



Northwest
1216 Lincoln Street
Eugene, Oregon 97401
(541) 485-2471

Rocky Mountains
103 Reeder's Alley
Helena, Montana 59601
(406) 443-3501

Southwest
208 Paseo del Pueblo Sur #602
Taos, New Mexico 87571
(575) 751-0351

Defending the West www.westernlaw.org

Western Environmental Law Center

March 14, 2016

Sent via Electronic Mail (scoping comments only) and Certified Mail (comments and exhibits)

U.S. Bureau of Land Management
Farmington Field Office
Attn: Mark Ames
6251 College Blvd., Suite A
Farmington, New Mexico 87402
Email: mames@blm.gov
Email: NMLEasesalecomments@blm.gov

Re: Scoping Comments – Farmington Field Office, October 2016 Oil and Gas Lease Sale

Dear Mr. Ames:

The Western Environmental Law Center, along with San Juan Citizens Alliance, Diné Citizens Against Ruining Our Environment, WildEarth Guardians, Natural Resources Defense Council, Amigos Bravos, Chaco Alliance, Earthworks, and Sierra Club (together “Citizens Groups”), submit the following Scoping Comments regarding the Bureau of Land Management (“BLM”) Farmington Field Office (“FFO”) October 2016 Oil and Gas Lease Sale, including three parcels and approximately 2,122 acres of Federal mineral estate in the Greater Chaco area, south of Counselor, NM.

These three parcels are all on Navajo Allotment lands, with a federal mineral estate administered by the FFO, and have already *twice* been deferred by the agency. These parcels were first included in the original group of 26 parcels proposed for BLM’s October 2016 oil and gas lease sale, DOI-BLM-NM-F010-0154-EA, and were then amongst the five parcels included in the January 2015 lease sale, DOI-BLM-NM-F010-2014-0227-EA. Notably, with the October 2016 lease sale, these parcels were “deferred until after the FFO Mancos Shale/Gallup Formation RMPA/EIS alternatives have been developed.” Oct. 2014 Lease Sale EA at 14. Then, with the January 2015 lease sale, the parcels were deferred because “additional time is required to evaluate public comments regarding potential drainage, tribal consultation, and environmental justice.” BLM Press Release, December 30, 2014. While the Mancos RMPA remains incomplete and alternatives are still being developed, no formal tribal consultation has occurred, and environmental justice issues remain ever present, remarkably, the FFO has chosen to move forward with the sale of these parcels *for a third time*.

Accordingly, Citizens Groups hereby incorporate by reference our prior administrative comments, protests, and exhibits submitted for these prior lease sales, including October 2016 Scoping Comments (March 24, 2014), Draft Environmental Assessment Comments (May 28, 2014), and Protest (August 14, 2014), as well as January 2015 Draft Environmental Assessment Comments (September 23, 2014) and Protest (November 19, 2014). Because the three parcels at issue here have previously been offered and deferred by the FFO, all prior administrative engagement is properly before the agency and should be considered and included in the administrative record for this lease sale. These incorporated comments and exhibits offer detailed technical information, expert reports, and legal analysis that the agency is required to consider in its decisionmaking process for the proposed action. *See Forest Guardians v. U.S. Fish and Wildlife Service*, 611 F.3d 692, 717 (10th Cir. 2010) (“The purpose behind NEPA is to ensure that the agency will only reach a decision on a proposed action after carefully considering the environmental impacts of several alternative courses of action and *after taking public comment into account.*”).

Because the Mancos RMPA remains incomplete, the applicable land use plan for this action is the 2003 Farmington RMP, with “the analysis of projected surface disturbance impacts ... based on well densities listed in the Reasonable Foreseeable Development (“RFD”) Scenario included in the 2003 Farmington RMP.” However, as will be explained in further detail, reliance on the 2003 RMP and RFD fails to demonstrate that impacts associated with the proposed leasing will not be significant, or that leasing will otherwise sufficiently protect resources in the FFO. This is due to the fact that, by the BLM’s own admission, the RMP and RFD do not account for the environmental impacts of horizontal drilling and multi-stage fracturing of the Mancos Shale formation. Yet by leasing these parcels, the BLM is poised to facilitate just this kind of unforeseen development, despite any analysis as to the actual environmental impacts on both project and programmatic level.

The **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.

Founded in 1986, **San Juan Citizens Alliance** (“SJCA”) organizes people to protect our water and air, our lands, and the character of our rural communities in the San Juan Basin. SJCA focuses on four program areas, including the *San Juan Basin Energy Reform Campaign*, which ensures proper regulation and enforcement of the oil, gas, and coal industry and transitioning to a renewable energy economy. SJCA has been active in BLM and National Forest oil and gas issues in the San Juan Basin since the early 1990s, and has commented on virtually every multi-well drilling program, lease sale, and programmatic environmental review conducted in the region by the federal land management agencies since the early 1990s. SJCA’s members live, work, and recreate throughout the San Juan Basin and San Juan Mountains. SJCA’s members’ health, use and enjoyment of this region is directly impacted by the decisions identified in this protest.

Diné Citizens Against Ruining Our Environment (“Diné C.A.R.E.”) is an all-Navajo organization comprised of a federation of grassroots community activists in Arizona, New Mexico and Utah who strive to educate and advocate for our traditional teachings derived from our Diné Fundamental Laws. Our goal is to protect all life in our ancestral homeland by empowering local and traditional people to organize, speak out, and determine the outlook of the environment through civic involvement and engagement in decision-making process relating to tribal development.

WildEarth Guardians protects and restores wildlife, wild places, wild rivers, and the health of the American West. As part of its Climate and Energy Program, Guardians works to advance clean energy and expose the true cost of fossil fuels. Guardians works to protect and restore the San Juan Basin in northwestern New Mexico in order to safeguard its cultural heritage, natural values, communities, and open spaces.

The **Natural Resources Defense Council** (“NRDC”) is a non-profit environmental membership organization with more than 440,000 members throughout the United States. Approximately 5,000 of these members reside in New Mexico. NRDC members use and enjoy public lands in New Mexico, including lands managed by the Bureau of Land Management within the Farmington Field Office planning area. NRDC members use and enjoy these lands for a variety of purposes, including: recreation, solitude, scientific study, and conservation of natural resources. NRDC has had a longstanding and active interest in the protection of public lands in New Mexico, the responsible development of oil and gas resources, and the protection of public health from environmental threats.

Amigos Bravos is a statewide river conservation organization guided by social justice principles. Amigos Bravos’ mission is to protect and restore the waters of New Mexico, and ensure that those waters provide a reliable source of clean water to the communities and farmers that depend on them, as well as a safe place to swim, fish, and go boating. Amigos Bravos works locally, statewide, and nationally to ensure that the waters of New Mexico are protected by the best policy and regulations possible.

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.

Earthworks is a nonprofit organization dedicated to protecting communities and the environment from the adverse impacts of mineral and energy development while promoting sustainable solutions. Earthworks stands for clean air, water and land, healthy communities, and corporate accountability. We work for solutions that protect both the Earth’s resources and our communities.

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 approximately 600,000 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.

I. The BLM is Required to Issue a Moratorium on All Oil and Gas Leasing and Development Decisionmaking so long as the Mancos Shale/Gallup Formation RMP and EIS Remains Uncompleted.

Where, as here, there is a pending revision to the Resource Management Plan Amendment (“RMPA”) and environmental impact statement (“EIS”) for the Mancos Shale/Gallup Formation (hereinafter “Mancos RMPA”) – updating the out-of-date reasonable foreseeable development (“RFD”) scenario for the planning area – NEPA establishes a duty “to stop actions that adversely impact the environment, that limit the choice of alternatives for the EIS, or that constitute an ‘irreversible and irretrievable commitment of resources.’” *Conner v. Burford*, 848 F.2d 1441, 1446 (9th Cir. 1988). When an EIS is underway, as here, NEPA regulations established by the Council of Environmental Quality (“CEQ”) prohibit an agency from taking any actions that would significantly impact the environment. 40 C.F.R. § 1506.1(c) (1997). Pursuant to these CEQ regulations:

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)(1)-(3).

Proceeding with the October 2016 Lease Sale – or any other major Federal action impacting resources in the planning area – is impermissible due to the inherent prejudice that this action will cause to the pending Mancos RMPA. Revision of the RFD for the planning area is fundamental to the public land use decisionmaking process in the FFO and beyond – creating the foundation upon which all mineral resource management decisions are made – and, as explained by the agency’s Federal Register Notice, the FFO’s 2003 RMP/EIS is incapable of performing this function.

As full-field development occurs, especially in the shale oil play, additional impacts may occur that previously were not anticipated in the RFD or analyzed in the current 2003 RMP/EIS, which will require an EIS-level plan amendment and

revision of the RFD for complete analysis of the Mancos Shale/Gallup Formation.

79 Fed. Reg. 10548 (Feb. 25, 2014).

The whole point of NEPA is to study the impact of an action on the environment before the action is taken. *See Conner*, 848 F.2d at 1452 (NEPA requires that agencies prepare an EIS before there is “any irreversible and irretrievable commitment of resources”). Where “[i]nterim action prejudices the ultimate decision on the program,” NEPA forbids it. 40 C.F.R. §§ 1506.1(c)(1)-(3). Action prejudices the outcome “when it tends to determine subsequent development or limit alternatives.” *Id.* In this case, once oil and gas lease rights are conveyed, lessees have a right to drill, and the impact on the environment from the exercise of those rights cannot be undone, which is exactly the situation NEPA disallows – allowing new activity that limits alternatives in the future.

As provided, while CEQ regulations require a moratorium on any further leasing until the Mancos Shale RMP and EIS are completed, such a decision is also well within the discretion of the FFO. As provided in BLM Instruction Memorandum No. 2010-117 (May 17, 2010):

As outlined in the Land Use Planning Handbook (H-1601-1), the Resource Management Plan (RMP) underlies fluid minerals leasing decisions. Through RMP effectiveness monitoring and periodic RMP evaluations, state and field offices will examine resource management decisions to determine whether the RMPs adequately protect important resource values in light of changing circumstances, updated policies, and new information (H-1601-1, section V, A, B). The results of such reviews and evaluations may require field office resource information updates and land use plan maintenance, amendment, or revision. In some cases state and field office staff may determine that the public interest would be better served by further analysis and planning prior to making any decision whether or not to lease.

(emphasis added). Here, the public interest would be better served by completing the RMPA and EIS *before* deciding whether it is appropriate to lease additional public lands. According to BLM oil and gas statistics, there are currently 5,027,750 acres of leased land that is “in effect” in New Mexico; but only approximately 70% of which is in production. *See* BLM, Oil and Gas Statistics by Year for Fiscal Years 1988 – 2012. Before additional public lands are sold to oil and gas industry speculators, the agency must understand the additional impacts of developing the Mancos Shale/Gallup formation.

Critically, BLM’s Taos Field Office recently deferred 16 parcels and 13,300 acres of public lands in the same Mancos Shale formation, and these three parcels were twice deferred by the FFO. At least in part due to the FFO’s pending RMPA, which, “[o]nce completed, the information provided by this study will help to BLM to make future decisions regarding leasing in this area[.]” the Taos Field Office decided to defer the sale.¹ The FFO took a similar approach

¹ *See* BLM, Taos Field Office, *October 2016 Oil and Gas Lease Sale*, available at: http://www.blm.gov/nm/st/en/fo/Taos_Field_Office/tafo_og_sale_october.html.

with the October 2016 lease sale, where these parcels were “deferred until after the FFO Mancos Shale/Gallup Formation RMPA/EIS alternatives have been developed.” Oct. 2014 Lease Sale EA at 14.

This type of reasoned approach should remain with the three parcels included in the October 2016 lease sale. Such an approach is not only commonsense, but, as discussed above, is also required given the resulting prejudice to the Mancos Shale RMPA and EIS that *any* sale and subsequent development would create. Under these circumstances, NEPA plainly prohibits undertaking any action that would limit alternatives, as proceeding in the sale of these three parcels certainly would. 40 C.F.R. §§ 1506.1(c)(1)-(3).

II. BLM Should Use Its Broad Discretion Not to Lease the Proposed Parcels.

The BLM FFO has broad discretion and remove the three parcels from nomination. Given the proximity of these parcels to already deferred areas – which are not divided by geography as much as they are by field office boundaries – deferral is the only reasonable option. As was true with the Taos Field Office parcels, the agency’s chosen path of opening this area up to oil and gas development would threaten the water resources serving both the communities and the surrounding area – which is particularly true given the unique geology underlying the planning area. Quite simply, developing this area for oil and gas represents an unnecessary and avoidable risk that would threaten the area’s other important multiple use resources.

BLM has broad discretion – and often the responsibility, though too often ignored – not to lease public lands for minerals development to safeguard other multiple use, environmental, and human health resources and values. *See, e.g., Udall v. Tallman*, 380 U.S. 1 (1965); *Rocky Mountain Oil & Gas Association v. U.S. Forest Service*, 157 F.Supp.2d 1142 (D. Mont. 2000). BLM’s authority to open these three parcels to oil and gas development is derived from the Mineral Leasing Act of 1920, 30 U.S.C. § 181 *et seq.* Nowhere does the Mineral Leasing Act (“MLA”) mandate that any particular lands be offered for lease. Rather, the Act states generally that “[a]ll lands subject to disposition under this chapter which are known or believed to contain oil or gas deposits *may* be leased by the Secretary.” 30 U.S.C. § 226(a) (emphasis added). The Ninth Circuit has held that the “permissive word 'may' in § 226(a) allows the Secretary to lease such lands, but does not require him to do so.... [T]he Secretary has discretion to refuse to issue any lease at all on a given tract.” *Burglin v. Morton*, 527 F.2d 486, 488 (9th Cir. 1975). The Supreme Court reached the same conclusion in *Udall v. Tallman*, 380 U.S. 1, 4 (1965), in which the Court declared that the Mineral Leasing Act “left the Secretary discretion to refuse to issue any lease at all on a given tract.” *See also Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1230 (9th Cir. 1988) (providing that refusal to issue leases constitutes a “legitimate exercise of the discretion granted to the Interior Secretary”); *McDonald v. Clark*, 771 F.2d 460, 463 (10th Cir. 1985) (“While the statute gives the Secretary the authority to lease government lands under oil and gas leases, this power is discretionary rather than mandatory.”); *McTiernan v. Franklin*, 508 F. 2d 885, 887 (10th Cir. 1975) (under § 226(a), the government “may refuse to issue any lease at all on a given tract”); *Pease v. Udall*, 332 F.2d 62, 63 (9th Cir. 1964) (Mineral Leasing Act “has consistently been construed as leaving to the Secretary, within his discretion, a determination as to what lands are to be leased thereunder”); *Pacific Legal Foundation v. Watt*, 529 F.Supp. 982,

991 n.14 (D. Mont. 1982) (under § 226(a), “the Secretary has discretion either to issue or refuse to issue oil and gas leases”).

Indeed, BLM’s discretion over oil and gas leasing is so great that courts have held that the agency may decide not to allow leasing even after the lands have been offered for lease and a qualified applicant selected. In *McDonald*, the Tenth Circuit Court of Appeals provided: “The fact that land has been offered for lease does not bind the Secretary to actually lease the land, nor is the Secretary bound to lease the land when a qualified applicant has been selected.” *McDonald*, 771 F.2d at 463. The Court continued, saying “the Secretary may withdraw land from leasing at any time before the actual issuance of the lease, even if the offer was filed long before the determination not to lease was made.” *Id.* (citing *Arnold v. Morton*, 529 F.2d 1101, 1106 (9th Cir. 1976); *Schraier v. Hickel*, 419 F.2d 663, 665-67 (D.C. Cir. 1969)).

Moreover, nothing in the Federal Onshore Oil and Gas Leasing Reform Act (“FOOGLRA”) requires BLM to open lands at the behest of the oil and gas industry. The MLA, as amended by FOOGLRA in 1987, 30 U.S.C. § 181 *et seq.*, simply requires BLM to *consider* oil and gas leasing on land consistent with the RMP. As identified above, just because land is identified for leasing does not mean that it must be leased. If review of a potential lease proposed for sale reveals problems, or that other resources and values should be protected, the agency can decide not to lease, period, and in fact, may be duty-bound, pursuant to laws such as FLPMA, not to lease to ensure that other resources and values are protected. For example, in *Marathon Oil Co.*, 139 IBLA 347 (1997), BLM removed parcels from a competitive lease sale for environmental reasons, even after they had been offered for sale pursuant to industry nomination. In that case, the IBLA held that “BLM enjoys considerable discretion to depart from its RMP in any specific case, and it may well be able to justify excluding these parcels from leasing for environmental purposes.” *Id.* at 356.

The MLA and FOOGLRA do not in any way restrict the factors that BLM may consider when exercising its considerable discretion under § 226(a). Therefore, even if the BLM bases its decision entirely on the public’s overwhelming opposition to oil and gas development in this area, it has the authority to do so. Indeed, it would be irresponsible for BLM’s FFO to propose these 26 lease parcels for sale without first performing the necessary due diligence and environmental review to determine, on a site-specific basis, whether these lands should be conserved as is.

Based on this expansive authority and discretion, we implore BLM FFO to reconsider its assent to the nomination of the three parcels in October 2016 Oil and Gas Lease Sale, and remove these parcels from consideration.

III. The BLM Must Take a Hard Look at the Direct, Indirect and Cumulative Impacts of Oil and Gas Development on Certain Resource Values in the Planning Area.

The National Environmental Policy Act (“NEPA”), 42 U.S.C. § 4321 *et seq.*, and its implementing regulations, promulgated by the Council on Environmental Quality (“CEQ”), 40 C.F.R. §§ 1500.1 *et seq.*, is our “basic national charter for the protection of the environment.” 40 C.F.R. § 1500.1. Recognizing that “each person should enjoy a healthful environment,” NEPA

ensures that the federal government uses all practicable means to “assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings,” and to “attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences,” among other policies. 43 U.S.C. § 4331(b).

NEPA regulations explain, in 40 C.F.R. §1500.1(c), that:

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.

Thus, while “NEPA itself does not mandate particular results, but simply prescribes the necessary process,” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989), agency adherence to NEPA’s action-forcing statutory and regulatory mandates helps federal agencies ensure that they are adhering to NEPA’s noble purpose and policies. *See* 42 U.S.C. §§ 4321, 4331.

NEPA imposes “action forcing procedures ... requir[ing] that agencies take a *hard look* at environmental consequences.” *Methow Valley*, 490 U.S. at 350 (citations omitted) (emphasis added). These “environmental consequences” may be direct, indirect, or cumulative. 40 C.F.R. §§ 1502.16, 1508.7, 1508.8. A cumulative impact – particularly important here – is defined 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.

Federal agencies 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).

Furthermore, the Federal Land Policy and Management Act (“FLPMA”), 43 U.S.C. § 1701 *et seq.*, directs that “the public lands be managed in a manner that will protect the quality of

[critical resource] values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use.” 43 U.S.C. § 1701(a)(8). This substantive mandate requires that the agency not elevate the development of oil and gas resources above other critical resource values in the planning area. To the contrary, FLPMA requires that where oil and gas development would threaten the quality of critical resources, that conservation of these resources should be the preeminent goal. As detailed, below, for several critical resource values in the planning area, the proposed action conflicts with the BLM’s mandate under FLMPA.

A. An Agency fails to take a “hard look” if it predetermines its NEPA analysis.

NEPA “requires ... that an agency give a ‘hard look’ to the environmental impact of any project or action it authorizes.” *Morris v. U.S. Nuclear Regulatory Commission*, 598 F.3d 677, 681 (10th Cir. 2010). This examination “must be taken objectively and in good faith, not as an exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made.” *Forest Guardians*, 611 F.3d at 712 (quoting *Metcalf v. Daley*, 214 F.3d 1135, 1142 (9th Cir. 2000)); *see also* 40 C.F.R. § 1502.2(g) (“Environmental impact statements shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made.”); *id.* § 1502.5 (“The statement shall be prepared early enough so that it can serve practically as an important contribution to the decision-making process and will not be used to rationalize or justify decisions already made.”).

As soon as BLM sells an oil and gas parcel – particularly, as here, when the lease may be sold without a no surface occupancy (“NSO”) stipulation – that sale confers a guaranteed right to the leaseholder, which includes the right of occupancy. In other words, once a lease sale occurs, the agency’s options regarding management of that parcel is severely restrained. Without analyzing impacts from the lease sale itself, any subsequent analysis intrinsically shifts from *preventing* impacts (and managing lands for other resource values) to merely *mitigating* impacts (and allowing oil and gas lessees to exercise their surface use rights to the lease at the expense of other resource values). This approach is fundamentally incongruous with NEPA’s mandate. The Ninth Circuit has noted: “In a way, reliance on mitigation measures presupposes approval. It assumes that – regardless of what effects construction may have on resources – there are mitigation measures that might counteract the effect without first understanding the extent of the problem. This is inconsistent with what NEPA requires.” *Northern Plains Resource Council v. Surface Transportation Board*, 668 F.3d 1067, 1084-85 (9th Cir. 2011). It is critical that BLM’s FFO avoid this scenario. If not otherwise withdrawn, as discussed above, the use of NSO stipulations should predominate the parcels offered, and mitigation should be relied upon only where such management is clearly supported by detailed site-specific analysis.

BLM, in making a predetermined conclusion, creates an unlevel playing field that benefits oil and gas leasing and drilling at the expense of other multiple use resources. There is a long line of cases that warn agencies against making a predetermined decision with respect to their NEPA analysis. The Tenth Circuit Court of Appeals has cautioned: “[I]f an agency predetermines the NEPA analysis by committing itself to an outcome, the agency likely has failed to take a hard look at the environmental consequences of its actions due to its bias in favor of that outcome and, therefore, has acted arbitrarily and capriciously.” *Forest Guardians*, 611

F.3d at 713 (citing *Davis v. Mineta*, 302 F.3d 1104 (10th Cir. 2002)). The Tenth Circuit further stated that “[w]e [have] held that ... predetermination [under NEPA] resulted in an environmental analysis that was tainted with bias” and was therefore not in compliance with the statute. *Id.* (citing *Davis*, 302 F.3d at 1112–13, 1118–26)).

While the threshold for finding agency predetermination is high – “occur[ing] only when an agency *irreversibly and irretrievably* commits itself to a plan of action that is dependent upon the NEPA environmental analysis producing a certain outcome, *before* the agency has completed that environmental analysis,” *Forest Guardians*, 611 F.3d at 714 (emphasis in original) – here, BLM’s misguided process threatens to meet that threshold. For example, BLM has already identified dates for public involvement – providing that scoping is no later than March 14, 2016, which will be followed by review of the Draft Environmental Analysis (“EA”) and a protest period in advance of the lease sale. This suggests that, regardless of what the agency’s environmental analysis indicates, the proposed parcels will be offered for competitive sale in October 2016. Adherence to this timeframe would require that the agency reach a finding of no significant impact (“FONSI”), based not on any actual analysis of impacts, but rather on the predetermined decision to maintain a schedule despite its findings. At a minimum, this creates an improper “inertial presumption” in favor of committing resources to oil and gas development before knowing the site-specific impacts of oil and gas development. *Natl. Wildlife Fed. v. Morton*, 393 F.Supp 1286, 1292 (D.D.C. 1975).

By reaching, in effect, a predetermined decision – or at least creating a presumption in favor of oil and gas leasing and development – BLM not only violates NEPA, but also, by elevating development of oil and gas over other multiple use resources, FLPMA. As the Tenth Circuit has explained:

It is past doubt that the principle of multiple use does not require BLM to prioritize development over other uses. . . . 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.

New Mexico ex rel. Richardson v. Bureau of Land Management, 565 F.3d 683, 710 (10th Cir. 2009). BLM’s presupposition of outcome is a direct affront to both NEPA and FLPMA, and cannot be sustained.

B. Because an irretrievable commitment of resources will occur at the lease sale stage, BLM must consider impacts prior to the sale.

In the past, BLM has stated its intent to defer NEPA analysis to determine whether significant impacts exist until the application for permit to drill (“APD”) stage. Given the timeline provided, as noted above, BLM FFO threatens to adopt the same approach, here.

BLM has previously relied on *Park County Resource Council v. U.S. Department of Agriculture*, 817 F.2d 609 (10th Cir. 1987), to support its contention that site-specific NEPA analysis is not required until the APD stage. In *Park County*, the Court provided that “*with appropriate lease stipulations* aimed at protecting the environment, lease issuance itself,

essentially a paper transaction, does not *usually* require prior preparation of an EIS.” *Park County*, 817 F.2d at 621 (emphasis added). *Park County*, however, does not stand for the proposition – as BLM has implied – that there is a categorical rule exempting BLM from ever performing site-specific analysis at the lease sale stage. Indeed, the 9th Circuit has consistently held that the sale of oil and gas leases is an irretrievable commitment of resources for which an EIS must be prepared. *See, e.g., Conner v. Burford*, 848 F.2d 1441 (9th Cir.1988); *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1227 (9th Cir.1988). Further, *Park County* cannot be understood in a vacuum; as the Tenth Circuit more recently explained:

[T]here is no bright line rule that site-specific analysis may wait until the APD stage. Instead, the inquiry is necessarily contextual. Looking to the standards set out by regulation and by statute, assessment of all ‘reasonably foreseeable’ impacts must occur at the earliest practicable point, and must take place before an ‘irretrievable commitment of resources’ is made. 42 U.S.C. § 4332(2)(C)(v); *Pennaco Energy v. U.S. Dept. of Interior*, 377 F.3d 1147, 1160 (10th Cir. 2004); *Kern v. U.S. Bureau of Land Management*, 284 F.3d 1062, 1072 (9th Cir. 2002); 40 C.F.R. §§ 1501.2, 1502.22. Each of these inquiries is tied to the existing environmental circumstances, not to the formalities of agency procedures. Thus, applying them necessarily requires a fact-specific inquiry.

New Mexico ex rel. Richardson, 565 F.3d at 717-18. The Court has unambiguously stated that “[t]he operative inquiry [is] simply whether all foreseeable impacts of leasing [are] taken into account before leasing [can] proceed.” *Id.* at 717.

Indeed, in *Pennaco Energy*, the Court found: “A plan-level EIS for the area failed to address the possibility of CBM development, and a later EIS was prepared only after the leasing stage, and thus ‘did not consider whether leases should have been issued in the first place.’” *New Mexico*, 565 F. 3d. at 717 (citing *Pennaco Energy*, 377 F.3d at 1152). Moreover, the Court held that “[b]ecause the issuance of leases gave lessees a right to surface use, the failure to analyze CBM development impacts before the leasing stage foreclosed NEPA analysis from affecting the agency’s decision.” *Id.* (citing *Pennaco Energy*, 377 F.3d at 1160).

Unlike *Park County* where site-specific impacts were difficult to anticipate, here, like in *Pennaco Energy*, the impacts of leasing these three parcels are reasonably foreseeable: other lands in this area have already been leased and development is ongoing. Thus, as in *Pennaco Energy*, an EIS assessing the specific effects of oil and gas development is required before the leasing stage.

Moreover, irrespective of BLM’s ultimate conclusion with regard to stipulations, an irretrievable commitment of resources will be conferred at the lease sale stage; oil and gas leases confer “the right to use so much of the leased lands as is necessary to explore for, drill for, mine, extract, remove and dispose of all the leased resource in a leasehold.” 40 C.F.R. § 3101.1-2; *Sierra Club v. Hodel*, 848 F.2d 1068, 1093 (10th Cir. 1988) (agencies are to perform hard look NEPA analysis “before committing themselves irretrievably to a given course of action so that the action can be shaped to account for environmental values”).

Yet, even if a parcel were to contain a NSO stipulation, the mere issuance of the lease confers a right to the resources thereunder. Whether through directional drilling or some other method of extraction, the leaseholder has an exercisable interest as soon as the lease is conferred, which it then relies upon in proceeding with its development plan. Therefore, significant environmental impacts, based on those lease rights, may also occur once a lease is issued. Although it is true that “some or all of the environmental consequences of oil and gas development may be mitigated through lease stipulations, it is equally true that the purpose of NEPA is to examine the foreseeable environmental consequences of a range of alternatives *prior* to taking an action that cannot be undone.” *Montana Wilderness Ass’n v. Fry*, 310 F.Supp.2d 1127, 1145 (D.Mont., 2004) (citation omitted) (emphasis added); 40 C.F.R. § 1501.2.

If BLM fails to perform site-specific analysis at the lease stage, BLM’s authority will thereafter be limited to imposing mitigation measures consistent with the terms of the lease. In other words, BLM FFO will not be able to impose conditions inconsistent with the lease terms and it cannot deny the developer the right to drill altogether. Consequently, if BLM discovers significant impacts at the APD stage, it may no longer be able to prevent them.

Because BLM is irretrievably committing resources at the lease sale stage, it must consider the impacts of its decision to lease parcels before it can confer public resources to a private developer in a lease – analysis which would be inherently flawed if performed without the benefit of a completed Mancos Shale RMP and EIS.

C. The preparation of an Environmental Impact Statement (“EIS”) is required prior to the issuance of the lease.

As the Tenth Circuit has explained, “[i]f 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.” *Airport Neighbors Alliance v. U.S.*, 90 F.3d 426, 429 (10th Cir. 1996) (citation omitted) (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) (citations omitted) (emphasis original).

If BLM FFO “decides not to prepare an EIS, ‘it must put forth a convincing statement of reasons’ that explains why the project will impact the environment no more than insignificantly. This account proves crucial to evaluating whether the [agency] took the requisite ‘hard look.’” *Ocean Advoc. v. U.S. Army Corps of Engrs.*, 402 F.3d 846, 864 (9th Cir. 2005). In the instant case, however, the BLM FFO would be hard pressed to reach any conclusion other than that three parcels and approximately 2,122 acres of development in this area *may* result in significant

degradation.

D. The BLM must take a “hard look” at impacts to air quality.

The BLM must take a hard look at the air quality impacts from oil and gas development in the planning area. Much of air pollution from oil and gas development and operations, which is specifically discussed, below, also degrades visibility. Section 169A of the Clean Air Act (“CAA”), 42, U.S.C. § 7401 *et seq.* (1970) sets forth a national goal for visibility, which is the “prevention of any future, and the remedying of any existing, impairment of visibility in Class I areas which impairment results from manmade air pollution.” Congress adopted the visibility provisions in the CAA to protect visibility in “areas of great scenic importance.” H.R. Rep. No. 294, 95th Cong. 1st Sess. at 205 (1977). In promulgating its Regional Haze Regulations, 64 Fed. Reg. 35,714 (July 1, 1999), the U.S. Environmental Protection Agency (“EPA”) provided:

Regional haze is visibility impairment that is produced by a multitude of sources and activities which emit fine particles and their precursors and which are located across a broad geographic area. Twenty years ago, when initially adopting the visibility protection provisions of the CAA, Congress specifically recognized that the “visibility problem is caused primarily by emission into the atmosphere of SO₂, oxides of nitrogen, and particulate matter, especially fine particulate matter, from inadequate[ly] controlled sources.” H.R. Rep. No. 95-294 at 204 (1977). The fine particulate matter (PM) (e.g., sulfates, nitrates, organic carbon, elemental carbon, and soil dust) that impairs visibility by scattering and absorbing light can cause serious health effects and mortality in humans, and contribute to environmental effects such as acid deposition and eutrophication.

The visibility protection program under sections 169A, 169B, and 110(a)(2)(J) of the CAA is designed to protect Class I areas from impairment due to manmade air pollution. The current regulatory program addresses visibility impairment in these areas that is “reasonably attributable” to a specific source or small group of sources, such as, here, air pollution resulting from oil and gas development and operations authorized by the LRMP. *See* 64 Fed. Reg. 35,714.

Moreover, EPA finds the visibility protection provisions of the CAA to be quite broad. Although EPA is addressing visibility protection in phases, the national visibility goal in section 169A calls for addressing visibility impairment generally, including regional haze. *See e.g., State of Maine v. Thomas*, 874 F.2d 883, 885 (1st Cir. 1989) (“EPA’s mandate to control the vexing problem of regional haze emanates directly from the CAA, which ‘declares as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in Class I areas which impairment results from manmade air pollution.’”) (citation omitted).

Here, there are numerous Class I areas within or near the project area that may be impacted by the proposed development, including: Bandelier National Monument, Wheeler Peak Wilderness, San Pedro Parks Wilderness, Cruces Basin Wilderness, Chama River Canyon Wilderness and Pecos Wilderness in New Mexico, as well as Weminuche Wilderness, La Garita Wilderness, South San Juan Wilderness, Great Sand Dunes National Park, and Mesa Verde National Park in Colorado.

In addition to impacts from the proposed development, cumulative air quality impacts from sources in and around the proposed development area may result in serious impairments. For example, there is considerable oil and gas development already taking place in the San Juan Basin, with approximately 23,000 active oil and gas wells, as well as significant emissions from coal-fired power plants at San Juan Generating Station and the Four Corners Power Plant.

The current status of air quality in an area is a fundamental consideration for analysis in the agency's NEPA analysis. Background monitored concentrations of all pollutants should be reviewed. Given the increasing development in the area, there may be higher concentrations that should be reflected. In particular, elevated monitored levels for the 8-hour ozone National Ambient Air Quality Standard ("NAAQS") in this area in recent years are very concerning. Exposure to ozone is a serious concern as it can cause or exacerbate respiratory health problems, including shortness of breath, asthma, chest pain and coughing, decreased lung function and even long-term lung damage, as discussed in greater detail below. *See also*, EPA's National Ambient Air Quality Standards for Particulates and Ozone, 62 FR 38,856 (July 18, 1997). According to a recent report by the National Research Council ("NRC"): "short-term exposure to current levels of ozone in many areas is likely to contribute to premature deaths."² Even ozone concentrations at levels as low as 60 ppb can be considered harmful to human health and the agencies should consider this when evaluating the air impacts that would result from developing these 26 parcels.

Elevated ozone concentrations have been recorded in recent years at eight monitors in the Four Corners Area. For example, the background value given for Mesa Verde is 142 $\mu\text{g}/\text{m}^3$, which is just under the NAAQS.³ Thus, the increased oil and gas development that will take place under the proposed action would be an important contributor to the ozone problem in the area. There is no room for growth in emissions that contribute to these harmful levels of ozone pollution in the area – namely, nitrogen oxides ("NO_x") and volatile organic compounds ("VOCs"). Any increase in emissions of ozone precursors will exacerbate the negative health effects of ozone in the region, as discussed below, and is almost certain to threaten the area's compliance with EPA's the ozone standard.

Additionally, PM_{2.5} is another potential area of major health impacts in the area. PM_{2.5} can become lodged deep in the lungs or can enter the blood stream, worsening the health of asthmatics and even causing premature death in people with heart and lung disease. Even PM_{2.5} concentrations lower than the current NAAQS are a concern for human health. While background PM_{2.5} values are not at the level of the NAAQS currently, it is likely that those levels will increase with continued development in the area. Elevated wintertime concentrations could

² National Research Council, *Link Between Ozone Air Pollution and Premature Death Confirmed*, (April 2008), available at: <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=12198>.

³ The 75 ppb 8-hour ozone standard of 75 ppb translates to 150 $\mu\text{g}/\text{m}^3$.

become an issue as they have in other areas of concentrated oil and gas development in the West, such as in the Uinta Basin in Utah.⁴

Also critical to the BLM's analysis of air quality impacts is the relationship to human health. Logically, the required air quality mitigation measures would have a positive relationship to human health, but poor baseline air quality conditions due to direct, indirect and cumulative impacts in the planning area warrants an independent hard look analysis at human health; and, moreover, such analysis is required by NEPA and CEQ implementing regulations.

Research indicates a strong correlation between oil and gas development and increased ozone concentrations – particularly in the summer when warm, stagnant conditions yield an increase in O₃ from oil and gas emissions.⁵ Particularly in areas of significant existing oil and gas development – such as the San Juan Basin in the Four Corners region, which was the focus of research, here – summertime “peak incremental O₃ concentration of 10 ppb” have been simulated. *Id.* at 1118. This study indicates a “clear potential for oil and gas development to negatively affect regional O₃ concentrations in the western United States, including several treasured national parks and wilderness areas in the Four Corners region – particularly Mesa Verde and the Weminuche Wilderness. “It is likely that accelerated energy development in this part of the country will worsen the existing problem.”⁶ Additionally, oil and gas production in the mountain west has recently been linked to *winter* ozone levels that greatly exceed the National Ambient Air Quality Standards (“NAAQS”).⁷

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

⁴ Several very high values of PM_{2.5} were recorded in Vernal, Utah starting in 2007, including six exceedances of the 24-hour PM_{2.5} NAAQS and a maximum 24-hour average PM_{2.5} concentration of 63 µg/m³. In 2009, there were three recorded exceedances of the 24-hour average PM_{2.5} NAAQS in Roosevelt, Utah with 24-hour average concentrations reaching 42 µg/m³ and four recorded exceedances in Vernal with 24-hour average concentrations as high as 60.9 µg/m³.

⁵ Marco A Rodriguez, et al., *Regional Impacts of Oil and Gas Development on Ozone Formation in the Western United States*, JOURNAL OF AIR & WASTE MANAGEMENT ASSOCIATION (Sept. 2009).

⁶ See Rodriguez at 1118.

⁷ See Gail Tonnesen and Richard Payton, EPA Region 8. *Winter Ozone Formation: Results from the Wyoming Upper Green River Basin Studies and Plans for the 2012, Uintah Basin Study* (seminar abstract) (Jan. 2012), available at: <http://www.esrl.noaa.gov/csd/seminars/2012/TonnesenPayton.html> (citing, *inter alia*, Schnell, et. al., *Rapid photochemical production ozone at high concentrations in a rural site during winter*, 2 Nature Geosci. 120-122 (2009).

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 produced. 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.⁸

Increases in ground-level ozone not only impact regional haze and visibility, but can also result in dramatic impacts to human health. According to the EPA:

Breathing ground-level ozone can result in a number of health effects that are observed in broad segments of the population. Some of these effects include:

- Induction of respiratory symptoms
- Decrements in lung function
- Inflammation of airways

Respiratory symptoms can include:

- Coughing
- Throat irritation
- Pain, burning, or discomfort in the chest when taking a deep breath
- Chest tightness, wheezing, or shortness of breath

In addition to these effects, evidence from observational studies strongly indicates that higher daily ozone concentrations are associated with increased asthma attacks, increased hospital admissions, increased daily mortality, and other markers of morbidity. The consistency and coherence of the evidence for effects upon asthmatics suggests that ozone can make asthma symptoms worse and can increase sensitivity to asthma triggers.⁹

Oil and gas development is one of the largest sources of VOCs, ozone, and sulfur dioxide emissions in the United States. The relationship between air quality and human health must be analyzed in the agency's NEPA analysis. "The agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the

⁸ The Endocrine Disruption Exchange. Undated. *Chemicals In Natural Gas Operations: Health Effects Spreadsheet and Summary*, available at: <http://www.endocrinedisruption.com/chemicals.multistate.php>.

⁹ EPA, *Health Effects of Ozone in the General Population*, available at: <http://www.epa.gov/apti/ozonehealth/population.html>.

facts found and the choice made.” *Motor Vehicle Mfrs.*, 463 U.S. at 43 (1983).

a. New Ozone Standards

Ozone has long been recognized to cause adverse health effects. Short term exposure to ozone causes multiple negative respiratory effects, from inflammation of airways to more serious respiratory effects that can lead to use of medication, absences from school and work, hospital admission, emergency room visits, and chronic obstructive pulmonary disease (“COPD”). Respiratory harm from ozone exposure, even at current standards, can harm healthy people. The impacts are much more serious for people with lung disease, such as asthma. Long-term exposure to elevated levels of ozone results in numerous negative harmful effects, such as permanent lung damage and abnormal lung development in children. Long-term exposure may also increase risk of death from respiratory problems. Short- and long-term exposure to elevated levels of ozone can also harm people’s hearts and cardiovascular system. *See* 79 Fed. 75234-311.

On December 17, 2014, EPA published a proposal to revise NAAQS for ozone to 65 to 70 parts per billion (ppb) from the current 75 ppb. National Ambient Air Quality Standards for Ozone, 79 Fed. Reg. 75234 (Dec. 17, 2014). This decision was driven by significant recent scientific evidence that the current standard of 75 ppb does not adequately protect public health and that ozone concentrations as low as 72 ppb can cause respiratory harm to young, healthy adults following exposure for less than eight hours. *Id.* at 75249-311 (citing controlled human exposure studies documenting adverse effects to lung function from ozone concentrations of 60 ppb and 72 ppb and epidemiologic panel studies documenting short- and long-term respiratory harms in cities that meet the 75 ppb ozone standard).¹⁰ Recent studies have also documented decreased lung functioning and airway inflammation in young, healthy adults at ozone concentrations as low as 60 ppb; these effects, if repeated, can lead to more serious respiratory impairments. *Id.* at 75280, 75305.

Studies have documented “significant associations with respiratory emergency department visits with children and adults” in places that met the current standard of 75 ppb, but would not have met the proposed standards of 65-70 ppb. *Id.* at 75283-85, 75307 (citing Mar and Koenig, 2009; Dales et al., 2006). The existing standard is plainly insufficient to protect children with asthma and members of other sensitive groups. *Id.* at 75285-87. These impacts will be exacerbated by the worsening impacts of climate change. *Id.* at 75242.

In short, the best science shows that the 75 ppb standard is inadequate to protect public health: “the respiratory effects experienced following exposures to O₃ concentrations lower than 75 ppb could be adverse to some individuals, particularly if experienced by members of at risk populations (e.g., people with asthma, children).” *Id.* at 75280.

¹⁰ Brown et al., 2008; Kim et al., 2011; Schelegle et al., 2009; Adams 2002; Adams 2008; Brunekreef et al., 1994; Spektor et al., 1988a; Ulmer et al., 1997; Gielen et al., 1997; Mar and Koenig, 2009.

Revision of the ozone standard from 75 ppb to 65 or 70 ppb is expected to lead to “meaningful reductions in mean premature mortality.” *Id.* at 75308. The Clean Air Scientific Advisory Committee (CASAC) has noted that even a reduced standard of 70 ppb may not be sufficient to protect public health with an adequate margin of safety, and that a standard as low as 60 ppb would be scientifically justified. *Id.* at 75309-10. CASAC concluded that adverse respiratory effects “almost certainly occur” at lower levels for potentially at risk populations, such as children, the elderly, and people with asthma, people who are active or work outdoors, and people with lung diseases such as COPD. *Id.* at 75305. Thus, a lower level is necessary in order to protect the broader population. *Id.*

NEPA imposes on federal agencies a continuing duty to supplement draft or final environmental impact statements in response to significant new circumstances or information relevant to environmental concerns and bearing on the proposed action. *Idaho Sporting Cong., Inc. v. Alexander*, 222 F.3d 562, 566 n.2 (9th Cir. 2000); 40 C.F.R. § 1502.9(c)(1)(i). Here, EPA’s proposal to revise ozone standards, as well as the science supporting the revision, constitute new circumstances and information, which BLM must take account of in its final EIS. The FEIS’s conclusions regarding ozone are based on comparison to the existing NAAQS for ozone. EPA’s proposed revision of the ozone NAAQS and the abundant science supporting the proposal plainly demonstrate that the current NAAQS are not sufficient to protect public health.

E. The BLM must take a “hard look” at climate change.

If we are to stem the impacts of climate change and manage for sustainable ecosystems, not only must the BLM take a hard look at greenhouse gas (“GHG”) emissions from the proposed development, but its decision must be reflective of the challenges we face.

The EPA has determined that human emissions of greenhouse gases are causing global warming that is harmful to human health and welfare. *See* 74 Fed. Reg. 66,496 (Dec. 15, 2009), *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act*. 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. E.P.A.*, 684 F.3d 102, 120-22 (D.C. Cir. 2012). Indeed, EPA could not have found otherwise, as virtually every climatologist in the world accepts the legitimacy of global warming and the fact that human activity has resulted in atmospheric warming and planetary climate change.¹¹ The world’s leading minds and most respected institutions – guided by increasingly clear science and

¹¹ *See, e.g.,* See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *The Science of Climate Change* (1995); U.S. Climate Change Science Program, *Abrupt Climate Change* (Dec. 2008); James Hansen, et. al., *Global Surface Temperature Change*, REVIEWS OF GEOPHYSICS, 48, RG4004 (June 2010); *see also*, Richard A. Muller, *Conversion of a Climate Change Skeptic*, NEW YORK TIMES, July 28, 2012 (citing Richard A. Muller, et. al., *A New Estimate of the Average Earth Surface Temperature, Spanning 1753 to 2011*; Richard A. Muller, et. al., *Decadal Variations in the Global Atmospheric Land Temperatures*).

statistical evidence – agree that dramatic action is necessary to avoid planetary disaster.¹² GHG concentrations have been steadily increasing over the past century,¹³ and our insatiable consumption of fossil fuels is pushing the world to a tipping point where, once reached, catastrophic change will be unavoidable.¹⁴ In fact, the impacts from climate change are already being experienced, with drought and extreme weather events becoming increasingly common.¹⁵

Renowned NASA climatologist, Dr. James Hansen, provides the analogy of loaded dice – suggesting that there still exists some variability, but that climate change is making these extreme events ever more common.¹⁶ In turn, climatic change and GHG emissions are having

¹² See, e.g., Rob Atkinson, et. al., *Climate Pragmatism: Innovation, Resilience, and No Regrets* (July 2011); Veerabhadran Ramanathan, et. al., *The Copenhagen Accord for Limiting Global Warming: Criteria, Constraints, and Available Avenues* (Feb. 2010); UNITED NATIONS, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Climate Change 2007: Synthesis Report* (2007); A.P. Sokolov, et. al., *Probabilistic Forecast for Twenty-First-Century Climate Based on Uncertainties in Emissions (without Policy) and Climate Parameters*, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) (Oct. 2009); UNITED NATIONS, FRAMEWORK CONVENTION ON CLIMATE CHANGE, *Report of the Conference of the Parties* (Dec. 2011); Bill McKibben, *Global Warming's Terrifying New Math*, ROLLING STONE, July 19, 2012; Elizabeth Muller, *250 Years of Global Warming*, BERKLEY EARTH, July 29, 2012; Marika M. Holland, et. al., *Future abrupt reductions in summer Arctic sea ice*, *Geophysical Research Letters*, Vol. 33, L23503 (2006).

¹³ See Randy Strait, et. al., *Final Colorado Greenhouse Gas Inventory and Reference Case Projections: 1990-2020*, CENTER FOR CLIMATE STRATEGIES (Oct. 2007); Robin Segall et. al., *Upstream Oil and Gas Emissions Measurement Project*, U.S. ENVIRONMENTAL PROTECTION AGENCY; Lee Gribovicz, *Analysis of States' and EPA Oil & Gas Air Emissions Control Requirements for Selected Basins in the Western United States*, WESTERN REGIONAL AIR PARTNERSHIP (Nov. 2011).

¹⁴ See, e.g., James Hansen, *Tipping Point: Perspective of a Climatologist*, STATE OF THE WILD 2008-2009; GLOBAL CARBON PROJECT, *A framework for Internationally Co-ordinated Research on the Global Carbon Cycle*, ESSP Report No. 1; INTERNATIONAL ENERGY AGENCY, *CO₂ Emissions from Fuel Combustion, Highlights 2011*; GLOBAL CARBON PROJECT, *10 Years of Advancing Knowledge on the Global Carbon Cycle and its Management*; Malte Meinshausen, et. al., *Greenhouse-gas emission targets for limiting global warming to 2° C*, *NATURE*, Vol. 458, April 30, 2009.

¹⁵ See, e.g., UNITED NATIONS, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* (2011); Aiguo Dai, *Increasing drought under global warming in observations and models*, *NATURE: CLIMATE CHANGE* (Aug. 2012); Stephen Saunders, et. al., *Hotter and Drier: The West's Changed Climate* (March 2008).

¹⁶ See, James Hansen, et. al., *Climate Variability and Climate Change: The New Climate Dice* (Nov. 2011); James Hansen, et. al., *Perception of Climate Change* (March 2012); James Hansen, et. al., *Increasing Climate Extremes and the New Climate Dice* (Aug. 2012).

dramatic impacts on plant and animal species and habitat, threatening both human and species resiliency and the ability to adapt to these changes.¹⁷ According to experts at the Government Accountability Office (“GAO”), federal land and water resources are vulnerable to a wide range of effects from climate change, some of which are already occurring. These effects include, among others, “(1) physical effects, such as droughts, floods, glacial melting, and sea level rise; (2) biological effects, such as increases in insect and disease infestations, shifts in species distribution, and changes in the timing of natural events; and (3) economic and social effects, such as adverse impacts on tourism, infrastructure, fishing, and other resource uses.”¹⁸

Despite the strength of these findings, the BLM has historically failed to take serious action to address impacts. This type of dismissive approach fails to satisfy the guidance outlined in Department of Interior Secretarial Order 3226, discussed below, or the requirements of NEPA. “Reasonable forecasting and speculation is . . . implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labelling any and all discussion of future environmental effects as ‘crystal ball inquiry.’” *Save Our Ecosystems v. Clark*, 747 F.2d 1240, 1246 n.9 (9th Cir. 1984 (quoting *Scientists’ Inst. for Pub. Info., Inc. v. Atomic Energy Comm.*, 481 F.2d 1079, 1092 (D.C. Cir. 1973)).

As noted above, NEPA imposes “action forcing procedures . . . requir[ing] that agencies take a *hard look* at environmental consequences.” *Methow Valley*, 490 U.S. at 350 (citations omitted) (emphasis added). These “environmental consequences” may be direct, indirect, or cumulative. 40 C.F.R. §§ 1502.16, 1508.7, 1508.8. BLM is required to take a hard look at those impacts as they relate to the agency action. “Energy-related activities contribute 70% of global GHG emissions; oil and gas together represent 60% of those energy-related emissions through their extraction, processing and subsequent combustion.”¹⁹ Even if science cannot isolate each additional oil or gas well’s contribution to these overall emissions, this does not obviate BLM’s responsibility to consider oil and gas development in the action area from the cumulative impacts of the oil and gas sector. In other words, the BLM cannot ignore the larger relationship that oil and gas management decisions have to the broader climate crisis that we face. Here, the agency’s

¹⁷ See Fitzgerald Booker, et. al., *The Ozone Component of Climate Change: Potential Effects on Agriculture and Horticultural Plant Yield, Product Quality and Interactions with Invasive Species*, J. INTEGR. PLANT BIOL. 51(4), 337-351 (2009); Peter Reich, *Quantifying plant response to ozone: a unifying theory*, TREE PHYSIOLOGY 3, 63-91 (1987).

¹⁸ GAO Report, *Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources* (2007); see also Committee on Environment and Natural Resources, National Science and Technology Council, *Scientific Assessment of the Effects of Global Climate Change on the United States* (2008); Melanie Lenart, et. al. *Global Warming in the Southwest: Projections, Observations, and Impacts* (2007) (describing impacts from temperature rise, drought, floods and impacts to water supply on the southwest).

¹⁹ International Investors Group on Climate Change, *Global Climate Disclosure Framework for Oil and Gas Companies*.

analysis must include the full scope of GHG emissions. *See Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1998) (“To ‘consider’ cumulative effects, some quantified or detailed information is required. Without such information, neither the courts nor the public, in reviewing the [agency’s] decisions, can be assured that the [agency] provided the hard look that it is required to provide.”). If we are to stem climate disaster – the impacts of which we are already experiencing – the agency’s decisionmaking must be reflective of this reality and plan accordingly.

BLM is, at the end of the day, responsible for the management of 700 million acres of federal onshore subsurface minerals.²⁰ Indeed, “the ultimate downstream GHG emissions from fossil fuel extraction from federal lands and waters by private leaseholders could have accounted for approximately 23% of total U.S. GHG emissions and 27% of all energy-related GHG emissions.”²¹ This suggests that “ultimate GHG emissions from fossil fuels extracted from federal lands and waters by private leaseholders in 2010 could be more than 20-times larger than the estimate reported in the CEQ inventory, [which estimates total federal emissions from agencies’ operations to be 66.4 million metric tons]. Overall, ultimate downstream GHG emissions resulting from fossil fuel extraction from federal lands and waters by private leaseholders in 2010 are estimated to total 1,551 [million metric tons of CO₂ equivalent (“MMTCO₂e”)].” *Id.* In 2010, the GAO estimated that BLM could eliminate up to 40% of methane emissions from federally authorized oil and natural gas development, the equivalent of eliminating 126 Bcf or 46.3 MMTCO₂e of GHG pollution annually and equivalent to roughly 13 coal-fired power plants.²² To suggest that the agency does not, here, have to account for GHG pollution from oil and gas development authorized by the FFO, would be to suggest that the collective 700 million acres of subsurface mineral estate is not relevant to protecting against climate change. This sort of flawed, reductive thinking would be problematic, and contradicted by the agency’s very management framework that provides a place-based lens to account for specific pollution sources to ensure that the broader public interest is protected. Therefore, even though climate change emissions from the proposed action may look minor when viewed in isolation, when considered cumulatively with all of the other GHG emissions from BLM-managed land, they become significant and cannot be ignored.

a. Social cost of carbon.

²⁰ *See* DOI-BLM, *Mineral and Surface Acreage Managed By BLM*, available at: http://www.blm.gov/wo/st/en/info/About_BLM/subsurface.html.

²¹ Stratus Consulting, prepared for: The Wilderness Society, *Greenhouse Gas Emissions from Fossil Energy Extracted from Federal Lands and Waters*, Feb. 1, 2012.

²² GAO, *Federal Oil & Gas Leases: Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases*, GAO-11-34 at 12 (Table 1)(October 2010) (attached as Exhibit 46). This GHG equivalence assumes a CH₄ warming potential of 72 (20-year warming period) as per the Intergovernmental Panel on Climate Change’s Fourth Assessment Report and using EPA’s GHG equivalencies calculator.

Research conducted by the National Research Council has confirmed the fact that the negative impacts of energy generation from fossil fuels are not represented in the market price for such generation.²³ In other words, failing to internalize the externalities of energy generation from fossil fuels—such as the impacts to climate change and human health—has resulted in a market failure that requires government intervention. Executive Order 12866 directs federal agencies to assess and quantify such costs and benefits of regulatory action, including the effects on factors such as the economy, environment, and public health and safety, among others. *See* Exec. Order No. 12866, 58 Fed. Reg. 51,735 (Sept. 30, 1993).²⁴ The Ninth Circuit has ruled that agencies must include the climate benefits of a significant regulatory action in federal cost-benefit analyses to comply with EO 12866.

[T]he fact that climate change is largely a global phenomenon that includes actions that are outside of [the agency's] control ... does not release the agency from the duty of assessing the effects of its actions on global warming within the context of other actions that also affect global warming.

Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1217 (9th Cir. 2008) (quotations and citations omitted); *see also* *Border Power Plant Working Grp. v. U.S. Dep't of Energy*, 260 F. Supp. 2d 997, 1028-29 (S.D. Cal. 2003) (finding agency failure to disclose project's indirect carbon dioxide emissions violates NEPA).

In response, an Interagency Working Group (“IWG”) was formed to develop a consistent and defensible estimate of the social cost of carbon—allowing agencies to “incorporate the social benefits of reducing carbon dioxide (CO₂) emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions.”²⁵ In other words, SCC is a measure of the benefit of reducing greenhouse gas emissions now and thereby avoiding costs in the future.²⁶ The charts below depict, (A) dramatically increasing damages from global

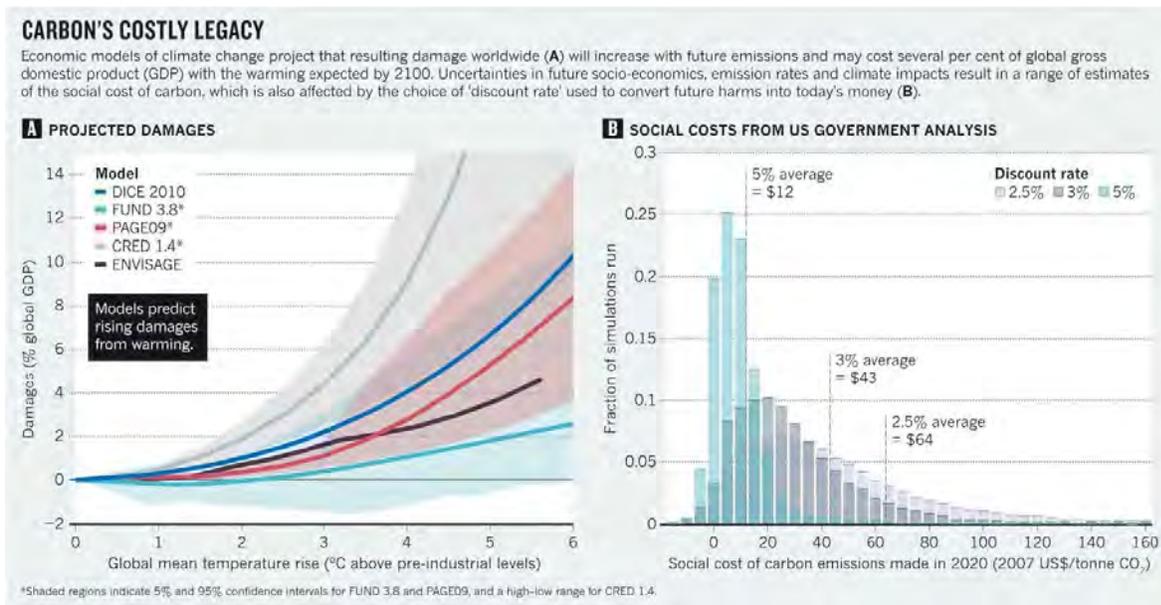
²³ *See, e.g.*, National Research Council, *Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use* (2010); Nicholas Muller, et. al., *Environmental Accounting for Pollution in the United States Economy*, AMERICAN ECONOMIC REVIEW (Aug. 2011); *see also*, Generation Investment Management, *Sustainable Capitalism*, (Jan. 2012) (advocating a paradigm shift to “a framework that seeks to maximize long-term economic value creation by reforming markets to address real needs while considering *all* costs and stakeholders.”).

²⁴ *See also* Executive Order 13563, 76 Fed. Reg. 3821 (Jan. 18, 2011) (reaffirming the framework of EO 12866 and directing federal agencies to conduct regulatory actions based on the best available science).

²⁵ *See* Interagency Working Group on the Social Cost of Carbon, United States Government, *Technical Support Document: Technical Update on the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866* (May 2013) at 2 (hereinafter 2013 TSD).

²⁶ *See* Ruth Greenspan and Dianne Callan, *More than Meets the Eye: The Social Cost of Carbon in U.S Climate Policy, in Plain English*, WORLD RESOURCES INSTITUTE (July 2011).

warming over time, as well as (B) the social cost of these carbon emissions based on 2013 TDS values.²⁷



Leading economic models all point in the same direction: that climate change causes substantial economic harm, justifying immediate action to reduce emissions.²⁸ The interagency process to develop SCC estimates—originally described in the 2010 interagency technical support document (“TSD”), and updated in 2013—developed four values based on the average SCC from three integrated assessment models (DICE, PAGE, and FUND), at discount rates of 2.5, 3, and 5 percent,²⁹ as well as a fourth value demonstrating the cost of worst-case impacts.³⁰

²⁷ See Richard Revesz, *et al.*, *Global warming: Improve economic models of climate change*, NATURE 508, 173-175 (April 10, 2014).

²⁸ See NATURE 508 at 174.

²⁹ The choice of which discount rate to apply—translating future costs into current dollars—is critical in calculating the social cost of carbon. The higher the discount rate, the less significant future costs become, which shifts a greater burden to future generations based on the notion that the world will be better able to make climate investments in the future. The underlying assumption of applying a higher discount rate is that the economy is continually growing. The IWG’s “central value” of three percent is consistent with this school of thought—that successive generations will be increasingly wealthy and more able to carry the financial burden of climate impacts. “The difficulty with this argument is that, as climate change science becomes increasingly concerning, it becomes a weaker bet that future generations will be better off. If they are not, lower or negative discount rates are justified.” WRI Report, at 9. “Three percent values an environmental cost or benefit occurring 25 years in the future at about half as much as the same benefit today.” *Id.*

³⁰ See 2013 TSD at 2.

These models are intended to quantify damages, including health impacts, economic dislocation, agricultural changes, and other effects that climate change can impose on humanity. While these values are inherently speculative, a recent GAO report has confirmed the soundness of the methodology in which the IWG's SCC estimates were developed, therefore further underscoring the importance of integrating SCC analysis into the agency's decisionmaking process.³¹ In fact, certain types of damages remain either unaccounted for or poorly quantified in IWG's estimates, suggesting that the SCC values are conservative and should be viewed as a lower bound.³²

The updated interagency SCC estimates for 2020 are \$12, \$43, \$65 and \$129 (in 2007\$).³³ The IWG does not instruct federal agency which discount rate to use, suggesting that the 3 percent discount rate (\$43 per ton of CO₂) as the "central value," but further emphasizing "the importance and value of including all four SCC values[;]" i.e., that the agency should use the range of values in developing NEPA alternatives.³⁴

The agency's obligation to analyze the costs associated with GHG emissions through NEPA was directly affirmed by the court in *High Country Conservation Advocates v. U.S. Forest Service*, 52 F.Supp.3d 1174 (D.Colo. 2014) (a decision the agency decided not to appeal, thus implicitly recognizing the importance of incorporating a social cost of carbon analysis into NEPA decisionmaking). In his decision, Judge Jackson identified the IWG's SSC protocol as a tool to "quantify a project's contribution to costs associated with global climate change." *Id.* at 1190.³⁵ To fulfill this mandate, they agency must disclose the "ecological[,] ... economic, [and] social" impacts of the proposed action. 40 C.F.R. § 1508.8(b). Simple

³¹ GAO-14-663, *Social Cost of Carbon* (July 24, 2014).

³² See Peter Howard, et al., *Omitted Damages: What's Missing From the Social Cost of Carbon*, ENVIRONMENTAL DEFENSE FUND, INSTITUTE FOR POLICY INTEGRITY, NATURAL RESOURCES DEFENSE COUNCIL (March 13, 2014) (providing, for example, that damages such as "increases in forced migration, social and political conflict, and violence; weather variability and extreme weather events; and declining growth rates" are either missing or poorly quantified in SCC models).

³³ See 2013 TSD at 3 (including a table of revised SCC estimates from 2010-2050). To put these figures in perspective, in 2009 the British government used a range of \$41-\$124 per ton of CO₂, with a central value of \$85 (during the same period, the 2010 TSD used a central value of \$21). WRI Report at 4. The UK analysis used very different assumptions on damages, including a much lower discount rate of 1.4%. The central value supports regulation four times as stringent as the U.S. central value. *Id.*

³⁴ See 2013 TSD at 12.

³⁵ See also *id.* at 18 (noting the EPA recommendation to "explore other means to characterize the impact of GHG emissions, including an estimate of the 'social cost of carbon' associated with potential increases in GHG emissions.") (citing Sarah E. Light, *NEPA's Footprint: Information Disclosure as a Quasi-Carbon Tax on Agencies*, 87 Tul. L. Rev. 511, 546 (Feb. 2013)).

calculations applying the SCC to GHG emissions from this project offer a straightforward comparative basis for analyzing impacts, and identifying very significant costs.³⁶

Notably, according to the IPCC, the 20-year GWP for methane—which is the relevant timeframe for consideration if we are to stem the worst of climate change—is 87.³⁷ While BLM fails to quantify what percentage of stated GHG emissions from the project are from methane, EPA estimates provide that approximately 97% of emissions from oil production in the San Juan Basin are from methane.

Critically, however, the agency must not only quantify the estimated emissions from the projects *production*, but also the indirect impacts of combustion, as NEPA demands. *See* 40 C.F.R. § 1508.25(c). The final consumption of oil represents 80% of CO₂e emissions.

As noted by Judge Jackson, the SCC protocol provides a tool to quantify the costs of these emissions. *See High Country Conservation Advocates*, 52 F.Supp.3d at 1190. By failing to consider the costs of GHG emissions from the Proposed Action, the agency’s analysis effectively assumes a price of carbon that is \$0. *See id.* at 21 (holding that although there is a “wide range of estimates about the social cost of GHG emissions[,] neither the BLM’s economist nor anyone else in the record appears to suggest the cost is as low as \$0 per unit. Yet by deciding not to quantify the costs as all, the agencies effectively zeroed out the cost in its quantitative analysis.”). The agency’s failure to consider the SCC is arbitrary and capricious, and ignores the explicit directive of EO 12866.

An agency must “consider every significant aspect of the environmental impact of a proposed action.” *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council*, 462 U.S. 87, 107 (1983) (quotations and citation omitted). This includes the disclosure of direct, indirect, and cumulative impacts of its actions, including climate change impacts and emissions. 40 C.F.R. § 1508.25(c). The need to evaluate such impacts is bolstered by the fact that “[t]he harms associated with climate change are serious and well recognized,” and environmental changes caused by climate change “have already inflicted significant harms” to many resources around the globe. *Massachusetts v. EPA*, 549 U.S. 497, 521 (2007); *see also id.* at 525 (recognizing “the enormity of the potential consequences associated with manmade climate change.”). Among other things, the agency’s analysis must disclose “the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity[,]” including the “energy requirements and conservation potential of various alternatives and mitigation measures.” 42 U.S.C. § 4332(c); 40 C.F.R. § 1502.16(e). As explained by CEQ, this requires agencies to “analyze total energy costs, including possible hidden or indirect costs, and total energy benefits of proposed actions.” 43 Fed. Red. 55,978,

³⁶ It is important to note that, although the 2010 IWG SCC protocol did not address methane impacts, the 2013 IWG Technical Update explicitly addresses methane impacts. Thus, it is appropriate to calculate a SCC outcome that takes into account the full CO₂e emissions associated with the proposed leasing.

³⁷ *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013: The Physical Science Basis*, at 8-58 (Table 8.7) (Sept. 2013).

55,984 (Nov. 29, 2009); *see also* Executive Order 13514, 74 Fed. Reg. 52,117 (Oct. 5, 2009) (requiring government agencies to disclose emissions information annually from direct and indirect activities). Failing to perform such analysis undermines the agency’s decisionmaking process and the assumptions made.

Moreover, BLM measures a planning area GHG emissions against a baseline of national and/or global GHG emissions—thereby marginalizing the Proposed Actions contribution to our climate crisis while concluding the agency is powerless to avoid or mitigate such impacts. CEQ warns against such a comparison, providing:

Government action occurs incrementally, program-by-program and step-by-step, and climate impacts are not attributable to any single action, but are exacerbated by a series of smaller decisions, including decisions made by the government. Therefore, the statement that emissions from a government action or approval represent only a small fraction of global emissions is more a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether to consider climate impacts under NEPA. Moreover, these comparisons are not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigation.

CEQ Guidance at 9. CEQ also provides that “[i]t is essential . . . that Federal agencies not rely on boilerplate text to avoid meaningful analysis, including consideration of alternatives or mitigation.” *Id.* at 5-6 (citing 40 C.F.R. §§ 1500.2, 1502.2). Indeed, the EPA has also cautioned “against comparing GHG emissions associated with a single project to global GHG emission levels” because it erroneously leads to a conclusion that “on a global scale, emissions are not likely to change” as a result of the project.³⁸ Applying the SCC, as provided above, takes these abstract emissions and places them in concrete, economic terms. It also allows the agency to easily perform the cost-benefit analysis envisioned by EO 12866, as well as BLM’s own policy. Specifically, Instruction Memorandum No. 2013-131 (Sept. 18, 2013) is reflective of the BLM’s attempt to internalize the costs of such emissions:

All BLM managers and staff are directed to utilize estimates of nonmarket environmental values in NEPA analysis supporting planning and other decision-making where relevant and feasible, in accordance with the attached guidance. At least a qualitative description of the most relevant nonmarket values should be included for the affected environment and the impacts of alternatives in NEPA analyses....

Nonmarket environmental values reflect the benefits individuals attribute to experiences of the environment, uses of natural resources, or the existence of particular ecological conditions that do not involve market transactions and therefore lack prices. Examples include the perceived benefits from hiking in a wilderness or fishing for subsistence rather than commercial purposes. The economic methods described in this guidance provide monetary estimates of nonmarket values. Several non-economic, primarily qualitative methods can

³⁸ *See Light*, 87 Tul. L. Rev. 511, 546.

also be used to characterize the values attributed to places, landscapes, and other environmental features. Guidance on qualitative methods for assessing environmental values, including ethnography, interviews, and surveys, is in preparation.

Ideally, economic analysis for resource management should consider all relevant values, not merely those that are easy to quantify. Utilizing nonmarket values provides a more complete picture of the consequences of a proposed activity than market data alone would allow. The BLM's Land Use Planning Handbook, Appendix D encourages inclusion of information on nonmarket values, but does not provide detail.

The agency simply cannot continue to ignore its obligation to consider the costs of GHG emissions in its decisionmaking, as it has done here.

Nor can the agency tout the benefits of oil and gas development without similarly disclosing the costs. *See* 40 C.F.R. § 1502.23. This type of misleading and one-sided analysis is expressly forbidden. *See Hughes River Watershed Conservancy v. Glickman*, 81 F.3d 437, 446-47 (4th Cir. 1996) (“it is essential that the EIS not be based on misleading economic assumptions); *Sierra Club v. Sigler*, 695 F.2d 957, 979 (5th Cir. 1983) (agency choosing to “trumpet” an action’s benefits has a duty to disclose its costs).

b. Methane emissions and waste.

The agency must take a hard look, and meaningful action, to address the serious issue of methane (“CH₄”) emissions and waste in the oil and gas production process. Such action must include an estimate of the projected methane emission rates from drilling and production activities authorized by the proposed action, as well as detailed analysis of measures employed to mitigate such emissions.

Methane emission rates can differ quite dramatically from one oil and gas field to the next, and, depending on the type of mitigation and emission controls employed, emissions can range anywhere from 1% to 12% of production.³⁹

³⁹ *See, e.g.,* David T. Allen, et. al., *Measurements of methane emissions at natural gas production sites in the United States*, PNAS (Aug. 19, 2013) (finding emissions as low as 1.5% of production at select sites); Anna Karion, et. al., *Methane emissions estimate from airborne measurements over a western United States gas field*, GEOPHYSICAL RESEARCH LETTERS (Aug. 27, 2013) (finding emissions of 6 to 12 percent, on average, in the Uintah Basin). *See also*, Joe Romm, *Study of Best Fracked Wells Finds Low Methane Emissions But Skips Super-Emitters*, CLIMATE PROGRESS (September 19, 2013), available at: <http://thinkprogress.org/climate/2013/09/19/2646881/study-fracked-wells-methane-emissions-super-emitters/>. *See also* GAO-11-34 (2010) at 25 (using a conversion factor of .4045 MMTCO₂e/Bcf for vented gas).

Assuming a lower-bound leak rate of 1% – which is approximately one-third lower than the EPA estimate of methane emissions in the Inventory of U.S. GHG Emissions and Sinks: 1990-2011⁴⁰ – methane emissions from gas production by the proposed action could represent a meaningful contribution of emissions over the life of the developed field.⁴¹ Assuming an upper-bound leak rate of 12%, the high end of the rate found in a 2012 study using air sampling over the Uinta Basin,⁴² methane emissions from gas could be truly significant indeed. Although there is substantial variability between the 1% and 12% emission leak rates – and, even without specific data from the proposed action, we can assume leakage somewhere between these two extremes – even at the low end emissions would not be trivial.

Even setting aside the issue of climate change, every ton of methane emitted to the atmosphere from oil and gas development is a ton of natural gas *lost*. Every ton of methane lost to the atmosphere is therefore a ton of natural gas that cannot be used by consumers. Methane lost from federal leases may also not yield royalties otherwise shared between federal, state, and local governments. This lost gas reflects serious inefficiencies in how BLM oil and gas leases are developed. Energy lost from oil and gas production – whether avoidable or unavoidable – reduces the ability of a lease to supply energy, increasing the pressure to drill other lands to supply energy to satisfy demand. 40 C.F.R. §§ 1502.16(e)-(f). In so doing, inefficiencies create indirect and cumulative environmental impacts by increasing the pressure to satisfy demand with new drilling. 40 C.F.R. §§ 1508.7, 1508.8(b).

i. Mineral Leasing Act’s duty to prevent waste.

Citizen Groups, and in particular WELC, have been urging field offices throughout the West to adopt common sense and economical measures to address the issue of fugitive methane waste. The agencies have expansive authority – and, indeed, the responsibility and opportunity – to prevent the waste of oil and gas resources, in particular methane, which is the primary constituent of natural gas. The Mineral Leasing Act of 1920 (“MLA”) provides that “[a]ll leases of lands containing oil or gas ... shall be subject to the condition that the lessee will, in conducting his explorations and mining operations, use all reasonable precautions to prevent waste of oil or gas developed in the land....” 30 U.S.C. § 225; *see also* 30 U.S.C. § 187 (“Each lease shall contain...a provision...for the prevention of undue waste....” As the MLA’s legislative history teaches, “conservation through control was the dominant theme of the debates.” *Boesche v. Udall*, 373 U.S. 472, 481 (1963) (citing H.R.Rep. No. 398, 66th Cong., 1st Sess. 12-13;

⁴⁰ *See* U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011* (April 2013).

⁴¹ *See* U.S. Environmental Protection Agency, *Greenhouse Gas Equivalencies Calculator*, available at: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>.

⁴² *See* Brian Maffly, *Uinta Basin gas leakage far worse than most believe*, THE SALT LAKE TRIBUNE (Aug 05, 2013), available at: <http://www.sltrib.com/sltrib/news/56692751-78/basin-carbon-emissions-gas.html.csp> (“Between 6 percent and 12 percent of the Uinta Basin’s natural gas production could be escaping into the atmosphere.”).

H.R.Rep. No. 1138, 65th Cong., 3d Sess. 19 (“The legislation provided for herein...will [help] prevent waste and other lax methods....”).

BLM’s implementing regulations, reflecting these provisions, currently provide that “[t]he objective” of its MLA regulations in 43 C.F.R. Subpart 3160 “is to promote the orderly and efficient exploration, development and production of oil and gas. 43 C.F.R. § 3160.0-4. In part, “orderly and efficient” operations are ensured through unitization or communitization agreements. 43 C.F.R. §§ 3161.2, 3162.2-4(b) (BLM authority to require lessees unitization or communitization agreements); 43 C.F.R. Subpart 3180 (general rules pertaining to drilling unit agreements). Such unit agreements, because they may limit BLM authority in subsequent stages, are therefore important tools for preventing waste. *See William P. Maycock et al.*, 177 IBLA 1, 20-21 (Dec. Int. 2008) (“BLM is not required to analyze an alternative that is [n]ot feasible because it is inconsistent with the basic presumption of the Unit Agreement and BLM cannot legally compel the operator to adopt that alternative under the terms of the Unit Agreement”).

Critically, subpart 3160 specifically requires BLM officials to ensure “that all [oil and gas] operations be conducted in a manner which protects other natural resources and the environmental quality, protects life and property and results in the maximum ultimate recovery of oil and gas with minimum waste and with minimum adverse effect on the ultimate recovery of other mineral resources.” 43 C.F.R. § 3161.2 (emphasis added). The lease owner and or operator is, similarly, charged with “conducting all operations in a manner which ensures the proper handling, measurement, disposition, and site security of leasehold production; which protects other natural resources and environmental quality; which protects life and property; and which results in maximum ultimate economic recovery of oil and gas with minimum waste and with minimum adverse effect on ultimate recovery of other mineral resources.” 43 C.F.R. § 3162.1(a) (emph. added). Waste is defined as “(1) A reduction in the quantity or quality of oil and gas ultimately producible from a reservoir under prudent and proper operations; or (2) avoidable surface loss of oil or gas.” 43 C.F.R. § 3160.0-5. Avoidable losses of oil or gas are currently defined as including venting or flaring without authorization, operator negligence, failure of the operator to take “all reasonable measures to prevent and/or control the loss,” and an operator’s failure to comply with lease terms and regulations, order, notices, and the like. *Id.*

In many respects, we think that BLM’s current rules can be tightened. Regardless, it is clear that BLM’s expansive authority, responsibility, and opportunity to prevent waste must permeate the agency’s full planning and decisionmaking processes for oil and gas. The agency must ensure that any development authorized by the proposed action take advantage of not only proven, often economical technologies and practices to prevent methane waste, but, further, the agency’s tools to ensure the orderly and efficient exploration, development, and production of oil and gas through controls placed on the very scale, pace, and nature of development. Moreover, it is clear that BLM’s authority, responsibility, and opportunity extends to both existing and future oil and gas development. BLM, ultimately, manages the federal – i.e., publicly owned – onshore oil and gas resource in trust for the American people.

On November 19, 2013, a coalition of over 90 environmental, health, and sporting organizations submitted an open letter to Secretary Jewell of the U.S. Department of Interior and Administrator McCarthy of the U.S. Environmental Protection Agency calling for action to

substantially reduce emissions of methane from the oil and gas industry on public and private lands, as well as from offshore oil operations. The coalition called on Secretary Jewell to reduce emissions from oil and gas operations on public lands by updating decades-old BLM rules on waste of mineral resources. Further, we asked Administrator McCarthy to directly regulate methane emissions from the oil and gas industry using existing Clean Air Act authority and to develop nationwide curbs on GHG emissions.

Notably, BLM is currently undertaking federal rulemaking pertaining to Onshore Oil and Gas Order No. 9, Waste Prevention and Use of Produced Oil and Gas for Beneficial Purposes. *See* 43 C.F.R. § 3164.1 (authorizing the Director to issue Onshore Oil and Gas Orders to implement or supplement regulations).

In a statement regarding Order No. 9, the agency provided:

This new order would establish standards to limit the waste of vented and flared gas and to define the appropriate use of oil and gas for beneficial use. This order would, among other things, delineate which activities qualify for beneficial use, minimize the amount of venting and flaring that takes place on oil and gas production facilities on Federal and Indian lands, and establish standards for determining avoidable versus unavoidable losses.

Office of Information and Regulatory Affairs, Unified Agenda and Regulatory Plan, RIN: 1004-AE14. The BLM must consider federal rulemaking on Order No. 9, and the implications that this rule would have on place-based action, such as the FFO October 2016 lease sale, in its planning level decisionmaking.

The Western Environmental Law Center and our partners also recently submitted what we have identified as “Core Principals” that should help guide BLM’s new order, and which are aimed to constructively inform the contours of BLM’s rulemaking process. These Core Principals are incorporated herein, and must also be considered by the FFO when undertaking the lease sale planning process. *See* 40 C.F.R. § 1502.9(c)(1)(ii).

ii. President Obama’s Climate Action Plan and Secretarial Order 3289.

President Obama’s June Climate Action Plan explains that “[c]urbing emissions of methane is critical to our overall effort to address global climate change.” *See* Climate Action Plan at 10. The President’s call for action ties in nicely with BLM’s authority and responsibilities, beyond the MLA, to reduce methane emissions.

The starting point is the Federal Land Policy and Management Act of 1976 (“FLPMA”). Pursuant to FLPMA, the agencies must manage the public lands:

in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their

natural condition, that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use.

43 U.S.C. § 1701(a)(8) (emphasis added). The BLM, as a multiple use agency, must also manage the public lands and the oil and natural gas resource to “best meet the present and future needs of the American people” and to ensure that management “takes into account the long-term needs of future generations for...non-renewable resources, including...minerals.” 43 C.F.R. § 1702(c). Put differently, the driving force behind agency-authorized oil and gas development is the long-term, and broad, public interest – not the often short-term, and narrow, interest of oil and gas companies. The agencies duty to prevent waste must account for this driving force.

Here, BLM must ensure that these objectives and duties are adhered to through the completion its NEPA analysis, which must, *inter alia*, “use and observe the principles of multiple use and sustained yield” and “weigh long-term benefits to the public against short-term benefits.” *See* 43 U.S.C. § 1712(c)(1), (7). Thus, the FFO has a substantive duty to consider the enduring legacy of oil and gas development in land management decisionmaking, which is to be balanced against other critical multiple use resource values.

Additionally, the BLM, as an agency within the U.S. Department of Interior, is subject to Secretarial Order 3289 (Dept. Int. Sept. 14, 2009). Secretarial Order 3289, in section 3(a), provides that BLM “must consider and analyze climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, developing multi-year management plans, and making major decisions regarding potential use of resources under the Department’s purview.” Section 3(a) of Secretarial Order 3289 also reinstated Secretarial Order 3226 (January 19, 2001). Secretarial Order 3226 commits the Department of the Interior to address climate change through its planning and decisionmaking processes. As the Order explains, “climate change is impacting natural resources that the Department of the Interior (Department) has the responsibility to manage and protect.” Sec. Or. 3226, § 1. The Order therefore “ensures that climate change impacts are taken into account in connection with Department planning and decision making.” *Id.* The Order obligates BLM to “consider and analyze potential climate change impacts” in four situations: (1) “when undertaking long-range planning exercises”; (2) “when setting priorities for scientific research and investigations”; (3) “when developing multi-year management plans, and/or” (4) “when making major decisions regarding the potential utilization of resources under the Department’s purview.” *Id.* § 3. The Order specifically provides that “Departmental activities covered by this Order” include “management plans and activities developed for public lands” and “planning and management activities associated with oil, gas and mineral development on public lands.” *Id.* (emphasis added). BLM’s oil and gas decisions are thus contemplated by and subject to section 3 of the Order.

These authorities and responsibilities can be properly exercised through effective use of NEPA. To comply with NEPA, the BLM must take a hard look at direct, indirect, and cumulative impacts, as discussed above. 40 §§ C.F.R. 1502.16(a), (b); 1508.25(c). In evaluating impacts, the agency must discuss “[e]nergy requirements and conservation potential of various alternatives and mitigation measures,” “[n]atural or depletable resource requirements and

conservation potential of various alternatives and mitigation measures,” and “[m]eans to mitigate adverse environmental impacts (if not fully covered under 1502.14(f)).” 40 C.F.R. §§ 1502.16(e), (f), (h).

We emphasize, here, the “heart” of the NEPA process: BLM’s duty to consider “alternatives to the proposed action” and 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.” 42 U.S.C. §§ 4332(2)(C)(iii), 4332(2)(E); 40 C.F.R. § 1502.14(a). Alternatives are critical because, “[c]learly, it is pointless to ‘consider’ environmental costs without also seriously considering action to avoid them.” *Calvert Cliffs’ Coordinating Comm., Inc. v. U.S. Atomic Energy Commn.*, 449 F.2d 1109, 1128 (D.C. Cir. 1971). Operating in concert with NEPA’s mandate to address environmental impacts, BLM’s fidelity to alternatives analysis helps “sharply defin[e] the issues and provid[e] a clear basis for choice among options by the decision maker and the public.” 40 C.F.R. § 1502.14. An agency must, accordingly, “[r]igorously explore and objectively evaluate all reasonable alternatives” and specifically “[i]nclude the alternative of no action.” 40 C.F.R. §§ 1502.14(a), (d). Even where impacts are “insignificant,” BLM must still consider alternatives. *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1229 (9th Cir. 1988) (agency’s duty to consider alternatives “is both independent of, and broader than,” its duty to complete an environmental analysis); *Greater Yellowstone Coalition v. Flowers*, 359 F.3d 1257, 1277 (10th Cir. 2004) (duty to consider alternatives “is ‘operative even if the agency finds no significant environmental impact’”).

iii. Methane mitigation measures should be adopted and analyzed.

There are several widely recognized best management practices (“BMPs”) for mitigating methane emissions that must be considered by BLM in its analysis of the proposed action. We believe that most, if not all of these measures should be considered and adopted, both because they can reduce methane emissions from significant emissions sources and because they have also been shown to have very quick paybacks from the sale of captured methane, even at today’s low gas prices. The most important of these measures include:

- Centralized Liquid Gathering Systems and Liquid Transport Pipelines
- Reduced Emission Completions/Recompletions (green completions)
- Low-Bleed/No-Bleed Pneumatic Devices on all New Wells
- Dehydrator Emissions Controls
- Replace High-bleed Pneumatics with Low-Bleed/No-Bleed or Air-Driven Pneumatic Devices on all Existing Wells; and
- Electric Compression
- Liquids Unloading (using plunger lifts or other deliquification technologies)

- Improved Compressor Wet Seal Maintenance/Replacement with Dry Seals
- Vapor Recovery Units on Storage Vessels
- Pipeline Best Management Practices; and
- Leak Detection and Repair

These and other mitigation measures are included among Best Management Practices that have been identified by BLM, EPA, the State of Colorado, and other organizations, as detailed below.⁴³

Here, BLM has already approved a number of Mancos Shale oil projects in the lower San Juan Basin – specifically in the Lybrook and Counselors areas – which have resulted in significant, un-assessed flaring operations contributing to waste and loss of royalties. BLM has failed to sufficiently analyze these projects, and, in particular, have not explained its rationale for why flaring is needed. BLM would need to take this information forward its NEPA analysis for the October 2016 lease sale to assess the overall lack of infrastructure necessary to handle additional development from the sale, and how the agency plans to mitigate and reduce flaring and waste in this new oil play.

Another area of concern to Citizen Groups is the effectiveness of the mitigation measures adopted to ensure that the methane captured is able to make it to market for sale and the realization of rapid payback. Such considerations must be included in the agency’s NEPA analysis. This includes, *inter alia*, how the agency will require operators on private and public lands to coordinate development to ensure that centralized liquids gathering and treatment investments are made prior to the appraisal and field development phase when production increases dramatically. The agencies should identify and describe the mechanisms they plan to employ to achieve this desirable outcome.

The second issue is how gas (as opposed to liquids) captured by implementation of the mitigation measures will enter sales gas lines and make it to market, as opposed to simply being flared and wasted. Citizen Groups believe that the agencies should spell-out whether all of the gas captured by the mitigation measures adopted is expected to have similar access to a sales line, or whether some or all of it will be sent to flares and wasted. If the latter, Citizen Groups believe that additional mitigation measures should be instituted, comparable to the measure adopted for liquids, requiring planning and timely development of gas gathering and treatment infrastructure to ensure that GHG emissions are reduced, that revenues from gas sales are maximized for the realization of paybacks for operators, royalty payments for the federal and state governments, and that waste of waste of this important resource is minimized.

⁴³ See also BLM, Best Management Practices for Fluid Minerals, available at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS__REALTY__AND_RESOURCE__PROTECTION_/bmps.Par.60203.File.dat/WO1_Air%20Resource_BMP_Slideshow%2005-09-2011.pdf.

Notably, at least one BLM Field Office has already taken pioneering steps to address methane emissions and waste through mandatory mitigation measures at the RMP stage. Specifically, in a joint Land and Resource Management Plan (“LRMP”), BLM: 1610 (CO-933), adopted by BLM Colorado’s Tres Rios Field Office (“TRFO”) and the San Juan National Forest (“SJNF”), the agencies broke new and essential ground in both acknowledging that significant GHG pollution would result from oil and gas development on TRFO lands, and then establishing required methane mitigation standards at the planning stage that will bind future leases and permits to drill to comply with these measures. As provided in the Final EIS for the LRMP:

NEPA analysis is typically conducted for oil and gas leasing and when permits are issued. **This FEIS is the first NEPA analysis where lands that could be made available for lease are identified and stipulated.** In a subsequent analysis stage, when there is a site-specific proposal for development, additional air quality impact analysis would occur. This typically occurs when an application for a permit to drill is submitted. Based on the analysis results, additional mitigation or other equally effective options could be considered to reduce air pollution.

Final EIS at 372 (emphasis added). The TRFO set a new standard by recognizing that the climate change impacts from oil and gas industry activities are cumulative and that methane losses from business-as-usual industry practices at the field office level contribute significantly to climate change and must be mitigated. In the Final EIS, the TRFO also recognized that methane emissions represent waste of a key natural resource that belongs to all U.S. citizens, and the failure to control such waste robs the U.S. and state treasuries of royalty revenues. Accordingly, the TRFO adopted six important methane mitigation measures, which include:

- Centralized Liquid Gathering Systems and Liquid Transport Pipelines
- Reduced Emission Completions/Recompletions (green completions)
- Low-Bleed/No-Bleed Pneumatic Devices on all New Wells
- Dehydrator Emissions Controls
- Replace High-bleed Pneumatics with Low-Bleed/No-Bleed or Air-Driven Pneumatic Devices on all Existing Wells; and
- Electric Compression

Id. at 376.

As the FFO proceeds in the lease sale planning process, it is essential to consider the pioneering action taken by the TRFO. *See* 40 C.F.R. § 1502.9(c)(1)(ii). Historically, the dismissive approach the agency has taken on climate change, and failure to adequately address methane emissions altogether, is plainly incompatible with the climate impacts of oil and gas development. It is incumbent upon the FFO to confront the issues of climate change and methane

emissions head-on, which must be accomplished through field office level decisionmaking that is reflective of challenges we face.

Moreover, and in addition to both national rulemaking and precedent-setting action at the local field office level, BLM's Colorado State Office has recently adopted its Comprehensive Air Resources Protection Protocol ("CARPP"), which, as provided by the agency:

[D]escribes the process and strategies the BLM will use when authorizing activities that have the potential to adversely impact air quality within the state of Colorado. This protocol also outlines specific measures that may be taken to address BLM-approved activities with the potential to cause significant adverse impacts to air resources ... within any planning area []. Further, the purposes of this protocol are to address air quality issues identified by the [BLM], or public scoping, in its analysis of potential impacts on air resources for BLM Colorado [RMPs] and [EIS']; and clarify the mechanisms and procedures that BLM will use to achieve the air resources goals, objectives, and management actions set forth in BLM Colorado RMPs.

While the BLM Colorado CARPP is not binding on the Farmington Field Office, it nevertheless provides an important state-of-the-art resource to guide the agency's analysis of GHG mitigation measures applicable to the October 2016 lease sale. In particular, Table V-I identifies Best Management Practices and Air Emission Reduction Strategies for Oil and Gas Development. The CARPP is attached hereto as Exhibit 116, and must be considered by BLM in its decisionmaking regarding the FFO October 2016 lease sale. *See* 40 C.F.R. § 1502.9(c)(1)(ii).

iv. The capture of methane is critical due to its global warming potential.

Ensuring compliance with the agency's methane waste obligations through proper analysis and documentation in the NEPA process is important: technologies and practices change, and the BLM's duty to prevent degradation and waste cannot be excused just because the agency apparently lags behind the technological curve. The GAO's 2010 report noted that BLM's existing waste prevention guidance – Notice to Lessees and Operators ("NTL") 4a – was developed in 1980, well before many methane reduction technologies and practices were developed and understood. GAO also found that NTL 4a does not "enumerate the sources that should be reported or specify how they should be estimated."⁴⁴ Problematically, GAO noted "that [BLM] thought the industry would use venting and flaring technologies if they made economic sense," a perspective which assumes – wrongly – that markets work perfectly in the absence of necessary regulatory signals and is belied by the lack of information about the magnitude of methane waste and the documented, if still poorly understood, barriers to the deployment of GHG reduction technologies and practices. *Id.* at 20-33. Compounding the problem, GAO also "found a lack of consistency across BLM field offices regarding their understanding of which intermittent volumes of lost gas should be reported to [the Oil and Gas

⁴⁴ *See* GAO-11-34 (2010) at 11, 27.

Operations Report].” *Id.* at 11. BLM, to its credit, conceded: “existing guidance was outdated given current technologies and said that they were planning to update it by the second quarter of 2012.” *Id.* at 27.

Indeed, a Report released by NRDC identified that “[c]apturing currently wasted methane for sale could reduce pollution, enhance air quality, improve human health, conserve energy resources, and bring in more than \$2 billion of additional revenue each year.”⁴⁵ Moreover, the Report further identified ten technically proven, commercially available, and profitable methane emission control technologies that together can capture more than 80 percent of the methane currently going to waste. *Id.* Such technologies must also be considered in BLM’s alternatives analysis.

Preventing GHG pollution and waste is particularly important in the natural gas context, where there is an absence of meaningful lifecycle analysis of the GHG pollution emitted by the production, processing, transmission, distribution, and combustion of natural gas. Although natural gas is often touted as a ‘cleaner’ alternative to dirty coal, recent evidence indicates that this may not, in fact be the case – and, at the least, indicates that we must first take immediate, common sense action to reduce GHG pollution from natural gas before it can be safely relied on as an effective tool to transition to a clean energy economy (a noted priority of this Administration).⁴⁶ A recent report by Climate Central addresses the leak rates estimated by various sources and the impacts of this new information on assertions that natural gas is a cleaner fuel than coal, ultimately concluding that given the losses from oil and gas sources it would be decades before switching electricity generation from coal to natural gas could bring about significant reductions in emissions.⁴⁷

Oil and natural gas systems are the biggest contributor to methane emissions in the United States, accounting for over one quarter of all methane emissions.⁴⁸ In light of serious controversy and uncertainties regarding GHG pollution from oil and gas development, the agencies quantitative assessment should account for methane’s long-term (100-year) global warming impact and, also, methane’s short-term (20-year) warming impact using the latest peer-reviewed science to ensure that potentially significant impacts are not underestimated or ignored. *See* 40 C.F.R. § 1508.27(a) (requiring consideration of “[b]oth short- and long-term effects”).

⁴⁵ Susan Harvey, et al., *Leaking Profits: The U.S. Oil and Gas Industry Can Reduce Pollution, Conserve Resources, and Make Money by Preventing Methane Waste* (March 2012).

⁴⁶ Robert W. Howarth, *Assessment of the Greenhouse Gas Footprint of Natural Gas from Shale Formations Obtained by High-Volume, Slick-Water Hydraulic Fracturing* (Rev’d. Jan. 26, 2011). *See also* Robert W. Howarth et al., *Venting and Leaking of Methane from Shale Gas Development: Response to Cathles et al.* (2012); Eric D. Larson, PhD, Climate Central, *Natural Gas and Climate Change* (May 2013).

⁴⁷ *See* Larson.

⁴⁸ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011.*

EPA's GHG Inventory – which BLM has historically relied upon in its analysis – assumes that methane is 21 times as potent as carbon dioxide (“CO₂”) over a 100-year time horizon,⁴⁹ a global warming potential (“GWP”) based on the Intergovernmental Panel on Climate Change’s (“IPCC”) Second Assessment Report from 1996.⁵⁰ However, the IPCC recently updated their 100-year GWP for methane, substantially increasing the heat-trapping effect to 36.⁵¹ A Supplementary Information Report (“SIR”), prepared for BLM’s oil and gas leasing program in Montana and the Dakotas, further explains that GWP “provides a method to quantify the cumulative effect of multiple GHGs released into the atmosphere by calculating carbon dioxide equivalent (CO₂e) for the GHGs.” SIR at 1-2.⁵² However, substantial questions arise when you calibrate methane’s GWP over the 20-year planning and environmental review horizon used in the SIR and, typically, by BLM. See SIR at 4-1 thru 4-45 (discussing BLM-derived reasonably foreseeable development potential in each planning area). Over this 20-year time period, the IPCC’s new research has calculated that methane’s GWP is 87⁵³ – yet another substantial increase from its earlier estimate of 72, which was still over three times as potent as otherwise assumed by the SIR.⁵⁴

However, recent peer-reviewed science demonstrates that gas-aerosol interactions amplify methane’s impact such that methane is actually 105 times as potent over a twenty year time period.⁵⁵ This information suggests that the near-term impacts of methane emissions have been significantly underestimated. See 40 C.F.R. § 1508.27(a) (requiring consideration of short and long term effects). Further, by extension, BLM has also significantly underestimated the

⁴⁹ See 78 Fed.Reg. 19802, April 2, 2013 (EPA proposal to increase methane’s GWP to 25 times CO₂).

⁵⁰ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Second Assessment Report* (1996) (attached as Exhibit 52); see also U.S. Environmental Protection Agency, *Methane*, available at: <http://www.epa.gov/outreach/scientific.html>.

⁵¹ See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013: The Physical Science Basis*, at 8-58 (Table 8.7) (Sept. 2013).

⁵² BLM, *Climate Change, Supplementary Information Report, Montana, North Dakota and South Dakota* (2010) available at: www.blm.gov/mt/st/en/prog/energy/oil_and_gas/leasing/leasingEAs.html.

⁵³ See IPCC *Physical Science Report*.

⁵⁴ See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Fourth Assessment Report, Working Group 1, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Ch. 2, p. 212, Table 2.14, available at: www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html.

⁵⁵ Drew Shindell et al., *Improved Attribution of Climate Forcing to Emissions*, SCIENCE 2009 326 (5953), p. 716, available at: www.sciencemag.org/cgi/content/abstract/326/5953/716.

near-term benefits of keeping methane emissions out of the atmosphere. 40 C.F.R. §§ 1502.16(e), (f); *id.* at 1508.27. These estimates are important given the noted importance of near term action to ameliorate climate change – near term action that scientists say should focus, *inter alia*, on preventing the emission of short-lived but potent GHGs like methane while, at the same time, stemming the ongoing increase in the concentration of carbon dioxide.⁵⁶ These uncertainties necessitate analysis. 40 C.F.R. §§ 1508.27(a), (b)(4)-(5).

Additional, serious, yet unaddressed uncertainties pertain to the magnitude of methane pollution from oil and gas emissions sources. As provided in the most recent EPA Inventory of Emissions and Sinks: 1990-2011, “[f]urther research is needed in some cases to improve the accuracy of emission factors used to calculate emissions from a variety of sources;” specifically citing the lack of accuracy in emission factors applied to methane sources.⁵⁷ A lack of data reliability has resulted in notable variation in methane emissions reporting from year to year. For example, in a Technical Support Document (“TSD”) prepared for EPA’s mandatory GHG reporting rule for the oil and gas sector for 2012, EPA determined that several emissions sources were projected to be “significantly underestimated.”⁵⁸ EPA thus provided revised emissions factors for four of the most significant underestimated sources that ranged from ten times higher (for well venting from liquids unloading) to as many as 3,500 and 8,800 times higher (for gas well venting from completions and well workovers of unconventional wells).⁵⁹ When EPA accounted for just these four revisions, it more than doubled the estimated GHG emissions from oil and gas production, from 90.2 million metric tons of CO₂ equivalent (“MMTCO₂e”) to 198.0 MMTCO₂e.⁶⁰ However, these emission estimates are based on an outdated GWP of 21. Using the IPCC’s new 100-year GWP for methane of 34, that is 320.5 MMTCO₂e, and, considering a 20-year GWP of 84, that is 792.0 MMTCO₂e – or, respectively, the equivalent emissions from 90.7 or 224 coal fired power plants that is wasted annually. These upward revisions were based primarily on EPA’s choice of data set, here, having replaced Energy Information Administration (“EIA”) data with emissions data from an EPA and Gas Research Institute (“GRI”) study. In the current year, EPA relied on yet another set of data; this time from an oil and gas industry survey of well data conducted by the American Petroleum Institute (“API”) and the American Natural Gas Alliance (“ANGA”).⁶¹ The API/ANGA survey was conducted in response to EPA’s upward

⁵⁶ See, e.g., *Limiting Global Warming: Variety of Efforts Needed Ranging from 'Herculean' to the Readily Actionable*, *Scientists Say*, SCIENCE DAILY (May 4, 2010), available at: <http://www.sciencedaily.com/releases/2010/05/100503161328.htm>; see also, Ramanathan, et. al.

⁵⁷ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*, at 1-19.

⁵⁸ U.S. Environmental Protection Agency, *Greenhouse Gas Emissions Reporting From The Petroleum And Natural Gas Industry Background Technical Support Document*, at 8, available at: <http://www.epa.gov/climatechange/emissions/subpart/w.html>.

⁵⁹ *Id.* at 9, Table 1; see also *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*.

⁶⁰ See EPA, *GHG Emissions Reporting* at 10, Table 2.

⁶¹ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*, at 3-63.

adjustments in the previous GHG inventory, noting that “[i]ndustry was alarmed by the upward adjustment,” and focused specifically on emissions from liquids unloading and unconventional gas well completions and workovers.⁶² Overall, the survey found that revising emissions from these two sources alone would reduce EPA oil and gas methane emissions estimates, which resulted in reported oil and gas production emissions at 100 MMTCO_{2e} pursuant to the EPA’s GHG Reporting Program.⁶³

To provide a specific example of these differing data sets, EPA previously used an emissions factor of 3 thousand standard cubic feet (“Mcf”) of gas emitted to the atmosphere per well completion in calculating its GHG inventory. EPA determined that this figure was significantly underestimated and that a far more accurate emissions factor was 9,175 Mcf per well.⁶⁴ The API/ANGA study suggested that this emission factor is 9,000 Mcf.⁶⁵ However, these emissions factors are simply broad, generalized estimates for well emissions across the nation, and can vary significantly from one geologic formation to the next. For example, emissions reported in the Piceance Basin are as high as 22,000 Mcf of gas per well.⁶⁶

Despite this variability in methane pollution data, what remains clear is that inefficiencies and leakage in oil and gas production results in a huge amount of avoidable waste and emissions, and, conversely, a great opportunity for the BLM to reduce GHG emissions on our public lands. Many of these uncertainties and underestimates, as EPA has explained, are a result of the fact that emissions factors were “developed prior to the boom in unconventional well drilling (1992) and in the absence of any field data and does not capture the diversity of well completion and workover operations or the variance in emissions that can be expected from different hydrocarbon reservoirs in the country.” *Mandatory GHG Reporting Rule*, 75 Fed. Reg. 18608, 18621 (April 12, 2010). These underestimates are also caused by the dispersed nature of oil and gas equipment – rather than a single, easily grasped source, such as a coal-fired power plant, oil and gas production consists of large numbers of wells, tanks, compressor stations, pipelines, and other equipment that, individually, may appear insignificant but, cumulatively, may very well be quite significant. While dispersed, oil and gas development is nonetheless a massive, landscape-scale industrial operation – one that just happens to not have a single roof. BLM, as the agency

⁶² API/ANGA, *Characterizing Pivotal Sources of Methane Emissions from Natural Gas Production: Summary and Analysis of API and ANGA Survey Responses*, Sept. 2012, at 1.

⁶³ See EPA, *Petroleum and Natural Gas Systems: 2011 Data Summary (for 2013 GHG Reporting)*, at 3.

⁶⁴ See EPA, *GHG Emissions Reporting*, attached above as Exhibit 57 at Appendix B at 84-87.

⁶⁵ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011*, at 3-69.

⁶⁶ See, e.g., EPA, *Natural Gas STAR Program, Recommended Technologies and Practices for Wells*, available at: www.epa.gov/gasstar/tools/recommended.html; see also EPA, *Natural Gas STAR Program, Reduced Emissions Completions*, Oct. 26, 2005, at 14.

charged with oversight of onshore oil and gas development, therefore has an opportunity to improve our knowledge base regarding GHG emissions from oil and gas production, providing some measure of clarity to this important issue by taking the requisite “hard look” NEPA analysis as part of its decisionmaking for the proposed action.⁶⁷

Convincing evidence also exists to support the consideration of alternatives that would attach meaningful stipulations to areas open to oil and gas development. As a prime contributor to short-term climate change over the next few decades, methane is a prime target for near-term GHG reductions. In fact, there are many proven technologies and practices already available to reduce significantly the methane emissions from oil and gas operations, further detailed below. These technologies also offer opportunities for significant cost-savings from recovered methane gas. Moreover, new research indicates that tropospheric ozone and black carbon (“BC”) contribute to both degraded air quality and global warming, and that emission control measures can reduce these pollutants using current technology and experience.⁶⁸ Employment of these strategies will annually avoid a substantial number of premature deaths from outdoor air pollution, as well as increase annual crop yields by millions of metric tons due to ozone reductions. Indeed, reducing methane emissions is important not only to better protect the climate, but also to prevent waste of the oil and gas resource itself and the potential loss of economic value, including royalties. BLM should evaluate these technologies, analyzing the benefits of technological implementation versus current agency requirements.

These benefits – as well as the proven, cost-effective technologies and practices that achieve these benefits – are documented by EPA’s “Natural Gas STAR” program, which encourages oil and natural gas companies to cut methane waste to reduce climate pollution and recover value and consolidates the lessons learned from industry for the benefit of other companies and entities with oil and gas responsibilities such as BLM.⁶⁹ EPA has identified well over 100 proven technologies and practices to reduce methane waste from wells, tanks, pipelines, valves, pneumatics, and other equipment and thereby make operations more efficient.⁷⁰ Though underutilized, EPA’s Natural Gas STAR suggests the opportunity to dramatically reduce GHG pollution from oil and gas development, *if* its identified technologies and practices were implemented at the proper scale and supported by EPA’s sister agencies, such as BLM. For calendar year 2010, EPA estimated that this program avoided 38.1 million tons CO₂ equivalent, and added revenue of nearly \$376 million in natural gas sales (at \$4.00/Mcf) – revenue which

⁶⁷ In this context, the 2010 SIR, while providing a basic literature review of GHG emissions sources, is merely a starting point for BLM’s responsibility to take a hard look at GHG emissions in the context of foreseeable drilling operations in the geologic formations proposed for leasing.

⁶⁸ Drew Shindell, et al., *Simultaneously Mitigating Near-Term Climate Change and Improving Human Health and Food Security*, SCIENCE 2012 335, at 183.

⁶⁹ See generally, EPA, Natural Gas STAR Program, available at: www.epa.gov/gasstar/.

⁷⁰ See EPA, Natural Gas STAR Program, *Recommended Technologies and Practices*, available at: www.epa.gov/gasstar/tools/recommended.html.

translates into additional royalties to federal and state governments for the American public.⁷¹ BLM must identify emission reduction strategies in its NEPA analysis, both to address impacts of the proposed action, as well as to satisfy the requirements of SO 3226, FLPMA, and the MLA.

b. Managing for Community and Ecosystem Resiliency.

Resilience is “an ability to recover from or adjust easily to misfortune or change.” MERRIAM-WEBSTER COLLEGIATE DICTIONARY (11th ed. 2008). In the context of climate change and the many resultant impacts, such as the alteration to the biosphere and impairments to human health, the resiliency of our landscapes and a community’s ability to respond and adapt to these changes takes on a new magnitude of importance.

According to experts at the Government Accountability Office (“GAO”), federal land and water resources are vulnerable to a wide range of effects from climate change, some of which are already occurring. These effects include, among others, “(1) physical effects, such as droughts, floods, glacial melting, and sea level rise; (2) biological effects, such as increases in insect and disease infestations, shifts in species distribution, and changes in the timing of natural events; and (3) economic and social effects, such as adverse impacts on tourism, infrastructure, fishing, and other resource uses.”⁷² There is absolutely no mention, much less analysis, in the PRMP/FEIS of these growing impacts or the necessity to employ climate mitigation measures to ensure landscape and human resiliency and their ability to adapt and respond to climate change impacts.

Beyond mitigating climate change by reducing contributions of GHG pollution to the atmosphere, the BLM can also help promote ecological resiliency and adaptability by reducing external anthropogenic environmental stresses (like coal, oil and gas development) as a way of best positioning public lands, and the communities that rely on those public lands, to withstand what is acknowledged ongoing and intensifying climate change degradation. It is crucial for

⁷¹ See EPA, Natural Gas STAR Program, *Accomplishments*, available at: www.epa.gov/gasstar/accomplishments/index.html#three. BLM should also take a look at EPA’s more detailed program accomplishments to provide a measure of what BLM could itself accomplish, and to understand the nature of the problem and opportunities. Also of interest, for calendar year 2008, EPA estimated that its program avoided 46.3 million tons of CO₂ equivalent, equal to the annual GHG emissions from approximately 6 million homes per year, and added revenue of nearly \$802 million in natural gas sales. To speculate, the calendar year 2009 declines are likely associated with ongoing economic and financial stagnation and the low price of natural gas that has slowed natural gas drilling and production.

⁷² GAO Report, *Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources* (2007); see also Committee on Environment and Natural Resources, National Science and Technology Council, *Scientific Assessment of the Effects of Global Climate Change on the United States* (2008); Melanie Lenart, et. al. *Global Warming in the Southwest: Projections, Observations, and Impacts* (2007) (describing impacts from temperature rise, drought, floods and impacts to water supply on the southwest).

the BLM to close the gap in their decisionmaking regarding the cumulative contribution of coal, oil and gas development made available in the planning area, particularly given the conflict between such authorization and the agency's responsibility to manage for healthy, resilient ecosystems. Although the BLM has recognized the threat of climate change, the agency's decisionmaking is not reflective of this harm and the agency fails to take the many necessary and meaningful steps to ameliorate the impacts to communities, landscapes, and species. The BLM's failure to even mention the relationship between climate change and these impacts is a fundamental deficiency in the PRMP/FEIS, and fails to satisfy the agency's hard look obligation. *See Morris*, 598 F.3d at 681.

Moreover, CEQ Guidance requires that agencies address the impacts of climate change on the environmental consequences of a proposed action. As the CEQ Guidance recognizes, "[c]limate change can increase the vulnerability of a resource, ecosystem, human community, or structure, which would then be more susceptible to climate change and other effects and result in a proposed action's effects being more environmentally damaging." 77 Fed. Reg. at 77,828. These effects are already occurring and are expected to increase, resulting in shrinking water resources, extreme flooding events, invasion of more combustible non-native plant species, soil erosion, loss of wildlife habitat, and larger, hotter wildfires. These impacts have been catalogued in recent scientific studies by federal agencies, including the National Climate Assessment,⁷³ and highlighted by President Obama. *See* Exec. Order No. 13,653, § 1. As the CEQ Guidance recognizes, "GHGs already in the atmosphere will continue altering the climate system into the future, even with current or future emissions control efforts." 77 Fed. Reg. at 77,829. In other words, climate change impacts are and will continue to be part of the new normal, and "managing th[o]se risks requires deliberate preparation, close cooperation, and coordinated planning ... to improve climate preparedness and resilience; help safeguard our economy, infrastructure, environment, and natural resources; and provide for the continuity of ... agency operations, services, and programs." Exec. Order No. 13,653, § 1.

NEPA analyses must account for this reality. While the CEQ Guidance suggests that existing and reasonably foreseeable climate change impacts be considered as part of an agency's hard look at impacts, the guidance must also account for the fact that climate change effects are and will continue to be a key component of the environmental baseline. Agencies are required under NEPA to "describe the environment of the areas to be affected or created by the alternatives under consideration." 40 C.F.R. § 1502.15. The affected environment discussion sets the "baseline" for the impacts analysis and comparison of alternatives. As the Ninth Circuit has recognized, "without establishing...baseline conditions...there is simply no way to determine what effect [an action] will have on the environment, and consequently, no way to comply with NEPA." *Half Moon Bay Fisherman's Marketing Ass'n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988) (explaining further that "[t]he concept of a baseline against which to compare predictions of the effects of the proposed action and reasonable alternatives is critical to the NEPA process").

Excluding climate change effects from the environmental baseline ignores the reality that the impacts of proposed actions must be evaluated based on the already deteriorating, climate-

⁷³ Available at <http://nca2014.globalchange.gov/>.

impacted state of the resources, ecosystems, human communities, and structures that will be affected. Accordingly, BLM must clarify that existing and reasonably foreseeable climate change impacts as part of the affected environment in the planning area, which then must be assessed as part of the agency's hard look at impacts, and integrated into *each* of the alternatives, including the no action alternative. Put differently, simply acknowledging climate impacts as part of the affected environment is insufficient. BLM must incorporate that information into their hard look at impacts (e.g., the cumulative impact of climate change, the proposed action, and other past, present, and reasonably foreseeable impacts), in particular to help inform the design and consideration of alternatives and mitigation measures.

Critically, the final guidance should emphasize that agencies may not shirk their responsibility to assess climate change merely because of uncertainties. "Reasonable forecasting and speculation is... implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labelling any and all discussion of future environmental effects as 'crystal ball inquiry.'" *Save Our Ecosystems v. Clark*, 747 F.2d 1240, 1246 n.9 (9th Cir. 1984 (quoting *Scientists' Inst. for Pub. Info., Inc. v. Atomic Energy Comm.*, 481 F.2d 1079, 1092 (D.C. Cir. 1973)). NEPA's hard look merely requires "a reasonably thorough discussion of the significant aspects of the probable environmental consequences" to "foster both informed decision - making and informed public participation." *Ctr. for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1194 (9th Cir. 2008) (quotations and citations omitted). As here, BLM has refused to address the implications of their actions in the context of climate change on the basis of uncertainties, such as the lack of fine-scale modeling, which has led BLM to take short-sighted, arbitrary, and capricious action that does not, in fact, account for climate change.

In this context, and to accurately account for and integrate climate change impacts into the affected environment, hard look, alternatives, and mitigation analysis, BLM should evaluate the relevant resources, ecosystems, or communities for key vulnerabilities as part of the baseline assessment. The vulnerability of ecosystems and communities, as well as the species and physical elements they comprise, depends on their inherent qualities and their ability to change or adapt to address new climatic conditions. For example, the vulnerability of certain species can be affected by the tolerance of individual organisms to the direct effects of climate change, the ability of populations to adapt to those conditions through the expression of genetic variability, and the ability to adjust behaviorally to changes in the ecosystem, such as prey shifts. A vulnerability assessment would examine the species and physical elements of existing ecosystems and determine which elements are sensitive, which are resilient, which have the ability to adapt, and what the likely consequences would be of anticipated changes in climate. Human infrastructure—bridges, roads, buildings, etc.—should be assessed similarly.

Because ecosystems (including the human communities that rest within such ecosystems) are so complex, it is impossible to evaluate the vulnerabilities of every population, species, community, or other element of the system in question. Instead, risk assessment must focus on particular, high-priority elements or "key vulnerabilities." In its 5th Assessment Report, the IPCC suggested the following criteria for identifying key vulnerabilities:

- Exposure of society, community or social-ecological system to climate stressors.

- Importance of vulnerable system(s).
- Limited ability of society, community, or social-ecological systems to cope with and build adaptive capacities or limit the adverse consequences of climate related hazard.
- Persistence of vulnerable conditions and degree of irreversibility of consequences.
- Presence of conditions that make societies highly susceptible to cumulative stressors in complex and multiple-interacting systems.

In other words, key vulnerabilities are likely to occur where the effects of climate change are large and intense, imminent, long lasting, highly probable, irreversible, and likely to limit the distribution of highly valued systems or system elements. BLM should clarify that understanding and assessing these vulnerabilities, based on existing information and tools,⁷⁴ is a key component of the affected environment, hard look at impacts, and the design and consideration of alternatives and mitigation measures.

F. The BLM must take a “hard look” at hydraulic fracturing.

Although advances in oil and gas extraction techniques – namely hydraulic fracturing, or fracking – have undoubtedly resulted in a growth of domestic production, the wisdom of these advances with regard to other resource values and human health is still very much in question.⁷⁵ As described in detail below, there is a wealth of information and reports stressing the dangers of fracking that must be considered in the agency’s subject NEPA analysis. Of course, given the national attention and debate that fracking is generating, significant sources of new information and research are being consistently published warning against the dangers and impacts that fracking can produce, which must also be considered by the agency.

For example, sobering new research shows that chemically concentrated fracking fluids can migrate into groundwater aquifers within a matter of years – directly refuting industry claims that rock layers separating aquifers are impervious to these pollutants.⁷⁶ For years, industry claimed that there has never been a documented case of groundwater contamination from fracking, an assertion that was invalidated by EPA’s research in Pavillion, Wyoming. Indeed, a second round of testing in the Pavillion area was recently performed by the U.S. Geological Survey, which supported EPA’s preliminary findings that hydraulic fracturing resulted in

⁷⁴ Where there is scientific uncertainty, agencies must satisfy the requirements of 40 C.F.R. § 1502.22.

⁷⁵ See, e.g., A.R. Ingraffea, et. al., *Natural Gas, Hydraulic Fracking and a Bridge to Where?* (April 2011).

⁷⁶ See, Abrahm Lustgarten, *New Study Predicts Frack Fluids can Migrate to Aquifers Within Years*, PROPUBLICA, May 1, 2012; Josh Fox, *The Sky is Pink: Annotated Documents*.

groundwater contamination.⁷⁷ Even in draft form, the Pavillion Report, as discussed below, and its troubling findings – as well as other evidence of fracking related contamination from around the country – underscore the need for thorough analysis to be performed by the FFO in its NEPA analysis of the October 2016 Lease Sale.

The dangers and impacts of fracking are not only limited to extraction, but can be found at every stage of the production cycle. For example, fracking’s waste stream can result in dramatic impacts – requiring onsite waste injection, trucking frack fluids offsite, and in some cases even the direct release of fracking waste into watercourses – the impacts of which can be compounded by ineffective or nonexistent regulation.⁷⁸ As detailed herein, shale gas production itself can be inefficient and wasteful – with practices such as the venting of methane,⁷⁹ and the use of vast quantities of water in the fracking process.⁸⁰ Thus, in addition to being wasteful, these practices can also be quite harmful to human health and the environment.

The wisdom of the natural gas boom is further brought into question by the underlying economics driving domestic growth, with a historically low cost of natural gas and a vast number of approved wells that industry has allowed to expire – all of which questions the imminent need for additional public lands to be made available for oil and gas development, often at the expense of other important resource values at stake in an area. However, a closer look at some of the economics motivating the oil and gas industry’s push for greater production reveals sheer industry greed and speculation – driven by huge capital investment and Wall Street profits.⁸¹ These factors cannot be ignored by BLM as it undertakes its NEPA analysis for the proposed October 2016 Lease Sale, and must help to inform the resource values the agency elevates in its minerals management program.

a. Fracking Impacts

⁷⁷ Peter Wright, et. al., U.S. Geological Survey, *Groundwater-Quality and Quality-Control Data for Two Monitoring Wells near Pavillion, Wyoming*, April and May 2012.

⁷⁸ See Abrahm Lustgarten, *The Trillion Gallon Loophole: Lax Rules for Drillers that Inject Pollutants Into the Earth*, PROPUBLICA, Sept. 20, 2012; Earthworks, *The Crisis in Oil & Gas Regulatory Enforcement*, September 2012.

⁷⁹ Energy Policy Research Foundation, *Lighting up the Prairie: Economic Considerations in Natural Gas Flaring*, Sept. 5, 2012; see also, James Hansen, et. al., *Greenhouse gas growth rates*, PNAS, vol. 101, no. 46, 16109-16114, Sept. 29, 2004 (curtailing methane waste is seen as a “vital contribution toward averting dangerous anthropogenic interference with global climate.”)

⁸⁰ See GAO, *Energy-Water Nexus: Coordinated Federal Approach Needed to Better Manage Energy and Water Tradeoffs* (Sept. 2012); Nicholas Kusnetz, *The Bakken oil play spurs booming business – in water*, High Country News, Sept. 5, 2012.

⁸¹ See Deborah Rogers, *In Their Own Words: Examining Shale Gas Hype*, Energy Policy Forum (April 2012).

The potential impacts that may result from hydraulic fracturing are myriad and significant; and include, among others, impacts to water quality and supply, impacts to habitat and wildlife, impacts to human health, as well as impacts on greenhouse gas emissions and air quality.⁸² The New York Times recently uncovered a 1987 U.S. Environmental Protection Agency (“EPA”) report to Congress which found, among other things, that fracking can cause groundwater contamination, and cites as an example a case where hydraulic fracturing fluids contaminated a water well in West Virginia.⁸³ The EPA report was further summarized and reviewed in an Environmental Working Group report.⁸⁴

Fracking fluid is a conglomeration of many highly toxic chemicals and compounds. The Endocrine Disruption Exchange (“TEDX”) has documented nearly 1,000 products energy companies inject into the ground in the process of extracting natural gas. Many of these products contain chemicals that are harmful to human health. According to TEDX:

In the 980 products identified...[for use during natural gas operations], there were a total of 649 chemicals. Specific chemical names and CAS numbers could not be determined for 286 (44%) of the chemicals, therefore, the health effects summary is based on the remaining 362 chemicals with CAS numbers...Over 78% of the chemicals are associated with skin, eye or sensory organ effects, respiratory effects, and gastrointestinal or liver effects. The brain and nervous system can be harmed by 55% of the chemicals. These four health effect categories...are likely to appear immediately or soon after exposure. They include symptoms such as burning eyes, rashes, coughs, sore throats, asthma-like effects, nausea, vomiting, headaches, dizziness, tremors, and convulsions. Other effects, including cancer, organ damage, and harm to the endocrine system, may not appear for months or years later. Between 22% and 47% of the chemicals were associated with these

⁸² See, e.g., National Wildlife Federation, *No More Drilling in the Dark: Exposing the Hazards of Natural Gas Production and Protecting America’s Drinking Water and Wildlife Habitats* (2011), available at: <http://www.nwf.org/News-and-Magazines/Media-Center/Reports/Archive/2011/No-More-Drilling-in-the-Dark.aspx>; see also United States Forest Service, Chloride Concentration Gradients in Tank-Stored Hydraulic Fracturing Fluids Following Flowback (Nov. 2010), available at: <http://nrs.fs.fed.us/pubs/38533/> (last visited Dec. 20, 2011).

⁸³ See U.S. Environmental Protection Agency, Report to Congress, *Management of Wastes from the Exploration, Development, and Production of Crude Oil, Natural Gas, and Geothermal Energy* (Dec. 1987), at Ch. IV, Damages Caused by Oil and Gas Operations (attached as Exhibit 78); see also *Drilling Down, Documents: A Case of Fracking Related Contamination*, THE NEW YORK TIMES ONLINE, available at: <http://www.nytimes.com/interactive/us/drilling-down-documents-7.html#document/p1/a27935>.

⁸⁴ See Environmental Working Group, *Cracks in the Façade: 25 Years ago, EPA Linked “Fracking” to Contamination* (Aug. 2011), available at: <http://www.ewg.org/reports/cracks-in-the-facade>.

possibly longer-term health effects. Forty-eight percent of the chemicals have health effects in the category labeled ‘Other.’ The ‘Other’ category includes such effects as changes in weight, or effects on teeth or bones, for example, *but the most often cited effect in this category is the ability of the chemical to cause death.*⁸⁵ (emphasis added)

A Congressional Report issued in April 2011 reveals that energy companies have injected more than 30 million gallons of diesel fuel or diesel mixed with other fluids into the ground nationwide in the process of fracking to extract natural gas between 2005 and 2009.⁸⁶ In Colorado, 1.3 million gallons of fluids containing diesel fuel was used in fracking natural gas wells.⁸⁷ The EPA has stated that “the use of diesel fuel in fracturing fluids poses the greatest threat” to underground sources of drinking water.⁸⁸ According to Congresswoman Diana DeGette of Colorado, fracking with diesel fuel was done without permits in apparent violation of the Safe Drinking Water Act.⁸⁹

In 2012, a former staffer responsible for investigating and managing groundwater contamination for New York State warned that allowing the controversial hydraulic fracturing practices would lead to contamination of the state’s aquifers and poison its drinking water. In staffer Paul Hetzler’s letter to an upstate New York newspaper, he provided:

⁸⁵ TEDX, *Chemicals In Natural Gas Operations*.

⁸⁶ U.S. CONGRESS, HOUSE OF REPRESENTATIVES, COMMITTEE ON ENERGY AND COMMERCE, *Chemicals Used in Hydraulic Fracturing* (April 2011), at 10; *see also* Memorandum from Chairman Henry A. Waxman and Subcommittee Chairman Edward J. Markey, to Committee on Energy and Commerce, Examining the Potential Impact of Hydraulic Fracturing (Feb. 28, 2010).

⁸⁷ Karen Frantz, *States probe use of diesel fuel*, DURANGO HERALD, February 5, 2011, available at: <http://www.durangoherald.com/article/20110206/NEWS01/702069922/-1/s>.

⁸⁸ David O. Williams, *U.S. House probe alleges Halliburton, others illegally used diesel in gas fracking*, COLORADO INDEPENDENT, February 1, 2011, available at: <http://coloradoindependent.com/73593/u-s-house-probe-alleges-halliburton-others-illegally-used-diesel-in-gas-fracking>.

⁸⁹ Letter from U.S. CONGRESS, HOUSE OF REPRESENTATIVES, COMMITTEE ON ENERGY AND COMMERCE, Representatives Henry A. Waxman, Edward J. Markey, & Diana DeGette, to Lisa Jackson, Administrator, U.S. ENVIRONMENTAL PROTECTION AGENCY (Jan. 31, 2011), available at: http://degette.house.gov/index.php?option=com_content&view=article&id=1048:energy-a-commerce-committee-fracking-investigation-reveals-millions-of-gallons-of-diesel-fuel-injected-into-ground-across-us&catid=76:press-releases-&Itemid=227; *see also* Environment News Service, *Toxic Diesel Fuel Used Without Permits in Fracking Operations*, February 4, 2011, available at: <http://www.ens-newswire.com/ens/feb2011/2011-02-04-092.html>.

I'm familiar with the fate and transport of contaminants in fractured media, and let me be clear: hydraulic fracturing as it's practiced today will contaminate our aquifers.

Not *might* contaminate our aquifers. Hydraulic fracturing *will* contaminate New York's aquifers. If you were looking for a way to poison the drinking water supply, here in the north-east you couldn't find a more chillingly effective and thorough method of doing so than with hydraulic fracturing.⁹⁰

Despite the energy industry's explanation that a thick layer of bedrock safely separates the gas-containing rock layer being fractured from ground-water used for drinking and surface water sources, evidence is emerging which warns that contaminants from gas wells are making their way into groundwater. This is particularly important, here, as the target Mancos Shale formation is shallow and less than 1,000 feet from the surface, heightening this risk to an even greater degree. Evidence suggesting contaminants from drilling operations have migrated towards the surface include:

- In March 2004, gas was discovered bubbling up in West Divide Creek and a few nearby ponds in Garfield County. The Colorado Oil and Gas Conservation Commission ("COGCC") took samples of the water and discovered they contained benzene, toluene, and m- & p-xylenes at concentrations of 99, 100, and 17 micrograms per liter (mg/l), respectively. This indicated that the gas seeping into West Divide Creek probably was not biogenic methane gas (gas made by the decomposition of organic matter by methanotrophic bacteria), but rather thermogenic gas. Further testing indicated that the gas seeping into West Divide Creek was thermogenic gas from the Williams Fork Formation where EnCana had been drilling for natural gas.⁹¹ EnCana was subsequently fined \$371,000 as a result of contaminating West Divide Creek.
- The COGCC investigated complaints from Weld County, Colorado that domestic water wells were allegedly contaminated from oil and gas development. The COGCC concluded after investigation that the Ellsworth's well contained a mixture of biogenic and thermogenic

⁹⁰ Karen McVeigh, *Damning New Letter from NY State Insider: 'Hydraulic Fracturing as It's Practiced Today Will Contaminate Our Aquifers,'* THE GUARDIAN, January 6, 2012, available at: http://www.alternet.org/water/153684/damning_new_letter_from_ny_state_insider%3A_%27hydraulic_fracturing_as_it%27s_practiced_today_will_contaminate_our_aquifers%27/.

⁹¹ Colorado Oil and Gas Conservation Commission, *Mamm Creek Gas Field - West Divide Creek Gas Seep – April 14, 2004 Update* (2004), available at: http://cogcc.state.co.us/Library/PiceanceBasin/WestDivide4_14_04summary.htm; see also Margaret Ash, Environmental Protection Supervisor, Colorado Oil and Gas Conservation Commission, *Investigation into Complaint of New Gas Seep, West Divide Creek, 2007-2008*.

methane (from gas drilling operations) that was in part attributable to oil and gas development. Ms. Ellsworth and the operator reached a settlement in that case.⁹²

- In 2007, EPA hydrologists sampled a pristine drinking water aquifer under the Jonah Well Field near Pinedale, Wyoming. They found high levels of benzene, a known carcinogen, in 3 wells and low levels of hydrocarbons in an additional 82 wells (out of the 163 wells sampled).⁹³ These contaminated wells are located in an area stretching across 28 miles in an undisturbed landscape in which the only industry that exists is natural gas extraction.
- In Pavillion, Wyoming, EPA found 11 of 39 water samples collected from domestic wells were contaminated with chemicals linked to local natural gas fracking operations. The EPA found arsenic, methane gas, diesel-fuel-like compounds and metals including copper and vanadium. Of particular concern were compounds called adamantanes – a natural hydrocarbon found in natural gas – and a little-known chemical called 2-butoxyethanol phosphate, or 2-BEp. 2-BEp is closely related to 2-BE, a substance known to be used in fracking fluids.⁹⁴
- Pennsylvania state regulators have uncovered more than 50 cases where methane and other contaminants have exploded out of wells or leaked underground into drinking water supplies.⁹⁵

Known and suspected adverse effects of drilling operations include:

- Garfield County, Colorado, Commissioners recently expressed their health and safety concerns regarding natural gas drilling by stating in a legal filing that, “No agency...can guarantee Garfield County residents that exposures to oil and gas emissions will not produce illness or latent effects, including death.” They cited the cases of three people – Chris Mobaldi, Verna Wilson, and Jose Lara – who died after suffering from drilling-related illnesses in Garfield County.⁹⁶

⁹² Letter from David Neslin, Director, Colorado Oil and Gas Conservation Commission, to Mr. and Mrs. Ellsworth (August 7, 2009).

⁹³ BLM Wyoming News Release, *BLM, Wyoming DEQ Require Test of Water Wells Within the Pinedale Anticline and Jonah Fields* (April 26, 2007), available at: http://www.blm.gov/wy/st/en/info/news_room/2007/04/26pfo-DEQ-BLMwatertests.html.

⁹⁴ See Neslin.

⁹⁵ See Robert B. Jackson, et al., *Increased stray gas abundance in a subset of drinking water wells near Marcellus shale gas extraction*, PNAS, December 17, 2012.

⁹⁶ David O. Williams, *GarCo officials blast state gas drilling rules in case requesting more well density*, THE COLORADO INDEPENDENT, January 19, 2011, available at: <http://coloradoindependent.com/72246/garco-officials-blast-state-gas-drilling-rules-in-case-requesting-more-well-density>.

- In April 2008, a nurse at a hospital in Durango, Colorado, became critically ill and almost died of organ failure as a result of second-hand chemical exposure acquired while treating a drill rig worker who had fracking fluid on his clothes.⁹⁷
- In Texas, which now has approximately 93,000 natural-gas wells, up from around 58,000 a dozen years ago, a hospital system in the six counties with some of the heaviest drilling reported in 2010 a 25 percent asthma rate for young children, more than three times the state rate of about 7 percent.⁹⁸
- A house in Bainbridge, Ohio exploded on November 15, 2007. The Ohio Department of Natural Resources attributed the explosion to a methane leak from a nearby hydraulic fractured well. The faulty cement casing of the well developed a crack allowing methane to seep underground and fill the couple's basement.⁹⁹

Abraham Lustgarten, an investigative reporter with ProPublica, who has won the George Polk Award for Environmental Reporting for his work on the dangers of natural gas drilling, writes:

Dennis Coleman, a leading international geologist and expert on tracking underground migration, says more data must be collected before anyone can say for sure that drilling contaminants have made their way to water or that fracturing is to blame. But Coleman also says there's no reason to think it can't happen. Coleman's Illinois-based company, Isotech Laboratories, has both the government and the oil and gas industry as clients. He says he has seen methane gas seep underground for more than seven miles from its source. If the methane can seep, the theory goes, so can the fluids.¹⁰⁰

⁹⁷ Eric Frankowski, *Gas industry secrets and a nurse's story*, HIGH COUNTRY NEWS, July 28, 2008, available at: <http://www.hcn.org/wotr/gas-industry-secrets-and-a-nurses-story>.

⁹⁸ Ian Urbina, *Regulations Lax as Gas Well's Tainted Waters Hits Rivers*, THE NEW YORK TIMES, February 26, 2011, available at: <http://www.nytimes.com/2011/02/27/us/27gas.html?pagewanted=all>.

⁹⁹ See Ohio Department of Natural Resources, Division of Mineral Resources Management, *Report on the Investigation of the Natural Gas Invasion of Aquifers in Bainbridge Township of Geauga County, Ohio* (September 1, 2008); see also Joan Demirjian, *Insurance company [sues] driller over home explosion*, CHAGRIN VALLEY TIMES, January 7, 2010, available at: <http://www.chagrinvallleytimes.com/NC/0/1571.html>.

¹⁰⁰ Abraham Lustgarten, *Hydrofracked? One Man's Mystery Leads to a Backlash Against Natural Gas Drilling*, PROPUBLICA, February 25, 2011, available at: <http://www.propublica.org/article/hydrofracked-one-mans-mystery-leads-to-a-backlash-against-natural-gas-drill/single>.

However, perhaps the most thorough evidence of groundwater contamination from hydraulic fracturing is found in a newly released EPA draft report investigating ground water contamination near Pavillion, Wyoming (“Pavillion Report”).¹⁰¹ Among its findings, the Pavillion Report provides:

Elevated levels of dissolved methane in domestic wells generally increase in those wells in proximity to gas production wells. Pavillion Report, at xiii.

Detection of high concentrations of benzene, xylenes, gasoline range organics, diesel range organics, and total purgeable hydrocarbons in ground water samples from shallow monitoring wells near pits indicates that pits are a source of shallow ground water contamination in the area of investigation. Pits were used for disposal of drilling cuttings, flowback, and produced water. There are at least 33 pits in the area of investigation. When considered separately, pits represent potential source terms for localized ground water plumes of unknown extent. When considered as whole they represent potential broader contamination of shallow ground water. *Id.* at 33 (emphasis added).

The explanation best fitting the data for the deep monitoring wells is that constituents associated with hydraulic fracturing have been released into the Wind River drinking water aquifer at depths above the current production zone. *Id.* (emphasis added).

Although some natural migration of gas would be expected above a gas field such as Pavillion, data suggest that enhanced migration of gas has occurred to ground water at depths used for domestic water supply and to domestic wells. *Id.* at 37 (emphasis added).

A lines of reasoning approach utilized at this site best supports an explanation that inorganic and organic constituents associated with hydraulic fracturing have contaminated ground water at and below the depth used for domestic water supply.... A lines of evidence approach also indicates that gas production activities have likely enhanced gas migration at and below depths used for domestic water supply and to domestic wells in the area of investigation. *Id.* at 39 (emphasis added).

Although the Pavillion Report is currently released as a “draft,” the EPA has shared preliminary data with, and obtained feedback from, Wyoming state officials, EnCana, Tribes, and Pavillion residents, prior to release. Even in draft form, the Pavillion Report and its troubling findings – as well as other evidence of fracking related contamination from around the country – satisfies the low threshold for consideration of the impacts described therein in the preparation of NEPA analysis for the October 2016 Lease Sale.

¹⁰¹ EPA Draft Report, *Investigation of Ground Water Contamination Near, Pavillion, Wyoming* (Dec. 2011).

Historically, BLM has been dismissive of possible impacts to water quality from hydraulic fracturing. However, given the weight of both new and old evidence documenting the risk of water contamination from gas drilling across the country, BLM's approach is becoming increasingly untenable, in particular given the absence of any scientific analysis that conclusively finds that these documented problems do not exist in the area of the proposed lease sale. Indeed, even an industry report prepared for Gunnison Energy Corporation – a major oil and gas developer – has acknowledged the potential for significant impacts to water resources from fracking.¹⁰² The simple fact of the matter is that natural gas development has the potential for poisoning our water with toxic, hazardous, and carcinogenic chemicals as well as naturally occurring radioactive radium, and BLM must provide a thorough hard look analysis of these potentially significant impacts in its analysis for the October 2016 lease sale.

Recent reporting from New Mexico 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.¹⁰³ This is a significant development that could result in well blowouts, contamination of resources, and issues over who is responsible for liabilities and costs of such impacts. BLM has a significant responsibility to include track hits in the EA for the October 2016 Lease Sale.

The bottom line is this – energy companies have told us, ‘Trust us, our fracking ingredients and process for extracting natural gas are harmless.’ We now know they have not been truthful and cannot be trusted. Without implementation of a precautionary approach to these risks, BLM will continue to place the health of our community and our environment at risk.

b. Disclosure Rules

One basic purpose of NEPA is to assure that the public and policy makers are aware in advance of the potential environmental consequences of proposed actions. 40 C.F.R. § 1500.1(a). Furthermore, the presence of uncertain or unknown risks may compel an agency to prepare a more thorough EIS, in lieu of an EA. 40 C.F.R. § 1508.27(b)(5). Currently, there are significant uncertainties about the different chemicals that are being used in hydraulic fracking, though, as mentioned above, it is clear that toxic, hazardous, and carcinogenic chemicals are used throughout the fracking process. Current, disclosure of fracking chemicals, via FracFocus, is insufficient to adequately protect the public from potentially toxic, hazardous, and/or

¹⁰² See Gunnison Energy Corporation, *Analysis of Potential Impacts of Four Exploratory Natural Gas Wells to Water Resources of the South Flank of the Grand Mesa, Delta County, Colorado* (March 2003) at 42, 56.

¹⁰³ See, e.g., Gayathri Vaidyanathan, *In N.M., a sea of ‘frack hits’ may be tilting production*, E&E News, (March 18, 2014) (attached as Exhibit 118); Tina Jensen, *Fracking fluid blows out nearby well*, KQRE (October 19, 2013).

carcinogenic chemicals.¹⁰⁴ In preparing its NEPA analysis for the October 2016 lease sale, BLM must catalogue the substances that will be used or are reasonably likely to be used in fracking on the parcels made available. In order to make this information accessible to the public, BLM should categorize these substances as hazardous, toxic, carcinogenic, or benign.

c. Seismic Impacts

The scientific communities recognition of the relationship between hydraulic fracturing and seismic activity is not new. Indeed, the USGS freely admits, “earthquakes induced by human activity have been documented.”¹⁰⁵ The largest and perhaps most widely known incident to date resulted from fluid injection at the Rocky Mountain Arsenal near Denver, Colorado, in 1967, where an earthquake of magnitude 5.5 followed a series of smaller earthquakes. Further, in a 1990 report studying the incident, the USGS confirmed, “the link between fracking fluid injection and the earlier series of earthquakes was established.”¹⁰⁶

Recently, “[a] northeast Ohio well used to dispose of wastewater from oil and gas drilling almost certainly caused a series of 11 minor quakes in the Youngstown area since last spring, a seismologist investigating the quakes said.”¹⁰⁷ After the latest and largest quake Saturday, December 31, 2011, which registered at 4.0 magnitude, “state officials announced their beliefs that injecting wastewater near a fault line had created enough pressure to cause seismic activity. They said four inactive wells within a five-mile radius of the Youngstown well would remain closed.”¹⁰⁸ As Andy Ware, deputy director of the Ohio Department of Natural Resources, which regulates gas drilling and disposal wells, stated, “the state asked on Friday that injection at the well be halted after analysis of the 10th earthquake, a 2.7-magnitude temblor on Dec. 24, showed

¹⁰⁴ Kate Konschnik *et al.*, *Legal Fractures in Chemical Disclosure Laws: Why the Voluntary Chemical Disclosure Registry FracFocus Fails as a Regulatory Compliance Tool*, Harvard Law School, Envtl. Law Program, Apr. 2013.

¹⁰⁵ See USGS, Earthquakes Hazards Program, FAQs, available at: <http://earthquake.usgs.gov/learn/faq/?categoryID=1&faqID=1>.

¹⁰⁶ Craig Nicholson and Robert Wesson, *Earthquake Hazard Associated with Deep Well Injection – A report to the U.S. Environmental Protection Agency*, U.S. Geological Survey Bulletin 1951 (1990), at 74 (also citing other well-documented examples of seismic activity induced by fluid injection, including: Denver, Colorado; Rangely, Colorado; southern Nebraska; western Alberta and southwestern Ontario, Canada; western New York; New Mexico; and Matsushiro, Japan).

¹⁰⁷ Thomas J. Sheeran, *Ohio Earthquakes Caused by Drilling Wastewater Well, Experts Say*, HUFFINGTON POST, January 2, 2012, available at: http://www.huffingtonpost.com/2012/01/02/ohio-earthquakes-caused-by-wastewater-well-drilling_n_1180094.html.

¹⁰⁸ *Id.*

that it occurred less than 2,000 feet below the well.”¹⁰⁹

The events in Youngstown unfortunately don’t seem to be isolated. “A string of mostly small tremors in Arkansas, Oklahoma, Texas, British Columbia and other shale-gas-producing areas suggest that [fracking] may lead, directly or indirectly, to a dangerous earthquake.”¹¹⁰ The commonality of circumstances suggests that a strong correspondence between seismic activity and development techniques used by the oil and gas industry does indeed exist. For example, “[t]he number and strength of earthquakes in central Arkansas have noticeably dropped since the shutdown of two injection wells in the area.”¹¹¹ Scott Ausbrooks, the Geohazards Supervisor for the Arkansas Geological Survey, provided, “[w]e have definitely noticed a reduction in the number of earthquakes, especially the larger ones. It’s definitely worth noting.”¹¹²

Moreover, the U.S. Geological Survey (“USGS”) has recently released a report that links a series of earthquakes in Oklahoma, in January 2011, to a fracking operation underway there. The USGS determined after analyzing earthquake data that “the character of seismic recordings indicate that they are both shallow and unique.”¹¹³ The report continues, providing: “Our analysis showed that shortly after hydraulic fracturing began small earthquakes started occurring, and more than 50 were identified, of which 43 were large enough to be located. Most of these earthquakes occurred within a 24-hour period after hydraulic fracturing operations had ceased.”¹¹⁴

In August 2011, an earthquake measuring 5.3-magnitude near Trinidad, Colorado, was the largest in more than 40 years.¹¹⁵ However, seismic activity near Trinidad is not new. Indeed, a September 2001 swarm of earthquakes near Trinidad prompted a U.S. Geological Survey investigation. The USGS report provided, “In recent years, a large volume of excess water that is

¹⁰⁹ Henry Fountain, *Disposal Halted at Well After New Quake in Ohio*, THE NEW YORK TIMES, Jan. 1, 2012, available at: <http://www.nytimes.com/2012/01/02/science/earth/youngstown-injection-well-stays-shut-after-earthquake.html?scp=3&sq=fracking%20earthquake&st=cse>.

¹¹⁰ *Id.*

¹¹¹ Sarah Eddington, *Ark. Quakes Decline Since Injection Well Closures*, HUFFINGTON POST, March 14, 2011, available at: <http://www.huffingtonpost.com/huff-wires/20110314/us-arkansas-earthquakes/>.

¹¹² *Id.*

¹¹³ Austin Holland, Oklahoma Geological Survey, *Examination of Possibly Induced Seismicity from Hydraulic Fracturing in Eola Field, Garvin County, Oklahoma* (Aug. 2011), at 1.

¹¹⁴ *Id.*

¹¹⁵ Jordan Steffen, *5.3 quake in Trinidad, Colo., area unnerves regions residents*, DENVER POST, August 24, 2011, available at: http://www.denverpost.com/news/ci_18744329.

produced in conjunction with coal-bed methane gas production has been returned to the subsurface in fluid disposal wells in the area of the earthquake swarm;” and later continues, “Because of the proximity of these disposal wells to the earthquakes, local residents and officials are concerned that the fluid disposal might have triggered the earthquakes.”¹¹⁶ The USGS investigation concluded: “the characteristics of the seismicity and the fluid disposal process do not constitute strong evidence that the seismicity is induced by the fluid disposal, though they do not rule out this possibility.”¹¹⁷

The threat of seismic activity induced from oil and gas development practices must be considered in the BLM’s analysis of the October 2016 lease sale. As noted above, Ohio officials placed a five-mile buffer around waste injection wells. Given the recognized correlation between oil and gas development practices and the inducement of earthquakes, taking such a precautionary approach, here, through required stipulations are prudent and would help stem potential future impacts. At the very least, however, BLM must take a hard look at possible seismicity impacts from the proposed action.

G. The BLM must take a “hard look” at impacts to human health.

As introduced above, emissions from oil and gas development are not limited only to combustion, rather they occur throughout the chain of production – with some of the greatest emissions occurring at the point of extraction. These impacts are a consequence of various stages of oil and gas development – from the drilling and fracking of oil and gas wells, to air quality impacts and the release of hazardous emissions. The FFO must sufficiently address and analyze these impacts in its NEPA analysis.

The implementation of methane waste mitigation technologies, as discussed above, can not only help spur economic benefit, but they can also allay some of the harmful health effects that have come as a consequence of the oil and gas industry boom. Not only do these emissions impact air quality,¹¹⁸ but they also can result in significant increases in ground-level ozone, and, consequently, have a dramatic impact on human health.¹¹⁹ For example, ozone has been shown

¹¹⁶ Mark E. Mermonte, et al., USGS, *Investigation of an Earthquake Swarm Near Trinidad, Colorado, August – October 2001* (2002), available at: <http://pubs.usgs.gov/of/2002/ofr-02-0073/ofr-02-0073.html>.

¹¹⁷ *Id.*

¹¹⁸ See, e.g., Colorado Department of Public Health and Environment, *2010 Air Quality Data Report* (2010).

¹¹⁹ See, e.g., GAO Report, *Oil and Gas: Information on Shale Resources, Development, and Environmental and Public Health Risks* (Sept. 2012); GAO Report, *Unconventional Oil and Gas Development: Key Environmental and Public Health Requirements* (Sept. 2012); Earthworks, *Natural Gas Flowback: How the Texas Natural Gas Boom Affects Health and Safety* (April 2012); Green River Alliance, *Healthy Air Questionnaire Final Report: Clean Air and Healthy Communities* (2011); Lisa McKenzie, Ph.D., et. al., *Human health and risk assessment of air*

to decrease lung function – particularly in adolescents and young adults – as well as increase the risk of death from respiratory causes.¹²⁰

The EPA is currently proposing standards to reduce air pollution from oil and natural gas drilling operations. According to the EPA, the oil and gas industry is “the largest industrial source of emissions of volatile organic compounds (“VOCs”), a group of chemicals that contribute to the formation of ground-level ozone (smog).”¹²¹ Moreover, “[e]xposure to ozone is linked to a wide range of health effects, including aggravated asthma, increased emergency room visits and hospital admissions, and premature death.”¹²² In addition to VOCs, the oil and natural gas industry is also “a significant source of emission of methane,” as well as “[e]missions of air toxics such as benzene, ethylbenzene, and n-hexane,” which are “pollutants known, or suspected of causing cancer and other serious health effects.”¹²³ The EPA reports that the oil and gas industry “emits 2.2 million tons of VOCs, 130,000 tons of air toxics, and 16 million tons of greenhouse gases (methane) each year (40% of all methane emission in the U.S.). The industry is one of the largest sources of VOCs and sulfur dioxide emissions in the United States.”¹²⁴ The rapid development of high volume/horizontal drilling in conjunction with hydraulic fracturing has driven expansion of new sources resulting in increased emissions – a change that requires consideration in the BLM’s October 2016 lease sale analysis. Notably, EPA has, thus far, decided that it will not regulate methane emissions directly, suggesting an important and necessary role for BLM.

Many of the impacts to human health have already been documented in communities subject to industrial scale oil and gas development. For example, in Garfield County, Colorado,

emissions from development of unconventional natural gas resources (Feb. 2012); Lisa McKenzie, Ph.D., Testimony on: *Federal Regulation: Economic, job, and energy security implications of federal hydraulic fracturing regulation*, May 2, 2012; Earthworks, *Gas Patch Roulette: How Shale Gas Development Risks Public Health in Pennsylvania*, October 2012.

¹²⁰ See Ira B. Tager, et. al., *Chronic Exposure to Ambient Ozone and Lung Function in Young Adults*, EPIDEMIOLOGY, Vol. 16, No. 6 (Nov. 2005); Michael Jarrett, Ph.D., et. al., *Long-Term Ozone Exposure and Mortality*, THE NEW ENGLAND JOURNAL OF MEDICINE, 360: 1085-95 (2009)

¹²¹ EPA, *Oil and Natural Gas Pollution Standards: Basic Information, Emissions from the Oil & Natural Gas Industry* (2011), available at: <http://www.epa.gov/airquality/oilandgas/basic.html>; see also Cally Carswell, *Cracking the ozone code – Utah’s gas fields*, HIGH COUNTRY NEWS, Sept. 4, 2012.

¹²² See EPA, *Pollution Standards* (fn. 101).

¹²³ *Id.*

¹²⁴ Letter from American Lung Association, American Public Health Association, American Thoracic Society, Asthma and Allergy Foundation of America, and Trust for America’s Health to Lisa Jackson, Administrator, U.S. Environmental Protection Agency (Nov. 30, 2011), at 4.

residents there have experienced health effects they believe to be caused from oil and gas development. “Community concerns range from mild complaints such as dizziness, nausea, respiratory problems, and eye and skin irritation to more severe concerns including cancer.”¹²⁵ Additionally, the community has “environmental concerns related to noise, odors, dust, and ‘toxic’ chemicals in water and air.”¹²⁶ After a thorough review of ambient air data across Garfield County, ATSDR determined that, “considering both theoretical cancer risks as well as non-cancer health effects and the uncertainties associated with the available data, it is concluded that the exposures to air pollution in Garfield County pose an indeterminate public health hazard for current exposures.”¹²⁷ ATSDR further provided that “estimated theoretical cancer risks and non-cancer hazards for benzene [in the community], which is within the oil and gas development area, appear significantly higher than those in typical urban and rural area, causing some potential concern,” and later concluded that “[t]hese elevated levels are an indicator of the increased potential for health effects related to benzene exposure ... in the oil and gas development area.”¹²⁸

Unfortunately, impacts to human health are not limited only to shale gas emissions, but can result from exposure to chemicals necessary for gas extraction – namely, the hundreds of chemicals used in hydraulic fracturing.¹²⁹ Indeed, “[b]etween 2005 and 2009, the 14 oil and gas service companies [analyzed by Congress] used more than 2,500 hydraulic fracturing products containing 750 chemicals and other components. Overall, these companies used 780 million gallons of hydraulic fracturing products – not including water added at the well site – between 2005 and 2009.”¹³⁰ Chemical components include BTEX compounds – benzene, toluene, xylene, and ethylbenzene – which are hazardous air pollutants and known human carcinogens. As BLM proceeds with the October 2016 lease sale, it must consider the human health impacts associated with these extractive practices.

¹²⁵ U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (“ATSDR”), *Health Consultation: Garfield County, Public Health Implications of Ambient Air Exposures to Volatile Organic Compounds as Measured in Rural, Urban, and Oil & Gas Development Areas* (2008), at 1.

¹²⁶ *Id.*

¹²⁷ *Id.*

¹²⁸ *Id.*

¹²⁹ See Theo Colborn, et. al., *Comments to the Bureau of Land Management, Uncompahgre Field Office*, THE ENDOCRINE DISRUPTION EXCHANGE, April 20, 2012 (attached as Exhibit 106); Theo Colborn, et. al., *Natural Gas Operations from a Public Health Perspective*, HUMAN AND ECOLOGICAL RISK ASSESSMENT, 17: 1039-1056 (2011).

¹³⁰ UNITED STATES HOUSE OF REPRESENTATIVES, COMMITTEE ON ENERGY AND COMMERCE, *Chemicals Used in Hydraulic Fracturing* (April 2011).

Leading doctors and scientists studying these issues recognize the unknown risks inherent to fracking. “We don’t know the chemicals that are involved, really; we sort of generally know,” Vikas Kapil, chief medical officer at National Center for Environmental Health, part of the U.S. Centers for Disease Control and Prevention, said at a conference on hydraulic fracturing.¹³¹ “We don’t have a great handle on the toxicology of fracking chemicals.”¹³² Christopher Portier, director of the CDC’s National Center for Environmental Health and Agency for Toxic Substances and Disease Registry further provided that “additional studies should examine whether wastewater from wells can harm people or the animals and vegetables they eat.”¹³³ “We do not have enough information to say with certainty whether shale gas drilling poses a threat to public health.”¹³⁴

Indeed, a new study demonstrates that animals, especially livestock, are sensitive to the contaminants released into the environment by drilling and by its cumulative impacts.¹³⁵ Because animals often are exposed continually to air, soil, and groundwater and have more frequent reproductive cycles, animals can be used to monitor potential impacts to human health – they are shale gas drilling’s “canary in the coalmine.” The study evaluated all available fracking-related reports on sick or dying animals. Although secrecy surrounds the fracking industry, “a few ‘natural experiments’ have provided powerful evidence that fracking can harm animals.”¹³⁶ For example:

Two cases involving beef cattle farms inadvertently provided control and experimental groups. In one case, a creek into which wastewater was allegedly dumped was the source of water for 60 head, with the remaining 36 head in the herd kept in other pastures without access to the creek. Of the 60 head that were exposed to the creek water, 21 died and 16 failed to produce calves the following

¹³¹ Alex Wayne, *Fracking Moratorium Urged by U.S. Doctors Until Health Studies Conducted*, BLOOMBERG NEWS, January 9, 2012, available at: <http://www.bloomberg.com/news/2012-01-09/fracking-moratorium-urged-by-u-s-doctors-until-health-studies-conducted.html>.

¹³² *Id.*

¹³³ Alex Wayne and Katarzyna Klimasinska, *Health Effects of Fracking for Natural Gas Need Study, Says CDC Scientist*, BLOOMBERG NEWS, January 4, 2012, available at: <http://www.bloomberg.com/news/2012-01-04/health-effects-of-fracking-for-natural-gas-need-study-says-cdc-scientist.html>.

¹³⁴ *Id.*

¹³⁵ Michelle Bamberger and Robert E. Oswald, *Impacts of Gas Drilling on Human and Animal Health*, NEW SOLUTIONS, VOL. 22(1) 51-77 (2012).

¹³⁶ See Peter Montague, *Why Fracking and Other Disasters Are So Hard to Stop*, HUFFINGTON POST, Jan. 20, 2012, available at: http://www.huffingtonpost.com/peter-montague/why-fracking-and-other-di_b_1218889.html (last visited Jan. 23, 2012).

spring. Of the 36 that were not exposed, no health problems were observed, and only one cow failed to breed. At another farm, 140 head were exposed when the liner of a wastewater impoundment was allegedly slit, as reported by the farmer, and the fluid drained into the pasture and the pond used as a source of water for the cows. Of those 140 head exposed to the wastewater, approximately 70 died and there was a high incidence of stillborn and stunted calves. The remainder of the herd (60 head) was held in another pasture and did not have access to the wastewater; they showed no health or growth problems. These cases approach the design of a controlled experiment, and strongly implicate wastewater exposure in the death, failure to breed, and reduced growth rate of cattle.¹³⁷

The health problems and uncertainties that proliferate in communities where oil and gas development takes place warrants the further collection of data and research, as contemplated under NEPA, before such development can be made possible through the authorization of development through the October 2016 lease sale. NEPA requires a hard look at these impacts.

H. The BLM must take a “hard look” at impacts to water resources.

a. Groundwater Impacts

The oil and gas development authorized through FFO’s October 2016 lease sale will result in significant potential to contaminate groundwater resources in the planning area. In addition to those impacts to groundwater from hydraulic fracturing, as discussed above, such contamination may result during the following processes: (1) the state of chemical mixing due to spills, leaks, and transportation accidents; (2) during the fracking process due to well malfunctions, migration of fracking fluids or fluids from the fractured formation to aquifers, and mobilization of subsurface materials to aquifers; (3) during flowback due to releases, leakage of on-site storage, and spills from pits (caused by improper construction, maintenance, or closure); and (4) during wastewater disposal due to discharges of wastewater into groundwater, incomplete treatment, and transportation accidents.¹³⁸ Fracking chemicals and wastewater may also contaminate groundwater supplies as a result of illegal dumping.¹³⁹ As discussed above, not all chemical used in fracking have been fully disclosed, but many of those that have been disclosed or discovered are toxic, hazardous, or harmful to human health or welfare. Despite a

¹³⁷ See Bamberger at 60.

¹³⁸ See U.S. Environmental Protection Agency, *Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources* (Feb. 2011).

¹³⁹ Nicholas Kusnetz, *North Dakota’s Oil Boom Brings Damage Along with Prosperity*, PROPUBLICA, July 7, 2012, available at: <http://www.propublica.org/article/the-other-fracking-north-dakotas-oil-boom-brings-damage-along-with-prosperi#>.

general lack of adequate oversight of fracking operations, various instances of water pollution from fracking operations have been documented.¹⁴⁰

Here, in preparing its NEPA analysis of the October 2016 lease sale, BLM must address the direct, indirect, and cumulative impacts to groundwater, 40 C.F.R. § 1508.25(c), giving particular scrutiny to the potential for contamination of groundwater supplies.

b. Surface Water Impacts

i. Antidegradation

Section 303 of the Clean Water Act (“CWA”), 33 U.S.C. § 1313, requires each State to institute comprehensive standards establishing water quality goals for all intrastate waters, and requires that such standards “consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses.” 33 U.S.C. § 1313(c)(2)(A). A 1987 amendment to the CWA makes clear that section 303 also contains an “antidegradation policy” – that is, a policy requiring that state standards be sufficient to maintain existing beneficial uses of navigable waters, preventing their further degradation. 33 U.S.C. § 1313(d)(4)(B); *see also PUD No. 1 of Jefferson County v. Washington Dept. of Ecology*, 511 U.S. 700, 705 (1994). Accordingly, EPA’s regulations implementing the CWA require that state water quality standards include “a statewide antidegradation policy” to ensure that “[e]xisting instream water uses and the level of water quality necessary to protect [those] uses [are] maintained and protected.” 40 C.F.R. § 131.12(a)(1). At a minimum, state water quality standards must satisfy these conditions. The CWA also allows States to impose more stringent water quality controls. *See* 33 U.S.C. §§ 1311(b)(1)(C), 1370; *see also* 40 CFR § 131.4(a) (“As recognized by section 510 of the Clean Water Act [33 U.S.C. § 1370], States may develop water quality standards more stringent than required by this regulation”). BLM also holds independent authority to protect water quality above and beyond what the CWA may require or authorize. 43 U.S.C. §§ 1701(a)(8), 1702(c), 1732(b).

The water quality standards that Congress required the States to develop must include three elements: (1) first, each water body must be given a “designated use,” such as recreation or the protection of aquatic life; (2) second, the standards must specify for each body of water the amounts of various pollutants or pollutant parameters that may be present without impairing the designated use; and (3) third, each state must adopt an antidegradation review policy which will allow the State to assess activities that may lower the water quality of the water body. *See American Wildlands v. Browner*, 260 F.3d 1192, 1194 (10th Cir. 2001) (citing 33 U.S.C. § 1313(c)(2)(A) and 40 C.F.R. §§ 130.3, 130.10(d)(4), 131.6, 131.10, 131.11).

In its NEPA analysis, BLM must address whether the development of oil and gas resources in the FFO will affect any high quality waters or whether it will degrade any existing

¹⁴⁰ *See, e.g., id.* (reporting on lack of oversight); Western Organization of Resource Councils, *Gone for Good: Fracking and Water Loss in the West* (2013) at 17-18, 31 (noting lack of state oversight).

uses. BLM may not evade its NEPA duty to consider these impacts by asserting that other agencies may issue discharge permits. 40 C.F.R. §§ 1502.14(f), 1502.16(h). “A non-NEPA document – let alone one prepared and adopted by a state government – cannot satisfy a federal agency’s obligations under NEPA.” *South Fork Band Council of Western Shoshone of Nevada v. U.S. Department of Interior*, 588 F.3d 718, 726 (9th Cir. 2009) (citing *Klamath-Siskiyou Wildlands Center v. BLM*, 387 F.3d 989, 998 (9th Cir. 2004)) (BLM’s argument that it need not consider impacts because a facility operated under a state permit issued pursuant to the Clean Air Act is “without merit”); *Southern Or. Citizens Against Toxic Sprays, Inc. v. Clark*, 720 F.2d 1475 (9th Cir. 1983) (another agency’s consideration of environmental impacts does not relieve BLM of its duty to consider effects; “BLM must assess independently [the impacts]”); *see also Calvert Cliffs’ Coordinating Comm., Inc. v. U. S. Atomic Energy Comm’n*, 449 F.2d 1109, 1123 (D.C. Cir. 1971) (“Certification by another agency that its own environmental standards are satisfied involves an entirely different kind of judgment.”).

ii. Water Quality Standards

Pursuant to CWA section 303(d)(1), 33 U.S.C. § 1313(d)(1), each state is further required to identify those waters that do not meet water quality standards – called the “303(d)(1) list.” For impaired waters identified in the § 303(d)(1) list, the states must establish a total maximum daily load (“TMDL”) for pollutants identified by the EPA. A TMDL specifies the maximum amount of pollutant that can be discharged or loaded into the waters from all combined sources, so as to comply with the subject water quality standards.

CWA section 1323(a) requires federal agencies to comply with state and local water-quality requirements “in the same manner, and to the same extent as any nongovernmental entity.” Congress intended this section to ensure that federal agencies were required to “meet all [water pollution] control requirements as if they were private citizens.” S. REP. NO. 92-414 (1971), *as reprinted in* 1972 U.S.C.C.A.N. 3668, 3734. This provision applies to activities resulting in either “discharge or runoff of pollutants.” 33 U.S.C. § 1323(a).

Accordingly, any activity undertaken by BLM FFO in this area – including the lease of public lands for oil and gas development – may degrade potential “outstanding waters.” Not only is BLM FFO mandated to follow antidegradation and water quality standards under the CWA and state law, but it must also take a NEPA “hard look” at any impacts that may be related to these water quality standards as well.

c. Water Quantity

In addition to impacts on water quality, oil and gas development processes, and particularly fracking, may result in significant impacts on water quantity. To frack a single well one time requires 2-8 million gallons.¹⁴¹ Annually, the EPA estimates that 70-140 billion gallons of water are used to frack wells in the United States – enough to supply drinking water to 40-80

¹⁴¹ J. David Hughes, *Will Natural Gas Fuel America in the 21st Century?*, May 2011, at 23.

cities of 50,000.¹⁴² This massive use of water is of particular concern in states in the interior west, like New Mexico, where water supplies are scarce and already stretched.¹⁴³ Indeed, as the Department of Energy has recognized, “[a]vailable surface water supplies have not increased in 20 years, and groundwater tables and supplies are dropping at an alarming rate.”¹⁴⁴ Because of the chemicals that are added to fracking water, the water may not be reused.¹⁴⁵ Removing water for fracking can stress existing water supplies by lower water tables and dewatering aquifers, decreasing stream flows, and reducing water in surface reservoirs.¹⁴⁶ This can result in changes to water quality, and it can also alter the hydrology of water systems, and it can increase concentrations of pollutants in the water.

There is also potential for the reductions in water quantity to impacts aquatic and riverine species and habitat by affecting water flows and natural river processes: this, in turn, could lead to fish declines, changes to riparian plant communities, and alterations to sediment.¹⁴⁷ Further, because water resources in New Mexico are in many locations stressed or over-allocated, and oil and gas development has already lead to unpermitted and illegal water withdrawals.¹⁴⁸

Here, in its NEPA analysis BLM must closely assess the direct, indirect, and cumulative impacts of lease development on water supplies. 40 C.F.R. §§ 1508.7, 1508.8. This analysis must consider the potential sources of water in the FFO that would be used for oil and gas development, and the impacts of these water withdrawals on water availability for drinking, agriculture, and wildlife. The analysis must further address the impacts to water quantity at different annual, seasonal, monthly, and daily time scales because the impacts of such water withdrawals could be more acute during times, months, and seasons of scarcity. For example, increased withdrawal and irretrievable contamination of waters will be particularly harmful during times – like the present – when much of the state is experiencing drought conditions.¹⁴⁹

IV. The BLM Must Sufficiently Analyze All Reasonable Alternatives.

¹⁴² See EPA Draft Plan at 20.

¹⁴³ See WORC, *Gone for Good*, at 7-8 (noting water scarcity in west and significant water demands of fracking).

¹⁴⁴ U.S. Dep’t of Energy, *Energy Demands on Water Resources: Report to Congress on the Interdependency of Energy and Water*, Dec. 2012, at 12.

¹⁴⁵ See EPA Draft Plan at 20.

¹⁴⁶ *Id.*

¹⁴⁷ Nat’l Parks Conservation Ass’n, *National Parks and Hydraulic Fracturing: Balancing Energy Needs, Nature, and America’s National Heritage* (2013) at 23.

¹⁴⁸ See WORC, *Gone for Good* at 21.

¹⁴⁹ See WORC, *Gone for Good* at 8.

Through the October 2016 lease sale NEPA process, the FFO required to “estimate and display the physical, biological, economic, and social effects of implementing each alternative considered in detail. The estimation of effects shall be guided by the planning criteria and procedures implementing [NEPA].” 43 C.F.R. § 1610.4-6. Incumbent to any NEPA process is a robust analysis of alternatives to the proposed action. Consideration of reasonable alternatives is necessary to ensure that the agency has before it and takes into account all possible approaches to, and potential environmental impacts of, a particular project. NEPA’s alternatives requirement, therefore, ensures that the “most intelligent, optimally beneficial decision will ultimately be made.” *Calvert Cliffs’ Coordinating Comm., Inc. v. U.S. Atomic Energy Comm’n*, 449 F.2d 1109, 1114 (D.C. Cir. 1971).

“[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). Thus, agencies must “ensure that the statement contains sufficient discussion of the relevant issues and opposing viewpoints to enable the decisionmaker to take a ‘hard look’ at environmental factors, and to make a reasoned decision.” *Izaak Walton League of America v. Marsh*, 655 F.2d 346, 371 (D.C. Cir.1981) (citing *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n. 21 (1976)).

Of critical importance is that the agency considers an alternative that properly balances the permanent protection of certain critical areas from the pressures of oil and gas development by industry proponents.

The FFO is uniquely empowered to make this determination and, as codified in BLM’s organic act, the Federal Land and Policy Management Act (“FLPMA”) of 1976, 43 U.S.C. § 1701 *et. seq.*, taking such action is part of its mandate. FLPMA’s congressional declaration states:

It is the policy of the United States that ... the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use;

43 U.S.C. § 1701(a)(8) (emphasis added).

Indeed, BLM is duty bound to develop and revise land use plans according to this congressional mandate, so as to “observe the principles of multiple use.” 43 U.S.C. § 1712(c)(1). “Multiple use” means “a combination of balanced and diverse resource uses

that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values.” *Id.* at § 1702(c).

The oil and gas leasing process, undertaken pursuant to FLPMA, requires BLM to engage in the type of planning that is intended to give context to the agency’s multiple use mandate. Accordingly, FLPMA provides specific criteria for land use plan revisions, requiring consideration of things such as: observation of the principles of multiple use and sustained yield; integrated consideration of physical, biological, economic, and other sciences; reliance on public lands resources and other values; consideration of present and future uses of the public lands; consideration of the relative scarcity of resource values; and weighing the long-term benefits to the public against the short-term benefits. *See* 43 U.S.C. § 1712(c)(1)-(9). Consideration of these criteria must drive the agency’s NEPA analysis.

FLPMA does not mandate that every use be accommodated on every piece of land; rather, delicate balancing is required. *See Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 58 (2004). “‘Multiple use’ requires management of the public lands and their numerous natural resources so that they can be used for economic, recreational, and scientific purposes without the infliction of permanent damage.” *Public Lands Council v. Babbitt*, 167 F.3d 1287, 1290 (10th Cir. 1999) (citing 43 U.S.C. § 1702 (c)). As held by the Tenth Circuit, “[i]f all the competing demands reflected in FLPMA were focused on one particular piece of public land, in many instances only one set of demands could be satisfied. A parcel of land cannot both be preserved in its natural character and mined.” *Rocky Mtn. Oil & Gas Ass’n v. Watt*, 696 F.2d 734, 738 n. 4 (10th Cir.1982) (quoting *Utah v. Andrus*, 486 F.Supp. 995, 1003 (D.Utah 1979)); *see also* 43 U.S.C. § 1701(a)(8) (stating, as a goal of FLPMA, the necessity to “preserve and protect certain public lands in their natural condition”); *Pub. Lands Council*, 167 F.3d at 1299 (citing § 1701(a)(8)). As further provided by the Tenth Circuit:

BLM’s obligation to manage for multiple use does not mean that development *must* be allowed on [a particular piece of public lands]. 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. Thus, an alternative that closes the [proposed public lands] to development does not necessarily violate the principle of multiple use, and the multiple use provision of FLPMA is not a sufficient reason to exclude more protective alternatives from consideration.

New Mexico ex rel. Richardson, 565 F.3d at 710.

This type of analysis has been absent from the FFO’s analysis of oil and gas leasing and development, which failed to consider, on equal footing, the value of permanent protection and preservation of public lands, along with industry pressure to lease and develop these lands for oil and gas resources. Given current industry pressure to open critical public lands to oil and gas development, it may be appropriate to revisit this decisionmaking in light of the new information and circumstances that BLM is now aware of. *See* 40 C.F.R. § 1502.9 (c).

While certain lands may indeed be appropriate for responsible fossil fuel resource development, it is equally evident that there are lands where other resource values should prevail. FLPMA affords BLM great authority to appropriately balance these competing interests, which expressly includes the responsibility to “preserve and protect certain public lands in their natural condition.” 43 U.S.C. § 1701(a)(8). Moreover, FLPMA further delegates BLM authority to permanently withdraw lands from consideration. *See* 43 U.S.C. § 1714. This ability authorizes the Secretary to “make, modify, extend, or revoke withdrawals.” *Id.* In either event, the FFO cannot management public lands in a manner that prioritizes oil and gas development above the other resource values at stake.

V. FLPMA: Unnecessary and Undue Degradation

Pursuant to the Federal Land Policy and Management Act (“FLPMA”), 43 U.S.C. § 1701 *et seq.*, “[i]n managing the public lands,” the agencies “shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands.” 43 U.S.C. § 1732(b). Written in the disjunctive, BLM must prevent degradation that is “unnecessary” and degradation that is “undue.” *Mineral Policy Ctr. v. Norton*, 292 F.Supp.2d 30, 41-43 (D. D.C. 2003). This protective mandate applies to agencies planning and management decisions, and should be considered in light of its overarching mandate that the FFO employ “principles of multiple use and sustained yield.” 43 U.S.C. § 1732(a); *see also, Utah Shared Access Alliance v. Carpenter*, 463 F.3d 1125, 1136 (10th Cir. 2006) (finding that BLM’s authority to prevent degradation is not limited to the RMP planning process). While these obligations are distinct, they are interrelated and highly correlated. The Bureau must balance multiple uses in its management of public lands, including “recreation, range, timber, minerals, watershed, wildlife and fish, and [uses serving] natural scenic, scientific and historical values.” 43 U.S.C. § 1702(c). It must also plan for sustained yield – “control [of] depleting uses over time, so as to ensure a high level of valuable uses in the future.” *Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 58, 124 S.Ct. 2373, 159 L.Ed.2d 137 (2004).

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

Here, that action is the oil and gas development authorized by the FFO through the October 2016 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 the proposed action permits. See *Theodore Roosevelt Conservation Partnership*, 661 F.3d at 76. For example, methane waste and pollution may cause “undue” degradation, even if the activity causing the degradation is “necessary.” Where methane waste and 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 FFO 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 at 645 (quoting *Kendall's Concerned Area Residents*, 129 I.B.L.A. 130, 140 (1994)). In the instant case, BLM must specifically account for UUD in its NEPA analysis for the October 2016 lease sale, which is distinct from its compliance under NEPA, and is also actionable on procedural grounds.

VI. Conclusion

The Citizen Groups appreciate your consideration of the information and concerns addressed herein, as well as the information included in the attached exhibits. This information is critical and must be reflected in the agency’s analysis of the October 2016 lease sale.

Should you have any questions, please do not hesitate to contact me.

Sincerely,



Kyle Tisdel
WESTERN ENVIRONMENTAL LAW CENTER
208 Paseo del Pueblo Sur, Unit 602
Taos, New Mexico 87571
575.613.8050
tisdel@westernlaw.org

Along with:

Mike Eisenfeld
SAN JUAN CITIZENS ALLIANCE
PO Box 6655
Farmington, NM 87499

meisenfeld@frontier.net

Lori Goodman
DINÉ CITIZENS AGAINST RUINING OUR ENVIRONMENT
10A Town Plaza PMB #138
Durango, CO 81301
lgoodman89@gmail.com

Tim Ream
WILDEARTH GUARDIANS
1536 Wynkoop St., Ste. 301
Denver, CO 80202
jnichols@wildearthguardians.org

Amy Mall
NATURAL RESOURCES DEFENSE COUNCIL
1152 15th Street, N.W., Suite 300
Washington, D.C. 20005
amall@nrdc.org

Rachel Conn
AMIGOS BRAVOS
PO Box 238
Taos, NM 87571
rconn@amigosbravos.org

Anson Wight
CHACO ALLIANCE
4990 SW Hewett Blvd. Portland, OR 97221
ansonw@comcast.net

Pete Dronkers
EARTHWORKS
PO Box 1102
Durango, CO 81032
pdronkers@earthworksaction.org

Eric E. Huber
SIERRA CLUB ENVIRONMENTAL LAW PROGRAM
1650 38th St. Ste. 102W
Boulder, CO 80301
eric.huber@sierraclub.org