), available at <https://www.intechopen.com/books/current-topics-in-public-health/the-need-to-measure-and-manage-the-cumulative-impacts-of-resource-development-on-public-health-an-au>
- Letter from American Lung Association to U.S. EPA (November 30, 2011)
- Lyman, Seth and Howard Shorthill, *Final Report: 2012 Uintah Basin Winter Ozone & Air Quality Study*, UTAH STATE UNIVERSITY, February 1, 2013
- Maclean, Ilya M. D. & Robert J. Wilson, *Recent ecological responses to climate change support predictions of high extinction risk*, 108 PNAS 12337 (2011)
- Malin, Stephanie A. *Depressed democracy, environmental injustice: Exploring the negative mental health implications of unconventional oil and gas production in the United States*, 70 Energy Research & Social Science, 101720 (2020)
- McKenzie, Lisa et al., *Ambient Nonmethane Hydrocarbon Levels Along Colorado's Northern Front Range: Acute and Chronic Health Risks*, 52 ENVIRONMENTAL SCIENCE & TECHNOLOGY 4514 (2018)
- McKenzie, Lisa M. et al., *Birth Outcomes and Maternal Resident Proximity to Natural Gas Development in Rural Colorado*, 122 ENVIRONMENTAL HEALTH PERSPECTIVES 412 (April 2014)
- McKenzie, Lisa M. et al., *Population Size, Growth, and Environmental Justice Near Oil and Gas Wells in Colorado*, 50 ENVIRONMENTAL SCIENCE & TECHNOLOGY 11471 (2016)
- Memorandum for Heads of Federal Departments and Agencies, *Effective Use of Programmatic NEPA Reviews*, Counsel on Environmental Quality, December 18, 2014
- Memorandum from David L. Bernhardt, Department of the Interior, Office of the Solicitor to the Secretary of the Department of the Interior Director (Oct. 3, 2008), available at <https://doi.opengov.ibmcloud.com/sites/doi.opengov.ibmcloud.com/files/uploads/M-37017.pdf>
- Memorandum from H. Dale Hall, Director Fish & Wildlife Service, to Regional Directors, Regions 1-8 (May 14, 2008), available at <https://www.fws.gov/policy/m0331.pdf>
- Merrill, M.D., Sleeter, B.M., Freeman, P.A., Liu, J., Warwick, P.D., and Reed, B.C., *Federal lands greenhouse gas emissions and sequestration in the United States—Estimates for 2005–14: U.S. Geological Survey Scientific Investigations Report 2018* (2018)

- Minnesota Pollution Control Agency, Cumulative Impact Analysis, available at <https://www.pca.state.mn.us/air/cumulative-impact-analysis>
- Moore, Christopher W. et al., *Air Impacts of Increased Natural Gas Acquisition, Processing, and Use: A Critical Review*, ENVIRONMENTAL SCIENCE & TECHNOLOGY (2014)
- Morello-Frosch, Rachel et al., *Understanding the Cumulative Impacts of Inequalities in Environmental Health: Implications for Policy*, 30 HEALTH AFFAIRS 879 (May 2011)
- Myhre, G. et al., *Anthropogenic and Natural Radiative Forcing*, in: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (T.F. Stocker et al. eds., 2013), available at <https://www.ipcc.ch/report/ar5/wg1/>
- Natural Resources Defense Council, *Drilling in California: Who's At Risk?*, October 2014
- New Mexico Department of Health, *Health Indicator Report of Asthma Emergency Department Visits Among Children* (last visited November 18, 2021), available at [https://ibis.health.state.nm.us/indicator/complete\\_profile/AsthmaEDChild.html](https://ibis.health.state.nm.us/indicator/complete_profile/AsthmaEDChild.html)
- New Mexico Department of Health, *Health Indicator Report of Asthma Emergency Department Visits Among Adults* (last visited November 18, 2021), available at <https://ibis.health.state.nm.us/indicator/view/AsthmaEDAdult.Cnty.html>
- New Mexico Department of Health, *Health Indicator Report of Prenatal Care in the First Trimester*, available at <https://ibis.health.state.nm.us/indicator/view/PrenCare.Cnty.html>
- New Mexico Department of Health, *The Burden of Asthma in New Mexico: 2014 Epidemiology Report* (Jan. 2014), available at <https://nmhealth.org/data/view/environment/54/>
- Occupational Health and Safety, *Radiation Sources in Natural Gas Well Activities*, (Oct. 01, 2012), available at <https://ohsonline.com/Articles/2012/10/01/Radiation-Sources-in-Natural-Gas-Well-Activities.aspx?Page=2>
- Office of Disease Prevention and Health Promotion, *Healthy People 2020: Social Determinants of Health*, available at <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>
- Oil and Gas Threat Map, New Mexico (2018), available at <http://oilandgasthreatmap.com/threat-map/new-mexico/>
- Pacifici, Michela et al., *Species' traits influenced their response to recent climate change*, 7 Nature Climate Change 205 (2017)
- Parmesan, Camille & Gary Yohe, *A globally coherent fingerprint of climate change impacts across natural systems*, 421 Nature 37 (2003)
- Pendery, Bruce M., *BLM's Retained Rights: How Requiring Environmental Protection Fulfills Oil and Gas Lease Obligations*, 40 Env'tl. L. 599 (2010)
- Pétron, Gabrielle et al., *Estimation of emissions from oil and natural gas operations in northeastern Colorado*, Power Point available at: [http://www.epa.gov/ttnchie1/conference/ei20/session6/gpetron\\_pres.pdf](http://www.epa.gov/ttnchie1/conference/ei20/session6/gpetron_pres.pdf)

- Physicians for Social Responsibility and Concerned Health Professionals of NY, Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking, Seventh Edition (Dec. 2020)
- Physicians, Scientists, and Engineers for Healthy Energy, The ROGER Citation Database, available at <https://www.psehealthyenergy.org/our-work/shale-gas-research-library/> (last visited November 19, 2021)
- Rabinowitz, Peter M. et al., *Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania*, 123 ENVIRONMENTAL HEALTH PERSPECTIVES 21
- Rasmussen, Sara G. et al., *Association Between Unconventional Natural Gas Development in the Marcellus Shale and Asthma Exacerbations*, 176 JAMA INTERNAL MEDICINE 1334 (2016)
- Reed, Kevin A. et al., *Forecasted Attribution of the Human Influence on Hurricane Florence*, Science Advances 6 (1): eaaw9253, <https://doi.org/10.1126/sciadv.aaw9253>
- Retzer, K.D. et al., *Motor vehicle fatalities among oil and gas extraction workers*, ACCIDENT ANALYSIS & PREVENTION (2013)
- Román-Palacios, Cristian & John J. Wiens, *Recent responses to climate change reveal the drivers of species extinction and survival*, 117 PNAS 4211 (2020)
- Root, Terry L. et al., *Fingerprints of global warming on wild animals and plants*, 421 Nature 57 (2003)
- Parmesan, Camille, *Ecological and evolutionary responses to recent climate change*, 37 Annual Review of Ecology Evolution and Systematics 637 (2006)
- SEI, IISD, ODI, E3G, and UNEP, The Production Gap Report: 2020 Special Report (2021), available at <http://productiongap.org/2020report>
- SEI, IISD, ODI, E3G, and UNEP, The Production Gap Report: 2021 (2021), available at <http://productiongap.org/2021report>
- Scheffers, Brett R., *The broad footprint of climate change from genes to biomes to people*, 354 Science 719 (2016)
- Spooner, Fiona E.B. et al., *Rapid warming is associated with population decline among terrestrial birds and mammals globally*, 24 Global Change Biology 4521 (2018)
- Spring Creek Coal, LLC Leasing Application, Spring Creek Mine (Modified: May 11, 2016)
- Spring Creek Coal, LLC Leasing Application, Spring Creek Mine (Modified: July 3, 2017)
- Stacy, Shaina L. et al., *Perinatal Outcomes and Unconventional Natural Gas Operations in Southwest Pennsylvania*, 10 PLoS ONE e0126425 (2015)
- Steinzor, Nadia et al., *Investigating links between shale gas development and health impacts through a community survey project in Pennsylvania*, NEW SOLUTIONS, Vol. 23 Iss. 1. (2013)

Stockholm Environment Institute, *The Production Gap: The Discrepancy Between Countries' Planned Fossil Fuel Production and Global Production Levels Consistent with Limiting Warming to 1.5°C or 2.0°C* (2019), available at <https://www.sei.org/publications/the-production-gap-report/>

Swain, Daniel L. et al., *Attributing Extreme Events to Climate Change: A New Frontier in a Warming World*, One Earth (Jun. 2, 2020)

Thomas, Chris D. et al., *Extinction risk from climate change*, 427 Nature 145 (2004)

Thuermer Jr., Angus M., Wyo sage grouse counts fall again, marking a 5-year trend, WyoFile, Sept. 8, 2021, available at <https://www.wyofile.com/wyo-sage-grouse-counts-fall-again-marking-a-5-year-trend/>

Tran, Kathy V. et al., Residential Proximity to Oil and Gas Development and Birth Outcomes in California: A Retrospective *Cohort Study of 2006–2015 Births*, 128 Environmental Health Perspectives, 067001 (2020)

U.N. Declaration on the Rights of Indigenous Peoples (“UNDRIP”), Articles 10, 11, 19, 28, 29, and 32

U.N. Expert Mechanism on the Rights of Indigenous Peoples, *Final report of the study on indigenous peoples and the right to participate in decision-making* (August 17, 2011)

U.N. General Assembly, *United Nations Declaration on the Rights of Indigenous Peoples*

United Nations Environment Programme & Climate and Clean Air Coalition, *Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions* 11 (2021), available at <https://www.unep.org/resources/report/global-methane-assessment-benefits-and-costs-mitigating-methane-emissions>

Urban, Mark C., *Accelerating extinction risk from climate change*, 348 Science 571 (2015)

U.S. Bureau of Land Management, Regulatory Impact Analysis for the Final Rule to Rescind the 2015 Hydraulic Fracturing Rule, (Dec. 2017), available at <https://beta.regulations.gov/document/BLM-2017-0001-0464>

U.S. Department of the Interior, Bureau of Land Management, 2020 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends (2020)

U.S. Department of Interior, Interior Department Issues Statement on Oil and Gas Leasing Program (last edited 8/26/2021), available at [www.doi.gov/pressreleases/interior-department-issues-statement-oil-and-gas-leasing-program](http://www.doi.gov/pressreleases/interior-department-issues-statement-oil-and-gas-leasing-program)

U.S. Environmental Protection Agency, Children are Not Little Adults, <https://www.epa.gov/children/children-are-not-little-adults>

U.S. Environmental Protection Agency, Environmental Justice, available at [www.epa.gov/environmentaljustice](http://www.epa.gov/environmentaljustice)

U.S. Environmental Protection Agency, Framework for Cumulative Risk Assessment (May) available at [https://www.epa.gov/sites/production/files/2014-11/documents/frmwrk\\_cum\\_risk\\_assmnt.pdf](https://www.epa.gov/sites/production/files/2014-11/documents/frmwrk_cum_risk_assmnt.pdf)

U.S. Environmental Protection Agency, Hydraulic Fracturing for Oil and Gas and Its Potential Impact on Drinking Water Resources (2016), available at [www.epa.gov/hfstudy](http://www.epa.gov/hfstudy)

U.S. Environmental Protection Agency, NEPA Final Guidance (1998), available at [https://www.epa.gov/sites/production/files/2015-02/documents/ej\\_guidance\\_nepa\\_epa0498.pdf](https://www.epa.gov/sites/production/files/2015-02/documents/ej_guidance_nepa_epa0498.pdf)

- U.S. Environmental Protection Agency, Ozone – Good Up High Bad Nearby, available at <http://www.epa.gov/oar/oaqps/gooduphigh/bad.html#7>
- U.S. Environmental Protection Agency, Promising Practices for EJ Methodologies in NEPA Review (2016), available at [https://www.epa.gov/sites/default/files/201608/documents/nepa\\_promising\\_practices\\_document\\_2016.pdf](https://www.epa.gov/sites/default/files/201608/documents/nepa_promising_practices_document_2016.pdf)
- U.S. Fish and Wildlife Service, *Polar bear (Ursus maritimus) Conservation Management Plan, Final* (2016)
- U.S. Fish and Wildlife Service & National Marine Fisheries Service, *Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities under Section 7 of the Endangered Species Act* xvi (1998), available at [https://www.fws.gov/endangered/esa-library/pdf/esa\\_section7\\_handbook.pdf](https://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf)
- U.S. Geological Survey, Naturally Occurring Radioactive Materials (NORM) in Produced Water and Oil-Field Equipment— An Issue for the Energy Industry, (1999), available at <https://pubs.usgs.gov/fs/fs-0142-99/fs-0142-99.pdf>
- U.S. Global Change Research Program, *Climate Change Impacts in the United States: The Third National Climate Assessment* 196 (Jerry M. Melillo et al. eds., 2014), doi:10.7930/J0Z31WJ2
- U.S. Global Change Research Program, *Impacts, Risks, and Adaptation in the United States, Fourth National Climate Assessment*, Vol. II 42, 44 (2018), <https://nca2018.globalchange.gov/>
- U.S. Government Accountability Office, Bureau of Land Management Should Address Risks from Insufficient Bonds to Reclaim Wells, GAO-19-615 (Sept. 2019)
- U.S. Government Accountability Office, Oil and Gas Wells: Bureau of Land Management Needs to Improve its Data and Oversight of Its Potential Liabilities 1, GAO-18-250 (May 2018), available at: <https://www.gao.gov/assets/700/691810.pdf>
- U.S. Government Interagency Working Group on Social Cost of Greenhouse Gases, Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990 (February 2021)
- UtahAmerican Energy, Inc., Leasing Application, UTU-80043 (March 1, 2002)
- UtahAmerican Energy, Inc. Leasing Application, UTU-014218 (December 13, 2017)
- UtahAmerican Energy, Inc. Leasing Application, UTU-0126947 (December 13, 2017)
- Vaidyanathan, Gayathri, *Fracking Can Contaminate Drinking Water*, Climate Wire (April 4, 2016), available at <https://www.scientificamerican.com/article/fracking-can-contaminate-drinking-water/>
- Van den Berg, Nicole et al., *Implications of various effort-sharing approaches for national carbon budgets and emission pathways*, Climatic Change 162: 1805-1822 (2020), available at <https://link.springer.com/article/10.1007%2Fs10584-019-02368-y>
- Vengosh, Avner et al., *The effects of shale gas exploration and hydraulic fracturing on the quality of water resources in the United States*, PROCEDIA EARTH AND PLANETARY SCIENCE (2014)

- Warren, Rachel et al., *Increasing impacts of climate change upon ecosystems with increasing global mean temperature rise*, 106 *Climatic Change* 141 (2011)
- Warren, Rachel et al., *Quantifying the benefit of early climate change mitigation in avoiding biodiversity loss*, 3 *Nature Climate Change* 678 (2013)
- Webb, Ellen et al., *Developmental and reproductive effects of chemicals associated with unconventional oil and natural gas operations*, 29 *REV ENVIRON HEALTH* 307 (2014)
- Webb, Ellen et al., *Potential Hazards of Air Pollutant Emission from Unconventional Oil and Natural Gas Operations on the Respiratory Health of Children and Infants*, 31 *REV. ENVIRONMENTAL HEALTH* (Jun. 1, 2016)
- Welsby, D., Price, J., Pye, S. et al., *Unextractable fossil fuels in a 1.5 °C world*. *Nature* 597 (2021)
- Western Environmental Law Center, *Reducing Oil and Gas Exploitation in the San Juan Basin*, available at <https://westernlaw.org/safeguarding-climate/reforming-oil-gas-operations/reducing-oil-and-gas-exploitation-in-the-san-juan-basin/>
- Wiens, John J., *Climate-related local extinctions are already widespread among plant and animal species*, 14 *PLoS Biology* e2001104 (2016)
- Willis, Mary D. et al., *Unconventional natural gas development and pediatric asthma hospitalizations in Pennsylvania*, 166 *ENVIRONMENTAL RESEARCH* 402 (2018)
- Witter, Roxana Z. et al., *Occupational exposures in the oil and gas extraction industry: state of the science and research recommendations*, *AMERICAN JOURNAL OF INDUSTRIAL MEDICINE* (2014)
- Witter, Roxana Z. et al., *The Use of Health Impact Assessment for a Community Undergoing Natural Gas Development*, *FRAMING HEALTH MATTERS* (2013)
- Zaffos, Joshua, *'Orphaned' Oil and Gas Wells are on the Rise.* High Country News, Jan. 16, 2018, available at <https://www.hcn.org/issues/50.3/energy-industry-orphaned-oil-and-gas-wells-are-on-the-rise>