April 1, 2020

Protest and exhibits submitted via email

U.S. Bureau of Land Management
New Mexico State Office
Attn. State Director
301 Dinosaur Trail
Santa Fe, NM 87508
blm_nm_leasesale@blm.gov

Re: Protest of the New Mexico BLM's May 20–21, 2020 Oil & Gas Lease Sale, Pecos District Office Parcels

Dear State Director,

Pursuant to 43 C.F.R. § 3120.1-3, WildEarth Guardians, the Center for Biological Diversity, Chaco Alliance, Living Rivers-Colorado Riverkeeper, Sierra Club, Southwest Native Cultures, Waterkeeper Alliance, and Western Environmental Law Center (hereinafter "the Citizen Groups") submit the following protest of the U.S. Bureau of Land Management's (BLM's) decision to move forward with its May 20–21, 2020 competitive oil and gas lease sale. The agency is proposing to auction off 95 publicly-owned oil and gas parcels totaling 45,445.76 acres across New Mexico and Texas.[1] This protest pertains to the 94 New Mexico parcels (45,414.07 acres) analyzed in the Pecos District Office's draft environmental assessment (EA)[2] and finding of no significant impact (FONSI).[3]

This protest is filed on behalf of the Citizen Groups and our members. The mailing address to which correspondence regarding this protest should be directed is as follows:

Rebecca Fischer
Climate & Energy Program Attorney
WildEarth Guardians
2590 Walnut Street
Denver, CO 80205

[1] The May 2020 Lease Sale Notice is available on BLM's website at: https://eplanning.blm.gov/epl-front-office/projects/nepa/1502406/20015098/250020239/May_2020_Competitive_OG_Lease_Sale_Notice_508.pdf.

[2] The Pecos District Office draft EA is available at: https://eplanning.blm.gov/epl-front-office/projects/nepa/1502406/20015101/250020242/EA_PDO_May2020LeaseSale_Public_Protest_508.pdf.

[3] The Pecos District Office' draft FONSI is available at: https://eplanning.blm.gov/epl-front-office/projects/nepa/1502406/20015102/250020243/FONSI_PDO_May2020LeaseSale_Public_Protest_508.pdf.

We protest all of the New Mexico parcels, including:

Parcel No.	**County**	**Field Office**	**Acres**
NM-2020-05-0220	Eddy	Carlsbad	533.97
NM-2020-05-0221	Eddy	Carlsbad	1,280.00
NM-2020-05-0219	Eddy	Carlsbad	600.32
NM-2020-05-0232	Chaves	Roswell	327.57
NM-2020-05-0260	Chaves	Roswell	960.00
NM-2020-05-0259	Chaves	Roswell	960.00
NM-2020-05-0257	Chaves	Roswell	295.20
NM-2020-05-0258	Chaves	Roswell	640.00
NM-2020-05-0303	Chaves	Roswell	400.00
NM-2020-05-0304	Chaves	Roswell	880.00
NM-2020-05-0309	Chaves	Roswell	160.00
NM-2020-05-0112	Chaves	Roswell	244.43
NM-2020-05-0100	Chaves	Roswell	520.00
NM-2020-05-0263	Chaves	Roswell	520.00
NM-2020-05-0102	Chaves	Roswell	760.00
NM-2020-05-0106	Chaves	Roswell	920.00
NM-2020-05-0269	Chaves	Roswell	1,040.00
NM-2020-05-0265	Chaves	Roswell	240.00
NM-2020-05-0268	Chaves	Roswell	120.00
NM-2020-05-0107	Chaves	Roswell	120.00
NM-2020-05-0270	Chaves	Roswell	160.00
NM-2020-05-0272	Chaves	Roswell	160.09
NM-2020-05-0308	Chaves	Roswell	320.30
NM-2020-05-0277	Chaves	Roswell	1,033.77
NM-2020-05-0108	Chaves	Roswell	600.00
NM-2020-05-0278	Chaves	Roswell	800.00
NM-2020-05-0109	Chaves	Roswell	633.64
NM-2020-05-0116	Chaves	Roswell	638.14
NM-2020-05-0312	Chaves	Roswell	952.87
NM-2020-05-0120	Chaves	Roswell	40.00
NM-2020-05-0314	Chaves	Roswell	40.00
NM-2020-05-0315	Chaves	Roswell	640.00
NM-2020-05-0317	Chaves	Roswell	1,039.52
NM-2020-05-0318	Chaves	Roswell	960.00
NM-2020-05-0319	Chaves	Roswell	1,120.00
NM-2020-05-0320	Chaves	Roswell	640.00

NM-2020-05-0321	Chaves	Roswell	800.00
NM-2020-05-0334	Chaves	Roswell	638.24
NM-2020-05-0335	Chaves	Roswell	160.00
NM-2020-05-0273	Chaves	Roswell	921.92
NM-2020-05-0276	Chaves	Roswell	240.00
NM-2020-05-0302	Chaves	Roswell	672.59
NM-2020-05-0114	Chaves	Roswell	40.00
NM-2020-05-0307	Chaves	Roswell	40.00
NM-2020-05-0115	Chaves	Roswell	320.00
NM-2020-05-0311	Chaves	Roswell	80.00
NM-2020-05-0238	Chaves	Roswell	642.04
NM-2020-05-0239	Chaves	Roswell	281.71
NM-2020-05-0241	Chaves	Roswell	79.48
NM-2020-05-0242	Chaves	Roswell	160.00
NM-2020-05-0243	Chaves	Roswell	1,200.00
NM-2020-05-0245	Chaves	Roswell	520.00
NM-2020-05-0105	Chaves	Roswell	1,120.00
NM-2020-05-0247	Chaves	Roswell	560.00
NM-2020-05-0253	Chaves	Roswell	480.00
NM-2020-05-0250	Chaves	Roswell	1,292.82
NM-2020-05-0252	Chaves	Roswell	400.00
NM-2020-05-0101	Eddy	Carlsbad	963.12
NM-2020-05-0119	Chaves	Roswell	80.00
NM-2020-05-0323	Chaves	Roswell	40.00
NM-2020-05-0325	Chaves	Roswell	160.00
NM-2020-05-0330	Chaves	Roswell	1,280.00
NM-2020-05-0329	Chaves	Roswell	480.00
NM-2020-05-0328	Chaves	Roswell	40.00
NM-2020-05-0118	Chaves	Roswell	840.00
NM-2020-05-0234	Chaves	Roswell	160.49
NM-2020-05-0233	Chaves	Roswell	800.46
NM-2020-05-0104	Chaves	Roswell	1,280.00
NM-2020-05-0256	Chaves	Roswell	160.00
NM-2020-05-0235	Chaves	Roswell	40.00
NM-2020-05-0279	Chaves	Roswell	960.04
NM-2020-05-0280	Chaves	Roswell	156.68
NM-2020-05-0281	Chaves	Roswell	80.00
NM-2020-05-0282	Chaves	Roswell	40.00
NM-2020-05-0285	Chaves	Roswell	156.68

NM-2020-05-0286	Chaves	Roswell	80.00
NM-2020-05-0287	Chaves	Roswell	200.00
NM-2020-05-0289	Chaves	Roswell	320.00
NM-2020-05-0290	Chaves	Roswell	80.00
NM-2020-05-0292	Chaves	Roswell	80.00
NM-2020-05-0293	Chaves	Roswell	40.00
NM-2020-05-0291	Chaves	Roswell	320.00
NM-2020-05-0255	Chaves	Roswell	438.77
NM-2020-05-6730	Eddy	Carlsbad	120.00
NM-2020-05-0230	Lea	Carlsbad	480.00
NM-2020-05-2165	Lea	Carlsbad	40.00
NM-2020-05-0236	Lea	Carlsbad	319.36
NM-2020-05-0228	Lea	Carlsbad	157.84
NM-2020-05-0110	Lea	Carlsbad	400.00
NM-2020-05-0294	Lea	Carlsbad	960.00
NM-2020-05-0296	Lea	Carlsbad	640.00
NM-2020-05-0297	Lea	Carlsbad	760.00
NM-2020-05-0305	Lea	Carlsbad	80.00
NM-2020-05-0306	Lea	Carlsbad	232.01

INTERESTS OF THE PROTESTING PARTIES

WildEarth Guardians is a nonprofit environmental advocacy organization dedicated to protecting the wildlife, wild places, wild rivers, and health of the American West. On behalf of our members in New Mexico and across the West, many of whom live near and/or recreate on and near many of the parcels, Guardians ensures that BLM fully protects public lands and resources as it conveys the right for the oil and gas industry to develop publicly-owned minerals. In particular, Guardians works to ensure that BLM meaningfully and genuinely takes into account the all of the environmental impacts of its oil and gas leasing decisions, including impacts to air quality, water, public health, and our climate as required by federal law.

The **Center for Biological Diversity** is a non-profit environmental organization with over 63,000 members, many of whom live and recreate in New Mexico. The Center uses science, policy, and law to advocate for the conservation and recovery of species on the brink of extinction and the habitats they need to survive. The Center has and continues to actively advocate for increased protections for species and their habitats in New Mexico, including public lands at risk from climate change impacts. The lands that will be affected by the proposed lease sale include habitat for listed, rare, and imperiled species that the Center has worked to protect including rare, endangered and threatened species like the lesser prairie chicken and the dunes sagebrush lizard. The Center's board, staff, and members use the public lands in New Mexico, including the lands and waters that would be affected by expanded fossil fuel development authorized by this lease sale, for quiet recreation (including hiking and camping), scientific research, aesthetic pursuits, and spiritual renewal.

The **Chaco Alliance** is a grassroots citizens group dedicated to protecting and preserving Chaco Culture National Historical Park. We are interested in all threats to the park and its surrounding landscape, especially the threat created by energy development in the area.

Living Rivers-Colorado Riverkeeper is a nonprofit organization based in Moab, Utah that promotes river restoration through mobilization. By articulating conservation and alternative management strategies to the public, Living Rivers seeks to revive the natural habitat and spirit of rivers by undoing the extensive damage done by dams, and water-intensive energy development on the Colorado Plateau. Living Rivers has approximately 1,200 members in Utah, Colorado, Wyoming and other states. Living Rivers' members and staff use the public lands in New Mexico, including the lands and waters that would be affected by actions under the lease sale, for quiet recreation (including hiking and camping), scientific research, aesthetic pursuits, and spiritual renewal.

The **Sierra Club** was founded in 1892 and is the nation's oldest grassroots environmental organization. The Sierra Club is incorporated in California, and has over 790,000 members nationwide and is dedicated to the protection and preservation of the environment. The Sierra Club's mission is to explore, enjoy and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; and to educate and enlist humanity to protect and restore the quality of the natural and human environments. The Sierra Club has a New Mexico chapter, known as the Rio Grande chapter, with members that live in and use this area for recreation such as hiking, climbing, backpacking, camping, fishing and wildlife viewing, as well as for business, scientific, spiritual, aesthetic and environmental purposes.

Terry Sloan is a Dine (Navajo) and Hopi Native American from Tuba City, Arizona and the director of **Southwest Native Cultures**. Through SWNC, he consults and advocates for indigenous people's rights, human rights, the environment, climate change and indigenous peoples environmental, social and economic issues.

Western Environmental Law Center ("WELC") uses the power of the law to defend and protect the American West's treasured landscapes, iconic wildlife and rural communities. WELC combines legal skills with sound conservation biology and environmental science to address major environmental issues in the West in the most strategic and effective manner. WELC works at the national, regional, state, and local levels; and in all three branches of government. WELC integrates national policies and regional perspective with the local knowledge of our 100+ partner groups to implement smart and appropriate place-based actions.

Waterkeeper Alliance is a not-for-profit, member-supported, international environmental organization based in New York City. Waterkeeper Alliance unites more than 300 Waterkeeper Organizations and Affiliates that are on the frontlines of the global water crisis, patrolling and protecting more than 2.5 million square miles of rivers, lakes, and coastal waterways on 6 continents. Waterkeeper Organizations and Affiliates defend our fundamental human right to drinkable, fishable and swimmable waters, and combine firsthand knowledge of their waterways with an unwavering commitment to the rights of their communities. Through

its Clean and Safe Energy campaign, Waterkeeper Alliance has increasingly engaged in public advocacy, administrative proceedings and litigation aimed at reducing the water quality and climate change impacts of fossil fuel extraction, transport and combustion, including from BLM-controlled lands, throughout the United States. Waterkeeper Alliance and its member Waterkeeper Organizations and Affiliates have members, supporters and staff who have visited public lands in New Mexico, including lands and waters that would be affected by actions under the lease sale, for recreational, scientific, educational, and other pursuits and intend to continue to do so, and are particularly interested in protecting them from water-intensive energy development.

As detailed below, the proposed leases would add to the overwhelming industrialization of the Greater Carlsbad area of southeastern New Mexico. Over the past decade, the Greater Carlsbad area has experienced an unprecedented oil and gas boom, with oil production doubling between 2017 and 2019.[4] Due to the COVID-19 global pandemic, this boom threatens to catastrophically collapse, leaving tax payers and citizens of the area responsible for the costs of environmental contamination from abandoned wells. Unfortunately, BLM, one of the largest land owners in southeastern New Mexico, is ill-prepared for either a boom or bust. BLM has not completed a comprehensive environmental impact statement for either the Carlsbad or Roswell Field Offices since 1997. As a result, BLM is permitting oil and gas activities with little to no insight on the full, cumulative impacts of its actions on the environment and public health. Through these comments, the Citizen Groups hope to shed a light on the irreversible impacts of BLM's actions on our climate, air, water, wildlife, and the fragile landscapes of the Greater Carlsbad area and encourage BLM to remove the 94 parcels proposed for lease in the May 2020 lease sale. Should BLM continue to approve oil and gas leasing, the agency must ensure, at minimum, that the May 2020 lease sale complies with the National Environmental Policy Act of 1976 ("NEPA"), 42 U.S.C. §§ 4321–4370h; NEPA regulations promulgated thereunder by the White House Council on Environmental Quality ("CEQ"), 40 C.F.R. § 1500, *et seq.*; the Federal Land Policy and Management Act of 1976 ("FLPMA"), 43 U.S.C. §§ 1701–1787; and the Federal Cave Resource Protection Act of 1988 ("FCRPA"), 16 U.S.C. § 4301–4310.

[4] Energy Info. Admin., Permian Region: Drilling Productivity Report (2020), https://www.eia.gov/petroleum/drilling/pdf/permian.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 1); N.M. Oil Conservation Div., Natural Gas & Oil Production, https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting//Reporting/Production/ExpandedProductionInjectionSummaryReport.aspx (last visited Feb. 4, 2020) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 2).

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STATEMENT OF REASONS

I. BLM's May 2020 Lease Sale Fails to Complies with NEPA and FLPMA.

NEPA is our "basic national charter for protection of the environment." 40 C.F.R. § 1500.1(a). The law requires federal agencies to fully consider the environmental implications of their actions, taking into account "high quality" information, "accurate scientific analysis," "expert agency comments," and "public scrutiny," prior to making decisions. *Id.* § 1500.1(b). This consideration is meant to "foster excellent action," resulting in decisions that are well-informed and "protect, restore, and enhance the environment." *Id.* § 1500.1(c).

NEPA regulations explain:

> Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork – even excellent paperwork – but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.
>
> *Id.*

To fulfill the goals of NEPA, federal agencies are required to analyze the "effects," or impacts, of their actions on the human environment prior to undertaking their actions. *Id.* § 1502.16(d); *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (holding that NEPA imposes "action forcing procedures . . . requir[ing] that agencies take a *hard look* at environmental consequences") (internal quotations omitted, emphasis added). To this end, agency must analyze the "direct," "indirect," and "cumulative" effects of its actions, and assess their significance. *Id.* §§ 1502.16(a), (b), and (d). Direct effects include all impacts that are "caused by the action and occur at the same time and place." *Id.* § 1508.8(a). Indirect effects are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." *Id.* § 1508.8(b). Cumulative effects include the impacts of all past, present, and reasonably foreseeable actions, regardless of what entity or entities undertake the actions. *Id.* § 1508.7.

Generally, an agency may prepare an environmental assessment ("EA") to analyze the effects of its actions and assess the significance of impacts. *See id.* § 1508.9; *see also* 43 C.F.R. § 46.300. Where impacts are not significant, an agency may issue a Finding of No Significant

Impact ("FONSI") and implement its action. *See* 40 C.F.R. § 1508.13; *see also* 43 C.F.R. § 46.325(2). But, where effects are significant, an agency must prepare an EIS. *See* 40 C.F.R. § 1502.3.

Federal agencies are required to determine whether direct, indirect, or cumulative impacts are significant by accounting for both the "context" and "intensity" of those impacts. 40 C.F.R. § 1508.27. Context "means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality" and "varies with the setting of the proposed action." 40 C.F.R. § 1508.27(a). Intensity "refers to the severity of the impact" and is evaluated according to several additional elements, including, for example: unique characteristics of the geographic area such as ecologically critical areas; the degree to which the effects are likely to be highly controversial; the degree to which the possible effects are highly uncertain or involve unique or unknown risks; and whether the action has cumulatively significant impacts. *Id.* §§ 1508.27(b).

Within an EA or EIS, the scope of the analysis must also include "[c]umulative actions" and "[s]imilar actions." 40 C.F.R. §§ 1508.25(a)(2) and (3). Cumulative actions include action that, "when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement." *Id.* § 1508.25(a)(2). Similar actions include actions that, "when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together." *Id.* § 1508.25(a)(3). Key indicators of similarities between actions include "common timing or geography." *Id*.

In addition to NEPA, BLM must comply with the Federal Land Policy and Management Act ("FLPMA"), 43 U.S.C. §§ 1701–1787. FLPMA requires that the Secretary of Interior manage public lands "in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values." 43 U.S.C. § 1701(a)(8). To achieve this, "[t]he Secretary [of the Interior] shall, with public involvement and consistent with the terms and conditions of this Act, develop, maintain, and, when appropriate, revise land use plans which provide by tracts or areas for the use of the public lands." *Id.* § 1712(a).

BLM manages public lands through Resource Management Plans ("RMPs") for each BLM field office. In general, RMPs must be up-to-date. BLM's Land Use Planning Handbook states that, "[RMP] revisions *are necessary* if monitoring and evaluation findings, new data, new or revised policy, or changes in circumstances indicate that decisions for an entire plan or a major portion of the plan no longer serve as a useful guide for resource management." BLM Land Use Planning Handbook, H-1610-1, Section VII.C at 46 (emphasis added); *see also* 43 C.F.R. § 1610.5-6. Furthermore, the Handbook provides that amendments are encouraged whenever the BLM must "[c]onsider a proposal or action that does not conform to the plan," "implement new or revised policy that changes land use plan decisions," "respond to new, intensified, or changed uses on public land," or "consider significant new information from resource assessments, monitoring, or scientific studies that change land use plan decisions." BLM Land Use Planning Handbook, Section VII.B at 45; *see also* 43 C.F.R. § 1610.5-5.

When BLM issues a new RMP or amends a RMP, the agency must also comply with the requirements of NEPA. *See* 43 C.F.R. § 1601.0–6. Thus, BLM is required to issue an EIS with each RMP. *Id.* Although the BLM may tier its project-level analyses to a broader NEPA document, such as the EIS accompanying the RMP, 43 C.F.R. § 46.140, "[n]othing in the tiering regulations suggests that the existence of a programmatic EIS . . . obviates the need for any future project-specific EIS, without regard to the nature of magnitude of a project." *Blue Mountains Biodiversity Proj. v. Blackwood*, 161 F.3d 1208, 1215 (9th Cir. 1998). Furthermore, "[a] NEPA document that tiers to another broader NEPA document . . . must include a finding that the conditions and environmental effects described in the broader NEPA document are still valid or address any exceptions." 43 C.F.R. § 46.140. Put another way, "[t]o the extent that any relevant analysis in the broader NEPA document is not sufficiently comprehensive or adequate to support further decisions, the tiered NEPA document must explain this and provide any necessary analysis." *Id.* § 46.140(b).

Last but not least, BLM is also required to "provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards[,]" in the development and revision of land use plans. 43 U.S.C. § 1712(c)(8)

A. BLM Must Postpone the Proposed Lease Sale in Light of the COVID-19 Pandemic.

On March 13, 2020, the Trump Administration declared a national health emergency.[5] On March 24, 2020, New Mexico Governor Michelle Lujan Grisham issued a stay-at-home order requiring all nonessential businesses to close.[6] The global health crisis has occurred concurrently with an economic crisis. The price of oil has dropped from $50.83 to $24.19 per barrel in less than a month and half.[7]

Despite these worsening health and economic crises, BLM has continued with the sale of public lands and minerals for oil and gas lease extraction. BLM's callous approach of continuing business as usual during the pandemic demonstrates not only a disregard for meaningful public involvement in the lease sale process, but also a disregard for public health. Right now, the American people are focused on survival; citizens have no capacity to meaningfully engage in oil and gas lease sale comment periods. Moreover, now is not the time to be adding additional sources of pollution. Research has shown that air pollution lowers a person's ability to fight viruses and increases the risk of death.[8] COVID-19 is no exception to this rule; the epicenters of the virus have so far been in areas with high levels of air pollution.

[5] Proclamation on Declaring a National Emergency Concerning the Novel Coronavirus Disease (COVID-19) 27, 2020 (last visited Mar. 30, 2020).

[6] NM Dep't of Health, Public Health Order, Mar. 23, 2020, https://www.governor.state.nm.us/wp-content/uploads/2020/03/COVID-19-DOH-Order-fv.pdf.

[7] U.S. Energy Info. Admin., Petroleum & Other Liquids, Spot Prices, "Weekly", https://www.eia.gov/dnav/pet/pet_pri_spt_s1_w.htm (last visited Mar. 30, 2020).

[8] Exhibit A, Justine Calma, Air Pollution Could Make the COVID-19 Pandemic Worse for Some People, The Verge, Mar. 19, 2020, https://www.theverge.com/2020/3/19/21186653/coronavirus-covid-19-air-pollution-vulnerable-lung-disease-pandemic.

As a result of these concerns, we request that BLM postpone the sale and issuance of any new oil and gas lease parcels until the COVID-19 pandemic has subsided. Any actions to the contrary will undermine the American people's ability to respond to the virus and protect public lands from fossil fuel extraction.

B. BLM's Shortened Public Comment Process Under BLM IM 2018-034 Is Illegal Under NEPA and FLPMA.[9]

On February 27, 2020, the U.S. District Court for the District of Idaho entered partial summary judgement for plaintiffs Western Watersheds Project and Center for Biological Diversity. *W. Watersheds Project v. Zinke*, No. 1:18-CV-00187-REB, 2020 WL 959242, at *2 (D. Idaho Feb. 27, 2020). The court invalided BLM's application of instruction memorandum 2018-034,[10] which purported to "streamline" oil and gas leasing for the June and September 2018 lease sales oil and gas lease sales in Nevada, Utah, and Wyoming and within the sage-grouse habitat, and prohibited use of the IM for any subsequent sales. *Id.*

The court's ruling was based on a finding that IM 2018-0024 was a final agency action subject to review. *Id.* at * 7. Specifically, IM 2018-0034 "implement[ed] a *required* template for BLM's oil and gas leasing process" that was "effective immediately," and "an unmistakably different regulatory framework for BLM's administration of oil and gas lease parcel reviews and leasing decisions." *Id.* at *9–10 (emphasis in original). This new framework "contained significant substantive and procedural changes in BLM decision-making practices and upon the rights and abilities of parties like WWP to participate in or challenge such practices and decisions[.]" *Id.* at *12.

The court also held that the IM was both "procedurally and substantively" invalid. *Id.* at 13. The IM was procedurally invalid because it imposed binding obligations without an opportunity for notice and comment. *Id.* at *14. The IM was substantively invalid because "public involvement in oil and gas leasing is required under FLPMA and NEPA," *id.* at *15, and "the record contain[ed] compelling evidence that BLM made an intentional decision to limit the opportunity for (and, in some circumstances, to preclude entirely) contemporaneous public involvement concerning whether to grant oil and gas leases on federal lands." *Id.* at *18. Ultimately, "IM 2018-034 was a mechanism for unharnessing prior constraints upon oil and gas leasing specifically reducing or eliminating public involvement in the oil and gas leasing process *because* such public involvement hindered the oil and gas production industry." *Id.* at *20 (emphasis in original).

Although this decision was limited to lease sales with sage grouse habitat, the reasoning undoubtedly applies to all BLM lease sales held using the IM, including those in New Mexico. Because of BLM IM 2018-034, the agency has cut down the time period allotted for scoping comments, comments on draft NEPA documents, and protests from 30 days to 10. Indeed, from September 2018 until June 2019, BLM had completely eliminated the comment period on the

[9] BLM responds to this argument solely to reiterate that BLM IM 2018-034 gives the agency discretion on comment periods, not whether or not BLM 2018-034 is invalid, as the Citizen Groups argue below.

[10] Available online at: https://www.blm.gov/policy/im-2018-034.

draft EA.[11] For the May 2020 draft EA comment period, interested citizens had only 12 days to review a technical, 162-page draft environmental assessment, and 10 days to review a revised EA for the protest period.[12] These purposeful actions cutting down the time allotted for public participation violate the fundamental purposes of NEPA and FLPMA whether or not the public lands at issue are within sage grouse habitat. As a result, BLM's entire process of identifying, reviewing, and offering oil and gas leases parcels for the BLM's May 2020 lease sale is fundamentally compromised by the unlawful provisions of IM 2018-034. Thus, we request that BLM remove all parcels from the May 2020 lease sale unless and until the agency allows for full, meaningful public participation.

C. BLM's Actions Approving the Proposed Lease Sale Parcels will Prejudice Alternatives Under the Draft Carlsbad RMP in Violation of NEPA and FLPMA.

Turning to substantive issues, the applicable land use plans and NEPA documents for the May 2020 parcels are the Carlsbad Resource Management Plan-FEIS (approved in 1988), the Carlsbad RMP Amendment-EIS (approved in 1997), and the Roswell RMP-EIS (approved in the same document as the Carlsbad RMPA in 1997).[13] May 2020 EA at 1–2. BLM has admitted that these documents fail to account for the increased and differing impacts of multi-stage hydraulic fracturing coupled with horizontal drilling.[14] Yet, BLM continues to rely on these documents to approve lease parcels which will result in the development of oil and gas wells that use these technologies. *See* EA at 13 ("All wells would be horizontal wells that would employ standard industry practices related to well completion (i.e., perforation and hydraulic fracturing)."). Indeed, to date, BLM has leased or is proposing to lease a total of 451 parcels totaling 177,782.58 acres and resulting in an estimated 2,700 new wells in the Pecos District since it

[11] BLM, FY 2018 Lease Sale Schedule, Updated Notice, https://www.blm.gov/sites/blm.gov/files/NM_Lease_Sale_Schedule_CY_2018.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 3); BLM, FY 2019 Lease Sale Schedule, Updated Notice, https://www.blm.gov/sites/blm.gov/files/CY%202019%20Updated%2003_21_19.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 4).

[12] BLM ePlanning Page for May 2020 Lease Sale, DOI-BLM-NM-0000-2020-0002-OTHER_NEPA, https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=200007836 (last visited Mar. 30, 2020).

[13] The 1988 Carlsbad RMP and 1997 Carlsbad Amendment/Roswell RMP are available on the BLM's website at: https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=90928.

[14] *See* BLM, Analysis of the Management Situation 1-1 (2014), https://eplanning.blm.gov/epl-front-office/projects/lup/64444/77501/86227/AMS_Compiled.pdf ("The plan revision will need to examine and more fully develop new decisions and guidance for other resources in response to changing land use conditions, taking into account new technology, such as horizontal drilling methods. Subsequent changes in resource demands in the planning area have resulted in the need to update the existing RMP through a plan revision and associated EIS.") (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 6); BLM, Update to the Reasonably Foreseeable Development Scenario for the BLM Pecos District, SENM 1, 5 (2014), https://eplanning.blm.gov/epl-front-office/projects/lup/64444/80056/93025/Final_Report-SENM-DEC2014_updated_RFD.pdf ("Horizontal drilling coupled with hydraulic fracturing has been a game changer in proving economic production from previously believed unproductive rock.") (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 7).

published the draft Carlsbad RMP in August 2018.[15] For comparison, BLM estimates in the draft Carlsbad RMP-DEIS that its preferred alternative (Alternative C) will result in 5,832 total oil and gas wells on federal minerals over the next 20 years.[16] Although BLM is currently in the process of updating the Carlsbad RMP-EIS,[17] this document is not yet final and cannot stand in for BLM's requisite NEPA analysis.

NEPA specifically forbids agency action that limits alternatives while a federal agency is revising a programmatic EIS.

> While work on a required program environmental impact statement is in progress and the action is not covered by an existing program statement, agencies *shall not* undertake in the interim any major Federal action covered by the program which may significantly affect the quality of the human environment unless such action:
>
> > (1) Is justified independently of the program;
> > (2) Is itself accompanied by an adequate environmental impact statement; *and*
> > (3) Will not prejudice the ultimate decision on the program. Interim action prejudices the ultimate decision on the program when it tends to determine subsequent development or limit alternatives.

40 C.F.R. § 1506.1(c) (emphases added).

Here, all of these requirements are met. BLM issued a notice of intent to revise the Carlsbad RMP in 2010.[18] The underlying RMPs for the lease sale do not analyze the impacts of fracking. The impacts posed by oil and gas development on the 15 Carlsbad parcels (110 wells, EA at 7) in May 2020 lease sale coupled with the impacts from the 309 parcels (121,024.43 acres) sold since September 2018 are potentially significant. Indeed, many of the proposed parcels for lease in May 2020 lease sale (parcels no. -0101, -0220, -0221, -0228, and -0236) directly overlap with lands proposed to be closed or restricted for surface occupancy under Alternative B of the draft RMP.

First, neither the 1988 Carlsbad RMP-EIS nor the 1997 Carlsbad RMP Amendment analyze the significant cumulative impacts from the use of hydraulic fracturing coupled with

[15] Of these parcels, 70% or 314 (109,407.66 acres) are within the Carlsbad Field Office. This includes parcels from the September 2018, December 2018, March 2019, June 2019, September 2019, November 2019, February 2020, and May 2020 lease sales.

[16] BLM, Draft Carlsbad RMP-DEIS Volume 1 at 2-88 (2018), https://eplanning.blm.gov/epl-front-office/projects/lup/64444/153042/187358/BLM_CFO_Draft_RMP_-_Volume_I_-_EIS_-_August_2018_(1).pdf.

[17] BLM released a draft RMP and EIS on August 3, 2018 and accepted comments on the documents until November 5, 2018. Guardians, Western Environmental Law Center, and the Center for Biological Diversity submitted joint comments on the RMP-DEIS on November 5, 2018. These comments are available online at: https://climatewest.files.wordpress.com/2018/11/2018-11-5-fnl-carlsbad-rmp-deis-comments1.pdf.

[18] BLM, Notice of Intent to Prepare a Resource Management Plan for the Carlsbad Field Office, New Mexico and Associated Environmental Impact Statement, 75 Fed. Reg. 32,962 (June 10, 2010), https://www.govinfo.gov/content/pkg/FR-2010-06-10/pdf/2010-13949.pdf.

multi-stage horizontal drilling, a more intense form of oil and gas development. Yet, BLM has admitted that these impacts can be significant in a number of documents. For example, in BLM's Analysis of the Management Situation ("AMS") for the 1998 RMP-EIS and the 1997 RMPA-EIS, the agency admits that this is one of the reasons for updating the RMP, explaining that "[t]he plan revision will need to examine and more fully develop new decisions and guidance for other resources in response to changing land use conditions, taking into account new technology, such as horizontal drilling methods."[19] In this document, BLM also admits that horizontal wells result in greater impacts such as "the need for additional disposal wells." BLM statements from the 2014 Reasonably Foreseeable Development Scenario ("RFDS") for the Pecos District Office echo this conclusion, noting that "[h]orizontal drilling coupled with hydraulic fracturing *has been a game changer in proving economic production from previously believed unproductive rock*[,]" and that horizontal wells result in much greater water usage than previously estimated.[20] Data from the Energy Information Administration ("EIA") also supports the conclusion that the nature of oil and gas has changed dramatically since the early 2000's.[21] In just five short years, oil production has tripled from 11.3 million barrels per month in 2014 to 31.9 million barrels per month in November 2019.[22] As result, even BLM's "current" estimate of production from the 2014 RFD is severely out of date.

Increased oil production from fracking results in different and increased environmental impacts. For example, air quality in the area has been rapidly deteriorating because of oil and gas as discussed in more depth in Section H. EPA has designated stricter standards for ozone, and monitors in the Carlsbad area have exceeded these standards dozens of times over the past three years. Yet, because BLM continues to rely on the outdated Carlsbad RMP and RMPA, the changing impacts of oil and gas development in the area on air quality are not comprehensively covered in any existing NEPA document and BLM cannot truly understand the impact of permitting more development. BLM's reliance on the 2019 Air Resources Technical Report for Oil and Gas Development[23] does nothing to change this. First, this document is not a NEPA document which analyzes impacts and was available for public comment. More importantly, this report relies solely on future state rulemaking to remedy any exceedances.[24] But, as BLM regulations note, once a lease is issued, the lessee has the right to develop. BLM may be able to impose more stringent controls if the lease stipulations allow, but there is no way of knowing whether these actions will actually reduce ozone levels below federal standards. Finally, although BLM does includes some information in the lease sale EA on the impacts of fracking on water and air resources, BLM's analysis is incomplete, ultimately failing to account for potentially significant cumulative impacts to these resources as well as impacts to resources

[19] 2014 AMS, supra, at 1-1, 2-103.

[20] 2014 RFDS, supra, at 21 (emphasis added).

[21] EIA, *New Mexico Field Production of Crude Oil*, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MCRFPNM1&f=M (last visited Feb. 5, 2020) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 8).

[22] *Id.*

[23] The 2019 ARTR is available under "Miscellaneous" at: https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/about/new-mexico.

[24] 2019 ARTR at 20.

beyond water and air, such as climate, public health, wildlife, karst geography, and Carlsbad Caverns National Park. Thus, BLM cannot rely on the EA to cure its deficiencies.

BLM's actions to lease oil and gas parcels before the revised RMP-EIS is complete directly prejudice the possible alternatives for the proposed Carlsbad RMP-DEIS. Leasing is an irretrievable commitment of resources. *New Mexico ex rel. Richardson v. Bureau of Land Mgmt.*, 565 F.3d 683, 717–18 (10th Cir. 2009); *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 65 (D.D.C. 2019) (accord). BLM's regulations provide, after a lease has been issued, "a lessee has the right to use so much of the leased land as necessary to explore for, drill for, mine, extract, remove, and dispose of all of the leased resource[.]" 43 C.F.R. § 3101.1-2. Here, once the May lease parcels are sold, BLM will no longer be able to consider an alternative that forbids oil and gas development on these parcels even if the agency determines that this is necessary based on its NEPA analysis. For example, parcels NM-2020-05-0101, -0236, -0228, and -2165[25] in the May 2020 sale are within lands proposed to be closed to leasing under Alternative B of the proposed RMP-EIS. BLM must carefully consider whether moving forward with these parcels will prejudice its alternatives in violation of NEPA.

Further, although there is a high bar to meet the standard of predetermination of outcomes under NEPA—"predetermination [is] present only when there [is] concrete evidence demonstrating that the agency had irreversibly and irretrievably bound itself to a certain outcome—for example, through a contractual obligation or other binding agreement,"—this standard is met here. *Wyoming v. U.S. Dep't of Agric.*, 661 F.3d 1209, 1265 (10th Cir. 2011). Because the BLM has a contractual obligation to allow surface use of the leases once the agency issues them without a no surface occupancy ("NSO") stipulation for the whole parcel, 43 C.F.R. 3101.1-2, BLM cannot actually consider an alternative disallowing development on these areas of land once it leases them. The language of the CEQ NEPA regulations directly supports this conclusion. "Interim action prejudices the ultimate decision on the program when it tends to determine *subsequent development*." 40 C.F.R. § 1506.1(c) (emphasis added). At a minimum, if these parcels are leased without full NSO stipulations as is proposed now, the companies that buy the proposed leases will be able develop the land in order to conduct exploration activities, thereby precluding BLM from choosing Alternative B as it is now proposed. In sum, BLM is predetermining its NEPA analysis for the Carlsbad RMP by limiting those lands available for additional stipulations or available to be protected for other resources besides oil and gas.

Finally, BLM's attempt to move forward with leasing without a valid RMP violates FLPMA. As noted above, FLPMA requires revision of an RMP "based on monitoring and evaluation findings, new data, new or revised policy and changes in circumstances affecting the entire plan or major portions of the plan." 43 C.F.R. § 1610.5-6. Here, the existing RMP completely fails to address the use of fracking coupled with horizontal drilling, a extraction technique which has more intense impacts on the resources including land, water, air, wildlife, and communities. *See, e.g.*, *Diné Citizens Against Ruining Our Environment v. Bernhardt*, 923 F.3d 831, 837 (10th Cir. 2019). Furthermore, the existing RMP fails to account for current federal ozone standards, which are becoming increasingly relevant for the area as it experiences exceedances of these standards. These issues represent new data and changes in circumstances

[25] BLM states in response that these parcels are open under the existing RMP. But, this argument fails to address whether the parcels are proposed to be closed under the draft RMP currently in progress.

that affect the entirety of the Carlsbad RMP area. Thus, BLM must wait until the draft RMP is complete before moving forward with additional oil and gas leasing.

In response, BLM states that its FLPMA regulations allow actions under an existing RMP even if an RMP revision is in progress. We do not deny that certain actions may be allowed under some circumstances. But, the plain language of BLM's FLPMA regulations only allows BLM to rely on the existing RMP "when that action is within the scope of, and analyzed in, an existing NEPA document[.]" Here that is not the case.

D. BLM Fails to Analyze a Range of Reasonable Alternatives.

Because BLM only analyzes two extreme alternatives, no leasing or full leasing, EA at 5–10, BLM fails to analyze and assess a range of reasonable alternatives as required by NEPA.

"[T]he heart" of an environmental analysis under NEPA is the analysis of alternatives to the proposed project, and agencies must evaluate all reasonable alternatives to a proposed action." *Colorado Environmental Coalition*, 185 F.3d at 1174 (quoting 40 C.F.R. § 1502.14). An agency must gather "information sufficient to permit a reasoned choice of alternatives as far as environmental aspects are concerned." *Greater Yellowstone*, 359 F.3d at 1277 (citing *Colorado Environmental Coalition*, 185 F.3d at 1174); *see also Holy Cross Wilderness Fund v. Madigan*, 960 F.2d 1515, 1528 (10th Cir. 1992). "The EA, while typically a more concise analysis than an EIS, must still evaluate the need for the proposal, alternatives as required by NEPA section 102(2)(E), and the environmental impacts of the proposed action and alternatives." *See High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F.Supp. 3d 1174 (D. Colo. 2014); *see also* 42 U.S.C. § 4332(E) (requiring agencies to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources"). NEPA requires agencies to "present the environmental impacts of the proposal and the alternatives *in comparative form, thus sharply defining* the issues and providing a clear basis for choice among options by the decisionmaker and the public." 40 C.F.R. § 1502.14 (emphasis added). Indeed, in 2018 a federal district court held that "BLM's failure to consider any alternative that would decrease the amount of extractable coal available for leasing rendered inadequate the Buffalo EIS and Miles City EIS in violation of NEPA." *Western Org. of Resource Councils v. U.S. Bureau of Land Mgmt.*, CV 16-21-GF-BMM, 2018 WL 1456624, at *9 (D. Mont. Mar. 23, 2018).

As noted above, here BLM only considers two alternatives, full leasing of all 94 parcels or no leasing. But, many variations of reasonable alternatives exist in between, and BLM is required to consider these under NEPA. For example, BLM could have considered an alternative that would reduce the lands available for leasing in order to address impacts to high karst potential parcels, impacts to air quality, impacts to our climate, and/or impacts to water quality and quantity. Indeed, it quite surprising that BLM failed to consider an alternative deferring parcels 219, 220, and 221, all of which are located within high karst occurrence potential zones, thereby posing significant risks to water quality and one of which includes three known caves and an active population of 5,000 bats. *See* EA at 43. Such an alternative would be well within BLM's multiple use mandate and would serve to protect important resource values such as water and wildlife in area that is highly susceptible to contamination. *New Mexico ex rel. Richardson v.*

Bureau of Land Mgmt., 565 F.3d 683, 710 (10th Cir. 2009) ("BLM's obligation to manage for multiple use does not mean that development must be allowed on the Otero Mesa. 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. BLM must consider these reasonable alternatives."). Here, BLM does not even include information stating that it consider *any other alternatives* besides full leasing and no leasing. As the Tenth Circuit has held, "[t]he APA's reasonableness standard applies both to which alternatives the agency discusses and the extent to which it discusses them." *Utahns for Better Transp. v. U.S. Dep't of Transp.*, 305 F.3d 1152, 1166 (10th Cir. 2002), as modified on reh'g, 319 F.3d 1207 (10th Cir. 2003). Because BLM does adhere to these standards, its alternative analysis fails to withstand scrutiny.

In response this, BLM argues that because the agency has broad discretion to defer parcels, a middle ground alternative would be a "false choice." EA at 155. But, it could just as easily be said that BLM's broad discretion mandates that the agency consider multiple middle ground alternatives. BLM has the authority to do so, NEPA mandates a consideration of a range of alternatives, therefore BLM has no excuse not to consider additional alternatives here.

E. BLM is Required to Prepare an EIS.

Because the proposed action may cause significant impacts not analyzed in any of BLM's existing NEPA analyses, BLM is required to prepare an EIS before the agency can sell the subject parcels at the May 2020 oil and gas lease sale.

An EIS is required when a major federal action "significantly affects the quality of the human environment." 42 U.S.C. § 4332(2)(C); 40 C.F.R. § 1502.4. A federal action "affects" the environment when it "will or *may* have an effect" on the environment. 40 C.F.R. § 1508.3 (emphasis added); *Airport Neighbors All. v. U.S.*, 90 F.3d 426, 429 (10th Cir. 1996) ("If the agency determines that its proposed action *may* 'significantly affect' the environment, the agency must prepare a detailed statement on the environmental impact of the proposed action in the form of an EIS.") (emphasis added). Similarly, according to the Ninth Circuit:

> We have held that an EIS *must* be prepared if "substantial questions are raised as to whether a project ... *may* cause significant degradation to some human environmental factor." To trigger this requirement a "plaintiff need not show that significant effects *will in fact occur*," [but instead] raising "substantial questions whether a project may have a significant effect" is sufficient.

Idaho Sporting Cong. v. Thomas, 137 F.3d 1146, 1149–50 (9th Cir. 1998) (emphasis in original) (citations omitted).

The significance of a proposed action is gauged based on both context and intensity. 40 C.F.R. § 1508.27. Context "means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality." *Id.* § 1508.27(a). Intensity "refers to the severity of impact," and is determined by weighing ten factors, including "[1] [t]he degree to which the proposed action affects public

health or safety," "[2] [u]nique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas," "[3] [t]he degree to which the effects on the quality of the human environment are likely to be highly controversial," "[4] [t]he degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks[,]" and "[5] [w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts." *Id.* § 1508.27(b)(2)–(5), (7). For this latter factor, "[s]ignificance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts." *Id.*

The first intensity factor under NEPA is "the degree to which the proposed action affects public health and safety." Here, there is no doubt the proposed action, which would allow for the use of fracking, impacts public health and safety.[26] Because of the advent of fracking and horizontal drilling, oil and gas development has grown to completely dominate the landscape of southeastern New Mexico. Despite this, BLM has failed to undertake any comprehensive analysis of impacts to public health from deteriorating air quality, water quality and quantity, noise and light pollution, the social fabric of communities, and many other concerns. *See, e.g.*, EA at 46 (admitting that "No formal human health assessment for past, present, or future development has been performed. Ongoing and future development would continue to present cumulative risks to human health as detailed below."). BLM must fully analyze and disclose the impacts of fracking in a comprehensive EIS before committing additional public lands and minerals to leasing.

In response to this latter point about human health impacts, BLM claims that its analysis in brief of the proximity of wells to residences is enough to constitute a hard look under NEPA. Not so. As noted above, BLM has not undertaken a comprehensive analysis of health impacts on the population of SE NM including impacts from oil and gas on crime rates and safety, noise and light pollution and other aspects beyond air quality and water quality/quantity. BLM also has never studied cumulative impacts to public health from the 38,500 wells already in existence. Without this, BLM has no idea whether permitting 490 new wells is the straw that breaks the camel's back.

[26] Concerned Health Prof'ls of NY & Physicians for Soc. Responsibility, *Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking (Unconventional Gas and Oil Extraction)* (6th ed. 2019) (hereinafter "Fracking Compendium") ("As fracking operations in the United States have increased in frequency, size, and intensity, and as the transport of extracted materials has expanded, a significant body of evidence has emerged to demonstrate that these activities are dangerous to people and their communities in ways that are difficult—and may prove impossible—to mitigate. Risks include adverse impacts on water, air, agriculture, public health and safety, property values, climate stability, and economic vitality, as well as earthquakes.") (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 9); TEDX, *Scientific Literature Addressing the Health Effects of Unconventional Oil and Gas Development* (2018) (hereinafter "TEDX Health Effects") (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 10); *see also* BLM, *Hydraulic Fracturing on Federal and Indian Lands*, 80 Fed. Reg. 161,128 (Mar. 26, 2015), https://www.gpo.gov/fdsys/pkg/FR-2015-03-26/pdf/2015-06658.pdf (noting that a final rule regulating fracking on federal land will "provide significant benefits to all Americans by avoiding potential damages to water quality, the environment, and public health").

A similar argument applies to the second and third intensity factors, which require, respectively, a look at the degree to which impacts are highly controversial and the degree to which impacts are highly uncertain or involve unique and unknown risks. The situation here is directly similar to the situation in *Center for Biological Diversity v. U.S. Bureau of Land Management*, where the court held that the BLM's "unreasonable lack of consideration of how fracking could impact development of the disputed parcels . . . unreasonably distort[ed] BLM's assessment of at least three of the 'intensity' factors in its FONSI," including the aforementioned factors. 937 F. Supp. 2d at 1157. Specifically, the court reasoned that fracking was highly controversial based on the possibility of significant environmental degradation, public outcry, and potential threats to health and safety. *Id.* at 1157–58. Here, just as in *Center for Biological Diversity*, fracking presents threats to public safety as outlined above. Much of the science regarding the impacts to fracking is still emerging, and a full understanding of the impacts is hindered by industry actions to keep fracking chemicals secret.[27] Fracking also presents a significant risk of environmental degradation because the Carlsbad area is geologically unique with significant karst and cave formations. Studies have shown that the extraction of oil and gas near these fragile formations can result in contamination of these features and water quality generally.[28] BLM has stated in past EAs that oil and gas drilling has connected with karst features despite existing lease stipulations. Indeed, the National Park Service has documented hydrocarbons in Rattlesnake Springs, a southern outlier of Carlsbad Caverns National Park.[29]

Additionally, based on the proximity of some of the May 2020 lease sale parcels to Carlsbad Caverns National Park, the city of Carlsbad,[30] and high potential karst areas there is no doubt that the fourth intensity factor—the unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas—is also implicated. Indeed, as discussed in more depth below, oil and gas is already significantly impacting the Park due to degraded air quality and visibility.[31] Yet, BLM has failed to study these issues in a comprehensive NEPA document, instead piecemealing any impacts through seven individual lease sales since September 2017.

[27] Fracking Compendium, supra, at 19.

[28] James R. Goodbar, *Dye Tracing Oil and Gas Drilling Fluid Migration Through Karst Aquifers: A Pilot Study to Determine Potential Impacts to Critical Groundwater Supplies in Southeast New Mexico, USA* (noting that "[t]he initial results [of the study] are conclusive that drilling fluids do enter aquifers") (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 11); *see also* Carlsbad RMP-DEIS at 4-47 ("There are many aspects of mineral development that would adversely impact karst resources. Adverse impacts from contamination are a primary concern, as drilling fluids, produced saltwater, oil and/or gas, cuttings, and cement could quickly enter groundwater, and subsequently aquifers, springs, and other resurgences through karst features that serve as natural conduits to these water sources.").

[29] Nat'l Park Serv., Carlsbad Caverns National Park: Natural Resource Condition Assessment 54–55 (2017), http://npshistory.com/publications/cave/nrr-2017-1466.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 12).

[30] BLM concludes, without support, that health impacts to those living wells would be short term. BLM cites to no health studies to support this conclusion, and, in fact, recently released study in Colorado directly contradicts this assumption, finding that exposure to benzene poses long term health risks. ICF, Final Report: Human Health Risk Assessment for Oil & Gas Operations in Colorado (2019), https://drive.google.com/file/d/1pO41DJMXw9sD1NjR_OKyBJP5NCb-AO0I/view (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 13).

[31] Nat'l Park Serv., Air Resources Div., *Ozone Standard Exceedances in National* Parks, https://www.nps.gov/subjects/air/ozone-exceed.htm (last visited Feb. 6, 2020) (documenting 10 ozone exceedance

Finally, as discussed in more depth below in Section J, because BLM has failed to fully analyze the cumulative impacts on our climate of the May 2020 lease sale in conjunction with other reasonably foreseeable lease sales within New Mexico and within the region, the fifth intensity factor is implicated, and BLM cannot conclude that cumulative impacts of oil and gas leasing in the area will not be significant.

In sum, because BLM has not fully accounted for significant impacts it cannot "put forth a convincing statement of reasons' that explains why [the May 2020 lease sale] will impact the environment no more than insignificantly," as required by NEPA. *Ocean Advoc. v. U.S. Army Corps of Engrs*., 402 F.3d 846, 864 (9th Cir. 2005) (internal citations omitted). We look forward to a full and complete EIS addressing these issues before BLM takes action on the proposed leases.

F. BLM Fails to Take A "Hard Look" at the Impacts of Hydraulic Fracturing and Horizontal Drilling.

As we explain above, the "current" Carlsbad RMP-EIS (adopted in 1988, amended in 1997) does not analyze the significant impacts posed by hydraulic fracturing and horizontal drilling and the May 2020 EA fails to fill this gap. Thus, here, BLM violates NEPA's hard look requirement with regard to the impacts from hydraulic fracturing and horizontal drilling.

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) (citations omitted). "Taking a hard look includes considering all foreseeable direct and indirect impacts . . . [and] involve a discussion of adverse impacts that does not improperly minimize negative side effects." *League of Wilderness Defs.-Blue Mountains Biodiversity Project v. U.S. Forest Serv*., 689 F.3d 1060, 1075 (9th Cir. 2012) (citing *N. Alaska Envtl. Ctr. v. Kempthorne*, 457 F.3d 969, 975 (9th Cir. 2006)) (internal quotations omitted).

Multiple courts have held that if BLM plans to allow a new oil and gas extraction technique, the agency must analyze the impacts of this technique in either a programmatic or project-specific NEPA document. *See Pennaco Energy, Inc. v. U.S. Dep't of the Interior*, 377 F.3d 1147, 1151, 1153 (10th Cir. 2004) (holding that when a new fossil fuel extraction technology becomes commercially viable, and creates "changed circumstances" such that production of energy with the new technology is "significantly different" than production using

days in 2018 and 6 in 2019 at Carlsbad Caverns; documenting 2 ozone exceedances in 2019 at Guadalupe Mountains National Park) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 14); EPA, Monitor Values Report, Ozone, Eddy County (2018), https://www.epa.gov/outdoor-air-quality-data/monitor-values-report (documenting 18 days of ozone exceedances at the Carlsbad in-town monitor in Eddy County in 2018) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 15); EPA, Monitor Values Report, Ozone, Eddy County (2019), https://www.epa.gov/outdoor-air-quality-data/monitor-values-report (documenting 6 days of ozone exceedances at the Carlsbad in-town monitor in Eddy County in 2019) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 16); EPA, Monitor Values Report, Ozone, Lea County (2018) (documenting 6 days of ozone exceedances in Lea County in 2018) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 17); EPA, Monitor Values Report, Ozone, Lea County (2019) (documenting 2 days of ozone exceedances in Lea County in 2019) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 18).

previously considered technology, an agency permitting activities utilizing the new technology must take new environmental impacts into account as part of the NEPA process); *see also Ctr. for Biological Diversity v. Bureau of Land Mgmt.*, 937 F. Supp. 2d 1140, 1157 (N.D. Cal. 2013) (invalidating a BLM lease sale because "the scale of fracking in shale-area drilling today involves risks and concerns that were not addressed by the PRMP/FEIS' general analysis of oil and drilling development in the area"); *ForestWatch v. U.S. Bureau of Land Mgmt.*, 2016 WL 5172009, Case No. CV-15-4378-MWF (JEMx) (C.D. Cal. Sept. 6, 2016) (accord); *Dine Citizens Against Ruining Our Environment v. Bernhardt*, 923 F.3d 831, 851 (2019) (holding that BLM needed to—but did not—consider the cumulative impacts to water resources associated with the 3,960 reasonably foreseeably horizontal Mancos Shale wells.").

With the use of fracking comes a myriad of potentially significant environmental impacts.[32] Fracking has not only opened up vast areas of minerals that were previously uneconomical to extract—thereby expanding the total land area impacted by development—the process of fracking also causes different and more intense impacts to our public health, air, water, land, and wildlife. *Diné Citizens Against Ruining Our Env't v. Jewell*, No. CIV 15-0209 JB/SCY, 2015 WL 4997207, at *11 (D.N.M. Aug. 14, 2015), aff'd, 839 F.3d 1276 (10th Cir. 2016) (finding that "directional drilling causes roughly double the surface impacts of vertical drilling on a well-for-well basis" and that "[i]t can take five to ten times more water to frack a directionally drilled well than a vertical well.").

Indeed, since 2010, oil production in the Permian Basin has grown from less than 1 million barrels per day to 4 million barrels per day, with production nearly doubling in the past two years alone.[33] EIA data also shows that overall oil production in New Mexico has risen dramatically over the past decade.[34] From an average daily production of less than 5.1 million barrels per month in 2009, production has skyrocketed to over 25 million barrels per month in January 2019.[35] Oil production in New Mexico has doubled between 2017 and 2019 as a result of fracking.[36]

i. Water Quality[37]

There are a number of specific areas where BLM's analysis is incomplete. To start, BLM fails to fully analyze impacts to water quality. Although BLM claims that the use of hydraulic

[32] *See generally* Fracking Compendium & TEDX Health Effects, *supra*.

[33] Drilling Info. Blog, West Texas Light – Analyzing the Growth of the Permian's Latest Crude Grade, Apr. 26, 2019, https://info.drillinginfo.com/blog/west-texas-light-analyzing-the-growth-of-the-permians-latest-crude-grade/ (last visited Feb. 6, 2020) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 19).

[34] EIA, New Mexico Field Production of Crude Oil, supra.

[35] *Id.*

[36] Tay Wiles, The Hidden Consequences of New Mexico's Latest Oil Boom, High Country News, May 22, 2019, https://www.hcn.org/issues/51.10/public-health-the-hidden-consequences-of-new-mexicos-latest-oil-boom (last visited Feb. 6, 2020) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 20).

[37] BLM does not respond to our additional information on threats to water quality in its draft EA for the protest period. Nor does BLM change its false statement that fracking has contributed to only one documented case of groundwater pollution.

fracturing has only resulted in one documented case of direct groundwater pollution, see EA at 14, there is substantial evidence to the contrary.

For example, EPA concluded in its 2016 study that "hydraulic fracturing water cycle . . . can impact drinking water sources under some circumstances."[38] EPA also found that:

> the presence of other wells near hydraulic fracturing operations can increase the potential for hydraulic fracturing fluids or other subsurface fluids to move to drinking water resources. There have been cases in which hydraulic fracturing at one well has affected a nearby oil and gas well or its fracture network, resulting in unexpected pressure increases at the nearby well, damage to the nearby well, or spills at the surface of the nearby well. These well communication events, or "frac hits," have been reported in New Mexico, Oklahoma, and other locations.[39]

Reporting on water contamination in New Mexico also directly refutes BLM's conclusions. First, according to the New Mexico Environment Department, since 1999 oil and gas spills have impacted groundwater on ten occasions.[40] Second, scientific reports on fracking in the Permian Basin have found that contamination frequently occurs.[41] Third, the oil and gas industry itself has acknowledged a proliferation of "frack hits," or "downhole communication," where new horizontal drilling for oil is communicating with both historic and active vertical wells.[42] This is a significant development that could result in well blowouts, contamination of water resources, and issues over who is responsible for liabilities and costs of such impacts. These frack hits reported occurred while BLM Onshore Order #2 was in place. Moreover, there is evidence that industry commonly does not comply with the mandate in Onshore Order #2 to protect all useable water resources.[43] Thus, BLM's protections in place do not work.

[38] EPA, Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States ES-3 (2016) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 21).

[39] *Id.* at ES-32.

[40] New Mexico Enviro. Dep't, Spills Search, "Water Details," "Will Or Has Impacted Groundwater," https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/Spills/Spills.aspx (last visited Feb. 6, 2020) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 22).

[41] Groundwater Quality Changes Alongside Expansion of Hydraulic Fracturing, University of Texas at Arlington, Apr. 26, 2016, https://phys.org/news/2016-04-groundwater-quality-expansion-hydraulic-fracturing.html (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 23).

[42] *See, e.g.*, Gayathri Vaidyanathan, *In N.M., A Sea Of 'Frack Hits' May Be Tilting Production*, E&E News, Mar. 18, 2014, https://www.eenews.net/energywire/2014/03/18/stories/1059996265 (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 24); Trent Jacobs, *Oil and Gas Producers Find Frac Hits in Shale Wells a Major Challenge*, Soc'y of Petroleum Eng'rs, Apr. 1, 2017, https://www.spe.org/en/jpt/jpt-article-detail/?art=2819 (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 25).

[43] *See, e.g.*, Comments from Independent Petroleum Association of America and Western Energy Alliance on the BLM's rescission of the Hydraulic Fracturing Rule, 82 Fed. Reg. 34,464 at 58–59 (2017), https://www.regulations.gov/document?D=BLM-2017-0001-0412 (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 26).

The most recent Fracking Compendium has additional data to support the conclusion that water contamination from fracking occurs everywhere:[44]

- In February 2019, the U.S. Justice Department reached a settlement with Antero Resources Corporation over claims that it violated the Clean Water Act at 32 different drilling and fracking-related sites in West Virginia. The violations involved unauthorized dumping of fracking waste into local waterways.
- In November 2018, three scientists found that contaminated drinking water in Pavillion, Wyoming was likely caused by gas leaking from faulty gas wells as well as by leaks from 40 unlined pits that, for many years, served as dumps for drilling wastewater. The scientists presented their findings to the community in advance of publishing a peer-reviewed scientific journal article. Statistical analyses show a correlation between what was disposed in the pits and contaminants appearing in nearby drinking water wells. One of the former EPA scientists told community members that the Wind River Formation drinking water aquifer will likely never be cleaned up. A preliminary report from the EPA in 2011 about groundwater contamination in Pavillion was never finalized.
- In August 2018, a Yale University team collected drinking water samples from 66 households in Belmont County that were located at varying distances away from well pads and analyzed them for the presence of fracking-related chemical contaminants. They also interviewed residents about their health symptoms. The primary goal of this exploratory study was to determine whether residential proximity to fracked wells was related to detection and concentrations of health-relevant drinking water contaminants. A second objective was to evaluate possible relationships between proximity to wells and health complaints in the community. The team found that all homes had at least one volatile organic compound or other organic compound above detectable levels and that prevalence of contaminants in drinking water, including toluene, bromoform, and dichlorobromomethane, was higher in homes closer to the wells.
- In January 2018, the Pennsylvania Department of Environmental Protection determined that fracking wastewater that had leaked from a storage pit contaminated groundwater and rendered a natural spring used for drinking water in Greene County undrinkable.

Data also suggests that there is a greater risk for structural integrity issues, e.g. casing failures, between unconventional and conventional oil and gas wells.[45]

ii. Water Quantity

With regard to water quantity, BLM's analysis is also incomplete. Although we appreciate that BLM includes some statistics on water usage as required by *San Juan Citizens*

[44] Fracking Compendium, *supra*, at 70–79.

[45] Anthony R. Ingraffea et al., Assessment and Risk Analysis of Casing and Cement Impairment in Oil and Gas Wells in Pennsylvania, 2000-2012, PNAS 1, 2 (2013) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 27).

All. v. U.S. Bureau of Land Mgmt., 326 F. Supp. 3d 1227, 1242–44 (D.N.M. 2018), *see generally* EA at Section 3.5.3, a number of gaps remain. First, BLM still fails to "make estimates of potential water usage for the different methods of hydraulic fracturing" for the specific lease sale parcels as required by the court. *See* EA at 68. Such an analysis is essential in order to weigh potential alternatives mitigating impacts and assess the significance of the lease sale parcels. Moreover, BLM has indicated in recent application permits to drill that information on the varying water usage levels between extraction methods is available.[46] Although BLM claims that uncertainty in the fracking methods prevents it from calculating water use for each method, this is simply not true. BLM includes the cumulative water use from slickwater in its Water Support Document. BLM could analyze existing APDs to determine the prevalence of each method of extraction just as it did for APDs in the Greater Chaco area in February 2020 and a range of water usage assuming nitrogen gel versus slickwater fracking.[47]

BLM must also consider cumulative water use. Although we appreciate that BLM finally accounts for increases in average water use per well as documented in the Kondash et al. report,[48] BLM fails to consider other aspects of the report. Kondash et al. also projected that *cumulative water use and produced water volumes* will increase up to 20-fold in gas producing regions and 50-fold in oil producing regions between 2018 and 2030.[49] Other reports support this conclusion as well and have found that water demand in the Permian has more than doubled since 2016 and now exceeds total U.S. frac water use demand.[50] In contrast, BLM assumes a constant water use per well over the 20-year life span of its RFDS. BLM must provide information why this metric is rational given the Kondash report. Finally, the report concluded that "[t]he predicted increasing water use and FP [produced] water production in the Permian and Eagle Ford basins are alarming given the extreme water scarcity in these regions."[51] BLM must not only quantify potential direct and indirect water usage, but calculate cumulative water usage for the proposed lease sale and surrounding reasonably foreseeable actions, assess the current conditions and sustainability of water resources, and assess wastewater disposal methods.

[46] *See, e.g.*, BLM, Environmental Assessment DOI-BLM-NM-F010-2019-0085, Piñon Unit M16-2410 Nos. 01H, 02H, 03H, and 04H Oil Wells Project at 54 (2019), https://eplanning.blm.gov/epl-front-office/projects/nepa/123911/175892/214261/DOI_BLM_F010_2019_0085_EA_Pinion_Unit.pdf ("Water use as it relates to completion activities is variable dependent on the technique proposed. While a multitude of completion activities and technologies exist, in general the Farmington Field Office permits wells that are completed in one of three ways. Operators may use what are called "Gel Fracs", "Nitrogen Fracs" or "Slick-Water Fracs". Each of these use different quantities of water, sourced from a variety of places (2019 Technical Report).") (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 28).

[47] *See, e.g.*, Exhibit B, BLM, Farmington Field Office, Environmental Assessment Addendum 1, 34 (Feb. 2020), https://eplanning.blm.gov/epl-front-office/projects/nepa/120872/20014629/250019723/Final_Addendum.pdf.

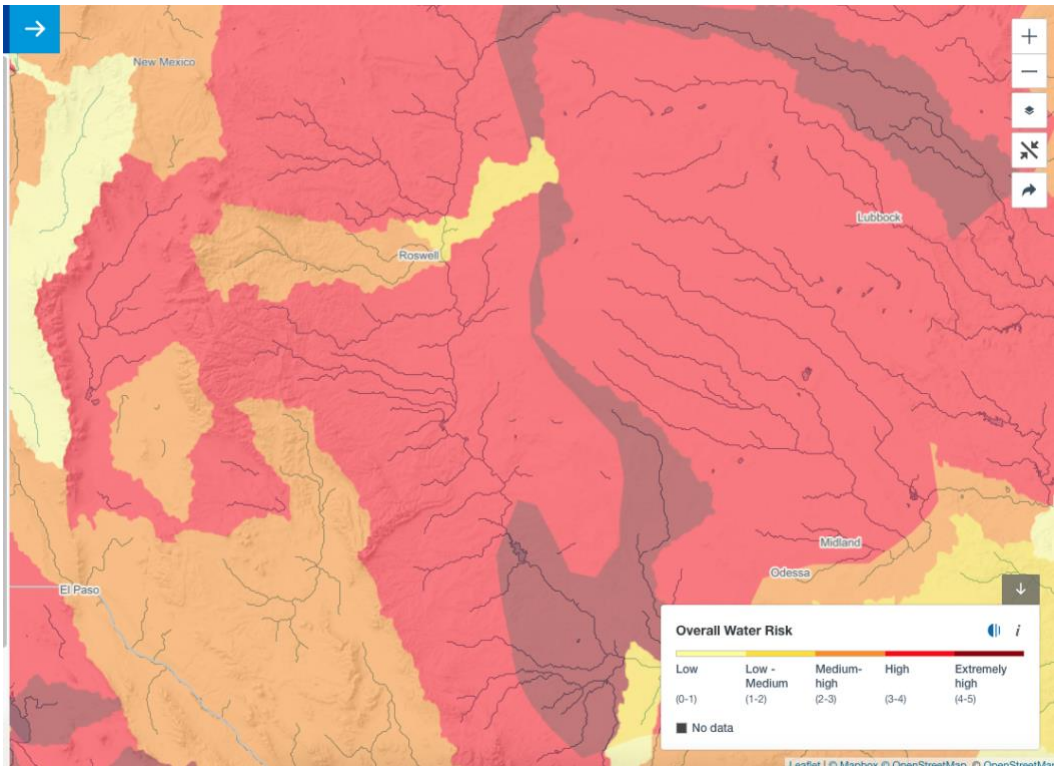
[48] ANDREW J. KONDASH *ET AL.*, THE INTENSIFICATION OF THE WATER FOOTPRINT OF HYDRAULIC FRACTURING, 4 SCIENCE ADVANCES 1 (Aug. 2018), http://advances.sciencemag.org/content/4/8/eaar5982 (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 30).

[49] *Id.* at 6.

[50] Rystad Energy, Frac Water Demand Is Sky-Rocketing, Jan. 22, 2019, https://www.rystadenergy.com/newsevents/news/press-releases/Frac-water-demand-is-sky-rocketing/ (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 31).

[51] *Id.*

Finally, BLM must place the water use proposed by the lease sale in the context of current information regarding the water risks from water stress and drought in the area. We recommend that BLM look at the Water Risk Atlas available online from Aqueduct.[52] In shows the following map indicating that the Carlsbad area is at high water risk from stress and drought.



Put simply, BLM cannot assume that existing levels of water withdrawals are sustainable, will remain sustainable, and that small increases in water uses will not have large impacts on the overall health of the water resources in the area. Such an approach is contrary to NEPA's requirement to assess the significance of agency actions and does not withstand scrutiny.

iii. Produced Water & Induced Seismicity

Wastewater disposal from oil and gas development on the lease parcels poses significant environmental risks at which BLM needs to take a hard look. In particular, subsurface disposal of wastewater has been linked to earthquakes and risks contaminating area aquifers; while recent proposals to expand the use of produced water outside the oil fields jeopardize human health and the environment.

First, BLM's cursory dismissal of risks associated with induced seismicity, EA at 17-18, 147-149, fail to constitute a hard look at the significant environmental impacts associated with seismic activity. Induced seismic activity—man-made earthquakes—is strongly associated with oil and gas extraction-related activities, with some studies directly linking seismicity to fracking. For instance, fracking has been inferred to trigger the majority of injection-induced earthquakes

[52] Aqueduct Water Risk Atlas, https://www.wri.org/aqueduct (last visited Feb. 6, 2019).

in western Canada.[53] In general, wastewater disposal associated with oil and gas extraction in the United States is considered the primary triggering mechanism, although fracking is sometimes implicated as well.[54]

The mechanisms linking wastewater injection and earthquakes are generally understood: injection-induced increases in fluid pressure within aquifers and fault lubrication by injected fluids have the potential to destabilize well bores and cause preexisting faults to slip.[55] Injection-induced earthquakes pose a threat to public health both through the inherent destructiveness of earthquakes and the potential for earthquakes to jeopardize the integrity of oil and gas wells and create new pathways for fluid flow, which could allow wastewater fluids or oil and gas to migrate into freshwater aquifers on which so many rely.

Subsurface disposal of fracking wastewater in Class II wells has been associated with earthquakes in several US states, including New Mexico, Oklahoma, Colorado, Arkansas, and Ohio.[56] An earthquake swarm in northern Arkansas has been attributed to fracking wastewater injection.[57] In the Raton Basin of southern Colorado and northern New Mexico, injection well disposal of produced water has been directly linked to seismic events.[58]

In 2013, the National Academy of Sciences published a comprehensive report on the relationship between energy production and induced seismicity.[59] The National Academy report concluded that while both fracking and wastewater injection have been identified as the case of induced earthquakes, the long-term effects of significantly increasing the number of wastewater disposal wells remains "unknown."[60] Researchers at the USGS found that the rate of earthquakes greater than magnitude 3.0 in the central and eastern United States has "increased dramatically" over the past decade, from an average of 25/year from 1973 through 2008 to more than 362 since

[53] Exhibit C, Bao, X. and Eaton, D.W., Fault activation by hydraulic fracturing in western Canada, Science 10.1125/science.aag2583 (2016).

[54] EPA, Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States, supra, at ES-45 (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 21); Bao et al., *supra* at 1.

[55] Exhibit D, R. Davies et al., Induced Seismicity and Hydraulic Fracturing for the Recovery of Hydrocarbons, 45 Marine and Petroleum Geology 171-185 (2013), available at: https://community.dur.ac.uk/g.r.foulger/Offprints/Davies2013.pdf; Exhibit E, Weingarten, M et al., Induced seismicity. High-rate injection is associated with the increase in U.S. mid-continent seismicity. 348 Science 1336 (2015). Bao et al., *supra* at 1.

[56] EPA 2016 HF Study, supra, p. 8-25.

[57] Exhibit F, Horton, S. (2012). Disposal of hydrofracking waste fluid by injection into subsurface aquifers triggers earthquake swarm in central Arkansas with potential for damaging earthquake. 83 Seismological Research Letters 250 (2012).

[58] Exhibit G, Rubinstein, JL et al., The 2001-present induced earthquake sequence in the Raton Basin of northern New Mexico and southern Colorado, 104 Seismological Society of America Bulletin 2162 (2014).

[59] Exhibit H, Induced Seismicity Potential in Energy Technologies, National Academies Press (2013), available at: https://www.nap.edu/catalog/13355/induced-seismicity-potential-in-energy-technologies.

[60] *Id*. at 2.

2009, with 1,010 occurring in 2015 alone.[61] The researchers hypothesize that this increase in activity could be related to oil and gas production activities, including underground injection of wastewater.[62]

Since the 1960's, earthquakes in the Permian Basin, including west Texas and southeast New Mexico, have been linked to oil and gas activities, particularly wastewater disposal.[63] While there are certain naturally-seismic areas in the Permian Basin, fluid injection has been identified as the potential "triggering mechanism" for "numerous" earthquakes that have occurred in the region.[64]

BLM acknowledges that "[d]isposal of wastewater (fluids that are a byproduct of oil production) is the primary cause of anthropogenic felt earthquakes in New Mexico." EA at 147. BLM has further identified more than a dozen earthquakes of a magnitude 2.5 or greater in the Pecos District since 2010. *Id.* at 147. In light of the documented link between wastewater disposal and earthquakes, BLM was arbitrary to conclude that "development of the leases is not expected to result in induced seismicity." *Id.* at 149. First, BLM's conclusion relies on "how the State of New Mexico regulates its injection wells," specifically regulations which set maximum limits for injection pressures. *Id.* at 149. But as the USGS has plainly stated, "[w]ells not requiring surface pressure to inject wastewater can still induce earthquakes."[65] And given the documented occurrence of earthquakes in the area, including three earthquakes in the last three months of 2019, *Id.* at 147, such regulations have plainly not eliminated induced earthquakes in the Greater Carlsbad region. Second, BLM's conclusion relies on its mischaracterization of more than 180 million barrels of wastewater projected from the lease sale – *5.8 billion gallons of wastewater – as a "low amount of produced water."* *Id.* at 147. That such a huge volume of wastewater is only a fraction of the total wastewater produced in the Greater Carlsbad region says nothing about the incremental impacts of additional wastewater disposal in the area, but instead helps illustrate the serious nature and extreme magnitude of the cumulative wastewater problem. Third, after identifying the Dagger Draw area as one of its "main areas of concern," *id.* at 17, and noting that at least one lease parcel is within 7.5 miles of the Dagger Draw area, *id*. at 18, BLM's conclusion relies on its description of the "current risk of earthquakes in the Permian Basin outside of the Dagger Draw Area." *Id.* at 149. BLM offers no assessment of the risk of produced water from the lease parcels resulting in induced seismic activity in the Dagger Draw area, the area of BLM's primary stated concern. Further, BLM's conclusion ignores the documented connection between injection wells and earthquakes in the far southeastern corner of New Mexico, near Jal.[66]

[61] Exhibit I, J. Rubinstein, U.S. Geological Survey, Induced Earthquakes, https://www.usgs.gov/natural-hazards/earthquake-hazards/induced-earthquakes?qt-science_support_page_related_con=4#qt-science_support_page_related_con.

[62] *Id.*

[63] Exhibit J, JL Snee & MD Zoback, State of Stress in the Permian Basin, Texas and New Mexico: Implications for Induced Seismicity, The Leading Edge (Feb. 2018).

[64] *Id*. at 810.

[65] Rubinstein, *supra*.

[66] *See* Weingarten, *supra* at 1338 fig.2.

Second, BLM needs to assess the indirect environmental impacts of transporting produced water from the leased parcels to wastewater disposal wells. While BLM may not be able to identify specific wastewater disposal wells that will be utilized, BLM needs to provide at least a general assessment of the environmental impacts associated with the thousands of truck trips that will be required to transport fracking wastewater from the lease parcels to disposal sites. Moreover, to meet its NEPA hard look obligations, BLM needs to assess the cumulative impacts of fracking wastewater disposal across the Pecos District, including the risks of induced seismicity and the impacts from transporting vast quantities of wastewater across the region.

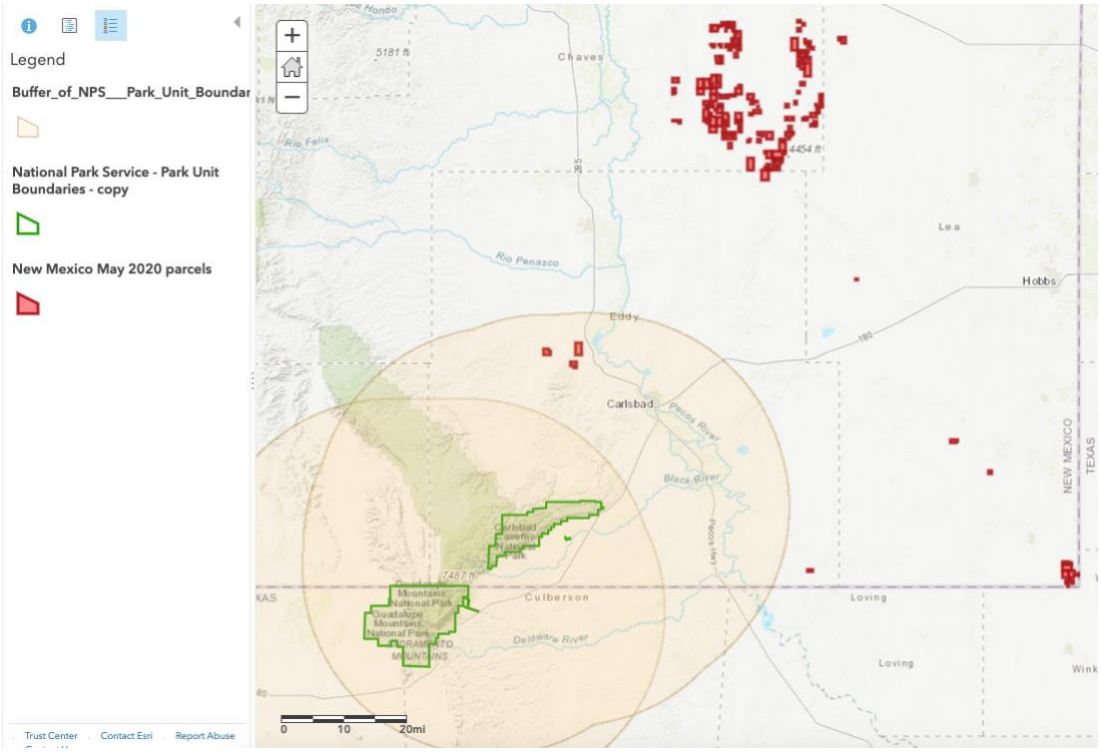
Third, BLM must account for potential contamination resulting from recent legislation allowing the broader use of "produced water" from oil and gas. New rules, which are proposed to be developed this year, may very well allow for use of produced water outside of the oil and gas fields.[67] Indeed, the state of New Mexico has been touting this as a benefit of the legislation. We look forward to full and fair discussion of how these rules will impact water quality in the Greater Chaco Region.

G. BLM Fails to Take a "Hard Look" at the Impacts of the Proposed Action on Carlsbad Caverns National Park.[68]

As shown by the map below and as indicated in the EA, a number of the lease sale parcels are near Carlsbad Caverns National Park. These parcels, coupled with existing development and future development of parcels in recent lease sales, will undoubtedly add to degrading air quality, visibility, and night skies near the park. Yet, BLM only takes a cursory look at impacts to visibility and night skies using extremely outdated data, and BLM's discussion of air quality ignores current trends of violations of federal air quality standards. Thus, BLM fails to take a hard look at impacts to Carlsbad Caverns.

[67] New Mexico Enviro. Dep't, Produced Water Factsheet 1, 2, https://www.env.nm.gov/wp-content/uploads/sites/16/2019/10/Produced-Water-Factsheet_ENGLISH_-FINAL-191010.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 32).

[68] In response to this argument, BLM states that it has analyzed impacts of the proposed action on air quality at the Park, but, BLM solely analyzes visibility and deposition, not the impact of increased ozone levels on the Park.



The May 2020 parcels are in red. The park boundaries are in green. A 30-mile buffer from Carlsbad Caverns and Guadalupe Mountains National Park is in light yellow.

In 2017, 520,000 people visited Carlsbad Caverns to view the park system's extensive network of caves and unique wildlife. The University of New Mexico's Bureau of Business & Economic Research estimates that visitors on average spend over 24 million dollars visiting the park.[69] Under the Clean Air Act, the park is also designated as a Class I airshed. According to the 2015 air quality data from National Park Service's Air Resources Division, the park currently faces moderate concerns for ozone and visibility based on risks to human health and vegetation, and significant concerns for nitrogen and sulfur deposition based on the sensitivity of the ecosystems in the area.[70]

Adding more oil and gas wells will only exacerbate these issues, necessitating that BLM perform an updated cumulative effects assessment of air quality impacts. For example, the Carlsbad RMP-DEIS, which relies on air quality data from 2013, notes that "10 of 31 monitoring sites had 8-hour design values above [the ozone] NAAQS[.]" Carlsbad RMP-DEIS at 2-146. "[D]ata suggest[s] that oil and gas production activities are significant contributors to emissions within the CFO boundary." *Id.* at 3-65. The RMP also predicts that there will be "366 days of significant visibility change [for Class 1 areas.]" Carlsbad RMP-DEIS at 2-147. To address these significant concerns, BLM must not only fully assess impacts from the proposed action in

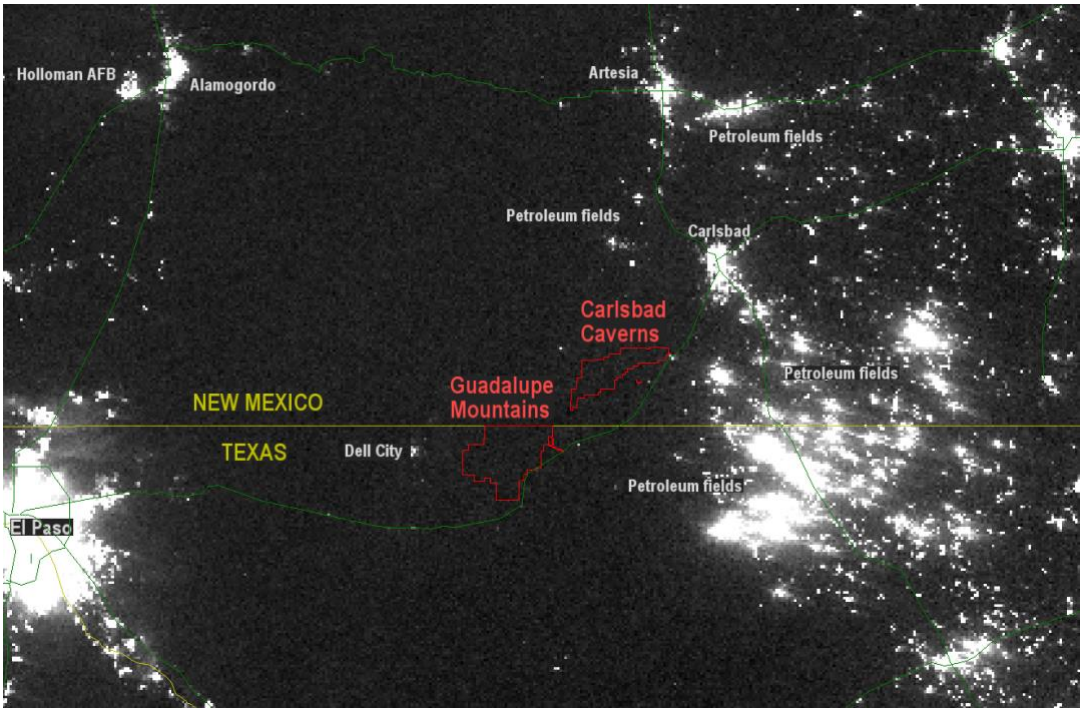
[69] *National Park Service Visitor Use Statistics*, "Carlsbad Caverns NP" https://irma.nps.gov/Stats/ (last visited Dec. 17, 2019).

[70] NPS, *Carlsbad Caverns NP - Air Quality Summary*, https://www.nps.gov/subjects/air/park-conditions-trends.htm (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 33).

conjunction with cumulative actions, BLM must also consider a range of alternatives which actually mitigate and address these valid concerns.

Unfortunately, because BLM has piecemealed its last seven leasing actions in the area into seven separate NEPA analyses, BLM concludes that impacts to air quality and visibility are not significant. EA at 54 (ozone), 39 (visibility). But, this conclusion ignores the very real cumulative impacts evinced in the Carlsbad RMP as noted above. It also ignores the very real increases in pollution as demonstrated by the ozone charts below. Because the pace of development in the area is increasing exponentially, BLM cannot afford to rely on stale data.

Finally, a similar argument applies to BLM's limited analysis of impacts of oil and gas on dark night skies at the Park. BLM relies on sky quality index data from 2009 (when oil production was less than a 1,000,000 barrels per day as opposed to 2020 when it was at 5,000,000 barrels per day) to arbitrarily conclude that impacts to dark night skies will largely come from cities. As shown below, 2016 satellite imagery roundly refutes this conclusion. The oil and gas fields emit significant levels of light pollution, and we request that BLM take a hard look at impacts using current data.



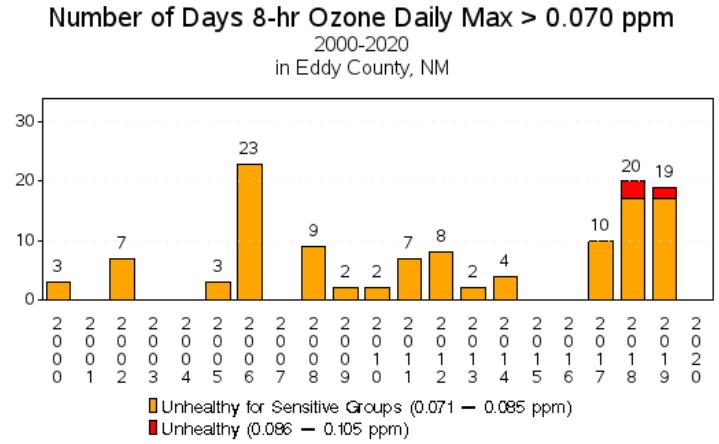
Source: L3Harris Geospatial, https://www.harrisgeospatial.com/Support/Maintenance-Detail/ArtMID/13350/ArticleID/15288/Remote-Sensing-of-Light-Pollution-Near-US-National-Parks.

In sum, we request that BLM rely on accurate scientific data to properly assess air quality, visibility, and light pollution impacts to Carlsbad Caverns National Park and take the hard look required by NEPA.

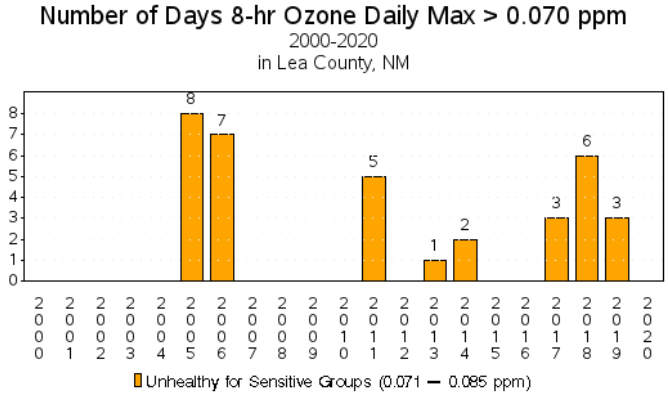
H. BLM Fails to Take a "Hard Look" at the Impacts of the Proposed Action on Ozone Levels.

Relatedly, BLM fails to thoroughly consider the air quality impacts of leasing 94 parcels (490 wells) in an area that has exceeded federal National Ambient Air Quality Standards ("NAAQS") for ozone dozens of times over the past three years. Although BLM finally acknowledges that exceedances are occurring, BLM downplays these impacts and ultimately concludes without support, the adding an additional 490 wells will not worsen these violations.

But, this conclusion is wrong. First, BLM relies on stale data. Ozone exceedance data from EPA for Eddy and Lea Counties demonstrates that the air quality problem these counties experienced a combined 13 ozone exceedances in 2017, 26 in 2018, and 22 from 2019.[71]



Note: Based on ALL sites
Source: U.S. EPA AirData <https://www.epa.gov/air-data>
Generated: February 6, 2020



Note: Based on ALL sites
Source: U.S. EPA AirData <https://www.epa.gov/air-data>
Generated: February 6, 2020

[71] EPA, Ozone Exceedances Chart, 2019, Eddy County, NM, https://www.epa.gov/outdoor-air-quality-data/air-data-ozone-exceedances (last visited Feb. 6, 2020); Ozone Exceedances Chart, 2019, Eddy County, NM, https://www.epa.gov/outdoor-air-quality-data/air-data-ozone-exceedances (last visited Feb. 6, 2020).

The Carlsbad Caverns National Park monitor is also currently exceeding the NAAQS for ozone.[72] The park monitor recorded 10 exceedances for 2018 and 6 exceedances for 2019.[73]

Oil and gas development is one of the largest sources of air pollution in the U.S. It emits nitrogen oxides ("NOx"), volatile organic compounds ("VOCs") (both of which react to form ozone), as well as sulfur dioxide emissions. As the Endocrine Disruption Exchange has noted:

> In addition to the land and water contamination issues, at each stage of production and delivery tons of toxic volatile compounds, including benzene, toluene, ethylbenzene, xylene, etc., and fugitive natural gas (methane), escape and mix with nitrogen oxides from the exhaust of diesel-driven, mobile and stationary equipment to produce ground-level ozone. Ozone combined with particulate matter less than 2.5 microns produces smog (haze). Gas field produced ozone has created a serious air pollution problem similar to that found in large urban areas, and *can spread up to 200 miles beyond the immediate region where gas is being produce*d. Ozone not only causes irreversible damage to the lungs, it is equally damaging to conifers, aspen, forage, alfalfa, and other crops commonly grown in the West. Adding to this is the dust created by fleets of diesel-driven water trucks working around the clock hauling the constantly accumulating condensate water from well pads to central evaporation pits.[74]

Additional oil and gas wells will undoubtedly exacerbate the problem, again demanding an assessment of the cumulative impacts of development of the leased lands in conjunction with existing and future sources of air pollution, particularly ozone. Existing, albeit outdated information, from the Carlsbad RMP predicts that the Carlsbad Caverns and Carlsbad in-town ozone monitors are expected to exceed ozone standards. Carlsbad RMP-DEIS at 4-258. And, in addition to the 94 parcels (490 wells) proposed for the May 2020 lease sale, BLM has sold 309 parcels since September 2017. As a result, BLM must take a "hard look" at the VOC and NOx emissions generated by all of the leasing in the area within the context of recent data, determine whether impacts from these emissions will be significant in light of existing air quality conditions on the ground, and consider an alternative that eliminates these impacts.

Although BLM finally includes information acknowledging ozone exceedances in the EA, BLM then proceeds to belittle the contribution of the lease sale to poor air quality conditions. But, there is no doubt that each and every well contributes incrementally to ozone pollution, and if the area is already exceeding standards, *any* additional sources will worsen exceedances. For example, even the Carlsbad RMP-DEIS, which relies on 2013 data, predicts ozone exceedances *for 10 out of the 31 monitors and exceedances of all ozone monitors within the field office*. Carlsbad RMP-DEIS at 2-146 ("Cumulative impacts showed 10 of 31 monitoring sites had 8-hour design values above [the ozone] NAAQS (maximum 79 ppb in the Four Corners

[72] Nat'l Park Serv., Ozone Standard Exceedances in National Parks, *supra*.

[73] *Id.*

[74] The Endocrine Disruption Exchange, *Drilling and Fracking Chemicals Spreadsheet Summary* (2011), available online at: https://endocrinedisruption.org/assets/media/documents/Multistate%20summary%208-3-17.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 34).

area vs. 75 ppb standard"); "Air Modelling Report_Carlsbad DRMP_08022018 at 4-32 and chart below.

Table 1: Predicted Design Values for Monitors in 4km Domain

Monitor ID	Monitor Location	2008 Design Value Baseline (ppb)	2017-Future Year Base Case (ppb)	Alternative: On the Books Controls (ppb)	Alternative: On the Books with Extra Management (ppb)
350151005	Holland St., Carlsbad	67	76	**77**	**76**
350153001	Carlsbad Caverns National Park	66	75	**75**	**75**
350250008	Hobbs-Jefferson	63	72	**72**	**72**

Source: Carlsbad RMP, Air Resources Technical Support Document, Table 4-17, at 4-32.

Actual EPA data from 2016 to 2018 as compared to 2017 to 2019, demonstrates that the problem is getting worse each year. The current federal ozone standard is 0.070 parts per million. Both monitoring stations in Eddy and Lea County were at or exceeded this level using the 3-year average of the 4th highest reading between 2016 to 2018.

County	**Site Name**	**AQS ID #**	**4th Max ozone 8-hr (ppm)**			**Design Value (2016-2018)**
			2016	**2017**	**2018**	
Eddy	Carlsbad-Holland Street	35-015-1005	0.063	0.076	0.083	**0.074**
Lea	Hobbs	35-025-0008	0.065	0.069	0.076	0.070

Adding in 2019 data demonstrates an upward trend of worsening air quality, particularly in Eddy County.

County	**Site Name**	**AQS ID #**	**4th Max ozone 8-hr (ppm)**			**Design Value (2017-2019)**
			2017	**2018**	**2019**	
Eddy	Carlsbad-Holland Street	35-015-1005	0.076	0.083	0.080	**0.079**
Lea	Hobbs	35-025-0008	0.069	0.076	0.070	**0.072**

Source: EPA Monitor Values Report, Ozone, https://www.epa.gov/outdoor-air-quality-data/monitor-values-report.

Put simply, BLM must use current data from the EPA to accurately assess direct, indirect, and cumulative impacts from the proposed action on air quality. Here, using current data, levels are already above federal standards and have been for the past three years. Thus, any additional oil and gas leasing and development will exceed the ozone standards, especially when properly assessed with emissions from the 38,500 active wells in the area as required by NEPA. Instead of acknowledging this, however, BLM arbitrarily concludes that impacts from the prosed action "would incrementally contribute to cumulative increases in air quality emissions." EA at 57. But, this approach turns the cumulative impacts standard on its head. NEPA does not require BLM to belittle the impacts of the proposed action as compared to cumulative impacts, NEPA requires the BLM to assess the impacts of the proposed action *in conjunction with cumulative impacts*. 40 C.F.R. §§ 1502.16, 1508.7. Here, because BLM fails to do this, it fails to meet the hard look standard required by NEPA.

In response, BLM again cites to future regulatory actions at the state level which might reduce ozone levels. EA at 156. But, these future rules cannot stand in for the hard look that is required now, before BLM irretrievably commits the minerals to leasing. BLM must analyze whether the lease parcels, in conjunction with existing wells, will result in exceedances of federal ozone standards.

I. BLM's Actions Approving Additional Leases In the Carlsbad Area Violates FLPMA's Requirement to Ensure Compliance with Federal Air Quality Standards.

Similarly, BLM cannot approve any additional leases at this time without a violation of FLPMA. FLPMA requires BLM to "provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, and other pollution standards or implementation plans." *See* 43 U.S.C. § 1717(c)(8). Both the Carlsbad and Roswell RMPs provide that "[a]ll activities will comply with applicable state and Federal air quality laws and regulations." 1988 Carlsbad RMP at 2-11; 1997 Roswell RMP at 1-373.

As argued above, because air quality in the area is well above federal standards for ozone, approval of *any* additional wells will violate air quality standards and the provisions discussed above. Thus, there is no way BLM can demonstrate that the proposed action of leasing 94 parcels (490 wells) will not violate both the existing Carlsbad and Roswell RMPs and FLPMA.

J. BLM Fails to Take a "Hard Look" at Recent Climate Science and the Greenhouse Gas Emissions that Will Result from the Proposed Action.

Within the context of climate change, NEPA requires an assessment of the impacts of the release of more greenhouse gases from the proposed APDs within the context of the global climate crisis. Specifically, BLM must consider "high quality information" and "accurate scientific analy[ses]," 40 C.F.R. §§ 1500.1, 1502.24, as well as discuss the significance of the direct, indirect, and cumulative greenhouse gases generated by its proposed action. 40 C.F.R. §§ 1502.16 (outlining what is required in an impacts analysis), 1508.7 (defining cumulative impacts), 1508.8 (defining direct and indirect impacts); *Western Org. of Res. Councils v. U.S.*

Bureau of Land Mgmt., CV 16-21-GF-BMM, 2018 WL 1475470, (D. Mont. Mar. 26, 2018) (requiring quantification of indirect GHG emissions at the resource management plan stage); *Sierra Club v. Fed. Energy Regulatory Comm'n*, 867 F.3d 1357, 1374 (D.C. Cir. 2017) (requiring quantification of indirect GHG emissions burned as a result of a natural gas pipeline); *Center for Biological Diversity v. National Highway Traffic. Admin.*, 538 F.3d 1172, 1215 (9th Cir. 2008) (requiring an assessment of the cumulative impacts of climate change from a proposed rule); *San Juan Citizens All. v. United States Bureau of Land Mgmt*., 326 F. Supp. 3d 1227, 1244 (D.N.M. 2018) (requiring an analysis of the direct, indirect, and cumulative GHG emissions at the oil and gas lease sale stage); *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41 (D.D.C. 2019) (requiring a robust analysis of the direct and indirect climate impacts from nine lease sales as well a quantitative, regional and national cumulative impacts analysis of reasonably foreseeable actions such as BLM lease sales).

Although here, BLM includes some information on the current state of the climate crisis and the impacts that will result from the proposed action, BLM's analysis remains incomplete and inadequate as detailed below. Such an analysis is particularly important because according to BLM's Analysis of the Management Situation for the Bureau of Land Management Carlsbad Field Office, "[t]he 1988 Carlsbad RMP and subsequent amendments did not make decisions for [greenhouse gases] GHGs (BLM 1988)."[75]

i. BLM Must Assess the Lease Sale within the Context of Current Climate Science.

NEPA requires BLM to assess the lease sale within the context of accurate, high quality climate science. 40 C.F.R. §§ 1500.1, 1502.24; *Lands Council v. Powell*, 395 F.3d 1019, 1031 (9th Cir. 2005) (finding that the agency's reliance on outdated data prevented it from completing an accurate cumulative impacts analysis); *San Juan Citizens All. v. United States Bureau of Land Mgmt*., 326 F. Supp. 3d 1227, 1249 (D.N.M. 2018) (holding that BLM could not rely on outdated climate data on remand). Additionally, "[e]ach time new, site specific data becomes available, and a new project is proposed, the BLM must take a hard look at it, determine its significance, and explain its decision regarding the data's significance." *S. Utah Wilderness All. v. United States Dep't of the Interior*, No. 2:13-CV-01060-EJF, 2016 WL 6909036, at *6 (D. Utah Oct. 3, 2016); *see also Friends of the Clearwater v. Dombeck*, 222 F.3d 552, 558 (9th Cir. 2000) ("When new information comes to light the agency must consider it, evaluate it, and make a reasoned determination whether it is of such significance as to require [supplemental environmental review.]").

Climate change has been intensively studied and acknowledged at the global, national, and regional scales. Climate change is being fueled by the human-caused release of greenhouse gas emissions, in particular carbon dioxide and methane. Carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are recognized as the key greenhouse gases contributing to climate change. In 2009, the EPA found that these "six greenhouse gases taken in combination endanger both the public health and the public welfare of

[75] Carlsbad AMS, supra, at 2-97.

current and future generations."[76] The D.C. Circuit has upheld this decision as supported by the vast body of scientific evidence on the subject. *See Coal. for Responsible Regulation, Inc. v. EPA.*, 684 F.3d 102, 120-22 (D.C. Cir. 2012).

The Intergovernmental Panel on Climate Change ("IPCC") is a Nobel Prize-winning scientific body within the United Nations that reviews and assesses the most recent scientific, technical, and socio-economic information relevant to our understanding of climate change. In one of its reports to policymakers in 2014, the IPCC provided an incredibly comprehensive summary of our understanding of human-caused climate change.[77] Among other things, the IPCC stated:

- Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems.[78]

- 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, and sea level has risen.[79]

- Anthropogenic greenhouse gas emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever. This has led to atmospheric concentrations of carbon dioxide, methane, and nitrous oxide that are unprecedented in at least the last 800,000 years. Their effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are extremely likely to have been the dominant cause of the observed warming since the mid-20th century.[80]

- In recent decades, changes in climate have caused impacts on natural and human systems on all continents and across the oceans. Impacts are due to observed climate change, irrespective of its cause, indicating the sensitivity of natural and human systems to changing climate.[81]

- Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive, and irreversible impacts for people and ecosystems. Limiting climate

[76] EPA, *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act*, 74 Fed. Reg. 66,496 (Dec. 15, 2009).

[77] IPCC AR5, *Synthesis Report, Summary for Policymakers* (2014), http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 35).

[78] *Id.* at 2.

[79] *Id.*

[80] *Id.* at 4.

[81] *Id.* at 6.

change would require substantial and sustained reductions in greenhouse gas emissions which, together with adaptation, can limit climate change risks.[82]

- Surface temperature is projected to rise over the 21st century under all assessed emission scenarios. It is very likely that heat waves will occur more often and last longer, and that extreme precipitation events will become more intense and frequent in many regions. The ocean will continue to warm and acidify, and global mean sea level will continue to rise.[83]

- Climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development.[84]

- Many aspects of climate change and associated impacts will continue for centuries, even if anthropogenic emissions of greenhouse gases are stopped. The risks of abrupt or irreversible changes increase as the magnitude of the warming increases.[85]

- There are multiple mitigation pathways that are likely to limit warming to below 2°C relative to pre-industrial levels. *These pathways would require substantial emissions reductions over the next few decades and near zero emissions of CO2 and other long-lived greenhouse gases by the end of the century*. Implementing such reductions poses substantial technological, economic, social and institutional challenges, which increase with delays in additional mitigation and if key technologies are not available. Limiting warming to lower or higher levels involves similar challenges but on different timescales.[86]

In fall of 2018, the IPCC issued a special report on the difference between the impacts of global warming of 1.5°C above preindustrial levels and that of 2°C above preindustrial levels.[87] The IPCC also included recommendations on the systems transitions needed to limit warming to 1.5°C, including a need to reduce reliance on fossil fuels by 50 to 90% depending on the temperature goal. Specifically, the IPCC found:

- Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate.[88]

[82] *Id.* at 8.

[83] *Id.* at 10.

[84] *Id.* at 13.

[85] *Id.* at 16.

[86] *Id.* at 20 (emphasis added).

[87] IPCC Special Report 15, *Global Warming of 1.5°: Summary for Policy Makers* (2018), http://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 36).

[88] *Id.* at 6.

- Warming from anthropogenic emissions from the pre-industrial period to the present will persist for centuries to millennia and will continue to cause further long-term changes in the climate system, such as sea level rise, with associated impacts but these emissions alone are unlikely to cause global warming of 1.5°C.[89]

- Climate models project robust differences in regional climate characteristics between present-day and global warming of 1.5°C, and between 1.5°C and 2°C. These differences include increases in: mean temperature in most land and ocean regions, hot extremes in most inhabited regions, heavy precipitation in several regions, and the probability of drought and precipitation deficits in some regions.[90]

- Climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C.[91]

- Pathways limiting global warming to 1.5°C with no or limited overshoot would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems (high confidence). These systems transitions are *unprecedented in terms of scale*, but not necessarily in terms of speed, and *imply deep emissions reductions in all sectors*, a wide portfolio of mitigation options and a significant upscaling of investments in those options (medium confidence).[92]

- CO2 emissions from industry in pathways limiting global warming to 1.5°C with no or limited overshoot are projected to be about 65-90% (interquartile range) lower in 2050 relative to 2010, as compared to 50-80% for global warming of 2°C (medium confidence).[93]

- Mitigation consistent with 1.5°C pathways creates risks for sustainable development in regions with high dependency on fossil fuels for revenue and employment generation (high confidence). Policies that promote diversification of the economy and the energy sector can address the associated challenges (high confidence).[94]

[89] *Id.* at 7.

[90] *Id.* at 9.

[91] *Id.* at 11.

[92] *Id.* at 17 (emphasis added).

[93] *Id.*

[94] *Id.* at 23.

According to the Third National Climate Assessment,[95] the Southwest Region—which includes Colorado, New Mexico, Utah, Arizona, Nevada, and California—is experiencing and will experience the following impacts:

- Snowpack and streamflow amounts are projected to decline in parts of the Southwest, decreasing surface water supply reliability for cities, agriculture, and ecosystems.[96]

- The Southwest produces more than half of the nation's high-value specialty crops, which are irrigation-dependent and particularly vulnerable to extremes of moisture, cold, and heat. Reduced yields from increasing temperatures and increasing competition for scarce water supplies will displace jobs in some rural communities.[97]

- Increased warming, drought, and insect outbreaks, all caused by or linked to climate change, have increased wildfires and impacts to people and ecosystems in the Southwest. Fire models project more wildfire and increased risks to communities across extensive areas.[98]

- Projected regional temperature increases, combined with the way cities amplify heat, will pose increased threats and costs to public health in southwestern cities, which are home to more than 90% of the region's population. Disruptions to urban electricity and water supplies will exacerbate these health problems.[99]

The Fourth National Climate Assessment, released in two volumes in 2017[100] and 2018,[101] provides significant updates on the science and impacts of climate change across the U.S. Volume I, released in 2017, focuses on the physical science of climate change. Volume II, released in 2018, focuses on the impacts, risks, and adaptations occurring as a result of climate change. The latter report reaffirms that "the continued warming that is projected to occur without significant reductions in global greenhouse gas emissions is expected to cause substantial net

[95] Jerry M. Melillo, *et al.*, *Climate Change Impacts in the United States: The Third National Climate Assessment* (2014), https://nca2014.globalchange.gov/downloads (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 37).

[96] *Id.* at 463.

[97] *Id.*

[98] *Id.*

[99] *Id.*

[100] U.S. Global Change Research Program, *Climate Science Special Report, Fourth National Climate Assessment, Volume 1* (D.J. Wuebbles et al. eds. 2017), https://science2017.globalchange.gov/ (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 38).

[101] U.S. Global Change Research Program, *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* (Reidmiller, D.R., et al. eds., 2018) (hereinafter "NCA4 Vol. II "), https://nca2018.globalchange.gov/downloads/NCA4_2018_FullReport.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 39).

damage to the U.S. economy."[102] The report also details that without "more immediate and substantial global greenhouse gas reductions," the most severe consequences of climate change will not be avoided in the long-term.[103] In comparison to past reports, the section on the Southwest "further examines interconnections among water, ecosystems, the coast, food, and human health and adds new Key Messages concerning energy and Indigenous peoples."[104]

NCA4 Volume II examines the current impacts of climate change on the Southwest in detail. It notes that the average annual temperature of the Southwest increased *1.6°F between 1901 to 2016*, magnifying the impacts of drought and wildfire.[105] Hotter temperatures have already contributed to reductions in snowpack, amplifying drought conditions in the Colorado River Basin, the Rio Grande, and other critical watersheds.[106] It is also estimated that the area burned by wildfire across the western United States between 1984 and 2015 was twice what would have burned had climate change not occurred.[107] "Native Americans are among the most at risk from climate change, often experiencing the worst effects because of higher exposure, higher sensitivity, and lower adaptive capacity for historical, socioeconomic, and ecological reasons."[108] In particular, the report notes that tribal water supplies are at risk due to reductions in water supply reliability and water contracts in place.[109]

Future projections for the region from NCA4 Volume II are even more alarming. "Under the higher scenario (RCP8.5), climate models project an 8.6°F (4.8°C) increase in Southwest regional annual average temperature by 2100."[110] Climate change threatens to lead to "to aridification (a potentially permanent change to a drier environment) in much of the Southwest, through increased evapotranspiration, lower soil moisture, reduced snow cover, earlier and slower snowmelt, and changes in the timing and efficiency of snowmelt and runoff."[111] "Any increase in water requirements for energy generation from fossil fuels would coincide with reduced water supply reliability from projected decreases in snowpack, and earlier snowmelt."[112] In particular, "[t]he water consumption, pollution, and greenhouse gas emissions of hydraulic fracturing (fracking) make that source of fuel even less adaptive under climate change."[113]

Here, neither the EAA nor the 2019 "Cumulative BLM New Mexico Greenhouse Gas Emissions, a Supplemental White Paper" include the significant, new information outlined in the IPCC's 2018 Special Report on Warming, the Third National Climate Assessment, and the

[102] *Id.* at 46.
[103] *Id.* at 27.
[104] *Id.* at 1110.
[105] *Id.* at 1108.
[106] *Id.* at 1104, 1111.
[107] *Id.*
[108] *Id.* at 1109.
[109] *Id.* at 1110.
[110] *Id.*
[111] *Id.*
[112] *Id.* at 1124.
[113] *Id.*

Fourth National Climate Assessment. For example, BLM cites to data indicated that "the region encompassing southern Colorado and New Mexico, average temperatures rose just under 0.7 degrees Fahrenheit per decade between 1971 and 2011, which is approximately double the global rate of temperature increase." EA at 56. This fact is directly contradicted by information in NCA4 Volume II which indicates that the average annual temperature of the Southwest increased 1.6°F between 1901 to 2016—more than double what BLM reports. Additionally, although BLM reports that temperatures in the future could increase 4 to 6 degrees Fahrenheit, in actuality the world is on track with the worst case climate scenario or the representative concentration pathway ("RCP") of 8.5.[114] As discussed in NCA4 Volume II, "[u]nder the higher scenario (RCP8.5), climate models project an *8.6°F (4.8°C) increase* in Southwest regional annual average temperature by 2100."[115] Put simply, because BLM relies on outdated climate science, BLM significantly underestimates existing impacts and future impacts that will result from the proposed action in conjunction with other cumulative impacts. BLM must correct this significant error before moving forward with approval of any of the APDs at issue.

In response, BLM claims that its 2019 Air Resources Technical Report incorporates recent climate science. But, a look at this report demonstrates that BLM continues to fail to assess the information in the IPCC's 2018 Special Report on the difference between warming of 1.5°C and 2.0°C. This report is critical to assess the significance of BLM's proposal to release more GHG emissions and must be analyzed and disclosed in the EA in order to satisfy NEPA's hard look mandate.

ii. BLM Fails to Quantify and Assess the Significance of Impacts from Direct and Indirect Greenhouse Gas Emissions.

NEPA requires BLM to assess the direct greenhouse gas emission that will result from the construction and operation of the 490 oil and gas wells which result from the offered leases. NEPA regulations specifically acknowledge that "short- and long-term effects are relevant" in assessing the "context" of an action and its environmental impacts. 40 C.F.R. § 1508.27(a). Similarly, "[s]ignificance cannot be avoided by terming an action temporary or by breaking it down into small component parts." *Id.* § 1508.27(b)(7). Although BLM includes some information to this effect, BLM's analysis remains inadequate for two reasons.
Similarly, BLM fails to fully quantify and assess the significant of its action with regard to direct and indirect greenhouse gas emissions.

BLM is responsible for the management of a significant portion—700 million acres—of federal onshore subsurface minerals.[116] BLM has never studied the full climate impacts of its oil and gas leasing program in a comprehensive document. But, other agencies have quantified emission from federal fossil fuels. The U.S. Geological Survey ("USGS") concluded in 2018 that "the ultimate downstream GHG emissions from fossil fuel extraction from federal lands and

[114] Robinson Meyer, Are We Living Through Climate Change's Worse-Case Scenario? Jan. 15, 2019 The Atlantic, https://www.theatlantic.com/science/archive/2019/01/rcp-85-the-climate-change-disaster-scenario/579700/ (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 40).

[115] *Id.* at 1110.

[116] *See* DOI-BLM, *Mineral and Surface Acreage Managed By BLM*, available at: http://www.blm.gov/wo/st/en/info/About_BLM/subsurface.html.

waters by private leaseholders could have accounted for approximately 23% of total U.S. GHG emissions (1,332 MMT of CO2e)."[117] USGS also found that emissions from oil and gas development account for approximately 34% of federal GHG emissions (498.76 MMT CO2e).[118] A separate report from EcoShift Consulting concluded that emissions from unleased BLM reserves contain up to 450,000 MMT of C02e.[119]

The Council on Environmental Quality ("CEQ") has recognized the unique nature of climate change and the challenges it imposes on NEPA compliance 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*.[120] The Final Guidance applies to all proposed federal agency actions, "including land and resource management actions."[121] In its Final Guidance, the CEQ recognized 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 are 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 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.[122]

Unfortunately, here, while BLM calculates direct and indirect greenhouse gas emissions for the 490 proposed wells, *see* EA at 62–64, BLM's analysis remains incomplete. First, we request that BLM explain how it reaches its per well emissions estimate detailed on page 63 of

[117] Merill, M.D., et al., *supra*, at 6.

[118] *Id.* at 7 (adding together oil and gas related emissions provided in Table 1).

[119] Mulvaney et al., The Potential Greenhouse Gas Emissions from U.S. Federal Fossil Fuels 1, 3 (2015), EcoShift Consulting (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 42).

[120] 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 (2016) (hereinafter, "Final Climate Guidance") (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 43). Although the Trump Administration has since revoked the CEQ's August 2016 Climate Guidance and the BLM revoked IM No. 2017-003 regarding the Guidance on October 24, 2017, the BLM is still bound by the CEQ's NEPA regulations and existing case law applying the Guidance. *See Sierra Club v. Fed. Energy Regulatory Comm'n*, 867 F.3d 1357, 1374 (D.C. Cir. 2017); *San Juan Citizens All. v. U.S. Bureau of Land Mgmt*., 326 F. Supp. 3d 1227, 1243 at n.5 (D.N.M. 2018).

[121] *Id*. at 9.

[122] *Id.* at 10-11.

the EA. We are concerned about the accuracy of these emissions estimates if BLM is relying on top down EPA National Emissions Inventory and GHG inventory data because a number of studies have found that EPA emissions inventories significantly underestimate methane emissions. For example, a report from Environmental Defense Fund found that EPA's emissions report underestimates methane emissions by 60%.[123] Other reports have found similar inaccuracies with underestimates up to 15%.[124]

Second, we are concerned that BLM's estimates of gas well operation emissions are very low. According to a BLM study of Colorado deep oil and gas wells (table below), gas well operation emissions levels are significantly higher (10 times) than BLM predicts. We request that BLM explain why its numbers are so much lower than this study completed for the BLM.

Table 0-4. Per-Well Emissions Estimates

Resource/Phase	PM_{10} tpy	$PM_{2.5}$ tpy	NO_x tpy	SO_2 tpy	CO tpy	VOC tpy	HAPs tpy	CO_2 tpy	CH_4 tpy	N_2O tpy
Oil										
Construction	28.51	3.61	11.16	0.03	2.63	0.75	0.08	1,518.74	0.03	0.01
Operation	15.62	1.64	10.58	0.01	6.26	20.96	2.01	1,149.23	20.86	0.02
Maintenance	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00
Reclamation	0.06	0.01	0.02	0.00	0.01	0.00	0.00	1.73	0.00	0.00
Total	44.27	5.27	21.75	0.03	8.90	21.72	2.09	2,670.32	20.89	0.03
Natural Gas										
Construction	28.62	3.63	11.18	0.03	2.77	0.76	0.08	1,563.51	0.03	0.01
Operation	14.68	1.65	4.53	0.01	8.06	33.30	3.65	1,211.83	31.69	0.01
Maintenance	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00
Reclamation	0.06	0.01	0.02	0.00	0.01	0.00	0.00	1.73	0.00	0.00
Total	43.45	5.30	15.73	0.03	10.84	34.06	3.73	2,777.69	31.72	0.03

Source: URS Group, Draft Oil & Gas Air Emissions Inventory Report for Seven Lease Parcels in the BLM Royal Gorge Field Office (2013)[125]

Third, we again request that BLM calculate total direct emissions from the wells over the lifetime of the propose wells. The wells that BLM approves today through the May 2020 lease sale will emit GHGs for decades. BLM cannot omit calculations of total lifetime direct and indirect emissions. To do so would be to significantly underestimate the long-term impacts of the proposed leases.

Fourth, BLM fails to explain why it relies solely on a 100-year global warming potential ("GWP") to assess the impacts of indirect greenhouse gas emissions as opposed to using both the 100 and 20-year GWP. *See* EA at 63. As BLM is well aware, methane is a short-lived but potent

[123] Envtl. Def. Fund, Major Studies Reveal 60% More Methane Emissions, https://www.edf.org/climate/methane-studies (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 44); Alvarez et al., Assessment of Methane Emissions from the U.S. Oil and Gas Supply Chain, 361 Science 186, 186 (2018) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 44.5).

[124] Miller et al., Anthropogenic Emission of Methane in the United States, 110 PNAS 20018, 20018 (2013) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 45).

[125] Previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 46.

greenhouse gas.[126] Methane emitted today will last in the atmosphere for approximately a decade. Thus, use of a 100-year GWP effectively nullifies the short-term impacts of methane. The scientific community has argued for a number of years that agencies should use both factors to estimate short and long term effects.[127] On EPA's website about GWPs, the agency specifically notes that the scientific community recommends use of alternative GWPs, including a 20-year GWP, to more accurately measure the impacts of methane.[128] And, the IPCC's 2014 Fifth Assessment notes, "[t]he choice of time horizon markedly affects the weighting especially of short-lived climate forcing agents, such as methane (CH4)" [129] and that "the choice of time horizon is a value judgment because it depends on the relative weight assigned to effects at different times."[130] Here, because BLM's RFDS predicts well development for the next = twenty years, it would be preeminently reasonable for BLM to assess indirect emissions using both a 20-year GWP and 100-year GWP. We request that BLM either do so or explain why such an approach would not meet the agency's requirements under NEPA. 40 C.F.R. § 1508.27(a) (require a hard look at short term and long term impacts); *see also Western Org. of Resource Councils v. U.S. Bureau of Land Mgmt.*, CV 16-21-GF-BMM, 2018 WL 1475470, at *15–16 (D. Mont. Mar. 26, 2018) (holding that BLM must explain its use of the 100-year GWP in light of changing science on the issue).

In response to this, BLM claims that it includes emissions calculations using the 20-year GWP. EA at 160. But, no such information is apparent in the draft EA.

Finally, as discussed in more depth below, BLM also fails to properly assess the significance of GHG emissions. For example, for direct emissions BLM implies that direct emissions are insignificant based on comparisons to statewide and national emissions. *See* EA at 63. But, these comparisons provides little to no context for the reader to assess the significance of the proposed lease sale and are simply a restatement of the nature of climate change. As the CEQ's Final Climate Guidance indicates, "[w]hen considering GHG emissions and their significance, agencies should use appropriate tools and methodologies for quantifying GHG emissions and comparing GHG quantities across alternative scenarios. *Agencies should not limit themselves to calculating a proposed action's emissions as a percentage of sector, nationwide, or global emissions in deciding whether or to what extent to consider climate change impacts under NEPA.*"[131] Here, a better assessment of significance would be a comparison of GHG emissions between alternatives reducing development, calculation of the social cost of carbon, assessment of the proposed action within the context of carbon budgeting, and/or assessment of the proposed action as compared to past lease sales. We request that BLM properly discuss

[126] Enviro. Prot. Agency, Greenhouse Gas Emissions: Understanding Global Warming Potentials, https://www.epa.gov/ghgemissions/understanding-global-warming-potentials (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 47).

[127] Enviro. Def. Fund, Paper Proposes Two-Value Reporting of Global Warming Potential (2017), https://www.edf.org/media/paper-proposes-two-value-reporting-standard-global-warming-potential (last visited Jan. 3, 2020) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 48).

[128] EPA, Understanding Global Warming Potentials, supra.

[129] IPCC, 2014 *Synthesis Report, Summary for Policy Makers*, supra, Box 3.2 at 87–88.

[130] IPCC, Climate Change 2013: The Physical Science Basis 711–712 (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 49).

[131] CEQ Final Climate Guidance, *supra*.

whether these metrics would be helpful in assessing significance before moving forward.

For indirect emissions, BLM abandons its percentage comparison even though it includes the national and regional indirect emissions numbers required to make such a calculation. As a result, BLM fails to include any measure of significance for indirect emissions. We again request that BLM use the tools discussed below to assess significant as required by NEPA before approving the leases at issue.

iii. BLM Must Fully Quantify Impacts from Cumulative Greenhouse Gas Emissions From the Project as a Whole.

BLM must also properly complete a cumulative impacts analysis of the proposed alternatives, including an assessment of the cumulative greenhouse gas emissions that will result. 40 C.F.R. §§ 1502.14, 1508.7; *Center for Biological Diversity v. National Highway Traffic. Admin.*, 538 F.3d 1172, 1215 (9th Cir. 2008). Specifically, BLM must analyze greenhouse gas emissions from any federal, state, and private oil and gas leasing and development projects as well as any other GHG-emitting projects in the region such as coal plants, transportation, etc. BLM must also analyze the cumulative GHG emissions from the federal fossil fuel program as a whole.

CEQ NEPA regulations define "cumulative impacts" as:

> 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. § 1508.7.

Here, BLM continues to fail to assess cumulative greenhouse gas emissions from reasonably foreseeable lease sales occurring in the region and nation as required by NEPA and the recent court decision in *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 63 (D.D.C. 2019). Instead, BLM solely looks at cumulative emissions in the Pecos District. This approach ignores emissions from BLM leases occurring just across the border in neighboring states. For example, BLM has sold, is selling, and will be selling thousands of acres of oil and gas leases, including:

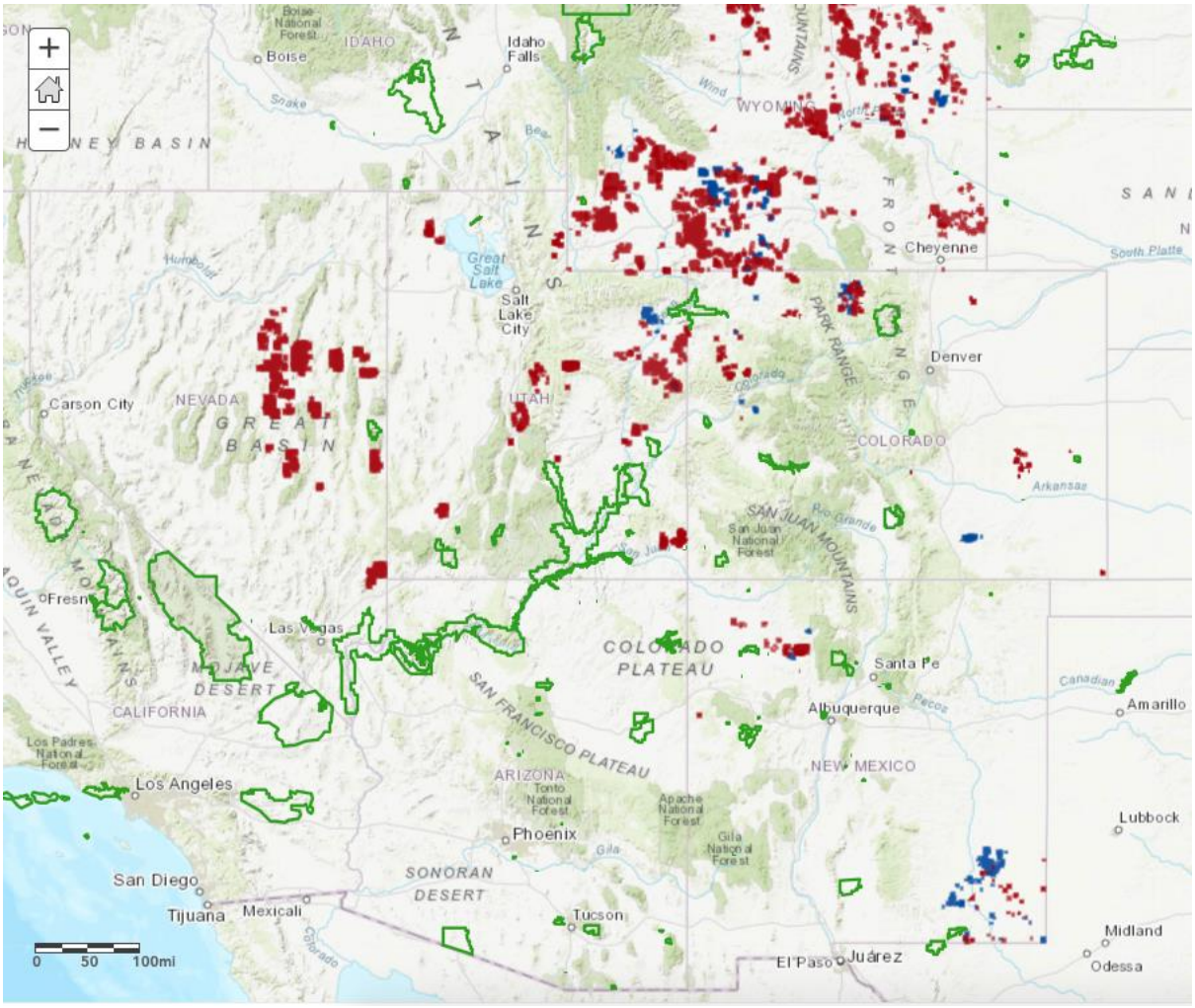
- New Mexico, Texas, Oklahoma, & Kansas: At the December 2018 sale, BLM sold 107 parcels in northwestern and southeastern New Mexico, https://www.blm.gov/press-release/blm-quarterly-oil-and-gas-lease-sale-nets-39327344. At the March 2019 lease sale, BLM sold 36 parcels totaling 10,535,07 acres in New Mexico, https://eplanning.blm.gov/epl-front-office/projects/nepa/115496/20010153/250013083/Sale_Results_03282019.pdf. At the June 2019 sale, BLM sold 47 parcels totaling 38,789.97 acres, https://eplanning.blm.gov/epl-front-

office/projects/nepa/119017/175501/213815/June_2019_New_Mexico_Oil_and_Gas_Lease_Sale_Results.pdf. At the September 2019 lease sale, BLM sold 15 parcels (3,174.08 acres), https://eplanning.blm.gov/epl-front-office/projects/nepa/120851/20003079/250003684/September_2019_Lease_Sale__Results.pdf. And, at the November 2019 sale, BLM sold 16 parcels totaling 7,619.46 acres, https://eplanning.blm.gov/epl-front-office/projects/nepa/122445/20008006/250009446/November_2019_Oil_and_Gas_Lease_Sale_Results.pdf.

- Colorado: BLM sold 20 parcels totaling 7,847.250 acres at the December 2018 lease sale across the state, https://eplanning.blm.gov/epl-front-office/projects/nepa/109938/164060/200164/Sale_Results_December2018.pdf. BLM sold 5 parcels (1,055.150 acres) at its March 2019 sale, https://eplanning.blm.gov/epl-front-office/projects/nepa/115103/169660/206230/Sale_Results_March2019.pdf. For its June 2019 lease sale, BLM sold 17 parcels (8,176.84 acres), https://eplanning.blm.gov/epl-front-office/projects/nepa/119117/175852/214216/Sale_Results_June2019.pdf. And, for its September 2019 lease sale, BLM sold 49 parcels (42,148.72 acres), https://eplanning.blm.gov/epl-front-office/projects/nepa/121040/20004618/250005475/Sale_Results_Sept2019.pdf.

- Utah: BLM sold 96 parcels totaling 139,079.68 acres at its December 2018 sale, https://www.blm.gov/sites/blm.gov/files/UtahSaleResultsSummary_Dec2018.pdf. For March 2019, BLM sold 90 parcels totaling 135,123.47 acres, https://eplanning.blm.gov/epl-front-office/projects/nepa/117403/169445/206045/4UtahSaleResultsSummary.pdf. For June 2019, BLM sold 8 acres totaling 9,822.52 acres, https://eplanning.blm.gov/epl-front-office/projects/nepa/119572/174908/212467/3-June2019_CompSaleResultsSummary.pdf. And, for September 2019, BLM sold 63 parcels (70,345.40 acres), https://eplanning.blm.gov/epl-front-office/projects/nepa/121035/20003558/250004196/CompSaleResultsSummary.pdf.

The map below shows the extensive spread of oil and gas leasing across the West since the beginning of 2019 and into 2020.



BLM lease sale parcels from 2019 are in red. Parcels for 2020 are in blue.

As the court made clear in *WildEarth Guardians v. Zinke*, BLM cannot ignore the impacts from these similar, cumulative federal lease sales—even those in neighboring states—and indeed must quantify emissions from these reasonably foreseeable lease sales. 368 F. Supp. 3d 41, 83 (D.D.C. 2019) ("Given the national, cumulative nature of climate change, considering each individual drilling project in a vacuum deprives the agency and the public of the context necessary to evaluate oil and gas drilling on federal land before irretrievably committing to that drilling."). Here, it is incredibly puzzling why such information is not included seeing as BLM included calculations from reasonably foreseeable BLM New Mexico lease sales in its draft EA for the September 2019 sale.[132]

The need to take into account "similar" and "cumulative" actions is underscored by the fact that BLM frequently acknowledges that the proper geographic area for analyzing and

[132] *See* BLM, September 2019 Competitive Oil and Gas Lease Sale Environmental Assessment Pecos District Office DOI-BLM-NM-P000-2019-0003 at 42 (2019), https://eplanning.blm.gov/epl-front-office/projects/nepa/120851/176147/214658/07052019_PDO_Sept_2019_Lease_Sale_EA_508.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 50).

assessing cumulative impacts of greenhouse gas emissions is on a statewide, regional, and global scale. *See, e.g.*, EA at 63 (describing direct emissions as a percentage of the state of New Mexico, the United States, and the globe). Although this assessment was apparently prepared to try to mislead the public into believing that emissions from the proposed development are not significant, it actually emphasizes the need for BLM to not simply account for emissions from the proposed lease sales, but to also account for all greenhouse gas emissions associated with BLM-approved oil and gas projects and lease sales region-wide. BLM cannot insinuate that emissions are insignificant in the context of state and regional emissions, but then fail to disclose the direct, indirect, and cumulative greenhouse gases that would result from all other "similar" and "cumulative" actions within the region. Thus, BLM's cumulative impacts analysis remains incomplete.

Finally, BLM must also account for state and private actions occurring both inside and outside the Pecos District Office. For example, the New Mexico State Land Office held a lease sale in January 2020 which sold 11 parcels totaling 3,858.92 acres.[133] The SLO plans to sell an additional 17 parcels (4,199.98 acres) in February.[134] Texas also consistently holds oil and gas lease sales with parcels right across the border. According to EnergyNet, an online auction website, Texas held an oil and gas lease on October 8, 2019.[135] A number of parcels from this sale are approximately 10 miles from BLM New Mexico parcels proposed for sale in May. BLM cannot ignore these cumulative actions and the impacts that will result.

In response, BLM claims that it has analyzed some regional impacts and that to the extent that it has not, it is within the agency's discretion to define the cumulative impacts analysis area. EA at 159. This argument misses the mark. First, BLM's RFDS solely assess development within the Pecos District. Therefore, wells in Texas are not included. Second, the court in *WildEarth Guardians v. Zinke* was clear, "[t]o the extent other BLM actions in the region—such as other lease sales—are reasonably foreseeable when an EA is issued, BLM must discuss them as well." 368 F. Supp. 3d 41, 77 (D.D.C. 2019). Because BLM does not include this information here, its analysis is incomplete.

K. BLM Must Assess the Significance of Greenhouse Gas Emissions.

BLM must also properly assess the significance of the direct, indirect, and cumulative climate change impacts from the challenged lease sales. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (holding that NEPA imposes "action forcing procedures . . . requir[ing] that agencies take a *hard look* at environmental consequences"). As the CEQ has recognized, simply providing GHG emissions in the abstract, or comparing incremental emissions to regional and national totals, fails to inform the decision-maker of the *significance* of the *impacts*. In other words, to appreciate the significance of the impacts of the lease sales, the

[133] EnergyNet Listing, New Mexico State Land Office Sealed Bid Lease Sale, Full Results, Jan 14-21, 2020 (last visited Feb. 7, 2020) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 51).

[134] EnergyNet Listing, New Mexico State Land Office Sealed Bid Lease Sale, Feb. 18, 2020 (last visited Feb, 7, 2020) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 52).

[135] EnergyNet Listing, Texas General Land Office Oil and Gas Lease Sale, Sale Results, Oct. 8, 2019, https://www.energynet.com/govt_listing.pl?sg=5151 (last visited Feb, 7, 2020) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 53).

decision-maker must understand the *context* in which those lease sales are occurring. That context is a global climate crisis.

i. BLM Must Assess the Costs of Reasonably Foreseeable Carbon Emissions Using Well-Accepted, Credible, GAO-Endorsed, Interagency Methods for Assessing Carbon Costs.

Because BLM's fails to properly assess significance in other ways (e.g. through a comparison of alternatives reducing development), BLM's failure in the EA to use the social cost of carbon violates NEPA's hard look mandate. 40 C.F.R. §§ 1500.1(b), 1502.24; *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 79, n.31 (D.D.C. 2019) ("BLM may not forgo using the social cost of carbon simply because courts have thus far been reluctant to mandate it. Given that the Department of Energy and other agencies consider the social cost of carbon reliable enough to support rulemakings, see *Zero Zone, Inc. v. U.S. Dep't of Energy*, 832 F.3d 654, 677 (7th Cir. 2016), the protocol may one day soon be a necessary component of NEPA analyses.").

NEPA does not, of course, require agencies to monetize adverse impacts in all cases. *See* 40 C.F.R. § 1502.23. NEPA does, however, require BLM to take a hard look at the "ecological …, aesthetic, historic, cultural, economic, social, [and] health," effects of its actions, "whether direct, indirect, or cumulative." 40 C.F.R. § 1508.8. Monetization of costs may be required where available "alternative mode[s] of [NEPA] evaluation [are] insufficiently detailed to aid the decision-makers in deciding whether to proceed, or to provide the information the public needs to evaluate the project effectively," *Columbia Basin Land Prot. Ass'n v. Schlesinger*, 643 F.2d 585, 594 (9th Cir. 1981), or the agency presents a misleading analysis assessing the economic benefits of the project without a counterbalanced discussion of economic costs, *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F.Supp. 3d 1174, 1193 (D. Colo. 2014).

The social cost of carbon protocol is a valid, well-accepted, credible, and interagency-endorsed method of calculating the costs of greenhouse gas emissions and understanding the potential significance of such emissions. Through the protocol, agencies "estimate the economic damages associated with a small increase in carbon dioxide (CO2) emissions, conventionally one metric ton, in a given year [which] represents the value of damages avoided for a small emission reduction (i.e. the benefit of a CO2 reduction)."[136] The protocol was developed by an interagency working group ("IWG") consisting of several federal agencies. [137]

[136] U.S. Environmental Protection Agency ("EPA"), "Fact Sheet: Social Cost of Carbon" (Nov. 2013) at 1, formerly available online at https://www.epa.gov/climatechange/social-cost-carbon (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 54).

[137] Although Executive Order 13783 disbanded the Interagency Working Group, the entity which developed the social cost of carbon protocol, and withdrew the technical support documents discussed below, the protocol is still "generally accepted in the scientific community." 40 C.F.R. § 1052.22(b)(4); Katharine Ricke et. al, *Country-Level Social Cost of Carbon*, Nature Climate Change, Vol. 8, 895 (2018), https://www.nature.com/articles/s41558-018-0282-y (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 55). Indeed, the Trump Administration still uses the SCC protocol despite drastically reducing the damages caused by carbon emissions. *See* Brad Plumer, *Trump Put a Low Cost of Carbon Emissions. Here's Why It Matters*, New York Times, Aug. 23, 2018, https://www.nytimes.com/2018/08/23/climate/social-cost-carbon.html (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 56).

The IWG issued its first set of estimates of carbon costs in 2020.[138] Based on the world's continued delay to address the climate crisis, the IWG proceeded to revise these estimates in 2013,[139] 2015,[140] and 2016.[141] Most recently, as an addendum to previous Technical Support Documents regarding the social cost of carbon, the Department of the Interior joined numerous other agencies in preparing estimates of the social cost of methane and other greenhouse gases.[142]

As of its 2016 report, the IWG estimated the cost of carbon emissions, and therefore the benefits of reducing carbon emissions, to range from $10 to $212 per metric ton of carbon dioxide. *See* Chart Below. For the year 2020, the IWGs central estimate is $42 per metric ton.[143]

Year	5% Average	**3% Average**	2.5% Average	High Impact (95th Pct at 3%)
2010	10	**31**	50	86
2015	11	**36**	56	105
2020	12	**42**	62	123
2025	14	**46**	68	138
2030	16	**50**	73	152
2035	18	**55**	78	168
2040	21	**60**	84	183
2045	23	**64**	89	197
2050	26	**69**	95	212

Most recent social cost of carbon estimates presented by Interagency Working Group on Social Cost of Carbon. The 95th percentile value is meant to represent "higher-than-expected" impacts from climate change.

[138] Interagency Working Group on Social Cost of Carbon, "Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866" (Feb. 2010), https://www.epa.gov/sites/production/files/2016-12/documents/scc_tsd_2010.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 57).

[139] Interagency Working Group on Social Cost of Carbon, "Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866" (May 2013), https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/inforeg/technical-update-social-cost-of-carbon-for-regulator-impact-analysis.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 58).

[140] Interagency Working Group on Social Cost of Carbon, "Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866" (July 2015) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 59).

[141] Interagency Working Group on Social Cost of Greenhouse Gases, "Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866" (Aug. 2016), https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc_tsd_final_clean_8_26_16.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 60).

[142] Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, "Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide" (Aug. 2016) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 61).

[143] *Id.* at 4.

In July 2014, the U.S. Government Accountability Office ("GAO") confirmed that the Interagency Working Group's estimates were based on sound procedures and methodology.[144]

Although often utilized in the context of agency rulemakings, the protocol has been recommended for use and has been used in project-level decisions. For instance, the EPA recommended that an EIS prepared by the U.S. Department of State for the proposed Keystone XL oil pipeline include "an estimate of the 'social cost of carbon' associated with potential increases of GHG emissions."[145]

More importantly, BLM's Billings Field Office, has also utilized the social cost of carbon protocol in the context of oil and gas approvals. For example, the Billings Field Office estimated "the annual SCC [social cost of carbon] associated with potential development on lease sale parcels."[146] In conducting its analysis, the BLM used a "3 percent average discount rate and year 2020 values," presuming social costs of carbon to be $46 per metric ton.[147] Based on its estimate of greenhouse gas emissions, the agency estimated total carbon costs to be "$38,499 (in 2011 dollars)."[148] In Idaho, the BLM also utilized the social cost of carbon protocol to analyze and assess the costs of oil and gas leasing. Using a 3% average discount rate and year 2020 values, the agency estimated the cost of carbon to be $51 per ton of annual CO_2e increase.[149] Based on this estimate, the agency estimated that the total carbon cost of developing 25 wells on five lease parcels to be $3,689,442 annually.[150]

To be certain, the social cost of carbon protocol presents a conservative estimate of economic damages associated with the environmental impacts climate change. As the EPA has noted, the protocol "does not currently include all important [climate change] damages."[151] As explained:

> The models used to develop [social cost of carbon] estimates do not currently include all of the important physical, ecological, and economic impacts of climate change recognized in the climate change literature because of a lack of precise information on the

[144] GAO, "Regulatory Impact Analysis, Development of Social Cost of Carbon Estimates," GAO-14-663 (July 2014), http://www.gao.gov/assets/670/665016.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 62).

[145] EPA, Comments on Supplemental Draft EIS for the Keystone XL Oil Pipeline (June 6, 2011) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 63).

[146] BLM, "Environmental Assessment for October 21, 2014 Oil and Gas Lease Sale," DOI-BLM-MT-0010-2014-0011-EA (May 19, 2014) at 76, https://blm_prod.opengov.ibmcloud.com/sites/blm.gov/files/MT-DAKS%20Billings%20Oct%202014%20EA%20Protest.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 64).

[147] *Id*.

[148] *Id*.

[149] BLM, "Little Willow Creek Protective Oil and Gas Leasing," EA No. DOI-BLM-ID-B010-2014-0036-EA 81 (Feb. 10, 2015), https://eplanning.blm.gov/epl-front-office/projects/nepa/39064/55133/59825/DOI-BLM-ID-B010-2014-0036-EA_UPDATED_02272015.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 65).

[150] *Id*. at 83.

[151] EPA Factsheet on SCC, supra, at 1.

> nature of damages and because the science incorporated into these models naturally lags behind the most recent research.

Id. In fact, more recent studies have reported significantly higher carbon costs. For instance, a report published in 2015 found that current estimates for the social cost of carbon should be increased six times for a mid-range value of $220 per ton.[152] A report from 2017, estimated carbon costs to be $50 per metric ton, a value that experts have found to be the "best estimate of the social cost of greenhouse gases."[153] In spite of uncertainty and likely underestimation of carbon costs, nevertheless, "the SCC is a useful measure to assess the benefits of CO2 reductions," and thus a useful measure to assess the costs of CO2 increases.[154]

That the economic impacts of climate change, as reflected by an assessment of social cost of carbon, should be a significant consideration in agency decision making, is emphasized by a 2014 White House report, which warned that delaying carbon reductions would yield significant economic costs.[155] As the report states:

> [D]elaying action to limit the effects of climate change is costly. Because CO_2 accumulates in the atmosphere, delaying action increases CO_2 concentrations. Thus, if a policy delay leads to higher ultimate CO_2 concentrations, that delay produces persistent economic damages that arise from higher temperatures and higher CO_2 concentrations. Alternatively, if a delayed policy still aims to hit a given climate target, such as limiting CO_2 concentration to given level, then that delay means that the policy, when implemented, must be more stringent and thus more costly in subsequent years. In either case, delay is costly.[156]

The requirement to analyze the social cost of carbon is supported by the general requirements of NEPA and is specifically supported in federal case law. Courts have ordered agencies to assess the social cost of carbon pollution, even before a federal protocol for such analysis was adopted. In 2008, the U.S. Court of Appeals for the Ninth Circuit ordered the National Highway Traffic Safety Administration to include a monetized benefit for carbon emissions reductions in an Environmental Assessment prepared under NEPA. *Center for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1203 (9th Cir. 2008). The Highway Traffic Safety Administration had proposed a rule setting corporate average fuel economy standards for light trucks. A number of states and public interest groups challenged the rule for, among other things, failing to monetize the benefits that would accrue

[152] Moore, C.F. and B.D. Delvane, "Temperature impacts on economic growth warrant stringent mitigation policy," Nature Climate Change 2 (January 12, 2015) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 66).

[153] Revesz, R. *et al*. "Best cost estimate of greenhouse gases," 357 *Science* 655, 655 (Aug. 18, 2017) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 67).

[154] EPA Factsheet on SCC, supra.

[155] Executive Office of the President of the United States, "The Cost of Delaying Action to Stem Climate Change," (July 2014) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 68).

[156] *Id.* at 1.

from a decision that led to lower carbon dioxide emissions. The Administration had monetized the employment and sales impacts of the proposed action. *Id*. at 1199. The agency argued, however, that valuing the costs of carbon emissions was too uncertain. *Id*. at 1200. The court found this argument to be arbitrary and capricious. *Id*. The court noted that while estimates of the value of carbon emissions reductions occupied a wide range of values, the correct value was certainly not zero. *Id.* It further noted that other benefits, while also uncertain, were monetized by the agency. *Id*. at 1202.

In 2014, a federal court did likewise for a federally-approved coal lease. That court began its analysis by recognizing that a monetary cost-benefit analysis is not universally required by NEPA. *See High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F.Supp. 3d 1174, 1193 (D. Colo. 2014) (citing 40 C.F.R. § 1502.23). However, when an agency prepares a cost-benefit analysis, "it cannot be misleading." *Id*. at 1182 (citations omitted). In that case, the NEPA analysis included a quantification of benefits of the project, but, the quantification of the social cost of carbon, although included in earlier analyses, was omitted in the final NEPA analysis. *Id*. at 1196. The agencies then relied on the stated benefits of the project to justify project approval. This, the court explained, was arbitrary and capricious. *Id*. Such approval was based on a NEPA analysis with misleading economic assumptions, an approach long disallowed by courts throughout the country. *Id*. Furthermore, the court reasoned that even if the agency had decided that the social cost of carbon was irrelevant, the agency must still provide "*justifiable reasons* for not using (or assigning minimal weight to) the social cost of carbon protocol . . . ." *Id.* at 1193 (emphasis added). In August 2017, a federal district court in Montana cited to the *High Country* decision and reaffirmed its reasoning, rejecting a NEPA analysis for a coal mine expansion that touted the economic benefits of the expansion without assessing the carbon costs that would result from the development. *See Mont. Envtl. Info. Ctr. v. U.S. Office of Surface Mining*, No. CV 15-106-M-DWM (D. Mont. Aug. 14, 2017).

A 2015 op-ed in the New York Times from Michael Greenstone, the former chief economist for the President's Council of Economic Advisers, confirms that it is appropriate and acceptable to calculate the social cost of carbon when reviewing whether to approve fossil fuel extraction.[157] In 2017, the Proceedings of the National Academy of Sciences of the United States of America ("PNAS"), acknowledged in a peer-reviewed article from February of this year that the social cost of carbon analysis is "[t]he most important single economic concept in the economics of climate change," and that "federal regulations with estimated benefits of over $1 trillion have used the SCC."[158]

In response, BLM presents four arguments: 1) that the lease sale is not a rulemaking, 2) NEPA does not require a cost benefit analysis, 3) the protocol provides too broad of estimates to be useful, and 4) BLM has not assessed benefits of the lease sale. *See* EA, App'x E. Based on the information above, BLM's arguments must fail. Addressing the first and third arguments, BLM

[157] Greenstone, M., "There's a Formula for Deciding When to Extract Fossil Fuels," New York Times (Dec. 1, 2015), available at https://www.nytimes.com/2015/12/02/upshot/theres-a-formula-for-deciding-when-to-extract-fossil-fuels.html (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 69).

[158] William D. Nordhaus, Revisiting the Social Cost of Carbon, PNAS, Feb. 14, 2017, http://www.pnas.org/content/114/7/1518.full.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 70).

has used the protocol with success at the lease sale level in the past as shown by the EA's for the Montana BLM's May 2014 lease sale and Idaho BLM's February 2015.[159] And, exact precision of numbers is not required. NEPA simply requires reasonable forecasting. Second, and perhaps more importantly, BLM has to assess the significance of its lease sale in some way, and it has failed to use any of the scientifically-accepted tools to do so for this lease sale. BLM's only attempt at assessing significance—comparing emissions on a statewide and national level—fails to give the public information with which to weigh the impacts of the proposed action because it simply demonstrates the nature of climate as the CEQ has stated. Thus BLM must use alternative methods. For example, BLM could compare alternatives which reduce levels of development, use the social cost of carbon, use carbon budgeting, and/or compare the lease sale to other lease sales. Either way, summarily rejecting the social cost of carbon protocol does not suffice to meet NEPA's requirements. Finally, although BLM does not specifically quantify economic benefits in the May 2020 EA, BLM consistently assesses economic benefits within the underlying RMPs and touts royalties and bonus bids in press releases with the lease sale results.[160] Also, in the May 2020 EA BLM notes under the No Action Alternative that by adopting it "no royalties would accrue to Federal or State treasuries." EA at 11. Without providing an accurate counter to these statements using the social cost of carbon, BLM risks misleading the reader.

In sum, the social cost of carbon provides a useful, valid, and meaningful tool for assessing the climate consequences of the proposed leasing, and BLM must discuss the benefits of this tool before continuing on with the lease sale.

ii. BLM Must Assess the Significance of Its Action Within the Context of Global Carbon Budgeting.[161]

Carbon budgeting is another valuable tool for assessing the significance of GHG emissions in the context of the climate crisis. A "carbon budget" offers a cap on the remaining stock of greenhouse gases that can be emitted while still keeping global average temperature rise below scientifically-based warming thresholds beyond which climate change impacts are highly likely to result in severe and irreparable harm to the biosphere and humanity. Carbon budgeting gets closer to the question of climate impacts, as opposed to comparing incremental project emissions to static annual emissions, because it is adjusted based on current day emission levels and remaining budgets for both the world and the U.S. Here, because BLM fails to assess significance in other ways, BLM must specifically assess whether other methodologies for quantifying climate change, such as carbon budgeting, would contribute to informed decisionmaking. *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 79 n.31 (D.D.C. 2019). Simply providing GHG emissions in the abstract, or comparing lease sale emissions to regional and national totals, fails to inform the decision-maker and the public of the *significance* of the *impacts*.

[159] *See supra*.

[160] BLM, *BLM New Mexico Oil and Gas Lease Sale Nets More Than $130 Million* (Sept. 7, 2017), https://www.blm.gov/press-release/blm-new-mexico-oil-and-gas-lease-sale-nets-more-130-million.

[161] BLM does not respond to our argument on carbon budgeting in its response to comments.

The science of carbon budgeting is not new. Starting in 2014, the IPCC calculated world carbon budgets and concluded that the only way to meet these budgets was to ratchet down fossil fuels. Specifically, the IPCC, in its 2014 AR5 Synthesis Report, found that carbon emissions from burning *existing* fossil fuel reserves—the known belowground stock of extractable fossil fuels—would considerably exceed both 2°C and 1.5°C of warming.[162] "Estimated total fossil carbon reserves exceed this remaining [world carbon budget] by a factor of 4 to 7."[163] In raw magnitude, global coal, oil and gas resources considered currently economically recoverable contain potential greenhouse gas emissions of 4,196 $GtCO_2$,[164] with the IPCC indicating they are as high as 7,120 $GtCO_2$.[165]

These findings are echoed by other research. To constrain warming within the 2°C guardrail, a 2015 study published in *Nature* found that "a third of oil reserves, half of gas reserves and over 80 percent of current coal reserves should remain unused from 2010-2050."[166] And, in a 2016 analysis, Oil Change International found that burning the oil, gas, and coal in the world's *currently operating* fields and mines would fully exhaust and exceed carbon budgets calibrated to constrain warming below 1.5°C or 2°C.[167] Moreover, Oil Change International found that burning the reserves in currently operating oil and gas fields, excluding coal mines, would alone lead to warming beyond 1.5°C.[168] Put simply, regardless of what IPCC carbon budget calculations are used, *most* of the existing oil and gas fields and coal mines will need to be closed before their reserves are fully extracted in order to limit warming to 1.5°C and that some existing fields and mines will need to be closed to limit warming to 2°C.[169]

More recently, the IPCC's 2018 *Global Warming of 1.5°C* special report provided a revised carbon budget for a 66 percent probability of limiting warming to 1.5°C, estimated at 420 $GtCO_2$ and 570 $GtCO_2$ depending on the temperature dataset used, from January 2018 onwards.[170] The IPCC also found that compared with the average global emissions rate of 36 $GtCO_2$ per year for 2012-2014, the global emissions rate had increased to 42 $GtCO_2$ per year.[171] At this rate, the global carbon budget would be expended in just 10 to 14 years, underscoring the

[162] IPCC 2014 AR5 Synthesis Report, *supra*, at 63.

[163] *Id.*

[164] Michael Raupach, *et al.*, *Sharing a Quota on Cumulative Carbon Emissions*, 4 Nature Climate Change 873, 875 (2014) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 71).

[165] IPCC, AR5, *Climate Change 2014: Mitigation of Climate Change* at Table 7.2, https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_full.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 72).

[166] Christopher McGlade & Paul Ekins, *The Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming to 2°C*, 517 Nature 187 (2015) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 73).

[167] Greg Muttitt, *et al.*, Oil Change International, *The Sky's Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production* 6 (2016) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 74).

[168] *Id.*

[169] *Id.* at 5, 7.

[170] IPCC, Global Warming of 1.5°C, Summary for Policymakers, supra, at SPM-16.

[171] *Id.*

urgent need for transformative global action to transition from fossil fuel use to clean energy.[172] In fact, according to the U.S. Global Change Research Program, we may have *already* burned through the world's entire carbon budget needed to limit average warming to 1.5°C.[173]

In effect, we're burning through our carbon budget at a rapid pace and thereby limiting the flexibility future generations may require or desire as they intensify our world's transition away from fossil fuels. BLM must acknowledge that the 393 wells, as well as the remainder of the 3,200 wells projected in the RFDS, will continue generating GHG emissions long after the world's carbon budget has been exhausted. The agency must further assess the implications and impacts of its decisions to knowingly permit expansion of fossil fuel development and GHG emissions directly incompatible with meeting global carbon reduction targets.

To put these global carbon budgets in the specific context of domestic U.S. emissions and the U.S.' obligation to reduce emissions, the U.S. is the world's largest historic emitter of greenhouse gas pollution, responsible for 26 percent of cumulative global CO_2 emissions since 1870, and is currently the world's second highest emitter on an annual and per capita basis.[174] To conform to a 1.5°C target, the estimated U.S. carbon budget is 25 $GtCO_2eq$ to 57 $GtCO_2eq$ on average,[175] depending on the sharing principles used to apportion the global budget across countries.[176] The estimated U.S. carbon budget consistent with limiting temperature rise to 2°C ranges from 34 $GtCO_2$ to 123 $GtCO_2$,[177] again depending on the sharing principles used. Under any scenario, the remaining U.S. carbon budget compatible with the Paris climate targets is extremely small.

[172] *Id.*

[173] NCA4 Vol. I, at 396-97.

[174] Global Carbon Project, Global Carbon Budget 2019, https://www.globalcarbonproject.org/carbonbudget/19/files/GCP_CarbonBudget_2019.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 75).

[175] Robiou du Pont, Yann et al., EQUITABLE MITIGATION TO ACHIEVE THE PARIS AGREEMENT GOALS, 7 NATURE CLIMATE CHANGE 38, Supplemental Tables 1 and 2 (2017) (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 76). Quantities measured in $GtCO_2eq$ include the mass emissions from CO_2 as well as the other well-mixed greenhouse gases (CO_2,methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and SF_6) converted into CO_2-equivalent values, while quantities measured in $GtCO_2$ refer to mass emissions of just CO_2 itself.

[176] Robiou du Pont et al. (2017) averaged across IPCC sharing principles to estimate the U.S. carbon budget from 2010 to 2100 for a 50 percent chance of returning global average temperature rise to 1.5°C by 2100, consistent with the Paris Agreement's "well below 2°C" target, and based on a cost-optimal model. The study estimated the U.S. carbon budget consistent with a 1.5°C target at 25 $GtCO_2eq$ by averaging across four equity principles: capability (83 $GtCO_2eq$), equal per capita (118 $GtCO_2eq$), greenhouse development rights (-69 $GtCO_2eq$), and equal cumulative per capita (-32 $GtCO_2eq$). The study estimated the U.S. budget at 57 $GtCO_2eq$ when averaging across five sharing principles, adding the constant emissions ratio (186 $GtCO_2eq$) to the four above-mentioned principles. However, the constant emissions ratio, which maintains current emissions ratios, is not considered to be an equitable sharing principle because it is a grandfathering approach that "privileges today's high-emitting countries when allocating future emission entitlements."

[177] Robiou du Pont et al. (2017) estimated the U.S. carbon budget for a 66 percent probability of keeping warming below 2°C at 60 $GtCO_2eq$ based on four equity principles (capability, equal per capita, greenhouse development rights, equal cumulative per capita), and at 104 $GtCO_2eq$ based on five principles (adding in constant emissions ratio, but see footnote above).

Federal fossil fuels are a significant contributor to global emissions and could significantly reduce in the U.S.'s remaining carbon budget. Between 2003 and 2014, approximately 25% of all United States and 3-4% of global fossil fuel GHGs are attributable to federal minerals leased and developed by the Department of the Interior.[178] The United States Geological Survey reaffirmed this in its 2018 report which found that federal fossil fuel production currently contributes to 23% of all U.S. greenhouse gas emissions.[179] According to a 2015 report, leased federal fossil fuels could unleash between 30 to 43 Gt of CO2e—an amount equivalent to the U.S. carbon budget under some sharing scenarios.[180] Unleased federal fossil fuels could emit 319 to 450 Gt of CO2e—easily obliterating the U.S.'s entire carbon budget.[181] Either way, any expansion of oil and gas development on federal public lands is entirely incompatible with progress toward adddressing the climate crisis.

But, rather than ratcheting down oil and gas, the U.S. is on a path to rapidly expand it with the federal government playing a key role. Oil Change International recently found that use of existing fossil fuel reserves would again push the world far beyond warming or 1.5°C and 2°C and that the U.S. is on track to release a carbon bomb of emissions from oil and gas development in the next 30 years.[182] The report specifically found that:

- Between now and 2030, the United States is on track to account for 60 percent of world growth in oil and gas production, expanding extraction at least four times more than any other country. This is the time period over which climate scientists say global carbon dioxide (CO_2) emissions should be roughly halved to stay in line with the 1.5°C target in the Paris Agreement.[183]
- Between 2018 and 2050, the United States is set to unleash the world's largest burst of CO_2 emissions from new oil and gas development (Figure ES-2). U.S. drilling into new oil and gas reserves – primarily shale – could unlock 120 billion metric tons of CO_2 emissions, which is equivalent to the lifetime CO_2 emissions of nearly 1,000 coal-fired power plants.[184]
- If not curtailed, U.S. oil and gas expansion will impede the rest of the world's ability to manage a climate-safe, equitable decline of oil and gas production. We find that, under an illustrative 1.5°C pathway for oil and gas taken from the Intergovernmental Panel on Climate Change (IPCC), U.S. production would exhaust nearly 50 percent

[178] Energy Information Administration ("EIA"), *Sales of Fossil Fuels Produced from Federal and Indian Lands, FY 2003 through FY 2014* (July 2015), https://www.eia.gov/analysis/requests/federallands/pdf/eia-federallandsales.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 77).

[179] Merrill, M.D., et al., supra, at 1.

[180] EcoShift, The Potential Greenhouse Gas Emission from U.S. Federal Fossil Fuels, supra, at 1, 3.

[181] *Id.*

[182] Kelly Trout & Lorne Stockman, Oil Change International, *Drilling Toward Disaster: Why U.S Oil & Gas Expansion is Incompatible with Climate Limits*, 1, 6 (Jan. 2019), http://priceofoil.org/content/uploads/2019/01/Drilling-Towards-Disaster-Web-v3.pdf (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 78).

[183] *Id.* at 6.

[184] *Id.*

of the world's total allowance for oil and gas by 2030 and exhaust more than 90 percent by 2050.[185]

Simply, BLM's push to unleash more greenhouse gas emissions from oil and gas development is extremely irresponsible and is significantly contributing to the world's climate crisis. BLM must, at a minimum, disclose the world's and the U.S.'s meager remaining carbon budgets and assess the significance of the proposed APDs within the context of these estimates and within the context of carbon emissions that stand to be released from already leased federal fossil fuels.

iii. BLM Must Assess the Significance of Its Action Within the Context of the Widening Production Gap.[186]

Finally, BLM must assess the significant of the proposed action within the context of the widening production gap or emissions gap between current fossil fuel production and where our world needs to be in order to meet climate goals limiting warming.

Two recent reports are relevant. First, the United Nations Environmental Programme ("UNEP") just released its *Emissions Gap Report* in November 2019.[187] The report has a number of significant, relevant findings regarding current emissions levels versus emissions levels needed to limit warming. Put plainly, the UNEP found that "the summary findings are bleak."[188] Specifically:

- GHG emissions have risen at a rate of 1.5 per cent per year in the last decade, stabilizing only briefly between 2014 and 2016. Total GHG emissions, including from land-use change, reached a record high of 55.3 GtCO2e in 2018.[189]
- Fossil CO2 emissions from energy use and industry, which dominate total GHG emissions, grew 2.0 per cent in 2018, reaching a record 37.5 GtCO2 per year.[190]
- There is no sign of GHG emissions peaking in the next few years; every year of postponed peaking means that deeper and faster cuts will be required.[191]
- By 2030, emissions would need to be 25 per cent and 55 per cent lower than in 2018 to put the world on the least-cost pathway to limiting global warming to below 2℃ and 1.5°C respectively.[192]

[185] *Id.*

[186] BLM does not address this argument in its response to comments.

[187] United Nations Enviro. Program, Emissions Gap Report (2019), https://www.unep-wcmc.org/news/2019-emissions-gap-report (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 79).

[188] *Id.* at XIV.

[189] *Id.*

[190] *Id.*

[191] *Id.* at XV.

[192] *Id.* at XV.

- The emissions gap is large. In 2030, annual emissions need to be 15 GtCO2e lower than current unconditional NDCs imply for the 2°C goal, and 32 GtCO2e lower for the 1.5°C goal.[193]
- Had serious climate action begun in 2010, the cuts required per year to meet the projected emissions levels for 2°C and 1.5°C would only have been 0.7 per cent and 3.3 per cent per year on average. However, since this did not happen, the required cuts in emissions are now 2.7 per cent per year from 2020 for the 2°C goal and 7.6 per cent per year on average for the 1.5°C goal. Evidently, greater cuts will be required the longer that action is delayed.[194]

The Stockholm Environment Institute ("SEI") released a report soon after the UNEP report on the production gap, or the action needed to wind down the world's fossil fuels in order to meet climate goals.[195] SEI found:

- Governments are planning to produce about 50% more fossil fuels by 2030 than would be consistent with a 2°C pathway and 120% more than would be consistent with a 1.5°C pathway.[196]
- This global production gap is even larger than the already-significant global emissions gap, due to minimal policy attention on curbing fossil fuel production.[197]
- CO2 emissions from fossil fuels will need to decline rapidly, by approximately 6% per year to remain on a 1.5°C-compatible pathway, and by roughly 2% per year to remain on a 2°C-compatible one.[198]
- A focus on reducing fossil fuel production avoids a carbon lock-in and limits financial risks from stranded assets.[199]
- [B]etween now and 2030, the United States' oil and gas production are each projected to increase by 30%.[200]
- The United States expects to become a net exporter of fossil fuels in 2020 and increase net exports throughout the next decade. In fact, the IEA expects the United States to account for 70% of the rise in global oil production and 75% of the expansion in liquefied natural gas (LNG) trade over the next five years.[201]

193 *Id.* at XVIII.

194 *Id.* at XX.

195 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/ (previously attached to our Feb. 7, 2020 draft EA comments as Exhibit 80).

196 *Id.* at 4.

197 *Id.*

198 *Id.* at 8.

199 *Id.* at 9.

200 *Id.* at 22.

201 *Id.* at 31.

- Supply-side climate policies are needed to address the production gap. The following are recommended.[202]

Table 5.1: Taxonomy of supply side policy

Category	Supply-side policy
Regulatory approaches	Limit exploration, production, or export (e.g., via moratoria, bans, or quotas)
	Prohibit development or limit permits for specific resources, infrastructure (oil pipelines and terminals, coal ports, etc.), or use of certain technologies
	Ensure comprehensive (upstream and downstream) emissions assessment in environmental impact reviews of new fossil fuel supply projects
Economic instruments	Remove fossil fuel producer subsidies
	Introduce fees or taxes for fossil fuel production or export, and increase royalties
Government provision of goods and services	Assist workers and communities transitioning out of fossil fuel production
	Divest state-controlled investment funds from companies involved in fossil fuel production
	Restrict financing for fossil fuel supply projects through government-owned finance institutions (e.g. export credit agencies, and national and multilateral development banks)
Information and transparency	Require corporate disclosure of long-term climate-related risks associated with capital-intensive upstream production and exploration (Carbon Tracker Initiative 2019a)
	Set targets for reducing fossil fuel production, and report on progress alongside existing climate mitigation accounts (e.g. by using an extraction based emissions accounting framework) (Steininger et al. 2016)

Source: Lazarus and van Asselt (2018), adapted from Somanathan et al. (2014) Table 15.2.

BLM must consider these new, relevant reports which indicate an imperative to transition away from fossil fuels rapidly using supply side policies.

L. BLM Fails to Take a Hard Look at Impacts to Caves and Karst In Violation of NEPA and the Cave Resources Protection Act.

Because there are significant cave resources located within many of the proposed lease parcels (parcel -0221, and likely parcels -0219 and -0220), BLM must take a hard look at the impacts of the lease sale on caves and karst topography and manage these lands to protect these resources.

Two statutes mandate this: NEPA and the Federal Cave Resources Protection Act ("FCRPA"). As noted above, NEPA mandates that federal agencies take a hard look at the direct, indirect, and cumulative impacts of their actions. 40 C.F.R. § 1502.16(d); *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989). Additionally, Congress passed the FCRPA in order to: "(1) to secure, protect, and preserve significant caves on Federal lands for the perpetual use, enjoyment, and benefit of all people; and (2) to foster increased cooperation and exchange of information between governmental authorities and those who utilize caves located on Federal lands for scientific, education, or recreational purposes." 16 U.S.C. § 4301(b). The FCRPA also

[202] *Id.* at 41–42.

specifies that "[i]t is the policy of the United States that Federal lands be managed in a manner which protects and maintains, to the extent practicable, significant caves." *Id.* § 4301(c).

According to Interior's regulations, "significant caves" are those which possess one or more of six criteria: habitat for organisms and animals, historical or archaeological properties, specific geologic features, connectivity to important water systems, recreational opportunities, and educational or scientific properties. *See* 43 C.F.R. § 37.11(c)(1)–(6). "If a cave is determined to be significant, its entire extent, including passages not mapped or discovered at the time of the determination, is deemed significant." *Id.* § 37.11(h). "This includes caves that extend from lands managed by any Federal agency into lands managed by one or more other bureaus or agencies of the Department of the Interior, as well as caves initially believed to be separate for which interconnecting passages are discovered after significance is determined." *Id.* The regulations then echo the statute, providing that "Federal lands be managed in a manner which, to the extent practical, protects and maintains significant caves and cave resources. The type and degree of protection will be determined through the agency resource management planning process with full public participation." *Id.* § 37.2.

According to the Carlsbad DRMP-EIS, "[k]arst terrain covers over one million acres of the planning area, encompassing almost one-third of its area." DRMP-EIS at 3-8. Indeed, "[t]here are currently more than 500 caves designated as significant across BLM-administered lands within the planning area." *Id.* at 4-33. And, caves in Carlsbad Caverns National Park "come within 1,000 feet of BLM-administered lands." *Id.* at 3-11. "Carlsbad Caverns National Park received World Heritage Site designation in 1995 following "examples of the major stages of the earth's history and outstanding geological features" and "superlative natural phenomena or natural beauty." *Id.*

The caves in the Carlsbad FO are uniquely susceptible to impacts from oil and gas including water contamination.[203] This includes not only impacts from drilling and fracking but also impacts from deep waste disposal.[204] As the BLM admits in the draft Carlsbad RMP, "[k]arst resources would be at greater risk of adverse impacts, resulting from surface and subsurface disturbances, in areas across the planning are that have a higher frequency of karst development and features present." DRMP-EIS at 4-47. Climate could have a multi-fold impact on caves and karst environments. *Id.* at 4-524. ("With the increased desertification of the karst landscape there would be less recharge of the aquifers. This would then result in decreasing water levels in the karst aquifers."). BLM also provides: "There are many aspects of mineral development that would adversely impact karst resources. Adverse impacts from contamination are a primary concern, as drilling fluids, produced saltwater, oil and/or gas, cuttings, and cement could quickly enter groundwater, and subsequently aquifers, springs, and other resurgences through karst features that serve as natural conduits to these water sources." *Id.* at 4-32. Furthermore, BLM admits that "A pilot dye tracing project within the CFO has shown positive connection between lost circulation zones encountered during oil and gas drilling in certain karst areas and area springs, seeps, rivers, caves, and water wells (Goodbar 2009b)." *Id.* at 3-14 (citing

[203] *See* James R. Goodbar, *supra.*

[204] Fracking Compendium, *supra*, at 183. (summarizing a 2018 study which found that "deep waste disposal carries the risk of introducing toxic fluids into karstified areas where there is "limited geologic characterization of the disposal zone. These deep, cave-like zones may transmit fluids in an unknown, unpredictable fashion.").

James R. Goodbar, *Dye Tracing Oil and Gas Drilling Fluid Migration Through Karst Aquifers: A Pilot Study to Determine Potential Impacts to Critical Groundwater Supplies in Southeast New Mexico, USA* (2009) (previously attached as Exhibit 11).

Despite these very real threats to the caves, karst environments, and water systems of the area, BLM admits that for the lease parcels, "unknown surface and subsurface features and undocumented caves are likely to exist due to the distribution of soluable rocks in shallow surface." EA at 43. Put simply, BLM does not know whether significant caves exist on the lease parcels and therefore does not know whether significant impacts will occur. BLM also notes that it has received five reports of subsurface voids opening up during drilling. *Id.* Thus, it is surprising when BLM arbitrarily concludes that these impacts to karst and caves will be insignificant because past impact features did not meet the definition of significant caves. *Id.* Past incidents say nothing about future impacts on the specific lease parcels at issue. Also, if major accidents are happening despite BLM's current lease stipulations and regulations, BLM cannot ensure that future, significant impacts will not occur and therefore fails to meet its duties under NEPA and the FCRPA.

In response, BLM turns again to its existing lease stipulations and regulations to claim that these will protect against drilling into unknown karst features. But, because so little of the area has been surveyed for karst features, and by definition, one cannot plan for encounters with unknown karst features, it is hard to see how BLM's stipulations will prevent a situation where a company drills into a karst feature and releasing drilling and fracking chemicals into underground waters. A better approach would be to avoid leasing high karst potential properties. We request that BLM take this approach here. If not, BLM is required to explain how its lease stipulations will prevent contamination from encounters with unknown karst features.

M. BLM Must Take a Hard Look at Impacts to Wildlife.[205]

i. BLM Must Evaluate Impacts to Lesser Prairie Chicken and Defer the Leasing of 51 Parcels within Populated Areas.

Approximately 51 of the proposed 94 parcels will affect habitat for the imperiled lesser prairie chicken (*Tympanuchus pallidicinctus*) ("LPC"), a species currently under consideration for listing as endangered under the Endangered Species Act. Although the lesser prairie-chicken is currently a non-listed species, on Nov 30, 2016, U.S. Fish and Wildlife Service announced a positive 90-day finding on a new petition to list the lesser prairie-chicken as endangered and initiated a 12-month status review to determine whether protection for the species under the ESA is warranted.

Despite the potential for serious impairment of identified habitat for the species, BLM's EA fails to consider deferral, incorporate recommended stipulations, or provide a meaningful analysis of impacts to lesser prairie chicken and its habitat. Although the EA acknowledges that 51 parcels are within LPC habitat, the EA, however, contains no analysis whatsoever of how leasing and resulting development may affect local habitat availability, amount and suitability of

[205] All exhibits previously submitted with our Feb. 7, 2020 comments on the draft EA.

high-priority habitats, New Mexico lesser prairie-chicken populations and prospects for recovery, and whether leasing is consistent with the survival and recovery of the species in southeast New Mexico. In particular, the EA contains no analysis whatsoever as to whether lease notice SENM-S-22 will be adequate to mitigate impacts to lesser prairie chicken habitat use, are consistent with the best available conservation science, or how they may affect the species' prospects for survival and recovery in southeast New Mexico. As discussed below, BLM must also evaluate the cumulative effect on lesser prairie-chicken habitat, survival, and recovery, of multiple threat factors, including but not limited to oil and gas development, other anthropogenic habitat disturbance, and climate change (including heightened probability of both drought and extreme snowfall events). BLM should also consider an alternative that not only defers leasing of parcels within lesser prairie-chicken habitat, but also recommends those parcels for withdrawal from availability for mineral leasing in the ongoing Carlsbad Field Office Resource Management Plan revision.

The LPC is currently under view by the Fish and Wildlife Service for listing under the Endangered Species Act (ESA), and as such, it is critically important the BLM take steps to protect it. The LPC first made the ESA's "candidate" list in 1998.[206] However, it wasn't until 2014 that the Service officially listed the LPC as threatened under the ESA.[207] Just one year later, the species was delisted following a court determination that the Fish and Wildlife Service failed to take state efforts to protect the LPC into account during their initial listing.[208] That same year, the Fish and Wildlife Service initiated a 90-day review of a new listing petition for the LPC, finding that the petition presents "substantial information indicating that listing, reclassification, or delisting [the] species may be warranted."[209] In January 2017, the FWS began a 12-month review status of the LPC.[210] Pending the FWS decision, it is crucial that the BLM refrain from further degrading, fragmenting, or substantially altering LPC habitat in southeast New Mexico.

1. Threats to Lesser Prairie Chicken and its Habitat

Preserving remaining LPC habitat is critical because the LPC population already faces significant threats to its survival. This section outlines the most significant current threats to the LPC, making preservation by BLM of remaining LPC habitat and population even more crucial.

Habitat fragmentation -- discontinuity in the spatial distribution of resources and conditions that affects occupancy, reproduction, or survival of a particular species -- poses the

206 *Lesser Prairie Chicken* (last visited October 18, 2018), Center for Biological Diversity https://www.biologicaldiversity.org/species/birds/lesser_prairie_chicken/index.html.

207 *Id.*

208 Fish and Wildlife Service, *Endangered and Threatened Wildlife and Plants; Lesser Prairie-Chicken Removed From the List of Endangered and Threatened Wildlife* (July 2016).

209 Fish and Wildlife Services, *Endangered and Threatened Wildlife and Plants: 90-Day Findings on the Lesser Prairie Chicken* (Nov. 2016).

210 *Id.*

greatest threat to the survival of the LPC,[211] because it creates or exacerbates several significant threats to the LPC population. According to the U.S. Fish and Wildlife Service, "[t]he loss and fragmentation of even relatively small amounts of existing and suitable habitat can easily put the [LPC] on a path towards a 'death spiral' from which it cannot recover, as the Service has seen for similar prairie grouse species such as the now-extinct heath hen and endangered Attwater's prairie-chicken."[212] Habitat specialists like the lesser prairie chicken require larger habitat patch sizes to survive in the long term; decline in population size associated with habitat fragmentation will almost certainly be greater than the effect of acreage of habitat lost alone.[213]

Habitat fragmentation increases the probability of LPC population extinctions. Without effective channels of connection between suitable pockets of LPC habitat, the separated pieces of the LPC population are prevented from breeding.[214] Thus, habitat fragmentation leads to the biological impoverishment of resulting fragments of habitat.[215] The population as a whole will diminish in genetic diversity, ultimately lowering the species' ability to withstand natural disease or predation. In addition, habitat fragmentation can result in a population increase in harmful species, such as predators, in the space between suitable LPC habitats; these harmful species can then detrimentally affect the LPC in the remaining pockets of suitable habitat.[216]

The effects of habitat fragmentation, including a diminished genetic pool, a decrease in the number suitably sized habitat patches, and an increase in natural predation, extend beyond the isolated pockets of the population in habitat patches and produce long-term consequences for the entire species.

Relatedly, the lesser prairie chicken is considered an "umbrella species": a species that requires a sufficiently large and un-fragmented native habitat such that conservation of that species effectively provides for the conservation of several other sensitive species.[217] Protecting the LPC population by providing millions of hectares of contiguous prairie serves as both an effective way to promote LPC survival in the wild, and a way of protecting the whole ecosystem of the region. Conversely, loss of habitat suitable for the LPC will not only affect that species,

211 T.L. Fields, *Breeding season habitat use of Conservation Reserve Program (CRP) land by lesser prairie-chickens in west-central Kansas* (2004) (unpublished M.S. thesis, Colorado State University).

212 (Defendant's Additional Filing in Support of their Opposed Motion to Amend the Judgment, Case No. 7:14-CV-00050-RAJ at 7; LPC Petition 53).

213 Darren J. Bender, Thomas A. Contreras, and Lenore Fahrig, *Habitat loss and population decline: a meta-analysis of the patch size effect*, 79 Ecology. 517 (1998).

214 L. Fahrig and G. Merriam, *Conservation of fragmented populations*, 8 Conserv. Biol. 50, 54 (1994).

215 S. Harrison & E. Bruna, *Habitat fragmentation and large-scale conservation: What do we know for sure?* 22 Ecography 225, 229 (1999).

216 D.S. Wilcove, C.H. McLellan, and A.P. Dobson, *Habitat fragmentation in the temperate zone*, in Conservation Biology: The Science of Scarcity and Diversity 237, 248 (M.E. Soulé, ed., 1986).

217 C.L. Pruett, M.A. Patten, and D.H. Wolfe, *Avoidance behavior by prairie grouse: Implications for development of wind energy*, 23 Conserv. Biol. 1253, 1254 (2009).

but will produce far-reaching consequences for the region.[218]

Habitat fragmentation can be caused by human activities such as construction of roads and powerlines, energy development, cropland cultivation, and urban or rural sprawl.[219] Habitat fragmentation can result in both displacement of populations from preferred habitats, and significant stress to individuals that remain in close proximity.
For example, a decrease in large patches of un-fragmented habitats, and a commensurate increase in human infrastructure, leads to habitat fragmentation and a decline in LPC population much larger than might be apparent from only taking into account what we might normally consider physical barriers to movement.[220] Active leks are only found, in general, at least 3,000 to 5,000 meters away from anthropogenic features like roads, power lines, and oil and gas wells.[221] In general, the LPC avoids power lines, wells, and buildings; therefore, areas with comparatively greater human development have significant habitat fragmentation and lower survival and fecundity rates than less fragmented areas.[222]

Given the current, advanced, level of habitat loss and fragmentation in New Mexico, BLM must analyze the extent to which the further development of high-quality prairie habitat for uses such as oil and gas development will severely threaten the future survival of the LPC. In neighboring New Mexico, only 26% of suitable habitat occurred in patches large enough to support lesser prairie chickens, whereas 74% of the "suitable" habitat (including most high-quality habitat) was in patches too small to support lesser prairie chickens.[223] Only four habitat patches exceeded the 17,885-acre threshold necessary to maintain lesser prairie chickens over the long term.[224] BLM's EA contains no analysis of the size or number of remaining patches of suitable habitat in southeast New Mexico, nor how development resulting from the proposed leases may affect the availability of suitable habitat patches.

Any new oil and gas development in LPC habitat, particularly the limited remaining high-priority habitat in eastern New Mexico, poses significant additional threats to future LPC survival. These threats arise from the infrastructure associated with development, and from the unique threats posed by extracting oil and gas and transporting it away from drilling sites.

218 N.J. Silvy, M.J. Peterson, and R.R. Lopez, *The cause of the decline of the pinnated grouse: The Texas example*, 32 Wildl. Soc. Bull. 16, 20 (2004).

219 B.A. Grisham, A.J. Godar, and C.P. Griffin, *Climate change*, 48 Stud. Avian Biol. 221, 227 (2016).

220 S.D. Fuhlendorf, A.J. Woodward, D.M. Leslie Jr., and J.S. Shackford, *Multi-scale effects of habitat loss and fragmentation on lesser prairie-chicken populations of the US Southern Great Plains*, 17 Landscape Ecol. 617, 626 (2002).

221 Anne M. Bartuszegive and Alex Daniels, *Impacts of energy development, anthropogenic structures, and land-use change on lesser prairie-chickens*, 48 Stud. Avian Biol. 205, 212 (2016).

222 C.A. Hagen, *A demographic analysis of lesser prairie-chicken populations in southwestern Kansas: Survival, population viability, and habitat use*(2003) (unpublished Ph.D. dissertation, Kansas State University).

223 K. Johnson, T.B. Neville, and P. Neville, *GIS habitat analysis for lesser prairie chickens in southeastern New Mexico*, 6 BMC Ecology (2006), at http://www.biomedcentral.com/1472-6785/6/18.

224 *Id.*

An expansion in oil and gas exploration, development, and extraction would result in an increase in infrastructure in LPC habitat, leading to an increase in LPC habitat fragmentation. New fossil fuel drilling is strongly associated with new roads and power lines, because electricity and physical access is required for new installations at drilling sites.[225] BLM must identify both the existing infrastructure network and the potential impacts of new leasing prior to authorizing any leasing of the parcels.

New roads and power lines built to support oil and gas development would further exacerbate the harms that the LPC already faces from these types of infrastructure. As mentioned above, roads threaten LPC habitat and LPC individuals in a number of ways. These threats include increased levels of lek abandonment, fragmentation of habitat, introduction of damaging foreign vegetation into the habitat, and LPC death through collisions with automobiles.[226] Power lines also pose a substantial threat to the LPC by increasing the incidence of nearby predator roosts, posing a collision threat to the LPC, and deterring the LPC from establishing leks within approximately one kilometer of the lines.[227] Each new road and power line further disturbs and harms the LPC, and any expansion of oil and gas development in LPC habitat will, because of the accompanying infrastructure, increase the harm to this vulnerable population and species. [228]

New oil and gas drilling would create new and significant noise pollution, posing a serious threat to nearby LPC populations. Drilling and its associated activities produce many noises not normally found in nature: the sounds of drilling, construction, and maintenance, along with the increase in extremely loud heavy-duty truck traffic necessary to transport people, drilling materials, and extracted oil and gas to and from drilling sites.[229] This noise pollution has been shown to be particularly disruptive to LPC leks and their successful reproduction.[230] In one study, researchers created recordings of sounds associated with oil and gas drilling and played them near leks in the wild, while observing other, unaffected lek sites as a control.[231] The study found a strong negative effect on both male and female attendance at the leks subjected to the noise, as compared to the control group.[232] Some of the leks subjected to the noises of oil and gas development showed a drop in female attendance of over 70 percent. [233]

225 Terry Z. Riley et al., Wilderness Society, *Impacts of Crude Oil and Natural Gas Developments on Wildlife and Wildlife Habitat in the Rocky Mountain Region (*2012) *available at* http://wildlife.org/wp-content/uploads/2014/05/Oil-and-Gas-Technical-Review_2012.pdf.

226 *See* Forman and Alexander 214 (1998), Hunt and Best 99 (2004), Patten et al. 240 (2005), Gelbard and Belnap 424 (2003).

227 *See* Robel et al. (2004), and Pitman et al. (2005), Pruett et al. (2009), Plumb (2015), Reinart (1984), Patten et al. (2005).

228 *See* Hunt and Best (2004); Pruett et al. (2009).

229 Francis, C.D., C.P. Ortega, and A. Cruz, *Noise pollution changes avian communities and species interactions*, (2009) at 1418.

230 Blickley, J.L., D. Blackwood, and G.L. Patricelli, *Experimental Evidence for the Effects of Chronic Anthropogenic Noise on Abundance of Greater Sage-Grouse at Leks* (2012) at 467.

231 *Id.*

232 *Id.*

233 *Id.*

These results have been supported by multiple other studies, including a study showing a statistically significant difference of 4 dB greater noise pollution at abandoned leks than active leks. [234] Sound disturbance at lek sites is likely to be "devastating to breeding efforts," and any further development of oil and gas drilling in current LPC habitat would pose a serious risk to the population's survival.[235]

New oil and gas drilling, and any new hydraulic fracturing, will also likely increase LPC exposure to hazardous chemicals, and may very lead to damaging changes to their habitat. Spills and emissions from oil and gas well pads, from the trucks that transport drilled oil and gas, and from trucks transporting fluids and compounds necessary for drilling are routine.[236] Researchers have documented LPC deaths in other areas "from sludge pits and poisonous gases" attributed to oil and gas drilling.[237] No new hydraulic fracturing should happen in the BLM lands up for leasing until the impact of fracking on the LPC has been further studied. While there is no research yet on the direct impact of hydraulic fracturing on the LPC, , multiple studies have found environmental impacts of fracking on the environment, from increased erosion, to chemical spills, to polluting the water supply.[238] [239] Until there is further research done, considering all the threats already facing the LPC, there should be no further disruption of the LPC's ecosystem with potentially hazardous activities.

ii. BLM Must Evaluate Impacts to Dunes Sagebrush Lizard and Defer the 27 Parcels Within DSL Habitat.

Leasing and the resulting development of 27 parcels in the May 2020 will affect habitat for the imperiled dunes sagebrush lizard, *scleorperus arenicolus* ("DSL"), a species currently under consideration for listing as endangered under the Endangered Species Act. The EA briefly acknowledges the presence of the species and likely habitat loss ("Surface disturbance would likely result in a decrease in habitat quality from human presence and loss of suitable habitat (sand dunes)."), EA at 74, but provides no detailed analysis, and assumes, without any analysis and contrary to best available science, that stipulations SENM-S-23 (controlled surface use) and

234 *See* Hunt and Best (2004) at 142.

235 Smith, H., K. Johnson, and L. DeLay, *Survey of the lesser prairie chicken on Bureau of Land Management lands, Carlsbad Resource Area, NM. Unpubl. Rep. to the Bureau of Land Management. Albuquerque, NM: New Mexico Natural Heritage* (1998) at 6.6 Program at 6

236 Clancy, S.A., F. Worrall, R.J. Davies, J.G. Gluyas. *The potential for spills and leaks of contaminated liquids from shale gas developments.* 626 Sci. of the Total Env't. 1463, 1464 (June 1, 2018)

237 Massey, M. *Long-range plan for the management of lesser prairie-chickens in New Mexico, 2002-2006. New Mexico Department of Game and Fish, Federal Aid in Wildlife Restoration* (2001) at 16.

238 Williams, H.F.L., D.L. Havens, K.E. Banks, and D.J. Wachal *Field-based monitoring of sediment runoff from natural gas well sites in Denton County, Texas, USA,* (2008).

239 Burton, G.A., K.J. Nadelhoffer, and K. Presley, *Hydraulic fracturing in the state of Michigan: Environment/ecology technical report. University of Michigan*. (2013)

SENM-S-34 would mitigate, to an undisclosed degree, these impacts. This unwarranted assumption and the proposal to lease occupied and/or potential DSL habitat violates BLM's obligations under NEPA, the Endangered Species Act, FLPMA, and BLM sensitive species policy.

The dunes sagebrush lizard, *scleorperus arenicolus* ("DSL"), has been petitioned for listing as endangered, and designation of critical habitat, under the Endangered Species Act, 16 U.S.C. § 1531.[240] The U.S. Fish and Wildlife has not yet completed its required 90-day finding under Section 4(b)(3)(A) as to whether the petition provides substantial information warranting a more in-depth 12-month status review. As discussed in detail below, however, BLM has substantial information available to it indicating that BLM land management activities within the Carlsbad planning area substantially threaten the survival and recovery of the dunes sagebrush lizard. Consequently, under FLPMA, NEPA, and the ESA, BLM must consult a meaningful evaluation of its proposed management actions on dunes sagebrush lizard habitats, populations, and recovery potential, and must consider alternatives – including closing all proposed critical habitat to new oil and gas leasing – that would facilitate the survival and recovery of the species.

The dunes sagebrush lizard is a narrow-ranging habitat specialist that lives in irreplaceable shinnery oak sand dune habitat in parts of southeastern New Mexico and West Texas. The species is currently in danger of extinction (endangered species) or is likely to become an endangered species in the foreseeable future (threatened species) throughout all or a significant portion of its range. The DSL's existence is threatened by present and future habitat modification and destruction, with over 40% of historic shinnery oak habitat already lost and the lizard gone from as much as 86% of previously occupied survey sites. The primary cause of habitat loss has been widespread oil and gas development in the shinnery oak sand dune complexes the species prefers. In addition to oil and gas development and sand mining, many areas of the species' range have already been converted, or may be converted in the future, for agriculture and other uses. Together, oil and gas development, sand mining, and habitat conversion for other uses are the primary drivers of past, current, and likely future rapid loss and fragmentation of the lizard's little remaining habitat.

Other manmade and natural factors, including invasive species, climate change, and contaminants further imperil the species throughout its range. Invasive species, including honey mesquite and Malta starthistle, are present threats to the DSL and shinnery oak dune communities, and their establishment is exacerbated by human activities such as oil and gas development in the area. Drought and temperature increases and variability driven by climate change may shift the climate envelope for the lizard or the shinnery oak beyond the species' biological limits over the next 50-80 years. A mismatch between the lizard or its preferred vegetation and the presence of sand dunes, even if direct habitat destruction was not an issue, will be perilous in coming decades. And contamination from various mining, drilling, and petroleum transportation activities may harm local populations and significantly impede conservation. When combined with the effects of habitat loss to oil and gas development and the demonstrated inability of existing voluntary mechanisms to protect the DSL and its habitat in Texas, the additional stressors of

[240] Center for Biological Diversity & Defenders of Wildlife, Petition to List the Dunes Sagebrush Lizard as a Threatened or Endangered Species and Designate Critical Habitat (May 8, 2018).

invasive species, climate change, and contamination are likely to exacerbate the threats to the lizard.

The modification and destruction of the lizard's habitat is the most severe of past, present, and future threats. Based on the habitat loss that has already occurred, and losses that are likely to occur absent strong avoidance and minimization measures, the designation of critical habitat has been requested in occupied and unoccupied suitable habitat across the lizard's range. This should include not only locations where the combination of essential physical and biological features is currently present, but also areas where the individual features are likely to combine and become fully suitable in the future. For example, sand deposits lacking shinnery oak may be colonized by the oak, or may migrate via wind to areas with the oak, to become suitable for the lizard. Particularly given the demonstrated inadequacy of conservation measures to preserve Texas DSL populations, BLM should not foreclose the possibility of protecting potential critical habitat within those New Mexico management areas subject to its authority.

The DSL has the second smallest range of lizard species that are endemic to North America. The majority of its crescent-shaped distribution is located in New Mexico in eastern Chaves County, southernmost Roosevelt County, northern Lea County, and northeastern Eddy and central/southern Lea counties. There is a second, geographically and genetically disjunct population in Texas in Gaines, Andrews, Winkler, Ward and Crane counties.

The DSL is restricted to sand dune habitat containing shinnery oak in the Mescalero Sandhills in southeast New Mexico and the Monahans Sandhills of west Texas (Fitzgerald and Painter 2009; Degenhardt *et al*. 1996; Fitzgerald *et al*. 1997; Laurencio *et al*. 2009; Smolensky and Fitzgerald 2010, 2011; Sena 1985). This habitat type, termed "shinnery sands" in some literature, is located in the High Plains Ecoregion (Griffith *et al.* 2004, Griffith *et al.* 2006). The Mescalero Sandhills and Monahans Sandhills overlay the Permian Basin, and consist of ancient parabolic dunes maintained by wind moving sand and partially stabilized by shinnery oak (Walkup *et al.* 2017; Hall and Goble 2008).

In New Mexico, the species' potential and occupied habitat spans 644 square miles (Painter *et al.* 1999). Fitzgerald *et al.* (1997) noted that "… an outstanding feature of the range is its narrow shape." The DSL's range is only about 16 miles at its widest, with some areas less than 1 mile wide. Because of this narrowness, the animal is vulnerable to breaks in its distribution caused by habitat loss and other factors that potentially disrupt dispersal. Painter *et al.* (1999) noted "… the species may not disperse into areas of suitable habitat, even across narrow barriers of unsuitable habitat." Fitzgerald *et al.* (1997) documented the species does not occupy apparently suitable habitat south of Jal in New Mexico, even though that habitat is separated from suitable habitat only by a narrow band of unsuitable habitat. At present, it is unknown whether the DSL formerly occupied this area, or if it never extended its range further south. Importantly, in New Mexico, approximately 49% of the DSL's range is on BLM lands, 20% on state lands, and 31% on private lands (Painter *et al*. 1999). There is limited gene flow among DSL subpopulations (Fitzgerald and Painter 2009), because of the patchily distributed habitat.

The DSL is an ecological specialist that occurs primarily in dune blowouts within sand dune complexes dominated by shinnery oak (Degenhardt *et al*. 1997; Fitzgerald *et al*. 1997; Snell *et al*. 1997; Fitzgerald and Painter 2009), but uses shinnery oak flats between blowouts for dispersal (Fitzgerald *et al*. 2005; Leavitt *et al*. 2011; Johnson *et al*. 2016). DSL dispersal is complex. Mark-recapture studies found the animal has high site fidelity and there may be little or no movement among disjunct populations (Snell *et al*. 1997). It appears the DSL breeds and forages almost exclusively in blowouts within shinnery oak-covered dunes, and rarely crossing other habitat types (Johnson *et al.* 2016). Painter (2004) recommended that "*Dispersal corridors of unsprayed (= application of herbicides) shinnery oak flats at least 500 m wide should be retained between occupied and suitable unoccupied habitat that is separated by <2000 m.*" His recommendation was based on monitoring data from pitfall traps, which suggested that shinnery flats are important as dispersal corridors for juveniles and females seeking egg deposition sites. In addition, experts contacted by Painter (2004) suggested that it would not be wise to consider any currently unoccupied patch of suitable habitat within its overall range or along the edge of the range as being useless to the species. Many areas that could serve as connections between occupied habitat for the lizard have not been restored (Johnson *et al.* 2016: figures 16-33).

Whether gene flow is maintained by cumulative shorter movements of many individuals across generations, longer dispersal of individuals, or both, preservation of large tracts of shinnery oak with blowouts is needed to "*…maintain historical levels of connectivity, prevent local extinction, and avoid the loss of genetic diversity due to genetic drift in reduced populations*" (Johnson *et al*. 2016; Chan *et al*. 2009). Healthy, non-declining source populations also are important for providing dispersing individuals in order to prevent local extinction of sub-populations and breakdown of connectivity at broader scales (Johnson *et al*. 2016).

The dunes sagebrush lizard is at risk due to habitat destruction and modification, inadequate regulatory mechanisms, and other factors including climate change, both in the Mescalero Sandhills of New Mexico and across its range.

Range-wide habitat loss and destruction is the most significant threat to the continued existence of the DSL. This threat is manifest in multiple forms: oil and gas development and operations (Sias and Snell 1998; Peterson and Boyd 1998), sand mining (Defenders of Wildlife 2017; Texas Comptroller of Public Accounts 2017), conversion for agriculture, road construction, and offroad vehicle use (U.S. Fish and Wildlife Service 2010). Over 20 years ago, researchers concluded, "[s]ignificant amounts of habitat alteration have already occurred throughout the range of the species and there is little doubt that the current distribution is a small part of a larger range in the past" (Snell *et al*. 1997). This threat has continued across most of the DSL's range, and, absent intervention, is near-certain to continue.

The impacts of oil and gas development and operations on the DSL are both direct and indirect. The most obvious direct effects are from the construction of roads, well pads, and associated infrastructure that results in loss of DSL habitat. The removal of shinnery oak has been associated with reductions in DSL populations by as much as 70-94% (Snell *et al.* 1994), and compaction of sandy soil by oil and gas development makes habitat unsuitable for the DSL (Painter *et al.* 1997). In general, these threats reduce patch size, which is associated with decreases in survival and reproduction (demographic parameters) of *Sceloporus* lizards (Hokit

and Branch 2003). Other details of dune structure have been related to DSL demographic parameters, such that dune modification directly influences vital rates (Ryberg et al. 2015). Further, oil and gas development and operations are likely to kill or harm DSLs by crushing or burying lizards.

Trenches and holes for pipeline and well development may be a direct threat to the DSL. Lizards and other species may fall or enter trenches and holes excavated for oil and gas well development and associated activities (see, e.g., Doody *et al.* 2003). The animals may have difficulty escaping, making them susceptible to crushing, entombment, or otherwise being injured or killed (U.S. Fish and Wildlife Service *et al.* 2008). Given the extensive use of pipelines across the DSL's range, and the possibilities for future development, trenches may be a substantial, if transient, threat to the species.

Indirect effects are as problematic for the DSL's conservation as the direct effects. In particular, the network of roads connecting well pads and associated infrastructure creates a grid-like pattern of fragmentation (Leavitt and Fitzgerald 2013; Walkup *et al.* 2017). Spatial patterns of road density parallel those for well density (BIO-WEST 2018); we expect their density to increase as more wells and more sand mines are constructed in the DSL's range, further increasing fragmentation. As stated in the "manual" for DSL management in Texas (Texas A&M 2016a):

> Research consistently points to the quality and connectivity of large contiguous areas of suitable habitat as the main factor affecting DSL persistence. Habitat fragmentation and degradation from roads and well pads have been identified as a threat to suitable habitats and DSL populations range-wide.

Oil and gas roads fragment habitat and create vehicle hazards to the animal (Dinerstein *et al.* 2000). In its conference opinion on the New Mexico CCA/A, the Service (2008) summarized the effects of roads:

> The negative impacts of roads going through habitat include increased soil compaction, decreased stability of microclimates, behavioral modification, loss of habitat and habitat quality, inhibited access to resources, subdivisions of populations into smaller more vulnerable habitat patches, division of the ecosystem with artificial linear gaps, generation of abrupt edges, and introduction of non-native, invasive weed species, and mortality due to collisons [sic]…

Fragmentation reduces connectivity among occupied and unoccupied habitat patches, and reduces the quality and quantity of shinnery dune habitat (Smolensky and Fitzgerald 2011). Fragmented sites have fewer, smaller, and more dispersed dune blowouts than unfragmented sites (Levitt and Fitzgerald 2013; Hibbitts *et al.* 2013). The DSL is found in sandy habitats other than blowouts (e.g., disturbed blowouts and barren sandy patches), and some evidence suggests it will cross sand and caliche roads, but not paved roads (Sias and Snell 1998; Johnson *et al.* 2016). Additional observations indicate the animal may bask on caliche roads and that these roads are not absolute movement barriers (Johnson *et al.* 2016). As oil and gas development and sand mining operations continue in the DSL's range, caliche roads may become paved to handle

the increased traffic. Such conversion would likely turn moderate barriers for the DSL into significant barriers, effectively increasing population fragmentation without increasing the footprint of infrastructure. Direct mortality from vehicles has been documented only once for this species. Roads may affect the animal through its avoidance of road surfaces, cars, or noise (e.g., Anderson *et al.* 2006; Hibbitts *et al.* 2017).

BLM currently manages DSL habitat under a Candidate Conservation Agreement With Assurances (CCA/A) with the Fish and Wildlife Service. The New Mexico CCA/As does have requirements to avoid development and impacts to the DSL's preferred shinnery oak sand dunes habitat. Data indicate the CCA/As are associated with a steep decline in well approvals inside DSL habitat and avoidance of undeveloped areas in the DSL range in New Mexico. However, the CCA/As fall short in three areas. First, the CCA/As are contingent on the BLM's RMPA, which, under all alternatives in the DEIS, would continue to encourage continued habitat fragmentation in the course of stipulating avoidance of sand dune habitat. Second, the monitoring program of the CCA/As is insufficient to show that DSL populations, as opposed to habitat, respond to conservation measures. And third, the lack of publicly available data about enrollments makes it difficult to ensure compliance with the CCA/As.

BLM's proposed Carlsbad amendment, under all alternatives, proposes to continue management measures that would limit oil and gas development on dunes themselves, but would promote fragmentation and loss of connectivity by displacing development onto shinnery oak flats important for DSL dispersal. Appendix L of the RMP-DEIS provides:

> For existing leases within the DSL boundary (see Map 1), the lessee would be responsible for occupancy and habitat suitability surveys required prior to permitting surface-disturbing activities. Surveys would be considered COAs and conducted by BLM employees or BLM-approved contractors and personnel. Depending on the results of the survey, proposed well sites may not be available to be developed and directional drilling may be necessary to develop all spacing units within a lease. Shinnery oak (*Quercus havardii*) flats adjacent to dune complexes are the preferred location for proposed well sites.[241]

In 2008, approximately 116,329 acres of the DSL's New Mexico range had well densities exceeding 13 wells/mi2. Approximately 13,947 acres exceeded that threshold during 2009-2017, and 1,242 acres of this occurred because of new well development in previously lowdensity areas. Visual inspection of some of these wells indicated they were, in fact, sited outside of shinnery oak dunes, but in areas that may interrupt DSL dispersal.[242] Thus, while development outside of core habitat may be avoided, pushing oil and gas development into dispersal habitat continues to fragment DSL populations even under the CCA/As. BLM should consider and adopt an alternative that defers leasing of all proposed DSL critical habitat, including shinnery oak dunes and dispersal habitat.

[241] RMP-DEIS at L-15.

[242] DSL Listing Petition at 36.

BLM should also incorporate requirements for monitoring of DSL populations and well as habitat. Based on the information from field work included in the CEHMM annual and monthly monitoring reports (CEHMM 2011, 2012, 2013, 2014, 2015, 2016, 2017d,e) it is not possible to determine if the New Mexico CCA/As adequately protect the DSL. While analysis indicates oil and gas well development has dramatically declined in DSL habitat in New Mexico and shows avoidance of the most undisturbed habitat,[243] that is not the same as monitoring DSL populations themselves. Until methods are developed to monitor the lizard's populations, we cannot tell how the species is faring. Key information not presented in the CEHMM reports that might help fill certain knowledge gaps include: location of the surveys, types of surveys (e.g., random, established transect, and if pitfall traps were used, including the design, how, where, amount of time set out in the field, and how often they were checked), dates and times they were conducted, and the qualifications of the biologist(s). These basic types of data simply do not exist today, but need to be a part of any monitoring program that can clearly demonstrate the DSL's status is improving.

Direct habitat loss in parts of the lizard's range in New Mexico appears to be substantially reduced because of the CCA/As.[244] However, losses that are in compliance with the CCA/As in connecting habitats (e.g., shinnery oak flats) will likely continue fragmenting DSL habitat in the southern portion of the Mescalero Sandhills, further imperiling the species. In the northern portion of the New Mexico range, the threats of invasive species, climate change, and contaminants all constitute unchecked threats to the DSL's habitat and the lizards themselves. The time horizon to extinction in New Mexico is clearly longer than in Texas, but extinction is a foreseeable outcome if threats are not controlled.

As the Fish and Wildlife Service considers listing and critical habitat designation, BLM, under its own obligations under FLPMA, its sensitive species policy, and Section 7(a) of the ESA, should consider an alternative of no new leasing within DSL habitat.

iii. BLM Must Evaluate Impacts to Pronghorn.

The vast majority of the proposed parcels contain habitat mapped as a priority pronghorn corridor by the New Mexico Game and Fish Department, yet the EA dismisses reasonably foreseeable impacts to pronghorn seasonal habitat, migration, behavior, and abundance without analysis. The EA, although acknowledging the presence of substantial mule deer and pronghorn habitat on the proposed lease parcels, EA at 33, provides zero analysis of the impacts of oil and gas development on pronghorn antelope and mule deer, and lacks any site-specific analysis.

Pronghorn exhibit avoidance of areas with high levels of disturbance from oil and gas development. In a study analyzing the effects of gas field infrastructure on pronghorn in the Upper Green River Basin, researchers detected avoidance of patches with high levels of disturbance.[245] Over a five year period, patches classified as very high use for pronghorn

[243] DSL Listing Petition, Appendix A.

[244] DSL Listing Petition at 45 & Fig. 7.

[245] Beckmann, Jon P., et al., Human-mediated shifts in animal habitat use: Sequential changes in pronghorn use of a natural gas field in Greater Yellowstone, Biological Conservation 147 (2012) 222-233 at 230.

declined by 82%, resulting in "a significant loss of high value winter habitat for pronghorn."[246] The study suggests these behavior impacts could presage "negative demographic impacts in this population as the human-footprint grows in the UGRB."[247]

Another study found that steep declines in pronghorn populations from 2008 to 2012 could be explained primarily by winter weather conditions, and by land-use related to oil and gas development, which increased rapidly in the later years of the study.[248] The study observes declines from increased development are "likely due to a combination of increased vehicle traffic and habitat fragmentation associated with oil development. Parts of North Dakota with high oil-well densities have extremely high traffic volume, thereby posing a barrier to seasonal movements as well as a source of additional mortality."[249] It further notes the "interactive effects of severe winters and increased fragmentation of the landscape by well pads and associated roads may be significant, and are cause for concern for pronghorn":

> In winters with heavy snowfall or extreme temperatures, pronghorn populations are buffered by their tendency to migrate to areas with more accessible forage, warmer temperatures, and/or less snow. However, in areas with high densities of wells and roads, their migration may be impeded and the total area of winter habitat available to them is reduced.[250]

Another recent study found increased summer mortality of female pronghorn following harsh winters.[251] While the study did not observe an indirect effect of oil and gas development on summer mortality of female pronghorn, it noted that "any negative influences of oil and natural gas development on pronghorn fitness may lag behind the observed behavioral changes in resource selection and movement associated with infrastructure" (which have been documented), such that a longer monitoring period may be needed to detect demographic effects.[252] It further emphasized the importance of pronghorn access to high-quality resources "during periods of high energetic demand or harsh environmental conditions," which roads and fences could prevent. Moreover, "[t]he ability to move to areas that offer better resources, such as higher quality forage, may be even more important for pronghorn, as an animal potentially employing more of an income strategy (Clancey et al. 2012), than many other ungulates in western North American that may rely more heavily on previously accrued energy reserves."[253]

The EA should evaluate each of these studies regarding the effects of oil and gas development on pronghorn behavior, habitat loss, and abundance.

[246] *Id*. at 231-232.

[247] *Id*. at 230.

[248] Christie 2015 at 449-450.

[249] *Id*. at 451.

[250] *Id*. at 451.

[251] Reinking 2018.

[252] *Id*. at 614.

[253] *Id*.

N. BLM Must Take a Hard Look at the Environmental Impacts of Orphaned and Abandoned Wells.

As explained above, BLM must analyze the "indirect" and "cumulative" impacts of its actions, and assess their significance. 40 C.F.R §§ 1502.16 (b), and (d). Indirect impacts are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." *Id.* § 1508.8(b). Cumulative impacts result 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." *Id.* § 1508.7.

Here, it is reasonably foreseeable that many of the wells to be developed on the lands leased by BLM will ultimately be orphaned or abandoned before the wells are plugged and above-ground resources are fully remediated. Indeed, such a likelihood has drastically increased with the current economic crisis. BLM, however, arbitrarily assumes that each of the 490 projected wells developed on the lease parcels will be properly plugged and reclaimed before abandonment. *See* EA at 46 ("When wells reach the end of their useful life and are properly plugged and reclaimed, they would no longer contribute to [public health] effects."); EA at 37 (noting that pursuant to Onshore Order 1, "interim reclamation (reclamation of surface disturbance not necessary for production) and final reclamation (reclamation following well plugging and abandonment) is required within 6 months of well completion and well plugging, respectively"); EA at 37 ("At the landscape level, vegetation rehabilitation efforts such as Restore New Mexico would continue, existing and active wells would be plugged and reclaimed to former visual condition, and a countervailing impact on visual resources would also occur.").

Historic practice by the oil and gas industry shows that BLM's faith is misplaced. In 2018, EPA estimated that there were 3.11 *million* abandoned oil and gas wells across the United States, of which 69% remained unplugged.[254] In New Mexico alone, there are an estimated 2,500 inactive wells on federal lands that have not been plugged and abandoned, as well as nearly 2,000 additional inactive wells on non-federal lands in the State.[255]

In light of the oil and gas industry's documented history of leaving unplugged wells littered across the landscape, BLM lacks any support for its assumption that wells developed on the lease parcels will be fully plugged and reclaimed before abandonment. In fact, BLM admits that it lacks a "reliable estimate for past wells that are no longer in use, and were either plugged, reclaimed, and abandoned or in some cases abandoned without full reclamation." EA at 11. Thus, BLM admits that wells have been abandoned without full reclamation in the past, but assumes—without support—that 100% of the new wells developed on the lease parcels will be properly plugged and fully reclaimed.

BLM needs to take a hard look at the indirect environmental impacts from orphan wells that are likely to be left unplugged and unreclaimed on the leased parcels, as well as the

[254] Exhibit K, EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2016: Abandoned Oil and Gas Wells 8 tbl.7 (April 2018), available at: https://www.epa.gov/sites/production/files/2018-04/documents/ghgemissions_abandoned_wells.pdf.

[255] Exhibit L, J. Ho et al., Plugging the Gaps in Inactive Well Policy, Resources for the Future at 15 tbl.2 (May 2016), available at: https://media.rff.org/archive/files/document/file/RFF-Rpt-PluggingInactiveWells.pdf.

cumulative impacts from orphaned wells across the Pecos District. Orphaned and abandoned wells pose significant environmental risks that are reasonably foreseeable and therefore must be considered by BLM before it irretrievably commits federal resources by leasing additional lands for oil and gas development. Of particular concern, wells that are left unplugged or improperly plugged can "leak methane or contaminate surface water and groundwater."[256] EPA has estimated that methane emissions amounting to more than 7 million metric tons of CO2e are annually emitted from abandoned oil and gas wells.[257] Orphaned wells are well-documented as providing conduits for contaminants, such as oil, gas, or salty water, to leak into freshwater aquifers.[258] And such subsurface contamination can be very difficult to detect.[259] Given the absence of a comprehensive groundwater monitoring program in the Greater Carlsbad region, orphaned wells could leak for years before being discovered. In addition, failure to reclaim well pads and surrounding lands can also result in long-term impacts to vegetation, wildlife, and visual resources that BLM has failed to consider.

A 2018 report from the Government Accountability Office ("GAO") documented BLM's failure to fully assess the potential liabilities associated with orphaned wells on BLM lands.[260] GAO found that "BLM does not systematically or comprehensively track how much the agency has spent to reclaim orphaned wells or information, such as the number of orphaned wells and inactive wells over time, necessary to determine the agency's potential liabilities."[261] Moreover, BLM lacks dedicated funding for reclaiming orphaned wells,[262] so even when BLM is aware of orphaned wells on its lands, the agency often fails to plug and reclaim these wells. According to the GAO, more than half of the orphaned wells identified by BLM in 2010 still remained orphaned in 2017; and the number of known orphaned wells had risen significantly over that time.[263] BLM officials told the GAO that the "processing permits is the agency's highest priority activity," and dealing with the problem of orphaned and abandoned wells, including well and bond adequacy reviews used to manage potential liabilities, is simply not a high priority for the agency.[264]

Similarly, after reviewing BLM's management of its idle well inventory, Interior's Office of the Inspector General concluded in 2018 that: "The Bureau of Land Management (BLM) did

256 Exhibit M, 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.

257 EPA, Abandoned Oil and Gas Wells, *supra,* at 8 tbl.8.

258 Exhibit N, American Geosciences Institute, Abandoned Wells: What Happens to Oil and Gas Wells When They are no Longer Productive?, available at: https://www.americangeosciences.org/sites/default/files/AGI_PE_AbandonedWells_web_final.pdf.

259 Exhibit O, J. Malewitz, *Abandoned Texas Oil Wells Seen as "Ticking Time Bombs" of Contamination*, Texas Tribune (Dec. 21, 2016), available at: https://www.texastribune.org/2016/12/21/texas-abandoned-oil-wells-seen-ticking-time-bombs-/.

260 U.S. Gov't Accountability Office, BLM Liabilities, supra, at 30 n.228.

261 *Id.* at 30.

262 *Id*. at 26

263 *Id.* at 14.

264 *Id*. at 25-26.

not implement its 2012 Idle Well Review and Data Entry policy in a manner that resulted in a reduced number of idle wells, as the policy intended." [265] As the IG's report concluded: BLM:

1. Did not have an accurate inventory of idle wells.
2. Did not have a clear strategy for conducting idle well reviews.
3. Could not ensure required reviews and approvals were performed and does not have sufficient guidance for tests of idle wells.
4. Used unreliable data in managing idle wells.[266]

Orphan wells not only pose a serious environmental risk, but constitute significant financial liabilities for BLM and the State of New Mexico. The GAO has recognized that "[b]onds generally do not reflect reclamation costs because most bonds are set at their regulatory minimum values, and these minimums have not been adjusted since the 1950s and 1960s to account for inflation."[267] Nor have federal bonding requirements adapted to account for the dramatically higher reclamation costs associated with much deeper and longer horizontal wells now being drilled in areas like the Greater Carlsbad region.[268] Given the documented failure of bonding requirements to ensure that orphaned oil and gas wells are properly plugged and remediated, BLM cannot rely on such bonding requirements to ensure that significant environmental impacts will not result from orphaned wells on the challenged lease parcels. As the Inspector General's report noted, agency staff at one BLM field office estimated 97 then-idle wells would become orphaned "in the near future."[269] Even based on a low-ball cleanup estimate of $15,000 per well, this would result in total cleanup costs of nearly $1.5 million. But the companies' bonds totaled only $150,000 "leaving taxpayers responsible for the remaining $1.35 million."[270] The GAO has estimated that the average value of bonds held by BLM for oil and gas wells on federal lands was just $2,122 in 2018, a slight decrease from bond levels in 2008.[271]

Similarly, New Mexico Commissioner of State Lands Stephanie Garcia Richard recently recognized that "current bonding is inadequate to ensure that the financial burden of remediation falls on those responsible for contamination and not on New Mexico families."[272] Commissioner Garcia Richard recognized that "[t]he industry and construction have expanded rapidly, and we

[265] Exhibit P, Office of Inspector General, U.S. Dep't of Interior, Bureau of Land Management's Idle Well Program, Rep. No. 2016-EAU-061 1 (Jan. 2018) ("IG Report").

[266] *Id*. at 4.

[267] Exhibit Q, U.S. Gov't Accountability Office, Bureau of Land Management Should Address Risks from Insufficient Bonds to Reclaim Wells, GAO-19-615 (Sept. 2019).

[268] Exhibit R, ECONorthwest, Reclaiming Oil and Gas Wells on Federal Lands: Estimate of Costs 3, 6-9 (Feb. 2018). BLM regulations set minimum bond values: $10,000 for all of an operator's wells on an individual lease (known as an individual lease bond), $25,000 for all of an operator's wells in a state (known as a statewide bond), and $150,000 for all of an operator's wells nationwide (known as a nationwide bond). 43 C.F.R. §§ 3104.2, 3104.3.

[269] IG Report, *supra* at 4.

[270] *Id.*

[271] U.S. Gov't Accountability Office, BLM Insufficient Bonds, *supra* at 11.

[272] Exhibit S, S. Garcia-Richard, NM Not Ready to Restore Lands if Boom's a Bust, Albuquerque Journal (Feb. 3, 2020).

need to catch up so we aren't left holding the bag" for a "billion-dollar bill to clean up our land."[273]

As the GAO has concluded, "[b]onds do not provide sufficient financial assurance to prevent orphaned wells for several reasons."[274] While BLM "does not track the number of orphaned wells over time," GAO's analysis indicated that BLM has continued to identify new orphaned wells in recent years, providing incontrovertible evidence that bonding requirements are not sufficient to prevent orphaned wells.[275] Of critical concern, bonds "do not reflect full reclamation costs for the wells they cover."[276]

The risk of wells being abandoned in the Greater Carlsbad region is particularly high given the precarious finances underlying the current fracking boom. With financial analysts recently describing the fracking business model "unsustainable,"[277] there are increasing concerns that the fracking boom, fueled by "massive borrowing" over the past decade, could collapse in coming years.[278] As Wall Street cuts off access to capital needed to drill and frack new wells, oil and gas producers saw a rise in bankruptcies in 2019,[279] and a broader collapse in the fracking industry could result in thousands of wells being abandoned without being plugged or remediated across BLM lands, including in the Pecos District.

Given the inadequacy of current bonding requirements to ensure cleanup of new and existing oil and gas wells, and the significant risk of an economic collapse in the fracking industry resulting in numerous orphaned wells in the Greater Carlsbad region, BLM needs to take a hard look at the potential indirect and cumulative environmental impacts from oil and gas wells that may be orphaned and abandoned without cleanup on the leased parcels and throughout the Pecos District.

O. BLM Must Prevent Unnecessary and Undue Degradation.

Finally, FLPMA mandates that BLM, "[i]n 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). More specifically, 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 agencies planning and management decisions, and should be considered in light of its overarching mandate that the BLM employ "principles of multiple use and sustained yield." 43 U.S.C. § 1732(a); *see also, Utah Shared Access All. v. Carpenter*, 463 F.3d 1125, 1136 (10th Cir. 2006) (finding that BLM's

[273] *Id.*

[274] U.S. Gov't Accountability Office, *supra* at 14.

[275] *Id.*

[276] *Id*.

[277] Exhibit T, H. Richards, Is U.S. Shale Facing an 'Unmitigated Disaster'?, E&E News (Sept. 19, 2019). https://www.eenews.net/stories/1061136849.

[278] Exhibit U, J. Mikulka, Will the Fracking Revolution Peak Before Ever Making Money?, DESMOG (Oct. 3, 2019).

[279] Exhibit V, J. Blum, Energy Bankruptcies Back on the Rise in 2019, Houston Chronicle (Aug. 15, 2019).

authority to prevent degradation is not limited to the RMP planning process). While these obligations are distinct, they are interrelated and highly correlated. BLM 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 or "control [of] depleting uses over time, so as to ensure a high level of valuable uses in the future." *Norton v. S. Utah Wilderness All.*, 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 P'ship 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'tl Coal.*, 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, that action is oil and gas drilling and production as authorized by the proposed lease sale. The inquiry, then, is whether the agency has taken sufficient measures to prevent degradation unnecessary to, or undue in proportion to, the development that will occur under proposed alternative. *See Theodore Roosevelt Conservation P'ship*, 661 F.3d at 76. For example, ozone pollution may cause "undue" degradation where it exceed federal air quality standards. Where this pollution is avoidable, even if in the process of avoiding such emissions lessees or operators incur reasonable economic costs that are consistent with conferred lease rights, it is "unnecessary" degradation. 43 U.S.C. § 1732(b).

Therefore, drilling activities may only go forward as long as unnecessary and undue environmental degradation does not occur. This is a *substantive* requirement, and one that the BLM must define and apply in the context of oil and gas development authorized through the lease sale. In other words, the BLM must define and apply the substantive UUD requirements in the context of the specific resource values at stake.

Further, these UUD requirements are distinct from 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*, 623 F.3d 633, 645 (9th Cir. 2010) (quoting *Kendall's Concerned Area Residents*, 129 IBLA 130, 140 (1994)). In the instant case, BLM must specifically account for UUD in its NEPA analysis, which is distinct from its compliance under NEPA, and is also actionable on procedural grounds.

In response to this, BLM claims that UUD will be analyzed at the APD stage. But, it is impossible to see how BLM could prevent UUD if it has already committed lands to oil and gas development. As BLM knows, once a lease is issued, the lessee has the right to develop. Thus, BLM must consider UUD now, before it irretrievably commits resources to development.

II. Conclusion

In sum, the Citizen Groups recommend that BLM cancel the May 2020 lease sale based on the serious concerns identified above.

Sincerely,

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Exhibit List: Pecos District May 2020 Protest

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Exhibit B, BLM, Farmington Field Office, Environmental Assessment Addendum 1, 34 (Feb. 2020), https://eplanning.blm.gov/epl-front-office/projects/nepa/120872/20014629/250019723/Final_Addendum.pdf.

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Exhibit K, EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2016: Abandoned Oil and Gas Wells 8 tbl.7 (April 2018), available at: https://www.epa.gov/sites/production/files/2018-04/documents/ghgemissions_abandoned_wells.pdf.

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