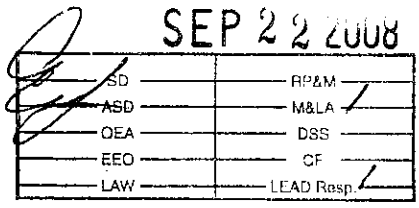
BIODIVERSITY CONSERVATION ALLIANCE, CLARK RESOURCE COUNCIL, WESTERN WATERSHEDS PROJECT, WYOMING OUTDOOR COUNCIL, WYOMING WILDERNESS ASSOCIATION

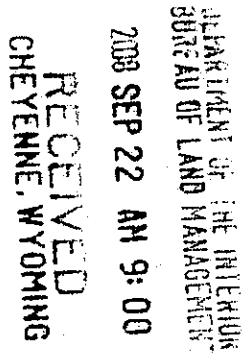
September 18, 2008

VIA: U.S. MAIL with return receipt requested, and FACSIMILE at 307-775-6203

Robert Bennett, State Director
Bureau of Land Management
5353 Yellowstone Road
Cheyenne, WY 82003

Rick Cables, Regional Forester
U.S. Forest Service
U.S. Department of Agriculture
740 Simms Street
Golden, CO 80401





RE: PROTEST OF CERTAIN PARCELS TO BE OFFERED AT BLM'S October 2008 COMPETITIVE OIL & GAS LEASE SALE

Dear Mr. Bennett and Mr. Cables:

In accordance with 43 CFR §§ 4.450-2 and 3120.1-3, Biodiversity Conservation Alliance, Clark Resource Council, Western Watersheds Project, Wyoming Outdoor Council, and Wyoming Wilderness Association (Parties) protest certain parcels being offered at the Bureau of Land Management's (BLM) October 2008, competitive oil and gas lease sale.

The Parties hereby protest the entire October 2008 lease sale for the State of Wyoming. Based on BLM's Notice of Competitive Oil and Gas Lease Sale, there are 246 land parcels up for lease in the State of Wyoming. This protest is submitted to the U.S. Forest Service because some of the lease parcels implicate Forest Service lands. For these lands, the Forest Service should ensure that oil and gas leasing fully accounts for the concerns, claims, and recommendations identified and discussed herein.

This protest is based on seven concerns. These concerns are: (A) parcels being offered in or adjacent to Wilderness Study Areas and Citizens Wilderness Proposal Areas (CWPs); (B) many parcels being offered in known big game crucial winter ranges and parturition areas, in violation of the policies of the State of Wyoming; (C) parcels being offered in areas with active RMP revisions, in violation of IM 2004-110 Change 1; (D) parcels being offered in and/or adjacent to big game migration routes; (E) protections for greater sage-grouse; and (F) parcels

being offered adjacent to historic trails; and (G) BLM's failure to address global warming and climate change.

This Protest incorporates by reference all Exhibits provided to BLM with the protest of the October 2008 lease sale by Biodiversity Conservation Alliance et al. As BLM is already in possession of these documents, we have not attached them hereto.

I. THE PARTIES

Biodiversity Conservation Alliance (BCA) is a non-profit conservation group with hundreds of members in Wyoming and other states. BCA is dedicated to protecting Wyoming's wildlife and wild places, particularly on public lands. BCA's members live in all of the Field Office areas where lease parcels would be offered in the August 2006 lease sale. Members of BCA utilize land and water resources within and near these areas for hiking, fishing, camping, recreational, scientific study, photography, and aesthetic uses. BCA and its members are actively involved in BLM oil and gas activities in this region and participate in all National Environmental Policy Act (NEPA) stages of BLM oil and gas projects by submitting comments and attending public meetings. BCA has a long record of advocating for environmentally sound oil and gas development in Wyoming and throughout the West. As a consequence, BCA and its members would be adversely affected by the sale of the lease parcels being protested here and they have an interest in this matter.

The Clark Resource Council is dedicated to preserving the natural splendor, wildlife, recreational opportunities and quality of life on the Eastern Front of the Beartooth Mountains in the Bighorn Basin in the vicinity of Cody. Consequently, the Clark Resource Council and its members would be adversely affected by the sale of certain lease parcels that are protested in this Protest, on the various grounds below.

Wyoming Outdoor Council (WOC) is a non-profit conservation organization with over 1,000 members in Wyoming, other states and abroad. WOC is dedicated to the protection and enhancement of Wyoming's environment, communities and quality of life. WOC's members live in all of the Field Office areas where lease parcels would be offered in the April 2006 lease sale. WOC members utilize land and water resources within and near these areas for hiking, fishing, camping, recreational and aesthetic uses. WOC is actively involved in BLM oil and gas activities in this region and participates in all NEPA stages of BLM oil and gas projects by involving its staff and members in submitting comments and attending public meetings. WOC's long-standing commitment to environmentally sound oil and gas leasing and development throughout Wyoming stems over 15 years. Consequently, WOC and its members would be adversely affected by the sale of the lease parcels at issue in this protest and have an interest in this matter.

II. THE ISSUES

AT RISK: WILDLIFE, OPEN SPACES, AND CLEAN AIR AND WATER

Oil and gas activities on the public lands at issue herein are quickly escalating. BLM is approving record numbers of large oil and gas development projects in Wyoming. The lands at issue here are mostly federal lands managed by BLM. Many of these lands provide critical habitat for a number of species, ranging from sage grouse, to mule deer, to severely imperiled species, such as fish species in the Green/Colorado River Basin and Platte River Basin, and sage grouse on the sagebrush country. Many of the BLM lands at issue serve as quiet, serene places of natural beauty and solitude, and as such, they provide excellent recreational opportunities for hiking, birding, wildlife viewing, hunting, fishing, backpacking, and enjoyment of open spaces.

Explosive oil and gas development on these lands threatens all of the above resources, for which BLM has a mandatory duty to protect for "multiple use." Oil and gas development has and will lead to fragmented habitat and surface disturbances through well pad construction, oil and gas well rigs, increased vehicular traffic, miles of roads, pipelines and power lines, and noise from generators and compressor stations. All of these associated activities serve to disrupt habitat, destroy nesting and brooding grounds, and disturb wildlife. These activities can significantly impact elk, mule deer, pronghorn antelope, and sage grouse, as well as many other species that live there. Many of these lands serve as crucial winter range and parturition areas for elk, pronghorn antelope and mule deer, as well as critical breeding and nesting habitat near sage grouse leks. Many rare species find some of their last secure refuges on these lands.

In addition, many of these lands have been used by ranchers and farmers for generations, yet BLM would allow mineral development without having taken steps to fully protect the rights and interests of surface owners. While policy such as BLM IM 2003-131 provides instruction on how protections for surface owners are to be afforded ***after*** a lease is granted, there is nothing which would prevent BLM from ensuring even greater protection of surface owner interests ***before*** leasing. That has not even been considered here. Consequently, Wyoming's rural heritage and lifestyle are threatened by the sale of the lease parcels protested here.

The parties realize, of course, that a lease itself does not necessarily create immediate disturbances, but as BLM well knows, if a lease is not subject to a "No Surface Occupancy" stipulation, the lessee receives contractually-enforceable surface use rights. 43 C.F.R. § 3101.1-2. In other words, once a lease a sold, the cat is out of the bag, putting sensitive resources which have yet to be properly considered through site-specific NEPA analysis at risk of significant and potentially unacceptable harm. Because it represents an irretrievable and irreversible commitment of resources, the leasing stage is extremely critical. We are deeply concerned that the BLM has exploited the leasing stage by disparaging it as little more than a paper transaction when, in reality, it is an important, legally consequential event that commits lands to a particular use. Deferring site-specific analysis to the drilling stage presents only the illusion of proper process because, unless a lease is subject to an NSO stipulation, BLM has already surrendered surface use rights and thus BLM's ability to protect lands and resources is hamstrung. Given this level of importance, and particularly due to the many legal violations that will occur on the date of the sale of the parcels protested here, the Parties are filing this Protest.

A. THE PARCELS IN OR ADJACENT TO CITIZENS WILDERNESS PROPOSAL AREAS AND BLM WILDERNESS STUDY AREAS CANNOT BE OFFERED FOR SALE BECAUSE TO DO SO WOULD VIOLATE NEPA AND BLM INSTRUCTION MEMORANDUM NO. 2004-110 CHANGE 1

The parties protest parcels located in and adjacent to Wilderness Study Areas and Citizen Wilderness Proposal areas. In January 2004, Wyoming Wilderness Association submitted the list of Citizen Wilderness Proposals in the state to the Wyoming state office of the BLM. BLM has chosen to offer for sale a number of parcels that are in or adjacent to these Citizens Wilderness Proposal areas and/or adjacent to BLM Wilderness Study Areas. The following parcels are located within or adjacent to CWPs and/or adjacent to BLM WSAs: WY 0810- 205, 204, 206, 202, 203, 195, 189, 145, 146, 164, 183, and 184.

These parcels will hereinafter be referred to as the Special Values Parcels. Because all of these parcels lie in or very near Citizens Proposed Wilderness areas or BLM Wilderness Study Areas they clearly have special values, such a wildness and remoteness characteristics and the ecological services typical of such areas (such as greater biological diversity and better water quality), even if BLM does not recommend them for wilderness designation. The fact that BLM did not recommend CWP areas for wilderness designation does not change these special and unique wilderness values. We are certain BLM is well aware of these special values, as well as the WSA areas it has recommended for wilderness designation.

The Lysite Badlands encompass vast swaths of undisturbed sagebrush falling away into a spectacular maze of wild and rugged badlands. Rare and sensitive species such as Porter's sagebrush, golden eagles, ferruginous hawks, and burrowing owls make their homes here. This area provides the visitor with a unique opportunity to experience the wild, wide-open spaces of Wyoming's high desert plateau, most of which has been destroyed by development in neighboring areas.

The Copper Mountain area has proposed leases as cataloged above, this area is a citizen proposed wilderness and wilderness study area, a designation that excludes the authorization for mineral lease extraction.

The Kinney Rim is an area that is designated as a citizen proposed wilderness. This area contains crucial habitat for mule deer and elk.

The Springer/Bump Sullivan Wildlife Habitat Management Area is located in the Torrington area lease parcel. The area is home to one of the most important waterfowl and upland game bird sanctuaries in the state. Bald eagles have been found to inhabit the area. (Wyoming Fish and Game, 2008)

The proposal of wilderness-quality lands has not been analyzed thoroughly. Leasing these parcels without No Surface Occupancy (NSO) stipulations could irretrievably destroy the wilderness character of these areas. Therefore, BLM will violate NEPA if these lands are leased in this sale. Before leasing these parcels, BLM must analyze impacts to visitors' experiences, recreation values, and scenic values. *See e.g., Pennaco Energy, Inc. v. Department of the*

Interior, 377 F.3d 1147 (10th Cir. 2004). The regulations implementing NEPA provide that federal agencies shall, to the fullest extent possible, "[u]se the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment." 40 C.F.R. § 1500.2(e). Such alternatives should include reasonable alternatives to a proposed action that will accomplish the intended purpose, are technically and economically feasible, and yet have a lesser impact. *Id.*; *Headwaters, Inc. v. BLM,* 914 F.2d 1174, 1180-81 (9th Cir. 1990); *City of Aurora v. Hunt*, 749 F. 2d 1457, 1466-67 (10th Cir. 1984). The purpose of NEPA's alternatives requirement is to ensure agencies do not undertake projects "without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means." *Envnt'l Defense Fund, Inc. v. U.S. Army Corps of Eng'rs*, 492 F.2d 1123, 1135 (5th Cir. 1974); *see also Or. Envtl. Council v. Kunzman*, 614 F.Supp. 657, 660 (D. Or. 1985) (stating that the alternatives that must be considered under NEPA are those that would "avoid or minimize" adverse environmental effects).

The Lander RMP was adopted substantially before submission of the Lysite Badlands CWP proposal. These RMPs are quite old and the NEPA analysis that was conducted is even older than the plans. These plans were approved ***before*** oil and natural gas of the current scale and impact was on the BLM's radar screen. While there has been light oil and gas development in Wyoming for decades, today's pace of leasing and drilling wasn't foreseen, indeed, couldn't have even been contemplated, at the time these management plans were developed. It is undeniable that BLM has been under intense pressure to lease every acre of public land which has any potential for future oil and gas development.

In its initial inventorying of the CWP proposed lands in the 1970s under the Wilderness Act of 1964, BLM determined that they did not possess wilderness qualities. Since that time, new information has been provided to BLM regarding these proposed wilderness areas. In approximately 1992 the Sierra Club submitted a citizens' wilderness proposal to BLM which included the Lysite Badlands. In 2004 a more comprehensive citizens' proposal for wilderness areas was submitted to BLM by the Wyoming Wilderness Association. To the best of our information and belief, BLM has not reassessed these areas for their wilderness qualities since receiving the Wyoming Wilderness Association submission. Many years have passed since the initial assessment and inventory by BLM in the 1970s.

As part of its preparations of lease parcels for sale, BLM field offices complete Determination of NEPA Adequacy (DNA) documents for all the parcels in that field office. DNAs are not NEPA documents, but merely an administrative convenience. They are used by field offices solely to "determine whether BLM can properly rely on existing NEPA documents" in the issuance of leases for sale. *Southern Utah Wilderness Alliance v. Norton*, 457 F. Supp. 2d 1253 (2006), 1256.

Under the Federal Land Policy and Management Act (FLPMA) BLM was required to inventory all roadless areas on public lands over 5000 acres under its jurisdiction and to identify lands which have wilderness characteristics as described in the Wilderness Act of 1964. 43 U.S.C. § 1782(a). In addition, under 43 U.S.C. 1711(a), BLM is required to maintain an inventory of all public lands and their resource and other values, which is to be kept current so as

to reflect changes in conditions and to identify new and emerging resource and other values. BLM has failed to comply with the mandates of 43 U.S.C. 1711(a), in that it has failed to re-evaluate the wilderness characteristics of the Bobcat Draw Badlands and Lysite Badlands CWP areas. This failure is in spite of the receipt by BLM of information from citizen wilderness proposals indicating that these areas do indeed have the wilderness characteristics defined by the Wilderness Act and should be identified by BLM as Wilderness Study Areas (WSAs).

BLM has failed to fulfill its responsibilities under FLPMA to perform a continuing inventory and to identify and include additional WSAs. BLM's failure to maintain current inventories will result in unnecessary or undue degradation of the public lands in the Lysite Badlands and Bobcat Draw Badlands.

What is equally important for consideration, however, is that as a result of BLM's failure to maintain current inventories the agency does not have current and accurate information about the wilderness qualities of these parcels, and thus BLM cannot make a determination that the prior NEPA analysis is adequate. Making this determination without current and accurate information is arbitrary and capricious. *See The Wilderness Society v. Wisely*, U.S. District Court for the District of Colorado, Civil Action No. 06-cv-00296-MSK-MEH, Opinion and Order Vacating, in Part, Agency Action, August 6, 2007; *Oregon Natural Desert Association v. Rasmussen*, U.S. District Court for the District of Oregon, CV 05-1616-AS unpublished Findings and Recommendation of the Magistrate Judge, issued April 20, 2006; approved and adopted by the U.S. District Court by Order entered September 6, 2006.

Allowing oil and gas development on these parcels may preclude the proposed wilderness areas from ever again possessing the wilderness characteristics necessary under the Wilderness Act. It is imperative that these parcels be withdrawn from the lease sale until such time as BLM has met its legal obligation under FLPMA to re-inventory and re-evaluate these lands for potential inclusion as Wilderness Study Areas. At the very least, BLM should consider a "no action" alternative before selling these leases. At the lease stage, the "no action" alternative is, of course, the option of not selling the lease. 42 U.S.C. § 4332(2)(E); 40 C.F.R. § 1502.14(d). Alternatively, BLM should consider an alternative whereby BLM subjects these lease parcels to NSO stipulations. In both situations, BLM would preserve its ability to preclude surface use of these parcels and thereby preserve its ability to properly account for wilderness values through site-specific NEPA analysis.

IM 2004-110 Change 1 requires BLM to "evaluate the application of BMPs when taking leasing actions." (See also WO IM 2004-194.) The Documentation of Land Use Plan Conformance and NEPA Adequacy (DNA) prepared by the Field Offices where these parcels are located give no indication there was any evaluation of applying BMPs to the CWP and WSA parcels in order to protect their values. Because neither the DNAs nor the underlying Resource Management Plans (RMPs) evaluated the application of BMPs to these parcels, IM 2004-110 Change 1 (Change IM) was violated. No evaluation of the potential application of BMPs has occurred prior to offering the parcels for sale.

The leases at issue here contain a number of stipulations intended to protect resources. Many of them are timing limitation stipulations intended to protect big game, sage grouse, or

raptors. While these stipulations may help protect these specific resources temporarily, they do not prohibit development; as IM 2004-110 Change 1 recognizes, "[O]ften BMPs, applied as either stipulations or conditions of approval, are more effective in mitigating impacts to wildlife resources than stipulations such as timing limitations or seasonal closures." Thus, the existing stipulations attached to these parcels are not enough, standing alone, to meet the requirements of the Change IM. ***BMPs*** must also be ***evaluated*** before leases are offered for sale, and there is no indication this occurred for these parcels. Without identifying and evaluating the efficacy of BMPs before leases are offered for sale, BLM has no idea whether BMPs would be able to mitigate impacts within acceptable limits. *See e.g.*, 43 U.S.C. § 1732(b) (requiring BLM to prevent unnecessary or undue degradation.).

There is no indication BLM identified or evaluated the BMPs referenced in IM 2004-194 in the context of the site-specific conditions and circumstances presented by the delineated lease parcels being offered for sale. BLM did not even evaluate the application of BMPs that should be "considered in nearly all circumstances," such as requirements for camouflage painting and construction of roads to a standard "no higher than necessary." Certainly such BMPs can be identified, evaluated, and required, as effectively at the leasing stage as the application for permit to drill (APD) stage. Indeed, a front-end analysis of BMPs provides a measure of certainty for the lessee and, most importantly, may reveal that BMPs, alone, may be inadequate to mitigate impacts within acceptable limits, thus indicating the need for more robust lease stipulations. Moreover, it may behoove BLM to require the BMPs as a lease stipulation rather than as a condition of approval. Additionally, front-end evaluation of BMPs may indicate that BLM may be unable to mitigate impacts within acceptable limits and, therefore, the lease should either be subject to an NSO stipulation or withdrawn from sale (i.e., through selection of a "no action" alternative).

There is no doubt that IM 2004-110 Change 1 is intended to apply to leasing. The IM specifically applies to fluid minerals ***leasing*** actions. It is not the intent of the Change IM with respect to BMP evaluation, that it be applied at the APD stage. That had already been very specifically accomplished with IM 2004-194 issued on June 22, 2004. The Change IM was issued on August 16, 2004, ***after*** IM 2004-194, to fill in gaps in the ***leasing*** program guidance provided by IM 2004-110. Thus, while BLM may further consider and refine BMPs at the APD stage, it nevertheless ***must*** evaluate their application at the leasing stage. There is no indication in the Documentations this was done for any of the parcels listed in the table above, despite the clear language in the Change IM that BLM "shall also evaluate the application of BMPs" at the leasing stage.

Additionally, there is no question that BLM has ongoing authority and responsibility to consider the wilderness values of an area, especially where an area has been proposed for wilderness consideration by private citizens. IM 2003-275 recognizes this authority and that citizen wilderness proposal areas may contain a number of values that are not protected by the above stipulations, such as providing solitude and preserving areas that do not have significant signs of human use or development. The stipulations which would be applied to these parcels do not protect these kinds of values which clearly exist in the CWP parcels. BLM's failure to evaluate BMPs as a way to protect these values violated IM 2004-110 Change 1 and IM 2003-275.

BLM has the ongoing authority and responsibility to consider the wilderness values of an area before it authorizes the sale of leases which intrude upon Citizen Wilderness Proposal areas. The U.S. District Court for the District of Utah recently underscored this duty with its decision in *Southern Utah Wilderness Alliance v. Norton*, Case No. 2:04CV574 DAK. The Court held that BLM violated NEPA by issuing leases in areas proposed for wilderness without taking a hard look at the no-leasing alternative and by failing to consider significant new information about wilderness values and characteristics of the parcels. The Worland and Lander Field Offices have failed to take the hard look at a no-leasing alternative for these 13 parcels and have failed to give adequate consideration to the wilderness values and characteristics of the parcels. The parcels should be withdrawn from the sale.

B. THE CRUCIAL WINTER RANGE PARCELS and PARTURITION AREAS PARCELS VIOLATE FLPMA AND STATE POLICIES

The parties protest the sale of parcels located in big game crucial winter range and parturition areas. Parcels WY-0810- 186, 187, 189, 164, 147, 184, 183, 185, 164, 165, 171, 172, 173, 079, 147, 151, 178, 087, 066, 211, 212, 245, 246, 239, 240, 237, 235, 217, 218, 215, 216, 233, 234, 232, 031, 169, 176, and 177 are located in big game crucial winter ranges and/or big game parturition areas. We protest the sale of these lease parcels for these reasons. These parcels are critical for the survival of these species in this area, and recent scientific studies show that populations of big game are declining sharply and the current lease stipulations are not adequate to protect big game species.

BCA was a party to an appeal filed with the Interior Board of Land Appeals of the BLM's denial of their Protest filed against the June 6, 2006 lease sale. In its April 2008 Decision,[1] the Board inquired into whether BLM had complied with the Memorandum of Understanding between BLM and the Wyoming Game and Fish Department in regarding lease parcels in big game crucial winter range and parturition areas. The BLM is required to have a rational basis for its decision to issue leases in crucial wildlife habitat, and that basis must be supported by the agency's compliance with applicable laws. While the Board held that failure of BLM to follow the directives contained in Instruction Memorandum No 2004-110 Change 1 was not, standing alone, proof of the violation of law or discretionary policy, it was probative of whether BLM had a rational basis for its decision. The Board found that the appeal record presented no evidence of compliance with the Memorandum of Understanding.

The Parties protest the lease parcels listed above because BLM has again failed to comply with the Memorandum of Understanding and therefore has not provided a rational basis for its decision to offer lease parcels in areas with big game crucial winter range and parturition areas. Until such time as BLM complies with the Memorandum of Understanding it has no rational basis for its decision and the decision is arbitrary and capricious. We request that the parcels be withdrawn from the October 2008 lease sale.

While the Parties strongly protest the offering of any of these lease parcels for sale, at the minimum, all such parcels in big game crucial winter range and parturition areas should have No

[1] IBLA 2007-136 (174 IBLA 174), decided April 4, 2008.

Surface Occupancy (NSO) stipulations applied to them. NSOs provide the only real protection for big game. Recent studies on the impacts of oil and gas development and production on big game in Wyoming show that the impacts have been huge.[2] Not only have impacts to big game been significant, but they have occurred in spite of the application of winter timing limitations, demonstrating that these stipulations alone do not provide adequate protections for big game.

A further noteworthy factor is that timing limitations apply only during oil and gas development, not during the production phase. Once production begins, there are no stipulations in place for the protection of big game. It is therefore imperative that stipulations adequate to protect big game be applied at the ***leasing*** stage, not the APD stage. *See Center for Native Ecosystems,* IBLA 2003-352, November 22, 2006.

Attached to some of the parcels listed above is a timing limitation stipulation prohibiting drilling between November 15 and April 30 for "protecting big game crucial winter ranges." Also attached to some of the parcels is a timing limitation stipulation prohibiting drilling between May 1 and August 5 for "protecting big game during parturition." These are, however, not total prohibitions on drilling during the stressful winter period and birthing time. Exceptions to the stipulations are regularly—almost automatically—granted anytime a lessee requests it. See, for example, http://www.wy.blm.gov/pfo/wildlife/exceptions.php (Pinedale Field Office winter range stipulation exceptions) which shows that ***123*** exceptions were granted for the winter of 2006-2007. Similar statistics are available for other Wyoming Field Offices. The enthusiasm with which the Pinedale FO has granted ***winter-long*** exceptions to the stipulation for drilling on crucial winter range further illustrates the totally discretionary nature and consequent ineffectiveness of this stipulation.

Just as important, these stipulations do not limit operational and production aspects of oil and gas development. *See,* for example, Jack Morrow Hills CAP EIS at A5-3. Obviously, if the stipulation does not reserve authority to BLM at the ***leasing stage***, BLM must allow development despite severe impacts to winter ranges and big game, except for being able to require very limited "reasonable measures." These reasonable measures cannot be nearly broad enough to ensure crucial winter ranges and parturition areas are protected at the operation ***and*** production stage. *See* 43 CFR 3101.1-2.

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[2] Berger, J., K. Murray Berger and J. Beckmann. 2006. Wildlife and Energy Development: Pronghorn of the Upper Green River Basin – Year 1 Summary. Wildlife Conservation Society, Bronx, NY. Berger, K., J. Beckmann, J. Berger. 2006. Wildlife and Energy Development: Pronghorn of the Upper Green River Basin – Year 2 Summary. Wildlife Conservation Society, Bronx, NY. These reports are attached to the BCA June 2008 Lease Protest as Exhibits 17 and 18.

Sawyer, H., R. Neilson, D. Strickland and L. McDonald. Oct. 2005. Sublette Mule Deer Study (Phase II): 2005 Annual Report. Sawyer, H., R. Neilson, D. Strickland and L. McDonald. 2006. Sublette Mule Deer Study (Phase II): 2006 Annual Report. Sawyer, H., R. Neilson, F. Lindzey and L. McDonald. Winter Habitat Selection of Mule Deer Before and During Development of a Natural Gas Field. Copies of these reports are attached to the BCA June 2008 Lease Protest as Exhibits 19, 20 and 21.

Powell, J.H. 2003. Distribution, habitat use patterns, and elk response to human disturbance in the Jack Morrow Hills, Wyoming. MS Thesis, Univ. of Wyoming, 52 pp. A copy of this study is attached to the BCA June 2008 Lease Protest as Exhibit 22.

Sawyer, H., and R. Nielson. 2005. Seasonal distribution and habitat use patterns of elk in the Jack Morrow Hills Planning Area, Wyoming. Cheyenne: WEST, Inc., 28 pp. A copy of this report is attached to the BCA June 2008 Lease Protest as Exhibit 23.

The Wyoming Game and Fish Commission (WG&F) has a formal policy relative to disturbance of crucial habitats, including crucial winter ranges.[3] Crucial habitat is habitat "which is the determining factor in a population's ability to maintain and reproduce itself . . . over the long term." *Id.* at 7. WG&F further describes big game crucial winter ranges as vital habitats. Vital habitats are those which directly limit a community, population, or subpopulation (of species), and restoration or replacement of these habitats may not be possible.[4] The WG&F has stated that there should be "no loss of habitat function" in these vital/crucial habitats, and although some modification may be allowed, habitat function, such as the location, essential features, and species supported must remain unchanged. Mitigation Policy at 5.

Furthermore, Wyoming Game and Fish released the recommended minimum standards to sustain wildlife in areas affected by oil and gas development. Their policy recognized the ineffectiveness of winter range stipulations standing alone as currently applied. Mitigation Policy at 6. In all cases, Wyoming's new mitigation policy recommends going beyond just the winter drilling timing limitations, which BLM currently applies to lease parcels on crucial winter range. In addition to the winter timing limitations, the Mitigation Policy includes a suite of additional standard management practices. Mitigation Policy at 9-11, 52-58. These additional management practices include planning to regulate the pattern and rate of development, phased development, and cluster development, among many other provisions. Mitigation Policy at 52.

Clearly, the timing limitation stipulation applicable to the Crucial Winter Range Parcels is not in compliance with the State of Wyoming's policies and plans regarding the protection of wildlife. The timing stipulation, standing alone, does not ensure protection of habitat function. There is absolutely no guarantee, or even the remote likelihood, that the location, essential features, and species supported on the crucial winter range will remain "unchanged."

Popular and scientific literature makes it clear that there will be loss of function if significant exploration and development occurs on the leaseholds. In prior Protests the parties have submitted substantial evidence showing that big game species are negatively affected by oil and gas drilling on winter ranges. *See* the studies referenced in Footnote 2 above. These studies document the negative effects of oil and gas drilling on big game winter ranges and winter range use, as well as on big game migration routes, even when winter timing stipulations are in effect.

The findings in the scientific and popular literature have been confirmed in recent BLM NEPA documents. The Green River EIS/RMP/ROD is replete with documentation of the importance of crucial winter ranges, and their ongoing loss, despite the stipulation required by BLM. Green River EIS/RMP at 347-349. ("Probably the single most important factor affecting antelope populations is weather," at 438-441.) (" . . . oil and gas development in Nitchie Draw causing forage loss and habitat displacement;" "Displaced wildlife move to less desirable habitat

[3] Wyoming Game and Fish Department. April 1998. Policy No. VII H, Mitigation, attached to the BCA June 2008 Lease Protest as Exhibit 24.

[4] Wyoming Game and Fish Department. Dec. 2004. Recommendations for Development of Oil and Gas Resources within Crucial and Important Wildlife Habitats, at 3. This document is attached to the BCA June 2008 Lease Protest as Exhibit 25.

where animals may be more adversely stressed . . .;" "Long-term maintenance and operations activities in crucial wildlife habitats would continue to cause displacement of wildlife from crucial habitats, including . . . crucial big game winter habitats;" "Surface disturbing activities would continue to cause long-term loss of wildlife habitat," etc.) The Jack Morrow Hills EIS also documents the importance of crucial winter ranges, particularly to elk, and the sensitivity of wildlife on winter ranges not only to drilling during the winter period, but also due to ongoing displacement and disturbance of wildlife from oil and gas development. Jack Morrow Hills EIS at 4-61 to 4-64, 4-80 to 4-88. The Rawlins Draft RMP further documents the negative effects of oil and gas drilling on big game when on winter ranges. Rawlins RMP Draft EIS at 3-131 to 3-136.

Given this evidence and the simple fact that each well pad converts 3-5 acres of crucial winter range to bare ground for extended periods of time, there is no rational basis for BLM to claim that it meets Wyoming's mitigation policy. It is impossible for crucial winter ranges to remain "unchanged" in terms of the location, essential features, and species supported, even if drilling does not take place during the timing stipulations. What is worse, however, is the fact that drilling ***does*** take place during the timing stipulations when they are waived, as they frequently are. Crucial winter ranges will clearly not remain "unchanged" because BLM has not retained the authority to condition well operations (lasting for decades) at the leasing stage.

The Federal Land Policy and Management Act (FLPMA) requires BLM to "coordinate the land use inventory, planning, and ***management activities*** of [public lands] with the land use planning and management programs of . . . the States and local governments . . . by, among other things, considering the policies of approved State and tribal resource management programs." 43 USC 1712I(9) (emphasis added). BLM must give special attention to "officially approved and adopted resource related plans." 43 CFR 1601.0-5(g). BLM must remain apprised of State land use plans, assure they are considered, and resolve to the extent practical, inconsistencies between state and federal plans. 43 USC 1712I(9).

There is no indication that BLM's winter timing stipulation is based on consideration of Wyoming's 1998 Mitigation Policy, or its new programmatic standards policy. *See* Footnote 3. It is apparent there has been no attempt to resolve inconsistencies between what BLM's stipulation provides and what Wyoming's mitigation policy requires. There are certainly inconsistencies. BLM's timing stipulation attempts to prohibit drilling during limited periods, yet this prohibition is frequently waived.[5] Indeed, quite recently the WG&F asked BLM in Wyoming not to grant any waivers of stipulations last winter due to the lack of quality forage for big game in their winter range and the anticipated impacts that year-round drilling will have on big game under those conditions. BLM has refused to accede to this request and has proceeded to grant waivers. Wyoming's mitigation policy specifically seeks to fill gaps left by the timing stipulation, by requiring a number of standard management practices on crucial winter ranges in ***all*** cases. These recommendations are standing policy which WG&F expects to be applied in every instance of leasing in crucial winter range.

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[5] Rocky Mountain News, Nov. 13, 2006, *BLM grants drilling rights: 13 permits for gas run counter to will of Wyoming officials.* Copy attached to the BCA June 2008 Lease Protest as Exhibit 26.

The inconsistencies are even more glaring when one considers the fact that BLM's timing stipulation does not regulate the production phase. Until BLM considers and attempts to resolve these inconsistencies, it cannot allow the sale of the Crucial Winter Range Parcels to go forward. To do so would be a violation of NEPA.

Furthermore, the timing stipulation attached to the Crucial Winter Range Parcels is inconsistent with the policy of the BLM Wyoming State Office, as enunciated in the Revised Umbrella Memorandum of Understanding (MOU) between BLM and Wyoming Game and Fish Department.

The various requirements in the WG&F minimum programmatic standards for oil and gas development establish "sideboards" as to what actions need to be taken to prevent unnecessary or undue degradation. BLM has not considered these standards from the perspective of its FLPMA-imposed requirement to prevent unnecessary or undue degradation. BLM is not meeting its duty to take "any" action that is necessary to prevent unnecessary or undue degradation. 43 USC 1732(b). Once again, this failure is most apparent where application of the winter timing stipulation does not even regulate ongoing operations such as production. BLM has an independent duty under FLPMA to take any action necessary to prevent unnecessary or undue degradation, in addition to its NEPA duty to coordinate its activities with the State of Wyoming and comply with the MOU. Since BLM has given up its ability to require restrictions in the future by not imposing sufficient stipulations at the leasing stage, the effect of this failure to require adequate restrictions at the leasing stage violates FLPMA by permitting unnecessary or undue degradation when oil and gas development commences.

The parties also protest the sale of the Crucial Winter Range Parcels on the basis that their sale would cause unnecessary or undue degradation of public lands. "In managing the public lands the [Secretary of Interior] **shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands."** 43 U.S.C. § 1732(b) (emphasis added). BLM's obligation to prevent unnecessary or undue degradation is not discretionary; it is mandatory. "The court finds that in enacting FLPMA, Congress's intent was clear: **Interior is to prevent, not only unnecessary degradation, but also degradation that, while necessary . . . is undue or excessive.**" *Mineral Policy Center v. Norton,* 292 F.Supp.2d 30, 43 (D.D.C. 2003) (emphasis added). The BLM has a statutory obligation to demonstrate that leasing will not result in unnecessary or undue degradation.

We hereby incorporate by reference all Protests previously filed by the Parties which address this issue.

C. BLM MUST CONSIDER DEFERRING LEASING IN AREAS WITH ACTIVE RMP REVISIONS IN COMPLIANCE WITH IM 2004-110 CHANGE 1

Some of the lease parcels are located in the Rawlins and Lander Field Offices which are currently undergoing RMP revision. Lease parcels WY-0810-087, 066, 136, 183, 185, 184, 166, 173, 171, 147, 127, 165, 172, 164, 145, 146, 162, 144, 163, 131 and are in the Rawlins and Lander Field Offices.

The January 2008 FEIS for the Rawlins RMP has the Chain Lakes area designated as a wildlife management area in the Great Divide Basin leasing area. Under alternative 4 of the Final EIS the RMP states that, "the area would be open to oil and gas leasing with intensive management of surface disturbing and disruptive activities." (FEIS-RMP, Rawlins, 2-65, 2008) The future management outlook for this leasing area should include looking at cumulative impacts of other forms of energy development. Uranium energy development is currently a hot topic of discussion that must be addressed for this area.

IM 2004-110 Change 1 provides that State Offices "are to consider temporarily deferring oil, gas and geothermal leasing on federal lands with land use plans that are currently being revised or amended." Specific consideration for deferral is to be given to certain categories of land "that are designated in the preferred alternative or draft or final RMP revisions or amendments as: (1) lands closed to leasing; (2) lands open to leasing under no surface occupancy; (3) lands open to leasing under seasonal or other constraints with an emphasis on wildlife concerns; or (4) other potentially restricted lands." There is no indication that the Wyoming State Office has given any consideration to deferring leasing on parcels in this Field Office, even though many of the lease parcels fall into one of the four categories. To offer these and other lease parcels in the Kemmerer and Lander Field Offices violates IM 2004-110 Change 1.

D. THE PROTESTED PARCELS ARE LOCATED ON BIG GAME MIGRATION ROUTES WITHOUT PRE-LEASING NEPA ANALYSIS

Parcels WY-0810- 136, 187, 186, 204, 206, 195, 151, 178, 087, 066, 211, 212, 215, and 232 lie on or near recognized migration routes for mule deer, pronghorn antelope, or elk. While the exact location of these migration routes may not have been determined, it is clear the area where the protested parcels lie is in a migration-route-rich area for big game animals seeking refuge for the winter. Due to this, the protested parcels should not be offered for sale until the effect of their sale on the migration routes, and the species using them, is considered by BLM, and appropriate permanent protective stipulations are attached to the parcels.

Wyoming Governor Dave Freudenthal and the Western Governors Association have called for greater protection of wildlife migration corridors and crucial wildlife habitat where oil and gas development is occurring, recognizing that critical wildlife migration corridors and crucial wildlife habitats are necessary to maintain flourishing wildlife populations.[6]

Indeed, the BLM has recently recognized the importance of big game migration routes. For example, the significance of migration routes is recognized in the Supplemental Draft EIS for the Pinedale Anticline at pages 3-105 to 3-112. The Jack Morrow Hills Final EIS also recognizes the importance of migration routes at pages 3-15 to 3-17. The Pinedale Field Office has been engaged in discussions regarding how to protect the crucial Trappers Point Bottleneck portion of one particularly constricted migration route. The Jackson Hole Pronghorn Study and Sublette Mule Deer Study, both of which were sponsored by BLM, document the importance of

[6] A copy of the WGA press release of February 27, 2007 and the resolution adopted by the WGA is attached to the BCA June 2008 Lease Protest as Exhibit 27.

migration routes in these areas.[7] A new study by Hall Sawyer on mule deer migration routes in Sublette County has undertaken mapping of not only the migration routes themselves, but also the "utilization distributions" along the migration corridors.[8] Utilization distributions are the areas surrounding corridors which big game use as they migrate. These areas are critical also for annual passage of the animals to summer and winter range.

Despite this recognized importance, BLM has not analyzed the environmental impacts of offering oil and gas leases for sale that lie on or near a migration route in a NEPA document or in a Federal Land Policy and Management Act (FLPMA) RMP. Thus, while stipulations are often attached to lease parcels in recognized critical winter range , no similar stipulation exists or is attached to parcels—such as those at issue here—so as to protect the equally crucial migration routes that allow big game species to reach crucial winter range refuges in the first place. The protested parcels contain no stipulation that would allow for protection of migration routes, if such were found to be necessary. These failings violate NEPA, and the prohibition on causing unnecessary or undue degradation of the public lands established by FLPMA. 43 U.S.C. § 1732(b).

The Wyoming Outdoor Council line of IBLA cases dealing with the need for pre-leasing NEPA analysis relative to coalbed methane development firmly establish that full compliance with NEPA is required prior to offering a lease parcel for sale where potentially significant environmental impacts have not been considered in a prior pre-leasing NEPA document. See Wyoming Outdoor Council et al., 156 IBLA 347 (2002); Wyoming Outdoor Council et al, (On Reconsideration), 157 IBLA 259 (2002); both affirmed by Pennaco Energy, Inc. v. U.S. Dep't of the Interior, 377 F.3d 1147 (10th Cir. 2004). See also Wyoming Outdoor Council et al., 158 IBLA 384 (2003). As noted above, the IBLA has strongly reaffirmed this view relative to parcels being offered in the Pinedale Field Office relative to air quality issues.

The situation here is exactly analogous to that present in the Wyoming Outdoor Council line of cases. A potentially very significant environmental impact—negative and potentially severe impacts to big game migration routes resulting from the right to develop oil and gas conveyed in a lease—simply has not been considered in pre-leasing NEPA documents. The EA for this lease sale is also silent regarding migration routes or corridors. Moreover, BLM has attached no stipulations to the protested parcels that would allow it to protect this ecological feature and the species using the migration routes if such proved to be necessary.

NEPA requires agencies to take a hard look at new information or circumstances concerning the environmental effects of a federal action even after an EIS has been prepared, and to supplement the existing environmental analyses if the new circumstances "raise significant new information relevant to environmental concerns." Portland Audubon Soc'y v. Babbitt, 998 F.2d 705, 708-09 (9th Cir. 1993). Specifically, an "agency must be alert to new information that

[7] Sawyer, H. and F. Lindzey. March, 2001. "Sublette Mule Deer Study." Wyoming Cooperative Fish and Wildlife Research Unit. Sawyer, H. and F. Lindzey. September, 2000. "Jackson Hole Pronghorn Study." Wyoming Cooperative Fish and Wildlife Research Unit. Copies of these reports are attached to the BCA June 2008 Lease Protest as Exhibits 28 and 29.

[8] Sawyer, H. and M. Kauffman. May 2008. "Identifying Mule Deer Migration Routes Along the Pinedale Front." Wyoming Wildlife and Natural Resource Trust. A copy is attached to the BCA June 2008 Lease Protest as Exhibit 30.

may alter the results of its original environmental analysis, and continue to take a 'hard look' at the environmental effects of [its] planned actions." Friends of the Clearwater v. Dombeck, 222 F.3d 552, 557 (9th Cir. 2000). See Marsh v. Oregon Natural Resource Council, 490 U.S. 360, 371 (1989) ("It would be incongruous . . . with [NEPA's] manifest concern with preventing uninformed action, for the blinders to adverse environmental effects, once unequivocally removed, to be restored prior to the completion of agency action simply because the relevant proposal has received initial approval."); BLM Instruction Memorandum (IM) 2001-062 ("If you determine you can properly rely on existing NEPA documents, you must establish an administrative record that documents clearly that you took a 'hard look' at whether new circumstances, new information, or environmental impacts not previously anticipated or analyzed warrant new analysis or supplementation of existing NEPA documents and whether the impact analysis supports the proposed action."). The migration routes certainly constitute important new environmental information that BLM has not considered previously in a NEPA analysis, and therefore it must do so now, before the protested parcels are offered for sale.

It bears emphasizing that none of the protested parcels have No Surface Occupancy stipulations, and none contain other stipulations that would allow BLM to protect the vitally important migration routes identified above if such were necessary. Consequently, BLM has an obligation to consider impacts to migration routes at the pre-leasing stage before allowing these parcels to be sold.

E. LEASE PARCELS WITH SAGE GROUSE AND SAGE GROUSE HABITAT

The Parties protest lease parcels WY-0810- 005, 007, 019, 021, 024, 056, 060, 063, 025, 028, 032, 048, 055, 057, 061, 064, 065, 066, 067, 069, 070, 074, 076, 077, 078, 079, 082, 085, 086, 096, 097, 098, 108 ,109 ,111,112, 114, 115, 116, 117, 138, 140, 141, 144, 119, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 137, 142, 143, 148, 149, 153, 154 ,155, 156, 157, 158, 162, 163, 171, 174, 175, 179, 180, 181, 182, 188, 190, 196, 197, 198, 200, 201 ,205, 207, 208, 210, 213, 217, 218, 219, 220, 221, 222, 223, 236, 241, 242, 243, 244, and 245. These parcels contain important sage grouse nesting habitats and/or wintering habitats. We request that these parcels be withdrawn from the lease sale. Lease parcel 221 was not requested for withdrawal (Rock Springs Field Office, DNA) by the Wyoming Fish and Game Dept. request, but should be included since it contains core sage grouse habitat.

Thirty-five percent of the lease sale parcels contain sage grouse habitat which is in sage grouse 75% population core areas, areas which are critical to the survival of the birds.[9] Gov. Dave Freudenthal with appropriate agency officials has designated areas in Wyoming as sage grouse core areas. This total includes the following lease parcels:

WY- 0810- 024, 025, 086, 079, 081, 080, 082, 083, 084, 085, 077, 098, 062, 078, 063, 064, 060, 061, 065, 076, 097, 127, 131, 144, 162, 163, 055, 067, 088, 099, 118, 059, 075, 096, 107, 126, 162, 163, 144, 127, 131, 097, 180, 181, 182, 179, 150, 139-143, 152-161, 138, 141, 137, 134, 133, 213, 210, 207, 209, 197, 198, 199, 196, 200, 201, 008, 014, 223, 222, 221, 224, 219, 220, 245, 246, 051, 052, 239, 240, 236, 241, 237, 235, 239, 217, 218, 215, 216, 168, 175, 167, and 132.

[9] *See* BLM June Lease Sale Summary, attached to the BCA June 2008 Lease Protest as Exhibit 31.

We protest these parcels as well and request that these leases not issue. Wyoming sage grouse populations are some of the largest left in the nation and were relatively stable until the last decade, when sage grouse populations experienced major declines range-wide. The Wyoming Game and Fish Department reported that since 1952, there has been a 20% decline in the overall Wyoming sage grouse population, with some fragmented populations declining more than 80%;[10] one of WGFD's biologists reported a 40% statewide decline over the last 20 years.[11] These declines are attributable at least in part to habitat loss due to mining and energy development and associated roads, and to habitat fragmentation due to roads and well fields. Oil and gas development poses perhaps the greatest threat to sage grouse viability in the region. The area within 2 to 3 miles of a sage grouse lek is crucial to both the breeding activities and nesting success of local sage grouse populations. In a study near Pinedale, sage grouse from disturbed leks where gas development occurred within 3 km of the lek site showed lower nesting rates (and hence lower reproduction), traveled farther to nest, and selected greater shrub cover than grouse from undisturbed leks.[12] According to this study, impacts of oil and gas development to sage grouse include (1) direct habitat loss from new construction, (2) increased human activity and pumping noise causing displacement, (3) increased legal and illegal harvest, (4) direct mortality associated with reserve pits, and (5) lowered water tables resulting in herbaceous vegetation loss. These impacts have not been thoroughly evaluated with full NEPA analysis.

Because leks sites are used traditionally year after year and represent selection for optimal breeding and nesting habitat, it is crucially important to protect the area surrounding lek sites from impacts. In his University of Wyoming dissertation on the impacts of oil and gas development on sage grouse, Matthew Holloran stated, "current development stipulations are inadequate to maintain greater sage-grouse breeding populations in natural gas fields." [13] The area within 2 or 3 miles of a sage grouse lek is crucial to both the breeding activities and nesting success of local sage grouse populations. Dr. Clait Braun, the world's most eminent expert on sage grouse, has recommended NSO buffers of 3 miles from lek sites, based on the uncertainty of protecting sage grouse nesting habitat with smaller buffers.[14] Thus, the prohibition of surface disturbance within 3 miles of a sage grouse lek is the absolute minimum starting point for sage grouse conservation.

Other important findings on the negative impacts of oil and gas operations on sage grouse and their implications for the species are contained in three studies recently accepted for

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[10] WGFD. 2000. Minutes of the Sage Grouse Conservation Plan meeting, June 21, 2000, Casper, WY. Cheyenne: Wyoming Game and Fish Department. A copy is attached to the BCA June 2008 Lease Protest as Exhibit 32.

[11] Christiansen, T. 2000. Sage grouse in Wyoming: What happened to all the sage grouse? Wyoming Wildlife News 9(5), Cheyenne: Wyoming Game and Fish Department. A copy is attached to the BCA June 2008 Lease Protest as Exhibit 33.

[12] Lyon, A.G. 2000. The potential effects of natural gas development on sage grouse (*Centrocercus urophasianus*) near Pinedale, Wyoming. M.S. Thesis, Univ. of Wyoming, 121 pp. A copy is attached to the BCA June 2008 Lease Protest as Exhibit 34.

[13] M. Holloran. Dec. 2005. Greater Sage-Grouse Population Response to Natural Gas Field Development in Western Wyoming, at 57. This study is attached to the BCA June 2008 Lease Protest as Exhibit 35.

[14] C. Braun. May 2006. A Blueprint for Sage-grouse Conservation and Recovery. Grouse, Inc. This study is attached to the BCA June 2008 Lease Protest as Exhibit 36.

publication.[15] Sage grouse mitigation measures have been demonstrated to be ineffective at maintaining this species at pre-development levels in the face of oil and gas development by Holloran (2005) and Naugle et al. (2006). Naugle found an 85% decline of sage grouse populations in the Powder River Basin of northeastern Wyoming since the onset of coalbed methane development there. BLM has repeatedly failed to provide any analysis, whether field experiments or literature reviews, that examines the effectiveness of the standard quarter-mile buffers where disturbance would be "avoided." There is substantial new information in recent studies to warrant supplemental NEPA analysis of the impacts of oil and gas development to sage grouse. It is incumbent upon BLM to consider the most recent scientific evidence regarding the status of this species and to develop mitigation measures which will ensure the species is not moved toward listing under the Endangered Species Act. It is clear from the scientific evidence that the current protections are inadequate and are contributing to the further decline of the bird's populations. This information constitutes significant new information that requires amendment of the Resource Management Plans before additional oil and gas leasing can move forward.

Western game and fish department biologists have reached a consensus that the Timing Limitation Stipulations proposed for sage grouse in this lease sale are ineffective in the face of standard oil and gas development practices. See Attachment 1. These stipulations have likewise been condemned as inadequate by the U.S. Fish and Wildlife Service and renowned sage grouse expert Dr. Clait Braun. See Attachment 2. The BLM itself has been forced to admit that "New information from monitoring and studies indicate that current RMP decisions/actions may move the species toward listing...conflicts with current BLM decision to implement BLM's sensitive species policy" and "New information and science indicate 1985 RMP Decisions, as amended, may not be adequate for sage grouse."[16] Continued application of stipulations known to be ineffective in the face of strong evidence that they do not work, and continuing to drive the sage grouse toward ESA listing in violation of BLM Sensitive Species policy, is arbitrary and capricious and an abuse of discretion under the Administrative Procedures Act.

The parties protest the sale of all lease parcels which contain sage grouse leks, nesting habitat, breeding habitat, wintering habitat and brood-rearing habitat. We request that these parcels be withdrawn from the lease sale. Failing withdrawal of the parcels, it is critical that no surface occupancy stipulations be placed on all lease parcels with sage grouse leks. In addition, three-mile buffers must be placed around all leks. It is also critical that these stipulations be attached at the leasing stage, when BLM has the maximum authority to restrict activities on these crucial habitats for the protection of the species, and that no exceptions to the stipulations be

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[15] Doherty, K.E., D.E. Naugle, B.L. Walker, and J.M. Graham. Greater sage-grouse winter habitat selection and energy development. Journal of Wildlife Management: In Press. Attached to the BCA June 2008 Lease Protest as Exhibit 37.
Walker, B.L., D.E. Naugle, and K.E. Doherty. Greater sage-grouse population response to energy development and habitat loss. Journal of Wildlife Management: In Press. Attached to the BCA June 2008 Lease Protest as Exhibit 38.
Walker, B.L., D.E. Naugle, K.E. Doherty, and T.E. Cornish. 2007. West Nile virus and greater sage-grouse: estimating infection rate in a wild bird population. Avian Diseases 51:In Press. Attached to the BCA June 2008 Lease Protest as Exhibit 39.

[16] Sage grouse plan amendment land user information meeting PowerPoint, available online at http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA/bfodocs/sagegrouse.Par.94571.File.dat/May28_InfoMtg.pdf. Site last visited 7/16/2008.

granted. BLM's failure to do so will permit oil and gas development activities which will contribute to declining sage grouse populations and the potential for listing by the US Fish and Wildlife Service as a threatened or endangered species, in violation of BLM's duty to take all actions necessary to prevent listing.

We also request that all lease parcels with sage grouse leks, nesting habitat, breeding habitat, wintering habitat and brood-rearing habitat contain stipulations which fully comply with and adhere to the Sage-Grouse Habitat Management Guidelines for Wyoming adopted July 24, 2007.

F. PARCELS OFFERED ADJACENT TO HISTORIC TRAIL SITES

It appears from available information that several parcels lie across and/or adjacent to portions of significant Historic Trails as well as world-renowned historic sites such as Fort Laramie. The parties protest the sale of lease parcels WY 1018- 005, 043,035, 138, 141, 134, 186, 203, 195, 077, 060, and 065, which lie across and/or adjacent to the trails mentioned above. Development in these areas is likely to impact the setting of these important trails, each of which is eligible for the National Register of Historic Places, and some of which have been accorded National Historic Trail status.

The Historic Bridger Trail was the route to the gold fields of Montana, but was short-loved, lasting only one year. Nevertheless, the trail funneled a huge number of the goldrush emigrants to Virginia City, Montana, in a single season. Even after being abandoned by the emigrants, the trail continued to be used for freighting goods to and from railheads along portions of the trail.

The Rawlins-Fort Washakie Stage Road was the first segment of the historic stage road which connected Rawlins to Red Lodge, Montana. The route was heavily used for moving freight between Wyoming and Montana, and was also used to transport supplies to the Arapaho and Shoshoni Tribes on the Wind River Reservation. The Rawlins-Fort Washakie segment took thirty-six hours to complete one-way by stagecoach. A number of colorful stations dotted the route, offering meals, beds and fresh horses.

The Mission Statement of the BLM's National Scenic and Historic Trails Strategy and Work Plan (the Plan) is:

> . . . to connect people to the land and its scenic wonders, our heritage, our cultures, and our communities. Through partnerships, community involvement, citizen action and agency commitment, the BLM will administer and manage the diverse network of Congressionally-designated trails and associated landscapes. In order to provide for enriching and inspiring experiences, the BLM, in fulfilling our multiple-use mandate, **will protect and sustain trail resources while fostering visitor enjoyment, appreciation, and learning opportunities**. (Emphasis added.)

The Resource Goal of the Plan is to "Protect and sustain trail resources to provide for enriching and inspiring experiences, scenic landscapes, or historic settings."

These trails are a vital part of the history of the West and preservation of not only the trails, but also the viewsheds and aesthetic qualities, is important. Whether they are part of the National Historic Trail System or not, they provide glimpses into the Old West and connections to our past; they should be preserved.

There appear to be no stipulations or restrictions attached to these lease parcels which will adequately protect and preserve the unique special values of the Bridger Trail, and the Rawlins-Fort Washakie Stage Road Trail. There is only the standard ¼-mile buffer for some of the parcels. A quarter mile buffer is inadequate for these historic trails. Such a narrow buffer cannot protect the viewshed of the trails, nor will it protect against the new roads, traffic, dust, noise and other significant impacts from oil and gas development in the future. Oil and gas development on all of these lease parcels will destroy the viewshed and create disruption of enjoyment of this area by the impacts of new roads, vehicle traffic, noise, dust, etc. Offering these lease parcels for sale violates the Plan with regard to preservation of the National Historic Trails and the other Historic Trails. Siting oil and gas development immediately adjacent to these Historic Trails will clearly not enhance opportunities for trail users to enjoy the diverse and unique phenomena which occur along the trail. BLM also has not conducted any pre-leasing NEPA analysis to determine the environmental impacts that oil and gas development might have along the trail corridors.

The lease parcels at issue here are being offered for sale pursuant to a Documentation of Land Use Plan Conformance and NEPA Adequacy (DNA) prepared by the various Field Offices. DNAs, however, are not NEPA documents and do not comply with BLM guidance for the use of DNAs. There is no basis we are aware of for claiming that existing NEPA documentation has considered or provided for the special circumstances that attend lease parcels in the immediate vicinity of the National Historic Trails and other Historic Trails, areas that clearly have unique circumstances and conditions not present on other BLM lands, and very special environmental values. Thus, current circumstances and information are not adequately reflected in existing NEPA documentation, and the use of the DNA is inappropriate.

These lease parcels should be issued only with No Surface Occupancy stipulations for the entire viewshed of the historic trail or site, or should be withdrawn permanently from this and all future lease sales.

The failure to provide for special protection of these historic trails should preclude sale of these lease parcels. Until adequate pre-leasing NEPA analysis is conducted and protections and mitigation are incorporated into the leases, they should be withdrawn from the sale. Absent adequate stipulations to protect these resources BLM may lack the power to protect these resources in the future. 43 C.F.R. § 3101.1-2. If BLM is limited in its ability to protect these resources it will be unable to fully meet its duty to "protect[ ] other natural resources and the environmental qualities" when surface operations are proposed and to ensure that plans of operation are "sound from both a technical and environmental standpoint." Id. § 3161.2. See also 30 U.S.C. § 226(g) (the Mineral Leasing Act requires BLM to "regulate" oil and gas

activities "in the interest of conservation of surface resources"). Thus, adequate stipulations that protect the known scenic and historic values of the trails must be in place at the outset if BLM is to meet its duty to protect the environment if surface operations are ever proposed.

Protection for other Historic Native Cultural Sites-

The Jack Morrow Hill's site located near the Point of Rocks leasing area is one area of concern for future destruction of Indian rock art, including petroglyphs. A stipulation for at least a mile or more buffers should be put in place between energy development and known rock art relics in the leasing area.

H. BLM'S FAILURE TO ADDRESS GLOBAL WARMING AND CLIMATE CHANGE

This portion of our Protest is predicated on BLM's failure to address global warming and climate change and the adverse consequences of this failure to the Protestors' interests, which are detailed below.[17] Oil and gas production, processing, transmission, and distribution activities emit greenhouse gas emissions ("GHG") into the atmosphere, contributing to global warming and climate change.[18] Global warming and climate change also impact the environment, stressing if not overcoming even strong, resilient ecological systems, particularly given the cumulative surface impacts caused by the spiderweb of oil and gas infrastructure on the landscape. These impacts affect – and must be addressed by – BLM's past, present, and future land protection and management activities through decision-making and analytical processes provided and required by law.

Before surrendering lease rights, the Protestors therefore ask BLM to prepare an environmental analysis pursuant to the National Environmental Policy Act ("NEPA") to address the global warming and climate change issues and concerns identified by this Protest. Given the nature of these issues and concerns, and the supporting evidence provided by this Protest, the Protestors surmise that an Environmental Impact Statement, rather than an Environmental Assessment, will be necessary. The Protestors further believe the BLM will need to coordinate the NEPA process with Resource Management Plan revisions or amendments at a state or regional scale. 43 C.F.R. §§ 1610.5-5, 1610.5-6. In any event, before these lease parcels are offered for sale, the Protestors specifically ask that BLM:

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[17] Global warming is a product of the greenhouse effect whereby greenhouse gases in the atmosphere trap the sun's heat and prevent it from being released into space. While the greenhouse effect is essential to life on earth, the marked increase in greenhouse gasses from human activities has warmed the Earth's climate and thus set in motion a chain of impacts to the climate and the life systems that rely upon the climate.

[18] The IPCC (www.ipcc.ch/pdf/glossary/tar-ipcc-terms-en.pdf) defines GHGs as follows: Greenhouse gases are those gaseous constituents of the *atmosphere*, both natural and *anthropogenic*, that absorb and emit radiation at specific wavelengths within the spectrum of *infrared radiation* emitted by the Earth's surface, the atmosphere, and clouds. This property causes the *greenhouse effect*. Water vapor (H2O), *carbon dioxide* (CO2), *nitrous oxide* (N2O), *methane* (CH4), and *ozone* (O3) are the primary greenhouse gases in the Earth's atmosphere. Moreover there are a number of entirely human-made greenhouse gases in the atmosphere, such as the *halocarbons* and other chlorine- and bromine-containing substances, dealt with under the *Montreal Protocol*. Besides CO2, N2O, and CH4, the *Kyoto Protocol* deals with the greenhouse gases *sulfur hexafluoride* (SF6), *hydrofluorocarbons* (HFCs), and *perfluorocarbons* (PFCs).

(1) Quantify past, present, and reasonably foreseeable GHG emissions from BLM-authorized oil and gas development to address the direct, indirect, and cumulative impacts of these GHG emissions to the environment;
(2) Identify, consider, and adopt a GHG emissions limit or GHG reduction objective for BLM-authorized oil and gas activities;
(3) Identify, consider, and adopt management measures – such as pre-commitment lease stipulations and post-commitment conditions of approval[19] – to reduce GHG emissions from BLM-authorized oil and gas management activities;
(4) Track and monitor GHG emissions from BLM-authorized oil and gas operations through time;
(5) Consider how global warming and climate change impacts the environment, and whether such impacts warrant additional environmental protections.

At the outset, it is important to emphasize that this Protest is not intended to prohibit oil and gas development across Wyoming. Rather, this Protest is designed to ensure that oil and gas development is held to the highest science-based standards, that BLM decisions to facilitate domestic energy production do not create unintended consequences, and that BLM decisions do not compromise the resiliency and integrity of the environment. In some instances, this may require BLM to not sell certain lease parcels in order to protect the environment.

Taking the precautionary approach suggested by this Protest is warranted by the urgent need for BLM to address global warming and climate change. Each day brings new reports of observed events that scientists assert are triggered by global warming and climate change. For example, several weeks ago, a 160-square mile chunk of Antarctic ice seven times the size of Manhattan collapsed. *See* BCA et al. June 2008 Lease Protest Exhibit 14 (Washington Post article detailing Antarctic ice collapse).

Furthermore, significant acreage within Wyoming has already been leased by BLM, and Wyoming has already witnessed extensive drilling. *See* BCA et al. June 2008 Lease Protest Exhibit 40 (Wyoming Oil & Gas Conservation Commission recent drilling data for Wyoming).[5] The sale of leases confers contractually-enforceable development rights and sets in motion oil and gas development that will hamstring BLM's authority to meaningfully address climate change for decades and trigger GHG emissions that can remain in the atmosphere for hundreds of years. In areas without a history of development and proven reserves, it is premature for BLM to sell leases and thereby surrender development rights before climate change concerns and issues are addressed, in particular given the existence of already leased areas with proven reserves. Fundamentally, BLM lease sale decisions must not exacerbate an already daunting problem.

The Protestors acknowledge that global warming and climate change present BLM with complicated issues. The immediate intent in submitting this Protest is to ensure that BLM complies with existing legal duties to address global warming and climate change. Ultimately,

[19] There is a distinction between BLM's expansive pre-commitment authority to subject a lease to stipulations at the lease stage, and BLM's far more limited post-commitment authority to subject a lessee's exercise of its contractually-enforceable lease rights to conditions of approval at the Application for Permit to Drill stage.

the Protestors hope that BLM can pivot from the agency's current failure to address global warming and climate change to lead an effort that engages federal and state partners, the public, and the oil and gas industry in a constructive, transparent dialogue.

1. THE THREAT OF GLOBAL WARMING AND CLIMATE CHANGE DEMANDS IMMEDIATE ACTION BY BLM

In its November 2007 Synthesis Report, Summary for Policymakers, the Nobel-prize winning Intergovernmental Panel on Climate Change ("IPCC") determined that "[w]arming of the climate system is unequivocal" and, further, that "[o]bservational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases."[20] According to Rajendra Pachauri, the IPCC's Chairman, "If there's no action before 2012, that's too late ... What we do in the next two to three years will determine our future. *This is the defining moment.*"[21]

Simply put, BLM is part of this defining moment. As BLM has explained, the intersection of global warming and climate change with BLM's management of the public lands "requires public engagement, science drawn from many disciplines, and careful balancing of multiple goals." Government Accountability Office, *Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources* at 174 (Aug. 2007) ("2007 GAO Report") (attached to the BCA et al. June 2008 Lease Protest as Exhibit 42). The Protestors could not agree more. Fortunately, as detailed below, Congress has provided BLM with legal tools to address the two distinct, though intertwined, land protection and management elements implicated by this intersection: mitigation and adaptation.

Through *mitigation*, BLM must quantify and reduce GHG emissions from oil and gas management activities. Through *adaptation*, BLM must address how global warming and climate change will impact the environment, and ensure that the built and natural environments BLM is responsible for are sufficiently resilient to withstand or adapt to global warming and climate change impacts. Given the time lag between the point a problem is acknowledged, and the point it is actually addressed – for example, through NEPA analysis or regulatory guidance – BLM must begin to act, *now*, to ensure that meaningful global warming and climate change management measures can be implemented well before 2012. Our concern over time lags is underscored by the 2007 GAO Report's statement that:

> Some resource managers identified potential complications with issuing guidance related to climate change. In our workshop, resource managers discussing the grasslands and shrublands ecosystem said that policy development can take years; therefore, in their view, *the agencies may not be able to respond to climate change in an appropriate time frame.*

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[20] 2007 IPCC Synthesis Report, Summary for Policymakers, at 2 www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf) ("IPCC Synthesis Report") attached to the BCA June 2008 Lease Protest as Exhibit 43).

[21] www.nytimes.com/2007/11/18/science/earth/18climatenew.html (emphasis added) (attached to the BCA June 2008 Lease Protest as Exhibit 44)

2007 GAO Report at 40 (emphasis added). As compellingly stated in a recent paper on global warming and climate change, whose lead author is Dr. James Hansen, of the National Space and Aeronautics Administration:

> Humanity today, collectively, must face the uncomfortable fact that industrial civilization itself has become the principal driver of global climate. If we stay our present course, using fossil fuels to feed a growing appetite for energy-intensive life styles, we will soon leave the climate of the Holocene, the world of human history ... *Humanity's task of moderating human-caused global climate change is urgent.*[22]

The Department of the Interior has rhetorically stated that global warming and climate change is a "high priority." 2007 GAO Report at 175. Unfortunately, despite this representation, the Protestors have yet to see this "high priority" reflected in BLM land protection and management decisions. This is highly troubling given the prominence of global warming and climate change issues in the scientific literature, the media, and our day-to-day public discourse. If indeed global warming and climate are a "high priority" then it is surely the case that BLM's lease sales should be scrutinized in this context *before* BLM commits public resources to long-term oil and gas development. The time for action is now.

2. BLM IS LEGALLY OBLIGATED TO ADDRESS GLOBAL WARMING AND CLIMATE CHANGE

a. Secretarial Order 3226 Requires that BLM Consider and Analyze Potential Climate Change Impacts.

The starting point underscoring BLM's legal obligation to address global warming and climate change is an Order issued by the Secretary of the Interior in 2001: Secretarial Order 3226, *Evaluating Climate Change Impacts in Management Planning* (January 19, 2001) (attached to the BCA et al. June 2008 Lease Protest as Exhibit 45). This Order, in Section 1, explains that "[t]here is a consensus in the international community that global climate change is occurring and that it should be addressed in governmental decision making." Secretarial Order 3226 is action-forcing, mandating, in Section 3 (with emphases added), the following:

> Each bureau and office of the Department will consider and analyze potential climate change impacts when undertaking long-range planning exercises, when setting priorities for scientific research and investigations, when developing multi-year management plans, and/or *when making major decisions regarding the potential utilization of resources under the Department's purview*. Departmental activities covered by this Order include, but are not limited to, programmatic and long-term environmental reviews undertaken by the Department, management plans and activities developed for public lands, *planning and management activities associated with oil, gas and mineral development on public lands*, and

[22] Hansen, J., *et al.*, *Target Atmospheric CO2: Where Should Humanity Aim?* (2008) (emphasis added) (attached to the BCA June 2008 Lease Protest as Exhibit 46).

planning and management activities for water projects and water resources.

Section 3's action-forcing mechanisms are self executing. Section 4 provides that Secretarial Order 3226 "is effective immediately and will remain in effect until its provisions are converted to the Departmental Manual or until it is amended, superseded or revoked, whichever comes first." Thus, while the Department of the Interior, since 2001, has not yet developed global warming and climate change-related guidance for BLM and BLM's field offices, this fact does not excuse BLM's duties, here, to comply with Secretarial Order 3226. *See* 2007 GAO Report at 8. This is particularly so given Section 3's express reference to resource utilization – which, clearly, includes oil and gas leasing and development – and, even more clearly, "planning *and* management activities associated with oil, gas and mineral development on public lands ...."

To a degree, BLM's failure to comply with Secretarial Order 3226 appears political. As the GAO noted, "[o]fficials at BLM headquarters stated that the order was signed during the prior administration, and that the order has not been emphasized because it was not consistent with the current administration's previous position on climate change." *Id.* at 37. This seems to undercut BLM's representation that climate change is a "high priority." *Id.* at 175. Further undercutting BLM's representation is the view of federal land managers that "efforts to address the effects of climate change are *ad hoc* and piecemeal." *Id.* at 37. Regardless, as set forth in this protest, global warming and climate change implicate legal obligations that cannot be excused on the basis of top-down political emphases or, as the case may be, de-emphases.

b. The Federal Land Policy and Management Act Requires that BLM Consider and Analyze Potential Climate Change Impacts.

Secretarial Order 3226 is complemented by the Federal Land Policy and Management Act ("FLPMA"). FLPMA provides BLM with the authority and responsibility to address global warming and climate change. This is done through inventories, land use planning, and actual land use protection and management. As FLPMA states:

> [T]he national interest will be best realized if the public lands and their resources are periodically and systematically inventoried and their present and future use is projected through a land use planning process coordinated with other Federal and State planning efforts.

43 U.S.C § 1701(a)(2). This provision is reflected in an action-forcing mandate whereby BLM "shall prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values ...." 43 U.S.C. § 1711(a). These inventories are used in the development and implementation of Resource Management Plans ("RMPs"). 43 U.S.C. § 1712.

By law, the BLM, in developing and revising RMPs, must adhere to a series of planning principles. 43 U.S.C. § 1712I. In particular, BLM must "weigh long-term benefits to the public against short-term benefits" and "coordinate the land use inventory, planning, and management activities of or for such lands with the land use planning and management programs of other Federal departments and agencies and of the States and local governments within which the lands are located." 43 U.S.C. § 1712I(7), (9). The essential purpose behind RMPs is to plan for

affirmative land protection and management; without RMP-stage guidance, BLM is reduced to a reactive posture that is ultimately ineffective and contrary to FLPMA.

These planning principles are reinforced by FLPMA's imposition of affirmative environmental protection responsibilities on BLM. FLPMA requires that:

> [T]he public lands be managed in a manner that will protect the quality of the 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). Generally managed for multiple use and sustained yield (43 U.S.C. § 1701(a)(7)), BLM is duty bound to manage the public lands for the broad public interest:

> The term "multiple use" means the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resources uses that takes into account the long-term needs of future generations for renewable and non-renewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources *without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.*

43 U.S.C. § 1702I (emphasis added). These provisions are reinforced by affirmative mandates requiring that BLM: (1) "take any action necessary to prevent unnecessary or undue degradation of the lands" (43 U.S.C. § 1732(b)); and (2) "minimize adverse impacts on the natural, environmental, scientific, cultural, and other resources and values (including fish and wildlife habitat) of the public lands involved" (43 U.S.C. § 1732(d)(2)(A)).

c. The National Environmental Policy Act Requires that BLM Consider and Analyze Potential Climate Change Impacts.

Implementation of our Nation's mineral leasing program must also comply with the National Environmental Policy Act ("NEPA"); global warming and climate change are issues that must be addressed through the NEPA process. *See e.g., Ctr. For Biological Diversity v. Nat'l. Highway Traffic Safety Admin.*, 508 F.3d 508, 550 (9th Cir. 2007) (NHTSA failed to

evaluate adequately global warming impacts of changes to fuel efficiency standards for vehicles); *Mid States Coalition for Progress v. Surface Transp. Bd.*, 345 F.3d 520 (8th Cir. 2003) (increased coal consumption and global warming emissions was reasonably foreseeable effect of railroad expansion to transport coal).

NEPA provides an overlay on all BLM authorities and responsibilities; "the policies, regulations, and public laws of the United States *shall* be interpreted and administered in accordance with the policies set forth in [NEPA]...." 42 U.S.C. § 4332(1) (emphasis added). NEPA thus functions as "our basic national charter for protection of the environment." 40 C.F.R. § 1500.1(a). As our national charter, NEPA is designed to:

> encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; [and] to enrich the understanding of the ecological systems and natural resources important to the Nation...

42 U.S.C. § 4321; *see also id.* § 4331. Accordingly, all federal agencies, when they articulate "proposals for ... major federal actions significantly affecting the quality of the human environment," must prepare a hard look NEPA analysis *prior to* "any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." 42 U.S.C. § 4332(2)I(v). As federal courts have explained:

> Agencies are to perform this hard look before committing themselves irretrievably to a given course of action so that the action can be shaped to account for environmental values.

Sierra Club v. Hodel, 848 F.2d 1068, 1093 (10th Cir. 1988). The lease sale, as the point of commitment, must therefore be justified through the NEPA process. Pre-commitment NEPA analysis is key because:

> 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 [an] understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.

40 C.F.R. § 1500.1I; *see also* 40 C.F.R. § 1500.2(e).

To "foster excellent action," NEPA's implementing regulations provide that "[a]gencies shall not commit resources prejudicing selection of alternatives before making a final decision ([40 C.F.R. §] 1506.1)." *Id.*; 40 C.F.R. § 1502.2(f). The regulations further provide that the NEPA analysis "shall serve as the means of assessing the environmental impact of proposed agency actions, rather than justifying decisions already made." 40 C.F.R. § 1502.2(g). Thus, BLM cannot merely promise to address global warming and climate change issues in the future; BLM has an immediate duty to address these issues now, before BLM sells lease rights.

Through the NEPA process, BLM must address a proposal's "environmental impact" and the "adverse environmental effects which cannot be avoided should the proposal be implemented." 42 U.S.C. §§ 4332(2)I(i), (ii); 40 C.F.R. §§ 1502.16 (requiring discussion of environmental consequences), 1508.9 (defining an Environmental Assessment as encompassing requirement to address environmental impacts and consider alternatives). These impacts fall into one of three categories: (1) direct impacts; (2) indirect impacts; and (3) cumulative impacts. 40 C.F.R. §§ 1508.7, 1508.8.

Here, direct impacts include the GHG emissions from oil and gas operations to the atmosphere; the indirect, secondary GHG emissions and impacts triggered by exploration, production, and processing, transportation and distribution, and refining; and the cumulative impacts of GHG emissions and development to the atmosphere from oil and gas operations when combined with oil and gas operations in other BLM Resource Areas and other GHG emitting sources, such as coal-fired power plants. According to the American Petroleum Institute ("API"), "[t]he oil and gas industry...includes all direct activities related to producing, refining, transporting, and marketing crude oil and associated natural gas, and refined products....These segments are the direct activities within the oil and gas industry that have the potential to emit GHG." API Compendium at 2-1.[23] GHGs released by oil and gas operations include CO_2, methane, and to a lesser extent nitrous oxide ("N_2O").[24]

According to the API Compendium, key sources of GHGs associated with oil and gas exploration, production, and processing (i.e., the upstream end of the oil and gas industry) include combustion sources, such as natural gas compressor engines, vented methane from sources such as tanks, pneumatic devices, well completions and workovers, and gas dehydration and sweetening, and vented CO_2 from coalbed methane ("CBM") gas. These activities additionally involve the emission of GHGs from electricity imports. *See* Table 1 (below). To a lesser extent, N_2O is released by combustion sources associated with oil and gas exploration, production, and processing.

[23] Shires, T.M. and C.J. Loughran. *Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry*, American Petroleum Institute (February 2004) ("API Compendium") (attached to the BCA June 2008 Lease Protest as Exhibit 47); see also http://ghg.api.org/documents/CompendiumErrata205.pdf (errata).

[24] According to the U.S. Environmental Protection Agency, methane is 21 times more potent than CO_2 as a greenhouse gas, while nitrous oxide is 310 times more potent. *See*, www.epa.gov/methane/scientific.html and http://www.epa.gov/nitrousoxide/scientific.html (last visited March 21, 2008).

Table 1. GHGs from Oil and Gas Exploration, Production, and Processing Operations.[25]

EXPLORATION AND PRODUCTION	CO_2	N_2O	CH_4	Section
COMBUSTION SOURCES – Stationary Devices				
Boilers/Steam Generators	X	X	X	4.1, 4.2, 4.3
Heaters/Treaters	X	X	X	4.1, 4.2, 4.3
Internal Combustion (IC) Engines	X	X	X	4.1, 4.2, 4.3
Turbines	X	X	X	4.1, 4.2, 4.3
Flares	X	X	X	4.4
Incinerators	X	X	X	4.6
COMBUSTION SOURCES – Essential Mobile Sources				
Planes/helicopters	X	X	X	4.5
Supply boats, barges	X	X	X	4.5
Other company vehicles	X	X	X	4.5
COMBUSTION SOURCES – Indirects				
Electricity imports	X	X	X	4.7
Process heat/steam imports	X	X	X	4.7
VENTED SOURCES – Process Vents				
Gas sweetening processes	X		X	5.1
Dehydration processes			X	5.1
VENTED SOURCES – Other Venting				
Tanks	X		X	5.4
Pneumatic devices	X (*)		X	5.6.1
Chemical injection pumps	X (*)		X	5.6.2
Well testing	X (*)		X	5.6.3
Exploratory drilling	X		X	5.6.3
VENTED SOURCES – Maintenance/Turnarounds				
Vessel blowdown	X (*)		X	5.7.2
Well workovers	X (*)		X	5.7.2
Compressor starts	X (*)		X	5.7.2
Compressor blowdowns	X (*)		X	5.7.2
Gathering pipeline blowdowns	X (*)		X	5.7.2
VENTED SOURCES – Non-routine Activities				
Pressure relief valves (PRVs)	X (*)		X	5.7.2
Well tests and blowdowns (when not flared)	X (*)		X	5.7.2
Emergency shutdown (ESD)/ emergency safety blowdown (ESB)	X (*)		X	5.7.2
FUGITIVE SOURCES				
Equipment component leaks	X (*)		X	6.1

X Document provides an emission estimation approach for these sources.
*Emission estimation approach is provided, but only applicable to CO_2 rich production streams (e.g., CO_2 flood or enhanced oil recovery). Significance of these sources depends on the CO_2 concentration and source-specific emission rate.

Downstream of oil and gas exploration, production, and processing operations, key sources of GHGs include the transportation and distribution of oil and gas, and oil refining. According to the API, GHGs from transportation and distribution are released as crude oil and associated gas are moved from the production sector to refineries or gas processing plants, and may also include

[25] *See* API Compendium at 2-5.

the movement of natural gas or other petroleum products to market or distribution centers. Key direct sources of GHGs include process engines and heaters, storage tanks, and transportation activities. *See* Table 3. With regards to oil refining, the API explains, "The refining segment consists of all refinery sites that take in crude and produce finish products, such as gasoline." API Compendium at 2-12. GHGs are released during distillation processes that separate petroleum hydrocarbons into narrower boiling ranges, and a number of processes that react with the hydrocarbons, including cracking, coking, reforming, alkylation, and isomerization. While CO_2 is the key GHG associated with refining, methane and nitrous oxide are also released during the process. *See* Table 4 (below).

Table 3. GHGs from Oil and Gas Transportation and Distribution Operations.[26]

TRANSPORTATION AND DISTRIBUTION	CO_2	N_2O	CH_4	Section
COMBUSTION SOURCES – Stationary				
Turbines	X	X	X	4.1, 4.2, 4.3
Engines	X	X	X	4.1, 4.2, 4.3
Heaters	X	X	X	4.1, 4.2, 4.3
Flares	X	X	X	4.4
Catalytic and thermal oxidizers	X	X	X	4.6
COMBUSTION SOURCES – Essential Mobile Sources				
Marine, road, or railroad tankers	X	X	X	4.5
Barges	X	X	X	4.5
Planes/helicopters	X	X		4.5
Other company vehicles	X	X		4.5
COMBUSTION SOURCES - Indirects				
Electricity imports	X	X	X	4.7
Process heat/steam imports	X	X	X	4.7
VENTED SOURCES – Process Vents				
Storage tanks			X	5.4
Loading/unloading/transit			X	5.5
Pneumatic devices			X	5.6.1
VENTED SOURCES – Maintenance/Turnarounds				
Pipeline blowdowns			X	5.7.4, 5.7.5
Pigging operations			X	5.7.4
Compressor starts			X	5.7.4
Compressor blowdowns			X	5.7.4
Compressor station blowdowns			X	5.7.4
Vessel blowdowns			X	5.7.4
VENTED SOURCES – Non-Routine Activities				
Pressure relief valves			X	5.7.4, 5.7.5
Surge tanks			X	5.7.4
FUGITIVE SOURCES				
Process equipment leaks			X	6.1
Pipeline leaks			X	6.1

[26] *See* API Compendium at 2-11.

Table 4. GHGs from Oil Refining Operations.[27]

REFINING	CO_2	N_2O	CH_4	Section
COMBUSTION SOURCES – Stationary Devices				
Boilers	X	X	X	4.1, 4.2, 4.3
Process heaters	X	X	X	4.1, 4.2, 4.3
Turbines	X	X	X	4.1, 4.2, 4.3
Engines	X	X	X	4.1, 4.2, 4.3
Flares	X	X	X	4.4
Catalytic and thermal oxidizers	X	X	X	4.6
Coke calcining kilns	X	X	X	4.6
Incinerators	X	X	X	4.6
COMBUSTION SOURCES – Essential Mobile Sources				
Company vehicles	X	X		4.5
COMBUSTION SOURCES - Indirects				
Electricity imports	X	X	X	4.7
Process heat/steam imports	X	X	X	4.7
VENTED SOURCES – Process Vents				
Catalytic cracking	X			5.2.1
Catalytic reforming	X			5.2.1
Catalyst regeneration	X			5.2.1, 5.2.4
Thermal cracking				5.2.6
Flexi-coking	X			5.2.3
Delayed coking	X			5.2.3
Steam methane reforming (hydrogen plants)	X			5.2.2
Sulfur recovery units				5.2.6
Asphalt production				5.2.5
VENTED SOURCES – Other Venting				
Storage tanks				5.4
Pneumatic devices				5.6.1
Loading racks			X	5.5
VENTED SOURCES – Maintenance/Turnarounds				
Equipment/process blowdowns			X	5.7.6
Heater/boiler tube decoking			X	5.7.6
Compressor starts			X	5.7.6
VENTED SOURCES – Non-routine Activities				
Pressure relief valves (PRV)	X		X	5.7.6
Emergency shut down (ESD)	X		X	5.7.6
FUGITIVE SOURCES				
Fuel gas system leaks			X	6.1, B.3
Other process equipment leaks			X	6.1, B.3
Wastewater collection and treating			X	6.2.1
Sludge/solids handling				6.2.1
Cooling towers				6.2.1

According to the API, other oil and gas industry operations that may release GHGs include petrochemical manufacturing, mining, heat and electricity generation, and oil and gas retail and marketing. These processes utilize equipment and practices that release CO_2, methane,

[27] *See* API Compendium at 2-13.

and N_2O. *See* API Compendium at 2-10, 2-15, 2-16, and 2-17. As is evident, the GHG footprint of the oil and gas industry can be quite large, extending from a single well downstream to refineries and other major sources.

Fundamentally, BLM must take a hard look at the full lifecycle of GHG emissions from oil and gas development (i.e., both upstream and downstream) and must not look at GHG emissions "in a vacuum." *Grand Canyon Trust v. FAA*, 290 F.3d 339, 342 (D.C. Cir. 2002). Beyond GHG emissions from oil and gas, BLM must also forthrightly address impacts from global warming and climate change to the environment and the validity of ongoing BLM management; a business-as-usual approach that ignores the impact of global warming and climate change to the environment, and to the validity and efficacy of ongoing BLM management, is self defeating and would compromise the environment and BLM's ability to execute future land protection and management decisions.[28]

Importantly, NEPA does not mandate that BLM simply take a hard look at the impacts of GHG emissions from oil and gas operations to the atmosphere and the impacts of global warming and climate change to the environment; NEPA affirmatively obligates BLM to consider what to do about such impacts. *See* 42 U.S.C. § 4321, 4331 (detailing NEPA's purpose and declaration of national environmental policy). To accomplish NEPA's purpose and our national environmental policy, BLM must consider "alternatives to the proposed action" and "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)I(iii), 4332(2)(E). BLM must "[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). Alternatives, notably, constitute NEPA's "heart." 40 C.F.R. § 1502.14(a). Operating in concert with NEPA's mandate to address environmental impacts, BLM's fidelity to alternatives analysis allows agencies to "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.

Here, these alternatives consist of GHG-specific lease stipulations and post-lease conditions of approval to oil and gas operations designed to reduce GHG emissions from production-based activities carried out on public lands. Given the nature of the problem, and how oil and gas development is authorized, these stipulations and conditions of approval must be identified and analyzed on the basis of pre-commitment decision-making and NEPA analysis. Awaiting post-commitment decision-making and NEPA analysis is too late as BLM has surrendered lease rights and thus constrained its own legal authority. Thus, in certain instances, for BLM to impose GHG reduction measures, BLM may have to burden a lease with a stipulation before the lease is sold and could not rely on an APD-stage condition of approval. Pragmatically, given the scope of global warming and climate change issues implicated by oil and gas leasing and development, broad-scale pre-commitment decision-making and NEPA analysis, whether completed regionally, state-wide, or for each Resource Area, offers significant efficiencies of scale, and affords BLM the chance to reach out to federal and state partners, engage the public and the oil and gas industry in a meaningful, transparent dialogue, and allow all parties to plan for and implement GHG reduction measures in a uniform, efficient, and consistent fashion.

[28] The impacts of global warming and climate change are detailed below in Section IV.5.

A review of BLM's recent NEPA logs for the Pinedale Field Office in Wyoming evidences numerous discrete oil and gas decisions and attests to the legal and pragmatic difficulty – if not impossibility – of addressing climate change and GHG emissions issue at the APD stage given: (1) the geographic scale of climate change impacts; (2) the massive volume of APD-stage decisions; (3) the legal consequence of the lease rights to BLM's authority; (4) the fact that these APD-stage decisions typically present a singular, myopic element of the overall lifecycle of GHG emissions from production, processing, transmission, and distribution activities; and (5) the need for BLM to solicit public review and comment on these decisions.[29]

Furthermore, as demonstrated by BLM NEPA logs in the Pinedale Field Office, BLM is approving a number of new wells through use of "Categorical Exclusions" and "Determinations of NEPA Adequacy" ("DNAs") and is therefore rarely preparing either Environmental Assessments or Environmental Impact Statements. Unlike Environmental Impact Statements, categorical exclusions receive perfunctory and truncated review at best; often the decision to capture a decision within a categorical exclusion is supported by no more than a checklist. DNAs are not even expressly sanctioned by NEPA or CEQ regulations, and appear patently inappropriate in the context of approving oil and gas development. Regardless, given the much abbreviated treatment given to APDs, it is highly unlikely that BLM will – or could – consider climate change at this stage or afford the public a meaningful opportunity to raise climate change issues at the APD stage. Moreover, given the nature of the problem, and the evidence contained within this protest, it is, put simply, arbitrary and capricious to defer such consideration until the APD stage. These issues must be addressed at a broader scale. Finally, BLM frequently emphasizes that it has only limited resources. It is difficult to imagine that addressing the issues and concerns presented in this protest at the APD stage is possible given BLM's limited resources.

Beyond alternatives that consider GHG reduction measures, alternatives centered on protecting the ecological environment – consisting of both built (e.g., human communities) and natural systems (e.g., watersheds and wildlife habitats) – on or proximate to BLM-managed public lands must account for global warming and climate change impacts. Land protection and management measures involving the protection of landscape permeability; key wildlife habitats, in particular core areas and migration/adaptation corridors; key watersheds, *etc.* must therefore be considered before lease rights are sold to ensure that the ecological landscape is properly protected and managed.[30]

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[29] Sample copy log is attached to the BCA June 2008 Lease Protest as Exhibit 41.

[30] Science-based mechanisms designed to compile information using computational models to predict landscape, vegetation, and wildlife changes in response to changing climate conditions are being developed now. *See* LandScope America, collaborative project of NatureServe and the National Geographic Society (http://www.natureserve.org/projects/landscope.jsp); Climate Impacts Group, University of Washington (http://cses.washington.edu/cig/pnwc/cc.shtml); Climate Change and Aspen: An Assessment of Impacts and Potential Responses (2006) (http://www.agci.org/pdf/Canary/ACIA_Report.pdf); Easterling DR, Meehl J, Parmesan C, Chagnon S, Karl TR, Mearns LO. 2000, *Climate extremes: observations, modeling, and impacts*, Science 289:2068-74.

For example, BLM should address wildlife protection alternatives prior to the sale of such a large expanse of the Bighorn Basin. This area is located in North-central Wyoming. The area that is proposed for leasing includes roughly 155,995 acres. This area is important to many Wyoming residents who visit the area to hunt, fish, hike, photograph, enjoy solitude, and watch wildlife. Areas in the Bighorn Basin have been proposed for Wilderness protection and a number of lease parcels are within and/or adjacent to WSAs and CWPs.

The areas proposed for leasing in the Bighorn Basin are home to diverse wildlife, including elk, pronghorn, mule deer, bobcats, big horn sheep, sage grouse, mountain lions, many raptor species, and wild horses, . In addition to these more common species, the area is also home to rare and imperiled wildlife, including the bald eagle and Yellowstone cutthroat trout, Snake River cutthroat trout, and Bear River cutthroat trout in the Bighorn River. This area includes a wide range of ecosystems, from grassy highlands to colorful eroded badlands. It includes large swaths of unfragmented habitat and supports natural communities that are becoming more scarce in Wyoming and across the West. Maintenance of the natural character of this area is a key part of a larger effort to conserve the biodiversity of the Rocky Mountains Ecoregion. Other areas proposed for leasing throughout Wyoming also have diverse and rich ecosystems that must be protected.

The proposed leasing could have direct, indirect, and cumulative negative impacts on all species found on and/or near lease parcels. The BLM will have to coordinate intensively with BLM's federal and state partners to address protection and management issues and concerns implicated by climate change at broader landscape scales to protect native species. The cost of BLM's failure to consider alternatives in terms of damaged wildlands, shrinking fish and wildlife populations, lost tourist revenue, and disappearing drinking water supplies may very well be exorbitant.[31]

Of note, once a NEPA analysis is completed, BLM must prepare a supplement whenever "[t]he agency makes substantial changes in the proposed action that are relevant to environmental concerns" or "[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R. §§ 1502.9I(1)(i)-(ii). As noted by the Supreme Court of the United States,

> It would be incongruous with ... [NEPA's] manifest concern with preventing uninformed action, for the blinders to adverse environmental effects, once unequivocally removed, to be restored prior to the completion of agency action. .....

Marsh v. Or. Nat. Resources Council, 490 U.S. 360, 371 (1989). Thus, BLM cannot

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[31] Even where an agency determines that the "costs of obtaining information is exorbitant or the means to obtain it are not known," CEQ regulations require an agency in its EIS to (1) state that the information is unavailable; (2) state the information's relevance; (3) give a summary of the existing "scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts"; and (4) evaluate such impacts based on "theoretical approaches or research methods generally accepted in the scientific community." 40 C.F.R. § 1502.22(b).

simplistically rely on existing NEPA analyses to justify the lease sales given that these NEPA analyses do not appear to address global warming and climate change in *any* capacity – let alone a meaningful capacity.

Importantly, the Protestors submit that the August 5, 2008 lease sale constitutes a proposal for purposes of NEPA that is distinct from the RMP-stage proposals which served as the basis for the RMP-stage NEPA analyses which BLM has apparently – and wrongly – relied upon to justify the lease sales. 40 C.F.R. § 1508.23. Thus, the Protestors believe that a "supplemental" NEPA analysis would generally not provide the proper analytical foundation unless BLM articulated a purpose and need that ensured: (1) a lease-stage hard look at the impacts of oil and gas leasing within the precise context of the proposed parcels to properly understand the significance and acceptability of impacts; (2) the consideration of proper lease-stage alternatives; and (3) the consideration of alternatives that did not fixate solely on oil and gas but, more broadly, protection of the environment as a whole. On the second point, lease-stage alternatives are distinct from RMP-stage alternatives, in particular relative to BLM's duty to address a no action alternative. In short, an RMP-stage no action alternative consists of the "continuation of present level or systems of resource use" while a lease-stage no action alternative consists of the distinct option of not selling the lease. *See* 43 C.F.R. § 1610.4-5.

At bottom, agency adherence to NEPA's action-forcing mandates ensures that NEPA's noble purpose and policies (42 U.S.C. §§ 4321, 4331) are achieved. As explained by the Supreme Court, "the thrust of [NEPA] is ... that environmental concerns be integrated into the very process of agency decision-making" *Andrus v. Sierra Club*, 442 U.S. 347, 350 (1979). The August 5, 2008 lease sale appears to be a textbook example of agency decision-making that violates this basic principal.

BLM should not be surprised by this Protest; beyond Secretarial Order 3226, BLM's duty to address global warming and climate change through NEPA was acknowledged over ten years ago by the Council on Environmental Quality ("CEQ"). CEQ, in draft guidance issued in 1997, stated that the "NEPA process provides an excellent mechanism for consideration of ideas related to global climate change."[32] CEQ then decided that the available scientific evidence showed that climate change is a reasonably foreseeable impact that must be considered in NEPA documents.[33] Of course, at this juncture, the available scientific evidence demonstrates that global warming and climate change are not merely reasonably foreseeable, but *observed*, with impacts to our environment being felt *now*. *See e.g.*, 2007 IPCC Synthesis Report. Regardless, CEQ concluded that "it would be prudent to consider in the context of planning for major federal actions, both their potential impact on emissions of greenhouse gases and how climate change might itself affect major federal projects."[34] CEQ importantly noted that "a regulatory change is not necessary in order to require federal agencies to consider global climate change in NEPA documents" because the scope of NEPA is broad enough to include such effects.[35] In particular,

[32] Memorandum from McGinty, Kathleen A., Chairman, Council on Environmental Quality, to Heads of Federal Agencies on Draft Guidance Regarding Consideration of Global Climatic Change in Environmental Documents Prepared Pursuant to the National Environmental Policy Act 1 (Oct. 8, 1997)
[33] *Id.* at 4.
[34] *Id.* at 3.
[35] *Id.* at 4, fn. 3.

the CEQ Guidance stated that "[c]onsideration of the potential impact of climate change on [large-scale] projects may be critical to avoiding costly operation and maintenance problems in future decades," and therefore consideration of climate change is especially crucial in programmatic analyses.[36] Specifically, CEQ called upon federal agencies to determine how their activities contribute to the emission of GHGs and thus to global warming and climate change, and to review how the agencies' activities will in turn be affected by the consequences of climate change.[37]

In accordance with CEQ's Guidance, other agencies have issued guidance incorporating climate change into NEPA documents. The National Park Service's Handbook for Environmental Impact Analysis notes that programmatic documents are often "ideal places" to address issues such as global warming.[38] The Minerals Management Service ("MMS"), BLM's counterpart in terms of managing offshore oil and gas resources, established NEPA Procedures for addressing climate change considerations in NEPA documents, citing to CEQ's 1997 Guidance document.[39] In keeping with its own guidance and CEQ's conclusion that climate change is a "reasonably foreseeable" impact of greenhouse gas emissions, MMS – right now – inventories emissions caused by oil and gas leasing on the Outer Continental Shelf and considers the contribution of such leases to climate change in both programmatic and lease-specific NEPA analyses.[40] For example, in its programmatic Final EIS for Outer Continental Shelf Oil and Gas Leasing Program from 2007 to 2012, MMS estimated "the total emissions of CO_2 and CH_4 for all projected activities associated with the proposed 5-year program."[41] MMS then used this information to determine potentially appropriate mitigation measures as well as to determine which GHG reductions would have the greatest impact in reducing GHG emissions. In addition to its programmatic NEPA analyses, MMS has also considered GHG emissions in individual lease sales to address both the impact of climate change on the lease sale as well as the lease sale's contributions to the adverse effects of climate change.[42] [43]

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[36] *Id.* at 2.

[37] *Id.* at 5.

[38] National Park Service, Director's Order No. 12 Handbook for Environmental Impact Analysis, 89 (2001), available at http://home.nps.gov/applications/npspolicy/DOrders.cfm (relevant excerpts attached as Exhibit 48)

[39] *See* Minerals Management Service, *NEPA Procedures, Global Climate Change*, available at http://www.mms.gov/eppd/compliance/nepa/procedures/climate/index.htm; Minerals Management Service, *Global Climate Change Considerations* available at www.mms.gov/eppd/compliance/nepa/procedures/climate/considerations.htm (relevant excerpts of both attached to the BCA June 2008 Lease Protest as Exhibit 49).

[40] Minerals Management Service, Outer Continental Shelf Oil and Gas Leasing Program: 2007-2012 Final Environmental Impact Statement, IV-3 - IV-12 (April 2007), available at www.mms.gov/5-year/2007-2012_FEIS.htm (relevant excerpts attached as Exhibit 50); Minerals Management Service, Environmental Assessment Proposed Oil and Gas Lease Sale 195 Beaufort Sea Planning Area, Appendix I (July 2004) available at www.mms.gov/alaska/ref/eis_ea.htm, http://www.mms.gov/alaska/ref/EIS%20EA/BeaufortFEIS_195/Sale195/EA195without%20linkver4.pdf (relevant excerpts attached as Exhibit 51).

[41] BCA June 2008 Lease Protest Exhibit 28, MMS, 2007-2012 FEIS at IV-12, Tables IV-1 – IV-3, IV-5.

[42] BCA June 2008 Lease Protest Exhibit 29, EA for Proposed Oil and Gas Lease Sale 195, Appendix I; Appendix C, Section VI.C.4 of the Biological Evaluation.

[43] Accentuating BLM's duty to address GHG emissions from onshore oil and gas leasing and development prior to the sale of a lease, it is notable that once a lease is sold, MMS retains more legal authority to protect the environment than BLM. *See, e.g.*, 43 U.S.C. § 1351(h) (delineating MMS' development-stage legal authority); *see*

d. The Public Trust Duty Requires that BLM Consider and Analyze Potential Climate Change Impacts.

BLM is subject not only to its statutory responsibilities, but the Public Trust Duty, a principle embedded in law as an attribute of the Federal Government's sovereignty. While the Public Trust Duty is most frequently applied to state governments, it applies with equal force to the Federal government. In basic terms, the Public Trust Duty is derived from the common law of property and acts as a fundamental safeguard to ensure that public trust resources are properly managed to ensure the public's welfare and survival. *See Illinois Cent. R. Co. v. Illinois*, 146 U.S. 387, 455 (1892), *Geer v. Connecticut*, 161 U.S. 519, 525-29 (1896) (detailing ancient and English common law principles of sovereign trust ownership of air, water, sea, shores, and wildlife). In effect, here, the Public Trust Duty underscores the need for BLM to take a precautionary approach to managing the public lands and cannot hide behind the false premise that oil and gas interests are on a par with the broader interests of the whole public.

The Public Trust Duty imposes upon BLM a duty of "reasonable care" in protecting the trust. Restatement (Second) of Trusts § 176 (1957) ("The trustee is under a duty to the beneficiary to use reasonable care and skill to preserve the trust property."). The Public Trust Duty is, to a degree, reflected in Secretarial Order 3226, FLPMA, and NEPA, providing a foundation to interpret and apply these statutory provisions in the context of federal public lands. *See e.g.*, 42 U.S.C. § 4331(b)(1) (2006) (declaring a national duty to "fulfill the responsibilities of each generation as trustee of the environment for succeeding generations"). However, the Public Trust Duty is also fundamentally more expansive, imposing upon BLM a duty that cannot be excused by mere reference to or compliance with BLM's statutory mandates. As the Court said in *Illinois Central*, "[t]he state can no more abdicate its trust over property in which the whole people are interested...than it can abdicate its police powers in the administration of government and the preservation of the peace...." 146 U.S. 387, 460.

As a trustee, BLM must protect trust resources for present and future generations. BLM is therefore prohibited from allowing irrevocable harm to public lands or the atmosphere by private interests. In *Geer v. Connecticut*, the Supreme Court explained that:

> [T]he power or control lodged in the State, resulting from this common ownership, is to be exercised, like all other powers of government, as a trust for the benefit of the people, and not as a prerogative for the advantage of the government, as distinct from the people, or for the benefit of private individuals as distinguished from the public good. . . . [T]he ownership is that of the people in their united sovereignty.

161 U.S. 519, 529.

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also Wyoming Outdoor Council, 157 I.B.L.A. 259, 265-66 (October 15, 2002) (rejecting BLM argument that BLM may defer NEPA analysis subsequent to lease issuance by refusing to equate BLM's limited post-commitment authority, pursuant to 30 U.S.C. § 226(g), with MMS' more expansive post-commitment authority, pursuant to 43 U.S.C. § 1351(h)).

Here the trust resources, or "*res*," are the public lands themselves and, more broadly, the atmosphere whose stability is harmed by anthropogenic GHG emissions. The Public Trust Duty obligates BLM to exercise its duty of reasonable care by quantifying GHG emissions from oil and gas operations on public lands, to affirmatively reduce those GHG emissions to protect the atmosphere and the public lands, and to affirmatively take action to ensure that the built and natural environments on BLM public lands are sufficiently resilient to withstand, as best as they are able, global warming and climate change impacts. As noted, the Public Trust Duty, in a sense, tips the balance in favor of the broad public interest as compared to the insular interests of the oil and gas industry.

4. BLM MUST ADDRESS GLOBAL WARMING, CLIMATE CHANGE, AND GREENHOUSE GAS EMISSIONS FROM FEDERAL ONSHORE OIL AND GAS DECISIONMAKING ACTIONS BEFORE LEASE RIGHTS ARE SOLD

a. BLM Must Quantify Past, Present, and Reasonably Foreseeable GHG Emissions from Oil and Gas Development to Address the Direct, Indirect, and Cumulative Impacts of these GHG Emissions to the Environment.

As explained above, direct and indirect GHG emissions from oil and gas industry operations include CO_2, methane, and to a lesser extent N_2O, from a number of sources and processes. In Wyoming, the BLM's surrender of lease rights will open the door for conventional natural gas development, CBM development, crude oil development, as well as attendant operations that will facilitate this development.

Indeed, development of oil and gas, including CBM, occurs throughout the State of Wyoming. In 2007, the WOGCC issued a record 8,122 drilling permits in the State of Wyoming. *See* BCA et al. June 2008 Lease Protest Exhibit 52. In November 2004 WOGCC approved **one** APD; in November 2007—just three years later—WOGCC approved 559 APDs. *Id.* In April 2008, 881 APDs were approved. The steep rise in the rate of approvals in a short time emphasizes the exponential increase in impacts to the land, wildlife and air quality.

GHG emissions associated with such oil and gas development will stem from a number of potential sources. According to a review by the California Air Resources Board, such sources include:

- Exploration, which includes CO_2 emissions from truck motors used in vibroseis or other exploratory operations;
- Well development, which includes GHG emissions from pad clearing, road construction, rigging up and drilling, the use of drilling fluids, casing placement, and well completion and testing (including emissions from hydraulic fracturing and the flaring and venting of flowback gases);
- Primary and secondary production phases, which include GHG emissions from the installation and use of compressor engines, well treatment and workovers, wellsite visits, wellsite facilities (including separators, heater treaters, gas conditioning, dehydration,

wastewater disposal, and evaporation ponds), leaks from primary and secondary production equipment (e.g., pipelines, valves, etc.), and accidental releases (e.g., well blowouts); and
- Site abandonment, which includes GHG emissions from plugging activities and site reclamation.[44]

Inventories of GHG emissions from oil and gas activities are now commonplace. The Environmental Protection Agency ("EPA") is currently in the process of updating its Inventory of U.S. Greenhouse Gas Emissions and Sinks for 1990-2006.[45] A draft report is presently available for review.[46] Archived EPA information provides reports for previous inventories.[47] MMS, as discussed above, has also been quantifying GHG emissions from offshore oil and gas operations in both programmatic and lease-specific NEPA analyses.

Additionally, individual states, particularly in the Rocky Mountain region, have taken the initiative to understand and take action to reduce GHG emissions by preparing state-level inventories. In fact, several oil and gas producing states, including Wyoming, have developed GHG inventories and have specifically prepared estimates for the oil and gas industry:

Wyoming. According to a Spring 2007 GHG inventory for the State of Wyoming, oil and gas operations released 11.5 tons of CO_2 in 2005, more than 20% of the state's total GHG emissions making oil and gas operations the second largest source of GHG emissions. Furthermore, by 2020, GHGs from oil and gas operations are projected to increase by nearly 10%. GHG emissions from oil and gas operations in Wyoming are reported to stem from CBM production and processing, conventional natural gas production and processing, and oil development and refining. *See* Final Wyoming Greenhouse Gas Emissions Inventory and Reference Case Projections 1990-2020 (attached to the BCA et al. June 2008 Lease Protest as Exhibit 53). The Wyoming GHG inventory states, "The natural gas industry is the major contributor to both GHG emissions and emissions growth[.]" BCA et al. June 2008 Lease Protest Exhibit 53 at E-6.

Colorado. According to an October 2007 GHG inventory for the State of Colorado, oil and gas operations directly released 5.16 million metric tons of CO_2 equivalent ("CO_2e") in 2005, more than 4% of the state's total GHGs.[48] *See* Final Colorado Greenhouse Gas Emissions Inventory and Reference Case Projections 1990-2020 (attached to the BCA et al. June 2008 Lease Protest as Exhibit 54).[49] Furthermore, GHGs from oil and gas operations are projected to increase by more than 80% by 2020. Although GHG emissions are reported to stem from both oil and gas production processing, and refining, the inventory states that "The natural gas industry accounts for the majority of both GHG emissions and emissions growth in the fossil fuel

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[44] Zahniser, A., *Characterization of greenhouse gas emissions involved in oil and gas exploration and production activities*, review for California Air Resources Board (undated) (attached to the BCA June 2008 Lease Protest as Exhibit 52) (available at www.wrapair.org/WRAP/ClimateChange/GHGProtocol/meetings/071025/Characterization_of_O&G_Operations_Sector_Emissions.pdf)

[45] www.epa.gov/climatechange/emissions/usinventoryreport.html

[46] www.epa.gov/climatechange/emissions/downloads/08_CR.pdf

[47] www.epa.gov/climatechange/emissions/usggginv_archive.html

[48] CO_2 equivalent refers to the global warming potential of a GHG, where CO_2 has a potential of "1" and, for example, methane has a potential of "21." Therefore, one ton of methane equals 21 tons of CO_2 equivalent.

[49] www.coloradoclimate.org/ewebeditpro/items/O14F13894.pdf

industry as a whole." BCA et al. June 2008 Lease Protest Exhibit 54 at E-5.

Montana. According to a September 2007 GHG inventory for the State of Montana, oil and gas operations released 4.7 million metric tons of CO_2e in 2005, more than 12% of the state's total GHG emissions. Furthermore, GHGs from oil and gas operations are projected to increase by more than 10% by 2020. GHG emissions from oil and gas operations in Montana are reported to stem from CBM production and processing, conventional natural gas production and processing, and oil development and refining. *See* Final Montana Greenhouse Gas Emissions Inventory and Reference Case Projections 1990-2020 (attached to the BCA et al. June 2008 Lease Protest as Exhibit 55).

New Mexico. According to the November 2006 GHG inventory for the State of New Mexico, oil and gas operations released 19.3 million metric tons of CO_2e in 2000, more than 23% of the state's total GHG emissions. Based on this data, oil and gas operations represent the second largest source of GHGs in New Mexico. Although this report shows that oil and gas GHGs are projected to increase by only 3.62% by 2020, the report based this projection on the assumption that there would be no change (i.e., decrease or increase) in natural gas or oil production in the state, an assumption that appears invalid. GHG emissions from oil and gas operations in New Mexico are reported to stem from CBM production and processing, conventional natural gas production and processing, and oil development and refining. *See* Final New Mexico Greenhouse Gas Emissions Inventory and Reference Case Projections 1990-2020 (attached to the BCA et al. June 2008 Lease Protest as Exhibit 56).

These GHG quantification efforts provide a useful starting point for BLM. They largely constitute top-down efforts to quantify GHG emissions and are less refined then bottom-up inventories prepared on the basis of specific equipment inventories and GHG measurements.

Complementing this governmental GHG quantification work is the API Compendium, referenced extensively above. In addition to explaining sources of GHGs associated with the oil and gas industry, the API Compendium lists emission factors and methodologies for estimating GHG gas emissions from compressor engines, fugitive sources, pneumatic controllers, and among many other pieces of equipment and processes. The API Compendium provides the best available information to quantify GHG emissions from oil and gas operations, particularly with regards to combustion sources. Indeed, a recent review by the California Energy Commission found that the API Compendium's "methods and data on evaluating combustion emissions and refinery emissions are considered the best information."[50] Although this same review recommended refinement of certain API Compendium methodologies, the review found the Compendium to be accurate and reliable.[51] A review of the API Compendium – as well as follow up assessments of the API such as the California Energy Commission's review – should provide BLM with a solid basis for quantifying GHG emissions from BLM-authorized oil and gas development.

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[50] California Energy Commission, *Evaluation of Oil and Gas Sector Greenhouse Gas Emissions Estimation and Reporting*, prepared by TIAX LLC and ICF Consulting (April 14, 2006) (attached to the BCA June 2008 Lease Protest as Exhibit 57).

[51] In the California Energy Commission review of the API Compendium, ICF Consulting provides recommendations for refining estimates of methane emissions from oil and gas operations.

The California Climate Action Registry is also in the process of finalizing protocol for quantifying GHGs from the natural gas transmission and distribution industry sector. In a 2007 final draft report entitled, the California Climate Action Registry identified methods to quantify GHG emissions from combustion sources, including compressor engines, direct emissions from process vents, fugitive emissions, and indirect GHG emissions.[52] Although the final draft report focuses on the natural gas transmission and distribution sector, many of the processes and equipment used by this sector are also used at the exploration and production stage of natural gas development.

By quantifying GHG emissions, BLM can provide itself with a base of knowledge to properly address global warming and climate change through the NEPA process and, accordingly, can properly ensure compliance with not just NEPA, but BLM's legal responsibilities pursuant to Secretarial Order 3226, FLPMA, and the Public Trust Duty. How this knowledge is displayed is of course important. An aggregate GHG emissions total for BLM-authorized oil and gas development is important to determine the contribution of such development to global, national, regional, and local GHG emissions footprints. But, given the varied equipment and technologies used in oil and gas development, and the varied conditions and circumstances in the field, it is also important to refine this information as much as possible to identify the precise sources and magnitude of those GHG emissions. This is particularly important given that upstream oil and gas production involves individually minor, but collectively significant GHG emissions sources. Such refined data enables BLM to best support GHG reduction efforts by identifying the highest impact, most cost-effective GHG reduction measures, and positions BLM to work effectively with federal and state agency partners, the public, and the oil and gas industry. In so doing, BLM allows all parties the opportunity to plan for and implement GHG reduction measures in a uniform, efficient, and consistent fashion.

Indeed, while the legal basis for quantifying GHG emissions is clear, there is a need for the BLM to refine existing top-down inventories to accurately and effectively implement GHG reduction strategies, as well as to instill certainty in the process. As explained in the Final New Mexico GHG Inventory and Reference Case Projections, 1990-2020:

> The sheer number and wide diversity of oil and gas activities in New Mexico present a major challenge for greenhouse gas assessment. Emissions of carbon dioxide and methane occur at many stages of the production process (drilling, production, and processing/refining), and can be highly dependent upon local resource characteristics (pressure, depth, water content, etc.), technologies applied, and practices employed (such as well venting to unload liquids which may result in the release of billions of cubic feet of methane annually). With over 40,000 oil and gas wells in the State, three oil refineries, several gas processing plants, and tens of thousands of miles of gas pipelines in the State – and no regulatory requirements to track CO_2 or CH_4 emissions – there are significant uncertainties with respect to the State's GHG emissions from this sector.

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[52] California Climate Action Registry, *Discussion Paper for a Natural Gas Transmission and Distribution Greenhouse Gas Reporting Protocol,* prepared by the URS Corporation and the LEVON Group (2007) (attached to the BCA June 2008 Lease Protest as Exhibit 58).

BCA et al. June 2008 Lease Protest Exhibit 56 at D-35. The Final New Mexico GHG Inventory and Reference Case Projections further noted:

> Local estimates of field gas use and provided by [the New Mexico Oil & Gas Association] suggest that top-down estimates of natural gas production-related emissions provided here (based on national average emission rates) may be low. Furthermore, CO_2 emissions that may occur as the result of CO_2 mining and use for enhanced oil recovery could be significant, but have not been estimated. Further analysis of emissions from activities in all of the State's principal gas and oil basins, as well as of emissions from transmission and distribution sources could help to resolve some of these uncertainties. Given the large emission reduction potential that may exist in these sectors, such efforts could be quite valuable.

Id. at D-18. Although these statements relate to oil and gas development in the State of New Mexico, the situation is similar, if not exactly the same in Wyoming. As the Final Wyoming Greenhouse Gas Emissions Inventory and Reference Case Projections 1990-2020 states:

> Emissions of CH_4 and entrained CO_2 can occur at many stages of production, processing, transmission, and distribution of oil and gas. With over 33,000 gas and oil wells in the state, 45 operational gas processing plants, 5 oil refineries, and over 9,000 miles of gas pipelines, there are significant uncertainties associated with estimates of Wyoming's GHG emissions from this sector. This is complicated by the fact that there are no regulatory requirements to track CO_2 or CH_4 emissions. Therefore, estimates based on emissions measurements in Colorado are not possible at this time.

BCA et al. June 2008 Lease Protest Exhibit 54 at E-2. Simply put, while oil and gas industry GHG emissions are being inventoried, these inventories have yet to fully capture the diversity and magnitude of emissions from every source related to oil and gas industry operations. Coupled with its legal responsibilities and the various GHG quantification tools available, the BLM is well poised to conduct the very "further analysis" that is needed to resolve uncertainty and ensure accurate planning, both in Wyoming and the Rocky Mountain region as a whole.

In terms of scale, BLM should *at least* quantify GHG emissions from past, present, and reasonably foreseeable oil and gas development within each Resource Area. As suggested, however, a broader, regional landscape-scale effort may be warranted. Obviously, any effort – including Resource Area-specific efforts – should account for the cumulative impacts of other GHG sources across the landscape, including state permitted oil and gas development and coal-fired power plants. Furthermore, BLM should assess the proportion of GHG emissions from oil and gas development relative to state, regional, and national GHG emissions totals.

Ultimately, it may behoove BLM to prepare a programmatic NEPA analysis to revise or amend RMPs throughout the Rocky Mountains to account for and reduce GHG emissions, properly justify oil and gas management activities, and properly protect the BLM-managed built and natural environments. Given the scale of this endeavor, it may also behoove BLM to initiate a top-level policy or rulemaking process to provide guidance to field staff and encourage the

development of models to predict climate change. As noted in the 2007 GAO Report, "resource managers said that they need local- and regional-scale models to predict change on a small scale as well as improved inventory and monitoring." 2007 GAO Report at 41.

BCA et al. June 2008 Lease Protest Exhibit 59 is a summary of oil and gas leasing and APD activity in the Rocky Mountain region between 2001 – 2007 based on government data, and, also, BCA et al. June 2008 Lease Protest Exhibit 60, a summary of the percent of Federal minerals and acreage available for oil and gas development in selected RMPs for the Rocky Mountain West, both of which are relevant to GHG quantification efforts, as well as efforts to address region-wide impacts to the built and natural environments in the Rocky Mountain region. Also attached are maps detailing federally-leased lands in Wyoming's sister states of Colorado, Montana and New Mexico. *See* BCA et al. June 2008 Lease Protest Exhibits 54, 55 and 56. Of note, based on now-dated 2004, it appears that at least 35 million acres of federal public lands were already leased but only 11,671,000 acres were under production. Nonetheless, current estimates suggest approximately 126,000 new federal (thus excluding state and private) wells in the Rocky Mountain West in the next 15-20 years. *See* BCA et al. June 2008 Lease Protest Exhibit 61. These data points suggest that BLM could – and, indeed, should – ratchet back its leasing decisions and APD approvals.

b. BLM Must Identify, Consider, and Adopt a GHG Emissions Limit or GHG Reduction Objective for BLM-authorized Oil and Gas Activities.

Effective GHG emissions management should be based upon an enforceable GHG emission limit set by BLM for oil and gas development. Alternatively, BLM could set an objective for overall GHG reductions in line with science-based recommendations. For example, the Governor of the State of New Mexico has specifically called for a 20% reduction in methane emissions from the oil and gas industry by 2020.[53] More generally, the Governor of Colorado has called for a 20% reduction in GHGs below 2005 levels by 2020 and an 80% reduction below 2005 levels by 2050. Establishing GHG limits or GHG reduction objectives are important to satisfy BLM's responsibility to prevent "permanent impairment," "prevent unnecessary or undue degradation," to "minimize adverse impacts on the natural, environmental, scientific, cultural, and other resources and values," and to satisfy the Public Trust Duty. 43 U.S.C. §§ 1702I, 1732(b), & 1732(d)(2)(A)). Without a GHG emissions limit or GHG emissions reduction objective, BLM may hamstring its own ability to address global warming and climate change by not having a definable and achievable goal. Furthermore, without articulated GHG limits of GHG reduction objectives, it is difficult if not impossible to ensure that actual GHG reduction efforts are effective; put another way, those efforts are rudderless.

To set a GHG emissions limit, or GHG reductions objective, BLM should look to the latest science concerning overall global GHG concentration thresholds. The latest and best science appears to be the paper – *Target Atmospheric CO_2: Where should Humanity Aim?* – authored by, amongst others, Dr. James Hansen at the National Space and Aeronautics

[53] *See* www.nmenv.state.nm.us/aqb/GHG/Docs/EO_2006_069.pdf Similarly, the Governor of the State of Colorado has called for an 80% reduction in GHGs by 2050. *See* www.colorado.gov/cs/Satellite?c=Page&cid=1194261894265&pagename=GovRitter%2FGOVRLayout

Administration discussed above and attached to the BCA et al. June 2008 Lease Protest as Exhibit 46. According to the paper, "If humanity wishes to preserve a planet similar to that on which civilization developed, paleoclimate evidence and ongoing climate change suggest that CO_2 will need to be reduced from its current 385 ppm to at most 350 ppm." BCA et al. June 2008 Lease Protest Exhibit 46 at 1. Notably, this is a lower overall ppm objective than set by IPCC. The paper argues that this lower objective is necessary because:

> Paleoclimate data and ongoing changes indicate that 'slow' climate feedback processes not included in most climate models, such as ice sheet disintegration, vegetation migration, and GHG release from soils, tundra or ocean sediments, may begin to come into play on time scales as short as centuries or less. Rapid on going climate changes and realization that Earth is out of energy balance, implying that more warming is 'in the pipeline', add urgency to investigation of dangerous level of GHGs.

Id. As the paper warns:

> Realization that today's climate is far out of equilibrium with current climate forcings raises the specter of 'tipping points', the concept that climate can reach a point such that, without additional forcing, rapid changes proceed practically out of our control.

Id. at 10. Importantly, there is a distinction between "tipping levels" and the "point of no return – the "climate state beyond which the consequence is inevitable, even if climate forcings are reduced." *Id.* Of note, while the paper focuses on CO_2, the reduction of non-CO_2 GHGs – such as methane – "could alleviate the CO_2 requirement, allowing up to about +25 ppm CO_2 for the same climate effect, while resurgent growth of non-CO_2 GHGs could reduce allowed CO_2 a similar amount." *Id.* at 11.

Of course, BLM, as a single federal agency, cannot alone constrain and reduce GHG emissions within the limits recommended by the draft paper. BLM can, however, do its part by establishing a GHG emissions limit for federal oil and gas activities – e.g., by identifying a proportional amount of GHG reductions – or by setting GHG reduction objectives, e.g., a reduction of aggregate GHG emissions by 15% by 2015, a reduction of 25% by 2020, a reduction of 35% by 2025, *etc.* States, such as Colorado, have taken this latter approach, calling for a 20% reduction GHG emissions below 2005 levels by 2020 and an 80% reduction below 2005 levels by 2050. *See* Governor Bill Ritter, Jr., Colorado Climate Action Plan (November 2007) (attached to the BCA et al. June 2008 Lease Protest as Exhibit 62). GHG emissions limits or GHG reduction objectives can then be used to constrain or even, if necessary, prohibit development to ensure that such development does not unacceptably contribute to global warming and climate change – a use that suggests the need for broad-scale decisions and NEPA analysis.

c. BLM Must Identify, Consider, and Adopt Management Measures to Reduce GHG Emissions from BLM-authorized Oil and Gas Management Activities

Efforts to reduce GHG emissions from oil and gas development have already been

underway for some time but, unfortunately, have had only a limited effect and have not even come close to constraining GHG emissions within the limits recommended by the scientific community to mitigate anthropogenic climate change. Nonetheless, these efforts demonstrate that GHG emissions reduction measures are technologically proven and frequently cost-effective, if not negative-cost and therefore an analogue of energy efficiency. This is for the common sense reason that if you reduce, for example, the emission of methane, a potent GHG, you end up putting more product in the pipeline to the benefit of the oil and gas company *and*, ultimately, the consumer. These efforts, however, must be intensified and set within a proper planning and management framework to ensure that GHG reduction efforts are commensurate to the scale of the problem presented by climate change and in accord with BLM's legal obligations.

To a degree, the intensification of these efforts through the development and implementation of planning and management frameworks is a logical component of the general prohibition against waste in oil and gas production; if measures exist to reduce GHG emissions which – e.g., in the context of methane – are also commercial product, then the failure to implement these measures is, by definition, wasteful. By extension, this also supports a go-slow approach to oil and gas leasing and development to allow for the development of more robust technological GHG reduction measures with the capability of constraining GHG emissions within acceptable GHG limits or to ensure the achievement of GHG reduction objectives. While such an approach may not serve the short-term interests of the oil and gas industry, it does serve the long-term interests of the whole public.

In any event, as BLM moves forward in this endeavor, BLM should first look to EPA's voluntary GHG reduction programs. For example, EPA manages a "Methane to Markets" program designed to advance "cost-effective, near-term methane recovery and use as a clean energy source ... to reduce global methane emissions in order to enhance economic growth, strengthen energy security, improve air quality, improve industrial safety, and reduce emissions of greenhouse gases.[54] EPA also manages the well-known, though underutilized, Natural Gas STAR program.[55] These programs provide useful starting points for BLM-based efforts to affirmatively reduce GHG emissions from federal oil and gas operations and ensure compliance with BLM's legal obligations.

A number of States, on the basis of their concerns over the consequences of global warming and climate change to their economies and environments, have also developed individualized Climate Action Plans to address global warming and climate change by reducing GHG emissions.[56] *See* 43 U.S.C. § 1712I(9) (requiring BLM to coordinate and act consistently with state-based plans and programs); 43 C.F.R. §§ 1610.3-1, 1610.3-2 (same). These States, recognizing regional-scale solutions, have also come together in a collaborative effort called the Western Climate Initiative to develop a regional-scale market-based GHG reduction mechanism,

[54] www.epa.gov/methanetomarkets/

[55] www.epa.gov/gasstar/. Notably, many major oil and gas producers are EPA Natural Gas STAR partners, including BP, Chevron, ConocoPhillips, EnCana Oil and Gas (USA), Marathon, Occidental, Williams Production, XTO, and others. *See* http://www.epa.gov/gasstar/partner.htm

[56] *See, e.g.*, BCA June 2008 Lease Protest Exhibit 62. *See also*, New Mexico Climate Change Advisory Group, Final Report (December 2006) (attached to the BCA June 2008 Lease Protest as Exhibit 63).

and The Climate Registry, a regional-scale GHG emissions reporting program.[57] Wyoming has initiated an assessment for its Climate Action Plan, but no plan has been adopted as yet.

The EPA and the State-level efforts are admirable, and provide BLM with a host of information to assist BLM in meeting its own obligations pursuant to Secretarial Order 3226, FLPMA, NEPA, and the Public Trust Duty. These efforts, far from excusing BLM inaction, evidence the fact that the time is now for BLM to step up to the plate and address global warming and climate change in a meaningful way.

As an initial action, BLM should subject leases to the stipulation that the lessee *must* participate in EPA's GHG reduction programs – e.g., EPA's Natural Gas STAR program – given that the mineral resources being extracted are the people's resources and that lessees that derive profit from public resources should be held to the highest standards. BLM should also subject the leases to a stipulation that empowers BLM to fully implement future laws and policies designed to combat global warming and climate change. Once BLM surrenders lease rights, BLM may be unable to subject lease operations to these laws and policies without violating the lessees' rights. At the least, enforcing these laws and policies in the context of already-issued leases may be met with fierce resistance by the lessees. Given that lease development can last for decades, it would be unfortunate if BLM commits public lands to activities that would undercut anticipated laws and policies designed to combat global warming and climate change. Bottom line, a simple solution would be to expressly subject leases to stipulations to ensure that future GHG reduction laws and policies can be fully implemented. Oil and gas companies would then have a front-end incentive to implement GHG reduction measures and could account for the cost of these measures in their lease sale offers.

These broad-brush measures, however, are only a first step. Given the existence, now, of technologically and economically viable GHG reduction measures, BLM should conduct a more in-depth analysis of these GHG reduction measures as a component of BLM's NEPA alternatives analysis and thereby address whether leases should be subjected to more specific GHG reduction stipulations. The alternatives would consider, e.g., stipulations mandating, generally, that oil and gas operations will be subjected to the best available GHG reduction measures, or mandating, specifically, precise types of GHG reduction measures. In some instances, BLM may be able to rely on conditions of approval so long as it first identifies and evaluate the efficacy of these conditions of approval prior to the point of commitment.

However BLM proceeds, the need for pre-commitment NEPA analysis is critical. Many existing GHG reduction measures are implemented because they are economically worthwhile from the perspective of the oil and gas operator. But even if these GHG reduction measures are implemented, they may be unable, without more, to achieve GHG limits or GHG reduction objectives. BLM may therefore find it necessary to require GHG reduction measures that are not economically worthwhile but nonetheless necessary to achieve GHG limits or GHG reduction objectives. Similarly, BLM may need to retain the legal authority to constrain development on the leasehold to ensure that GHG emissions are constrained within these limits or objectives. To do this, a lease stipulation would likely be required. Fundamentally, BLM needs to address these

[57] Information pertaining to the Western Climate Initiative can be found at www.westernclimateinitiative.org/; information pertaining to The Climate Registry can be found at www.theclimateregistry.org/

measures – and BLM's policy response – before lease rights are conferred. Moreover, pragmatically, pre-commitment decision-making and NEPA analysis BLM provides BLM with an informed basis to address GHG emissions, coordinate with federal and state agency counterparts, reach out to the public, ensure that GHG emissions can be constrained within acceptable limits, and provide the lessee with notice and thus the basis to plan for drilling-stage activities in advance.[58]

In terms of the precise types of GHG reduction measures, and the types of GHG emissions they reduce, GHG reduction measures targeting methane emissions are especially important. Not only is methane a potent GHG, but methane reductions typically involve methane recovery, therefore yielding a high potential for payback.[59] Measures that reduce methane and often yield a payback include:

Retrofitting or replacing high-bleed pneumatic controllers with low-bleed or no-bleed pneumatics.[60]

Requiring green completions to be used when completing CBM and conventional natural gas wells. Green completions essentially capture methane and other gases typically vented or flared during completion flowback operations.[61]

Enhancing maintenance of compressor engines, including periodic replacement of compressor rods and rod packing.[62]

Replacing glycol dehydrators with desiccant dehydrators, utilizing flash tank separators at glycol dehydrators, optimizing glycol circulation rate, or utilizing other zero emission dehydrator technologies.[63]

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[58] The distinction between BLM's pre- and post-lease authority is particularly important in the context of BLM's duty to address a "no action" alternative which, at the point a lease is offered for sale, is *the option of not issuing the lease* and thus the decision not to allow oil and gas development, period. 40 C.F.R. § 1502.14(d). This option is foreclosed by the sale and issuance of the lease as the lessee is given the legal right to develop the lease. 43 C.F.R. § 3101.1-2.

[59] Current natural gas prices are around $10.82/Mcf. *See* http://tonto.eia.doe.gov/oog/info/ngw/ngupdate.asp. Thus, efforts to recover methane are, in essence, recovering money.

[60] *See* BCA et al. June 2008 Lease Protest Exhibit 64 (www.epa.gov/gasstar/pdf/lessons/ll_pneumatics.pdf)

[61] *See* BCA et al. June 2008 Lease Protest Exhibits 65 & 66. (www.epa.gov/gasstar/workshops/durango_sept2007/06_%20bp_rec_Greenhouse_gas_emision_reduction.pdf and www.epa.gov/gasstar/workshops/durango_sept2007/05_weatherford_rec.pdf). *See also* Exhibit 67 http://www.epa.gov/gasstar/workshops/glenwood_sept2007/04_recs.pdf

[62] *See* BCA et al. June 2008 Lease Protest Exhibit 68. (http://www.epa.gov/gasstar/workshops/glenwood_sept2007/03_methane_savings_from_compressors.pdf).

[63] *See* BCA et al. June 2008 Lease Protest Exhibit 69 (http://www.epa.gov/gasstar/workshops/durango_sept2007/08_natural_gas_dehydration.pdf). *See* BCA et al. June 2008 Lease Protest Exhibit 70 (http://www.epa.gov/gasstar/pdf/lessons/ll_plungerlift.pdf).

Installing plunger lift systems in gas wells.[64]

Conducting directed inspection and maintenance at wellheads, compressor stations, and processing plants to reduce fugitive leaks from valves, flanges, and other connectors.[65]

Installing vapor recovery units on crude oil, condensate, or other tanks storing liquid petroleum products.[66]

Details on a number of other potential methane reduction measures for the oil and gas industry are readily available online at the EPA's Natural Gas STAR website, www.epa.gov/gasstar/techprac.htm.

Additionally, many methane reduction measures are detailed in the recently finalized report by the Four Corners Air Quality Task Force. The Four Corners Air Quality Task Force, which the BLM was actively a part of, released its final report on mitigation options for the oil and gas industry on November 1, 2007.[67] This report details a number of potential strategies to reduce air pollution, including methane. Notably, the report indicates that many methane reduction measures concurrently reduce emissions of volatile organic compounds ("VOCs"). VOCs react with sunlight to form ground-level ozone, a criteria pollutant for which the Clean Air Act sets National Ambient Air Quality Standards ("NAAQS") to limit unhealthy concentrations nationwide. *See* 40 CFR § 50.10. The EPA just strengthened the NAAQS for ozone, limiting concentrations to no more than 75 parts per billion over an eight hour period. *See* 73 Fed. Reg. 16435-16514. It would behoove the BLM to reduce both methane and VOCs from oil and gas development to address both global warming and ozone impacts.[68]

Many, if not all, of the measures identified by the EPA's Natural Gas STAR program and the Four Corners Air Quality Task Force are applicable to oil and gas development in Colorado. Natural gas production, including CBM, will utilize well drilling and completions, compressor engines, pneumatic controllers, dehydrators, wellhead equipment, among other processes and equipment where methane emissions could be reduced or eliminated. Oil production will utilize tanks, wellhead equipment, among other processes and equipment where methane could be reduced or eliminated. It is no wonder that Colorado Governor Bill Ritter called for the state to "work with the oil and gas sector to reduce methane leakage by expanding the use of proven emission reduction practices and encouraging the development of new technologies that both reduce emissions and save money." BCA et al. June 2008 Lease Protest Exhibit 62 at 21. Indeed, many companies producing oil and gas in Wyoming have already reported success in utilizing a number of methane reduction measures. For example:

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[64] *See* BCA et al. June 2008 Lease Protest Exhibit 70 (http://www.epa.gov/gasstar/pdf/lessons/ll_plungerlift.pdf).
[65] *See* BCA et al. June 2008 Lease Protest Exhibit 71 (http://www.epa.gov/gasstar/workshops/durango_sept2007/03_dim_in_gas_production_facilities.pdf).
[66] *See* BCA et al. June 2008 Lease Protest Exhibit 72 (http://www.epa.gov/gasstar/pdf/lessons/ll_final_vap.pdf).

[67] This report is readily available online at http://www.nmenv.state.nm.us/aqb/4C/Docs/4CAQTF_Report_FINAL_OilandGas.pdf.
[68] In fact, the BLM has a legal responsibility to ensure protection of the NAAQS in accordance with FLPMA, 43 USC § 1712(c)(8), and regulations thereunder, 43 CFR § 2920.7(b)(3).

- BP has successfully utilized green completions to reduce methane emissions from CBM well completions. *See* BCA et al. June 2008 Lease Protest Exhibits 47 & 48.
- EnCana Oil and Gas (USA) has replaced a number of high-bleed pneumatic controllers with low-bleed pneumatics, installed a number of plunger lifts, and utilized green completions, replaced gas-actuated pumps with solar electric pumps, and utilized vapor recovery units throughout the Rocky Mountain region.[69]
- Burlington Resources, a subsidiary of ConocoPhillips, has successfully reduced methane emissions in the San Juan Basin of southwestern Colorado through the use of plunger lift systems.[70]
- Occidental has successfully reduced methane emissions through directed inspection and maintenance, compressor engine maintenance, among other practices.[71]
- Williams Production has successfully reduced methane emissions through the use of green completions and vapor recovery units.[72]

While these are just some examples highlighting both the feasibility and acceptance of methane reduction measures among companies operating in Colorado, they highlight the need for the BLM to conduct a more in-depth analysis of these methane reduction measures before surrendering lease rights to: (1) address whether these measures should be made mandatory through lease stipulations (because, e.g., they would otherwise conflict with a lease issued only with standard terms and conditions); (2) afford BLM the chance to reach out to federal and state partners; (3) engage the public and the oil and gas industry in a meaningful, transparent dialogue; and (4) allow all parties to plan for and implement GHG reduction measures in a uniform, efficient, and consistent fashion, as well as to take advantage opportunities to reduce emissions of other harmful air pollutants, such as VOCs.

Relative to carbon dioxide reductions from oil and gas operations, according to the state of New Mexico's Climate Change Advisory Group:

> There are a number of ways in which CO_2 emissions in the oil and gas industry can be reduced, including (1) installing new efficient compressors, (2) replacing compressor driver engines, (3) optimizing gas flow to improve compressor efficiency, (4) improving performance of compressor cylinder ends, (5) capturing compressor waste heat, and (6) utilizing waste heat recovery boilers. Policies to encourage these practices can include education and information exchange, financial incentives, and mandates or standards that require certain practices.
>
> The [Climate Change Advisory Group] recommends that New Mexico focus

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[69] *See* BCA et al. June 2008 Lease Protest Exhibit 73 (http://www.epa.gov/gasstar/workshops/glenwood_sept2007/09_scott_mason_ancillary_equipment.pdf).

[70] *See* BCA et al. June 2008 Lease Protest Exhibit 74 (http://www.epa.gov/gasstar/workshops/farmington-feb06/burlington_resources.pdf).

[71] *See* BCA et al. June 2008 Lease Protest Exhibit 75 (http://www.epa.gov/gasstar/workshops/midland-6806/langley.pdf).

[72] *See* BCA et al. June 2008 Lease Protest Exhibits 67 (http://www.epa.gov/gasstar/workshops/glenwood_sept2007/04_recs.pdf & 77 http://www.epa.gov/gasstar/workshops/glenwood_sept2007/07_producer_bmps.pdf).

attention on reducing GHG emissions from fuel combustion in the oil and gas industry through education, financial incentives, mandates and/or standards – coupled with cost and investment recovery mechanisms, if appropriate – to: (1) improve the efficiency of compressors; (2) boost waste heat recovery for compressors and boilers including the deployment of CHP systems that could sell excess power back to the grid; and to a lesser extent, (3) replace gas-driven compressors with electrical compressors when doing so reduces CO_2 emissions (the average carbon intensity of New Mexico electricity would need to be reduced by approximately 30% to make this option carbon-neutral).[73]

In part to address GHG emissions, but to also address the cumulative impact of climate change and oil and gas development to the built and natural environments, BLM should subject leases to unitization. Through unitization, BLM could reduce surface disturbance and damage, use fewer wells to access the shared subsurface resource, and limit the amount of field processing equipment, roads, and other related development infrastructure.

d. BLM Must Track and Monitor GHG emissions from BLM-authorized Oil and Gas Operations through Time.

Hand-in-hand with the need to quantify GHG emissions, setting GHG limits or reduction objectives, and requiring the implementation of GHG reduction measures, BLM must also establish a system to track and monitor GHG emissions, the efficacy of GHG reduction measures, and impacts to the environment to support adaptive management. 43 U.S.C. § 1711(a); 43 C.F.R. §§ 1610.4-3, 1610.4-9. As noted in the 2007 GAO Report, "Resource managers interviewed for our case studies ... stated that they need better resource inventories and monitoring systems." 2007 GAO Report at 43. By quantifying GHG emissions and baseline conditions through inventories, and tracking and monitoring GHG emissions and changes to the baseline through time, BLM has an informed basis to address global warming and climate change and ensures that BLM land protection and management activities comport with BLM's duties pursuant to Secretarial Order 3226, FLPMA, NEPA, and the Public Trust Duty.

e. BLM Must Consider How Global Warming and Climate Change Impact the Environment, and Whether Such Impacts Warrant Additional Environmental Protections.

i. Climate Change Impacts – Summary Information

Many of the public resources managed by the BLM – and, more broadly, BLM's sister agencies in the Department of the Interior and Agriculture – are being impacted by global warming and climate change. Impacts, of course, are not limited to public resources, but extend across Colorado's landscape. BLM should account for this harm through a hard look NEPA analysis and by considering reasonable alternatives designed to protect the environment. Such pre-commitment decision-making and NEPA analysis affords BLM an informed basis to ensure

[73] BCA et al. June 2008 Lease Protest Exhibit 63 at 5-14.

a rational connection between the facts found and the ultimate choices made; a basis that also allows BLM to prevent permanent impairment, prevent unnecessary or undue degradation, minimize adverse environmental impacts, and comply with the Public Trust Duty. 43 U.S.C. §§ 1702I, 1732(b)), 1732(d)(2)(A).

For example, pre-commitment lease-stage decision-making and NEPA analysis may demonstrate that BLM should or must: (1) place certain areas off limits to leasing or surface occupancy by oil and gas operators; (2) subject leases to stipulations or otherwise take affirmative action to protect the environment within or proximate to the leaseholds because of the significance and magnitude of climate change impacts; or (3) take a timeout on leasing and further oil and gas development to initiate a landscape-scale RMP amendment or revision to protect the environment's resiliency because existing management direction is inadequate and because of the need to coordinate and act consistently with the activities of other federal and state partners (43 U.S.C. § 1712I(9); 43 C.F.R. §§ 1610.3-1, 1610.3-2). Such options need to be addressed by BLM as reasonable NEPA alternatives prior to the point lease rights are sold.

Regardless, to understand the actual and potential harm suffered by BLM public resources as a consequence of global warming and climate change, it is helpful to begin with the IPCC. The IPCC assessed the "current scientific understanding of impacts of climate change on natural, managed and human systems, the capacity of these systems to adapt and their vulnerability."[74] Relative to observed global warming and climate change impacts, the IPCC Impacts Report concluded the following:

- "Observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases."[75] The IPCC Impacts Report goes on to state that "[t]here is very high confidence … that recent warming is strongly affecting terrestrial biological systems, including such changes as … "poleward and upward shifts in ranges in plant and animal species."[76]
- "A global assessment of data since 1970 has shown it is likely that anthropogenic warming has had a discernible influence on many physical and biological systems."[77]
- "Other effects of regional climate changes on natural and human environments are emerging, although many are difficult to discern due to adaptation and non-climatic drivers."[78]

Beyond observed impacts, the IPCC Impacts Report also addresses the state of knowledge about future impacts. The IPCC Impact Report's conclusions relative to terrestrial species are troubling:

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[74] IPCC, 2007: Summary for Policymakers. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Groups III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdon and New York, NY, USA (www.ipcc.ch/SPM13apr07.pdf) ("IPCC Impacts Report") (attached as Exhibit 77).

[75] *Id.* at 1.

[76] *Id.* at 2.

[77] *Id.*

[78] *Id.* at 3.

- "The resilience of many ecosystems is likely to be exceeded this century by an unprecedented combination of climate change, associated disturbances (e.g., flooding, drought, wildfire, insects, ocean acidification), and other global change drivers (e.g., land use change, pollution, over-exploitation of resources)".[79]
- "Approximately 20-30% of plant and animal species assessed so far are likely to be at increased risk of extinction if increases in global average temperature exceed 1.52.5°C."[80]
- "For increases in global average temperature exceeding 1.52.5°C and in concomitant atmospheric carbon dioxide concentration, there are projected to be major changes in ecosystem structure and function, species' ecological interactions, and species' geographic ranges, with predominantly negative consequences for biodiversity, and ecosystem goods and services, e.g., water and food supply."[81]
- Calibrated specifically to North America, "[w]arming in western mountains is projected to cause decreased snowpack, more winter flooding, and reduced summer flows, exacerbating competition for over-alllocated water resources."[82]

Four other general reports contain a summation of the current science-based understanding of climate change impacts to the environment in the Western U.S. and, specifically, Colorado and Colorado's sister state to the south, New Mexico.

First, the State of Colorado issued a Climate Action Plan in November 2007 ("CO Climate Action Plan") (attached to the BCA et al. June 2008 Lease Protest as Exhibit 62). As Governor Bill Ritter, Jr., noted in the CO Climate Action Plan's opening message:

> Global warming is our generation's greatest environmental challenge. The scientific evidence that human activities are the principal cause of a warming planet is clear, and we will see the effects here in Colorado. But the seeds of change are also here in Colorado, in our scientific and business communities, and in each of us individually.
>
> This Colorado Climate Action Plan is a call to action. It sets out measures that we in our state can adopt to reduce emissions of greenhouse gases by 20 percent by 2020, and makes a shared commitment with other states and nations to even deeper emissions cuts by 2050.
>
> Why is this important? For Colorado, global warming will mean warmer summers and less winter snowpack. The ski season will be weeks shorter. Forest fires will be more common and more intense. Water quality could decline, and the demand for both agricultural and municipal water will increase even as water supplies dwindle.

[79] *Id.* at 5.
[80] *Id.* at 6.
[81] *Id.*

[82] *Id.* at 11.

The CO Climate Action Plan proceeds to detail the present and future impacts of climate change to Colorado. Some of these impacts are indirect, caused by "the displacement of millions of people living in coastal areas, thawing of arctic ecosystems and accelerated loss of usable lands to deserts." CO Climate Action Plan at 7. Critically, the CO Climate Action Plan states that "the direct risks to the state are very serious." *Id.* These "direct risks" are numerous, including current observations of shorter and warmer winters, with thinner snowpack and earlier spring runoff, with less precipitation overall, and more of that precipitation falling as rain, not snow. *Id.* Droughts are longer, and there are more wildfires "burning twice as many acres each year than before 1980." Beetle infestations are now "[w]idespread" and there is also a "[r]apid spread of West Nile virus." *Id.* On top of these observed impacts, "[i]n the coming decades, scientists project that Colorado and neighboring western states will see":

- (1) 3-4 degree temperatures increases by 2030, with more frequent and longer-lasting summer heat extremes;
- (2) even "[l]onger and more intense wildfire seasons" with fires "projected to claim more land each year than the year before;"
- (3) "Midwinter thawing and much earlier melting of snowpack" with resultant "Flooding," "ski season[s]" shortened by "three to six weeks," and "added stress on reservoirs;"
- (4) "Much lower flows in rivers in the summer months and a greater vulnerability to drought with consequent impacts to the ability of "[a]lready over-used river systems" to satisfy "existing water rights and future growth," degradation of water quality, and a potential "decline" in "[h]ydropower production;"
- (5) Slower recharge in groundwater aquifers, with an overall decline of 20% projected for the Ogallala aquifer if temperatures increase by more than 5 degrees F.
- (6) "Movement of plant and animal species to higher elevations and latitudes" and the fragmentation of high-elevation habitat. Many of today's high-elevation species will face localized or total extinction;"
- (7) "insect attacks in forests" caused by warmer winter temperatures that will "reduce winterkill of beetles," warmer summer temperatures that will "allow faster insect lifecycles," and forests rendered vulnerable by "summer droughts;"
- (8) "Less snow cover and more winter rain on farm lands" whereby the "[p]elting rain on bare ground will increase soil erosion;" and if that isn't enough,
- (9) "More weeks."

Id. These impacts are obviously dramatic, extending, as noted by the CO Climate Action Plan, across state lines.

Second, the State of New Mexico, reflecting these trans-boundary impacts, prepared a 2005 Report entitled *Potential Effects of Climate Change on New Mexico* ("NM Climate Change Report") (attached to the BCA et al. June 2008 Lease Protest as Exhibit 78) to inform its Climate Change Advisory Group. The NM Climate Change Report – mirroring the impacts identified in the CO Climate Action Plan – identified substantial impacts to: (1) water resources; (2) infrastructure (e.g., flood control, electrical power distribution, sewage, water supply, and transportation); (3) agriculture; (4) natural systems (e.g., forests, grasslands, deserts, lakes and streams); (5) outdoor recreation and related tourism; (6) environmental quality and health (e.g., from intensified ozone levels); (7) environmental justice and native peoples (because of these

communities limited resources to adapt and cope with climate change). NM Climate Change Report at 1-4.

Third, the GAO, in its 2007 Report (BCA et al. June 2008 Lease Protest Exhibit 42), reinforces the IPCC Report and the state-level reports prepared by Colorado and New Mexico in the specific context of federal public lands. The GAO identified a myriad of physical effects to federal public lands including "drought, floods, glacial melting, sea level rise, and ocean acidification." 2007 GAO Report at 5.

Fourth, the Rocky Mountain Climate Organization and NRDC just published a report entitled Hotter and Drier: The West's Changed Climate ("RMCO/NRDC Report") (attached to the BCA et al. June 2008 Lease Protest as Exhibit 61). Synthesizing much of the existing research regarding climate change, and refining that research in the specific context of the Western U.S., the RMCO/NRDC Report warns that "[t]he American West has heated up even more than the world as a whole" and "in the five latest years" experienced warming "70 percent[] more than the overall planet's warming." RMCO/NRDC Report at iv; 1-6. The RMCO/NRDC Report proceeds to convincingly detail how the West is getting drier, how global warming is disrupting ecosystems, and how warmer temperatures affect business, recreation, and tourism. RMCO/NRDC Report at 7-34.

The 2007 IPCC Report, 2007 CO Climate Action Plan, 2005 NM Climate Change Report, 2007 GAO Report, and 2008 RMCO/NRDC Report provide BLM with an excellent base of knowledge to begin the process of properly understanding and affirmatively taking action to address climate change in the region. Moving beyond these general reports, it is important to highlight and illuminate in more depth some of specific climate change impacts. Of note, many of the studies and reports referenced below pertain to Wyoming's sister states—in particular Colorado and New Mexico. Insofar as BLM may be apt to dismiss these studies and reports on that basis, BLM would be making a mistake. Efforts are only now intensifying how climate change will impact localized environments. The studies and reports prepared for Colorado and New Mexico—and other Rocky Mountain landscapes—thus provide a starting point. They are of course not meant to supplant Wyoming specific evaluation. Instead, they are intended to provide a basis of information that can be used by BLM to identify and evaluate Wyoming-specific impacts.

ii. Climate Change Impacts to Water

Perhaps the most obvious climate change impact noted above is the erosion of winter cold in the West's mountains. As GAO noted, "warmer springs have resulted in earlier snowmelt ...."[83] 2007 GAO Report at 5. Additionally, "more precipitation falls as rain and less as snow." *Id.* at 21. This limits winter recreational opportunities on public lands and diminishes water supplies that the public lands provide residents across the West. A recent article in Science "demonstat[ed] statistically that the majority of the observed low frequency changes in the hydrological cycle (river flow, temperature, and snow pack) over the western U.S. from 1950-

[83] *See* also 2007 IPCC Synthesis Report at 2 (discussing observed changes to hydrological systems); Mote P. W., Hamlet A. F., Clark M. P., and Lettenmaier D. P. 2005. Declining Mountain Snowpack in Western North America. Bulletin of the American Meteorological Society. 86: 39-49.

1999 are due to human-caused climate changes from greenhouse gases and aerosols."[84]

Warming is thus *already* reducing the amount of alpine tundra in the West. For instance, scientists studying the effects of climate change on Rocky Mountain National Park, home to the largest expanse of alpine tundra in the United States outside of Alaska, projected that warming of 5.6 degrees Fahrenheit could cut the Park's area of tundra in half.[85] An increase of 9 to 11 degrees Fahrenheit could virtually eliminate the park's tundra.[86] As the climate heats up, plant and animal species seek the habitat they need by moving toward the poles or to higher elevations. *See* 2007 IPCC Synthesis Report at 2 ("In terrestrial ecosystems, earlier timing of spring events and poleward and upward shifts in plant and animal ranges are with *very high confidence* linked to recent warming (italics original)).

In Yosemite National Park, a century ago, pikas lived as low as 7,800 feet. Today, they cannot be found any lower than 8,300 feet.[87] As one researcher has said, "[w]e might be staring pika extinction in the Great Basin, maybe in Yosemite, too, right in the face. . . . They don't have much up-slope habitat left."[88] In Glacier National Park, the glaciers are melting; "since 1850, the estimated numbers of glaciers in the park has dropped from 150 to 26." 2007 GAO Report at 5. Generally, "[a]s alpine habitats warm, the tree line is expected to move upslope, with forests beginning to invade alpine and subalpine meadows." 2007 GAO Report at 28. With "[s]ome of these changes ... already occurring," the impacts to wildlife that relies on these systems – "bighorn sheep, pikas (relatives of the rabbit), mountain goats, wolverines, and grizzly bears – "may be harmed." 2007 GAO Report on 28.

Changes to hydrological systems extend well beyond the alpine tundra. The CO Climate Action Plan was based on a stakeholder report prepared in 2006.[89] This report, in Chapter 8 of its appendices (Chapter 8 is attached to the BCA et al. June 2008 Lease Protest as Exhibit 81), provided a discussion of the effects of GHG emissions on water resources ("CO Water Adaptation Analysis"). The CO Water Adaptation Analysis notes on page 1 that "[t]he consensus of the scientific community is that warming caused by [GHGs] resulting from a wide variety of human endeavors will likely have significant effects on water supplies and availability in many parts of the world, including the American West." These effects, summarized on pages 8-2 to 8-3, include what should become a familiar litany: (1) [r]educed snowpack and streamflow; (2) [m]ore drought; (3) [e]arlier snowmelt; (4) [i]ntense precipitation; (5) [i]ncreased water needs; (6) [d]egraded water quality; (7) Interstate compact calls; and (8) [s]econdary impacts" such as

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[84] Barnett, Tim P., *et al.*, *Human-induced changes in the hydrology of the western United States*, Revised version submitted to the Journal *Science* January 10, 2008, and published in *Science Express* January 31, 2008 (attached as Exhibit 79).

[85] N. Hobbs and others, Future Impacts of Global Climate on Rocky Mountain National Park: Its Ecosystems, Visitors, and the Economy of its Gateway Community – Estes Park (2003) 1-45, 16-17, http://www.nrel.colostate.edu/projects/star/papers/2003_final_report.pdf (attached as Exhibit 80).

[86] *Id.*

[87] C. Mortiz, *Report – Year 4 of the terrestrial vertebrate resurvey of the 'Grinnel sites' in Yosemite National Park'* (2006), 1, http://mvz.berkeley.edu/Grinnell/pdf/Yosemite_Report_2006-FINAL.pdf.

[88] J. Schwarz, Tiny Pikas Seem to Be on March Toward Extinction in Great Basin," University of Washington Office of News and Information (December 29, 2005). See also, Beever EA, Brussard PF, Berger J. 2003, Patterns of apparent extirpation among isolated populations of pikas (Ochotona princeps) in the Great Basin, J. Mammal. 84:37-54.

[89] www.coloradoclimate.org/Climate_Action_Panel.cfm

"more forest fires" and "outbreaks of forest pests," which, in turn, "may affect total runoff and runoff timing."

In 2007, the National Research Council's Committee on the Scientific Bases of Colorado River Basin Water Management published a detailed report entitled *Colorado River Basin Water Management: Evaluating and Adjusting to Hydroclimatic Variability* ("NRC CO River Report") (Executive Summary attached to the BCA et al. June 2008 Lease Protest as Exhibit 82). Setting the stage for the Colorado River basin, the NRC CO River Report notes on page 1 that:

> It is known today that the Colorado River Compact of 1922 – the water allocation compact that divides Colorado River flows between the upper and lower Colorado River basin states – was signed during a period of relatively high annual flows. It is also accepted that the long-term mean annual flow of the river is less than the 16.4 million acre-feet assumed when the Compact was signed – a hydrologic fact of no small importance with regard to water rights agreements and subsequent allocations.

The stage thus set, the NRC CO River Report notes on page 4 that:

> Temperature records across the Colorado River basin and the western United States document a significant warming over the past century. These temperature records, along with climate model projections that forecast further increases, collectively suggest that temperatures across the region will continue to rise for the foreseeable future. Higher regional temperatures are shifting the timing of peak spring snowmelt to earlier in the year and are contributing to increases in water demands, especially during summer. Higher temperatures will result in higher evapotranspiration rates and contribute to increased evaporative losses from snowpack, surface reservoirs, irrigated land, and vegetated surfaces....
>
> Based on analysis of many recent climate model simulations, the preponderance of scientific evidence suggests that warmer future temperatures will reduce future Colorado River streamflow and water supplies. Reduced streamflow would also contribute to increasing severity, frequency, and duration of future droughts.

On the basis of "[m]ulti-century, tree-ring based reconstructions of Colorado River flow," the NRC CO River Report on page 6 found that while "extended drought episodes are a recurring and integral feature of the basin's climate," and that "future droughts will recur," nonetheless, these "future droughts ... may exceed the severity of droughts of historical experience, such as the drought of the late 1990s and early 2000s." The management implications are significant:

> Steadily rising population and urban water demands in the Colorado River region will inevitably results in increasingly costly, controversial, and unavoidable trade-off choices to be made by water managers, politicians, and their constituents. These increasing demands are also impeding the region's ability to cope with droughts and water shortages.

NRC CO River Report at 8.

These impacts and management consequences have been further illuminated by a January 23, 2008 report, accepted by the Journal of Water Resources Research, by the Scripps Institution of Oceanography entitled *When will Lake Mead go Dry?* ("Scripps Lakes Mead/Powell Report") (attached to the BCA et al. June 2008 Lease Protest as Exhibit 83). Lake Mead, of course, is an important component of the Colorado River basin. The Scripps Lakes Mead/Powell Report notes on page 3 that global warming is causing "a decrease in runoff to the Colorado River" in the "range between 10-30 percent over the next 3050 years." This should be a self-evidently action-sparking fact given that "[t]he Colorado River is quite literally the life's blood of today's modern southwest society and economy." Scripps Lakes Mead/Powell Report at 3. It is on this basis that the Scripps Lakes Mead/Powell Report looked at Lakes Mead and Powell to determine when they will 'go dry'; that is, when there function as a reservoir will end. [T]he answer is both startling and alarming." Scripps Lakes Mead/Powell Report at 4. As the Report explains on pages 4-5:

> It is obvious that once long-term outflow exceeds inflow the system is doomed to run dry ... currently scheduled depletions (loss of water from consumptive use), along with water losses due to evaporation/infiltration and reduction in runoff due to climate change, have pushed the system into a negative net inflow regime that is no sustainable ... natural variability, i.e., the change of getting strings of dry years consistent with the historical record, makes the system likely to run dry even with positive net inflow. When expected changes due to global warming are included as well, currently scheduled depletions are simply not sustainable.

Even in accord with very conservative assumptions, "live storage [in Lakes Mead and Powell] will be depleted completely 23-40 years from now ...." Scripps Lakes Mead/Powell Report at pages 8-9. The consequence of reductions in large storage capacity would, however, be felt much earlier; "only 14 years into the future" there is a "50% chance" that the Lakes' "minimum power pool level" would be reached by 2021 and "[a]t that point (or before), there would be an abrupt dropt in the abilities of the reservoirs to generate hydroelectric power." *Id.* at 10. Again, this is likely an optimistic projection because these findings were based on very conservative assumptions, including the assumption that "steady state where inflow to the reservoirs is equal to their discharge" (even though "Lake Mead is currently being overdrafted"), and analysis that neglects to include the "natural variability in River flow." *Id.* More realistic scenarios indicate that there is actually a "50% chance the minimum power pool levels will be realized by about 2017, in the absence of management responses," not the more optimistic estimate of 2021. *Id.* at 11. "It seems clear that the threat to power production on the Colorado is both real and more imminent than most might expect." *Id.*[90]

Impacts, of course, to the Colorado River basin are not limited to power production. The Colorado River is home to several aquatic species protected by the Endangered Species Act: Bonytail chub, Humpback chub, Colorado pikeminnow, and Razorback sucker ("CO River Fish"). These CO River Fish are already suffering considerable stress, as demonstrated by the Fish & Wildlife Service's 1994 critical habitat decision.[91]

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[90] *See also* Robert Kunzig, *Drying of the West*, National Geographic (February 2008) (attached as Exhibit 85).
[91] 59 Fed. Reg. 13,374-13,375 (Mar. 21, 1994).

Reinforcing the concerns identified in the NRC CO River Report and the Scripps Lakes Mead/Powell Report, in 2006, the New Mexico Office of the State Engineer and the Interstate Stream Commission published a report entitled *The Impact of Climate Change on New Mexico's Water Supply and Ability to Manage Water Resources* ("NM SEO/ISC Report") (attached to the BCA et al. June 2008 Lease Protest as Exhibit 84). As the NM SEO/ISC Report emphasizes:

> Water is so critical to [sic] New Mexico's quality of life and economic vitality that any impacts to our water resources reverberate across the social, economic and environmental fabric of the State. The anticipated impact of climate change is particularly important since New Mexico is highly dependent on climate-sensitive natural resources (e.g., snowpack, streamflow, forests) and on natural-resource based economic activities (e.g., agriculture, recreation and tourism).

NM SEO/ISC Report at 2. Impacts to water resources identified by the report vary depending on the precise climate change prediction model used but there is consensus amongst the models that generally we will witness: (1) an increase in temperature – and potentially, extreme heat waves; (2) a trend towards a higher freezing altitude and reduction in snowpack with delays in the arrival of snow season, acceleration of spring snowmelt, a decrease in total snowfall, and rapid and earlier seasonal runoff (including, under regional models, a loss of sustained snowpack south of Santa Fe and the Sangre de Cristo range); (3) uncertain changes to precipitation, overall, but intensified evaporative losses from temperature increases that could counteract any increase in precipitation; (4) severe droughts; and (5) an increase in flood events. *Id.* at 5-16. Given the magnitude of these impacts, the report, in its Executive Summary, explains, relative to at least water resources, that:

> Climate change needs to be added as "another pressure" along with population growth, changing demographics, existing climate variability, increasing water demand and availability challenges, land use, species protection and other ecosystem demands. Adaptive management strategies will need to be devised that are robust and flexible enough to address climate change.

Id. at v. As the NM SEO/ISC Report further notes, "[t]he key to successful adaptation is a robust planning structure that incorporates highly certain predictions (such as temperature increases) as well as less certain forecasts (such as precipitation changes) into scenarios that can direct implementation of flexible management strategies." *Id.* at vi. The NM SEO/ISC Report also encourages immediate action to address climate change impacts to water, explaining:

> Policy makers and managers are also constantly juggling multiple issues of immediate importance and have limited time and resources to take on what appears to be a "new" issue. Climate change is often viewed as one of those issues that can be addressed later when there is more certainty about what is really happening. However, many of the adaptive strategies required to address impacts of climate change will require years to plan and implement, and delaying may increase both vulnerability and ultimately the costs of mitigating those impacts. Often the tools needed to develop adaptive capacity for climate change are the

same or similar to those used in current management practices.

Id. at 33.

An additional report, completed July 2007, entitled *Climate Change and its Implications for New Mexico's Water Resources and Economic Opportunities* ("NM Water & Economy Report") serves as an important source of additional water-related information to understand how climate change is and will impact the West.[92] Evidencing the deep concern Westerners – including the Protestors – have with climate change's impacts to water, the NM Water Report explains that:

> The Rio Grande, and the subterranean aquifers that it feeds in some regions, are the principal – and often only – water sources for cities and farms from Southern Colorado through New Mexico and into far West Texas, ... The vulnerability that these water users face together – especially in light of potential climatic and hydrologic changes – is not only indicated by this high level of dependence on a sole source of supply, but by the oversubscribed nature and exhaustive use of this source .... The level of use is so exhaustive of surface supplies that after the thirst is satisfied it is, in fact, normal for the Rio Grande to trickle with salt-laden return flows and summer storm runoff for 180 miles until its confluence with Mexico's Rio Conchos – just above Big Bend national Park near Presidio, Texas – where, newly reconstituted, it continues its remaining 1,100 mile journey to the Gulf of Mexico.

NM Water & Economy Report at 1. The NM Water & Economy Report warns, based on tree-ring analysis and anthropological evidence, that:

> Observations indicate that significant climate anomalies are not unprecedented in [New Mexico]; and, that it is entirely plausible that with continued greenhouse gas forcing of the atmosphere, and its rising effects on the earth's energy balance, there can be a reasonable expectation of exceeding these natural extremes in the future (IPCC, 2007).

Id. at 2. Illustrating the feedbacks between factors such as temperature, the timing of precipitation, and the amount of precipitation, the NM Water & Economy Report identifies two key results of various climate scenarios:

> First, peak flow and total streamflow declines for all of the climate change scenarios, whether or not they are relatively 'wet'. The apparent robustness of this result could have important implications for the management of water resources in the region. Although, there is a potential for summer monsoonal activity to increase, as suggested by the 2080 Wet scenario, this is not likely, according to the model results, to offset the losses from diminished snowpack levels in the

[92] Hurd, Brian H. and Coonrod, Julie, *Climate Change and its Implications for New Mexico's Water Resources and Economic Opportunities* (July 2007) (attached as Exhibit 86).

> headwater regions. Second, there is a pronounced shift in later periods (i.e., 2080s time frame) in the peak runoff month by about 30 days. In all of the 2080 period runs, the peak occurs in April and, perhaps equally as important, there is a significant increase in late winter runoff compared to current conditions.

Id. at 11. Such reductions in peak flow and total streamflow, as well as the shift in timing, holds profound implications for Colorado's social and economic vitality:

> As might be expected for water use in a basin that exhausts even the present water supply in normal years, any reduction on long-run, average supply necessarily leads to a reduction in long-run average use ... Heavily influenced by the pattern of agricultural irrigation that peaks in June, ... total water use is curtailed as total supplies diminish with the severity of climate change. The dry scenarios lead to declines in total water use of nearly 10% and over 25% for the respective periods of 2030 and 2080. Declines of 2% and 18% accompany the middle scenarios, respectively; and for the wet scenarios water use declines of nearly 4% and 6.3% are projected, respectively.

Id. at 12. Impacts extend well beyond water quantity to encompass water quality:

> Reduced streamflow lowers assimilative capacity for both point and non-point pollutants. In non-attainment reaches of the river lower TMDLs (total maximum daily load) might be expected and could raise control costs. Climate change might also lead some river reaches to fall out of attainment and require TMDLs and higher pollution control costs.

Id. at 18.

iii. Climate Change Impacts to Ecosystems

Climate change impacts to the hydrologic regime are of course intertwined with climate change impacts to freshwater and terrestrial ecosystems. As the NM Water & Economy Report explains:

> Increased drying of soils and significant reductions in soil moisture are likely with climate change as potential evapotranspiration rises with increasing temperatures. These effects will compound the adverse effects of changes in the hydrology of runoff and water availability throughout New Mexico. Such changes will affect the quality and condition of New Mexico's significant range- and forest-lands, which is likely to accelerate the severity and extent of forest fires but will likely diminish forage production on rangelands that will adversely impact livestock and wildlife across the region.

Id. (references omitted).

Broadening out from this specific link between water and land, experts have "anticipated shifts in the distribution, abundance, and ranges of both plant and animal species." 2007 GAO

Report at 26. As "changes in species distribution are likely to occur in the future ... nonnative species might eventually dominate or replace native species in some areas." *Id.*

In forest ecosystems, "forest composition – both the trees and the species that depend on the trees and forest vegetation – may change." 2007 GAO Report at 26. "[S]ugar maple, white bark pine at high elevations, and subalpine spruce forests in the Rocky Mountains have already experienced such changes." *Id.* at 26.

In the context of the "grasslands and shrubland ecosystem," "tree die-offs triggered by drought and exacerbated by higher temperatures may lead to a shift from woodland to shrubland or grassland .... Southwestern pinyon and juniper woodlands are particularly vulnerable to such changes" and such vulnerability may extend to ponderosa pine and chaparral. *Id.*at 26-27. The problem is so severe that "some rare ecosystems, such as alpine tundra, California chaparral, and blue oak woodlands in California may become extinct altogether." *Id.*at 26.

At bottom, "native biodiversity will increase in many areas, and ... new assemblages of species will be living together, with unknown consequences." *Id.* at 27. The impacts to plant and animal species also include changes to plant and animal "phenology" – the "life-cycle events that are influenced by environmental changes, especially seasonal variations in temperature and precipitation" – including "critical species interactions." *Id.* at 28-29.

Specifically relative to freshwater ecosystems, "increased water body temperatures may increase the risk of toxic algal blooms as well as the severity of fish diseases." 2007 GAO Report at 25. In terms of species risk, "temperature increases are most likely to threaten cold-water species, such as trout, salmon, and amphibians." 2007 GAO Report at 28. Bull trout appear particularly vulnerable; 'the bull trout can only survive in a very limited area, and many of its migration corridors have been cut off as a result of ecosystem fragmentation." *Id.* As noted by the SEO/ISC Report:

> Aquatic and wetland ecosystems display high vulnerability to climate change. Changes in water temperature and shifts in timing of runoff will change aquatic habitats, resulting in species loss or migration as well as novel and unpredictable interactions of new combinations of species. Stream management practices will have to accommodate these new threats to aquatic species, increasing Endangered Species Act (ESA) and threatened species challenges.

NM SEO/ISC Report at 37.

Climate change will also spur insect and disease infestations, thereby negatively impacting aquatic and terrestrial ecosystems. As GAO noted, "[b]iological effects of climate change include increases in insect and disease infestations ...." 2007 GAO Report at 6. Such infestations "include bark beetles, grasshoppers, and various fungi as well as diseases caused by bacteria, parasites, and viruses." *Id.* at 23. Notably, the effects may not involve merely the occurrence of these infestations, but an "increase [in] the range and effects of insects and disease infestation." *Id.* at 23. And, further, a change from "episodic" to "persistent" infestations. *Id.* at 24.

Exemplifying the infestation issue are beetle infestations; with minimum temperatures rising, more beetles can survive winters. Of note, warming is likely to be more intense at high elevations, and at latitudes further from the equator. *See, e.g.*, GAO Report at 17 (discussing elevated temperatures in Glacier National Park relative to global increases). In any event, beetles now can survive at higher latitudes and higher elevations, where extreme cold used to keep them from becoming widespread.[93] In Colorado, the U.S. Forest Service and the Colorado State Forest Service recently predicted, "[a]t current rates of spread and intensification of tree mortality, the MPB [mountain pine beetle] will likely kill the majority of Colorado's large diameter lodgepole pine forests within the next 3-5 years."[94] Beetles are also now causing widespread devastation of whitebark pines, a high-altitude species that grow where winters almost always have been too cold to allow beetle populations to reach outbreak numbers.[95] In the Yellowstone ecosystem, the loss of whitebark pines threatens the survival of the region's grizzly bears, which depend on the fatty seeds of the whitebark pine as their single most important food source.[96]

Further exemplifying the infestation issue, in the BLM-managed Mojave Desert, "invasive grasses, combined with drought, caused, at least in part, by climate change, have increased the frequency and severity of wildland fires, destroying native plants and transforming some desert communities into annual grasslands." As GAO noted:

> Prolonged drought weakens the natural plant communities and then, in periods of wetness, invasive species – particularly grasses – fill the gaps between native vegetation. These invasive grasses can spread and grow faster than native species; the thicker and less evenly spaced vegetation leads to increased fire danger. If a fire starts, it burns much hotter due to the invasive grasses. Native plant communities, such as saguaro cacti and Joshua trees, are damaged, which provides further environment for invasive species and increased fire danger. According to experts, this shift in ecosystems from desert to grassland is likely to continue as the climate changes, which will in turn result in a loss of species diversity in these areas.

2007 GAO Report at 6.

The World Wildlife Fund and the Pew Center on Global Climate Change have compiled compelling scientific evidence linking climate change and impacts to terrestrial and aquatic ecosystems. For example, in 2000, the World Wildlife Fund published a report – *Global Warming and Terrestrial Biodiversity Decline* – wherein the authors, Malcolm & Markham,

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[93] Regniere J., Bentz B., *Modeling cold tolerance in the mountain pine beetle, Dendroctonus ponderosae*, Journal of Insect Physiology, 53: 559–572 (2007) (www.usu.edu/beetle/documents/Regniere_Bentz2007.pdf.); Logan J., J. Powell, *Ghost Forests, Global Warming, and the Mountain Pine Beetle* (Coleoptera: Scolytidae). American Entomologist, 47:3 161-162, 166-168 (2003); Logan J., Regniere J., & Powell J., *Assessing the impacts of global warming on forest pest dynamics*. Front. Ecol. Environ, 1:130-37 (2003)

[94] U.S. Forest Service, Region 2, and Colorado State Forest Service, *Forest Health Aerial Survey Highlights*, available at http://www.fs.fed.us/r2/news/2008/01/press-kit/survey_higlights.pdf.

[95] J. Connelly, *West Can't Beat Heat of Global Warming*, Seattle Post-Intelligencer (April 23, 2006) (http://seattlepi.nwsource.com/connelly/282173_joel23.html).

[96] Logan J., Powell J., *Ghost Forests, Global Warming, and the Mountain Pine Beetle (Coleoptera: Scolytidae)*, American Entomologist. 47:3 161-162, 166-168 (2003); C. Petit, *In the Rockies, Pines Die and Bears Feel It*, New York Times (January 30, 2007) (available at http://query.nytimes.com/gst/fullpage.html?res=9403E5DB143FF933A05752C0A9619C8B63).

provide several general conclusions that BLM should consider:

- "It is safe to conclude that although some plants and animals will be able to keep up with the rates reported here, many others will not.

- Invasive species and others with high dispersal capabilities can be predicted to suffer few problems and so pests and weedy species are likely to become more dominant in many landscapes.

- However, in the absence of significant disturbance, many ecosystems are quite resistant to invasion and community changes may be delayed for decades.

- Global warming is likely to have a winnowing effect on ecosystems, filtering out those that are not highly mobile and favoring a less diverse, more "weedy" vegetation or systems dominated by pioneer species.

- Non-glaciated regions where previous selection for high mobility has not occurred among species may suffer disproportionately. Therefore, even though high [required migration rates] are not as common in the tropics, there may still be a strong impact in terms of species loss.

- Some species have evolved *in situ* and may fail to migrate at all.

- Future migration rates may need to be unprecedented if species are to keep up with climate change.

- Human population growth, land-use change, habitat destruction, and pollution stresses will exacerbate climate impacts, especially at the pole-ward edges of biomes.

- Increased connectivity among natural habitats within developed landscapes may help organisms to attain their maximum intrinsic rates of migration and help reduce species loss.

- However, if past fastest rates of migration are a good proxy for what can be attained in a warming world, then radical reductions in greenhouse gas emissions are urgently required in order to reduce the threat of biodiversity loss."[97]

In *Ecosystems and Global Climate Change: A Review of Potential Impacts on U.S. Terrestrial Ecosystems and Biodiversity*, a 2000 report published by the Pew Center on Global Climate Change, authors Malcolm & Pitelka "provid[e] an overview of some of the potential effects of global warming on terrestrial ecosystems and their component species in the United States," focusing on "key findings, concepts, and information gaps."[98] Relative to

[97] Malcolm, J.R. & Markham, A., *Global Warming and Terrestrial Biodiversity Decline* at v-vi. World Wildlife Fund (2000) (attached to the BCA et al. June 2008 Lease Protest as Exhibit 87).
[98] Malcolm, J.R. and Pitelka, L.F. Ecosystems and Global Climate Change: A Review of Potential Impacts on U.S.

effects on species and communities, Malcolm & Pitelka explain that:

> As a result of climate change, existing climatic conditions in many areas will become unsuitable for the species that currently live there, requiring them to migrate to survive ... The fact that species will have to move in itself is not alarming – most have done so in the past and, even in the absence of human interference in the global climate system, will undoubtedly do so again. However, several aspects of anthropogenic global warming are of particular concern, including the potential rapidity of the change and the possibility that certain alpine or polar ecosystems, which are typical of very cold conditions, could be greatly reduced in size or lost entirely.[99]

Malcolm & Pitelka proceed to explain that "global warming has the potential to create a 'winnowing' or 'filtering' effect similar to the reduction in biodiversity sometimes observed during human development."[100] Additionally, there "is the possibility that different parts of the ecosystem will respond to the warming at different rates, hence altering the combination of conditions that a species might require."[101] Malcolm & Pitelka offer conservation strategies to address these impacts relevant to BLM's efforts to comply with federal law:

> an important strategy for allowing organisms to respond to their full potential is to maintain the habitats that they currently live in – that is, to maintain overall ecosystem structure and species composition. This can be accomplished by reducing fragmentation, loss and degradation of habitat, increasing connectivity among habitat blocks and fragments, and reducing external anthropogenic environmental stresses (Markham and Malcolm, 1996). Thus, adaptation to climate change should benefit from existing strategies to conserve biodiversity and protect natural ecosystems. Various general strategies to conserve biodiversity include establishment and maintenance of viable protected area networks, management of wild populations outside of protected areas, and the maintenance of captive populations. Some characteristics of protected area networks that are though to improve their viability in the face of a changing climate include:
>
> - redundancy of populations;
> - maximization of reserve connectivity, size, and number;
> - protection of areas that offer significant heterogeneity in topography, habitat, and microclimate; and
> - development of biodiversity-friendly management schemes in the landscapes surrounding reserves (Markham and Malcolm, 1996; Malcolm and Markham, 1997).[102]

Authors Parmesan & Galbraith, in the 2004 report *Observed Impacts of Global Climate Change in the U.S.* published by the Pew Center on Global Climate Change, reinforce the

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Terrestrial Ecosystems and Biodiversity at 1, Pew Center on Global Climate Change (2000) (attached to the BCA et al. June 2008 Lease Protest as Exhibit 88).

[99] *Id.* at 21.

[100] *Id.* at 22.

[101] *Id.* at 23.

[102] *Id.* at 33.

findings and conclusions in Malcolm & Markham's and Malcolm & Pitelka's previous studies, concluding that, "human-induced global warming has the potential to severely exacerbate the outcomes of already high levels of stress on ecosystems."[103] Parmesan & Galbraith discuss several anticipated effects to wild plants, animals, and ecological processes including: (1) evolutionary changes; (2) physical and physiological changes; (3) phenological changes; (4) range shifts; (5) community changes; and (6) ecosystem process changes.[104] Perhaps most troubling, however, is the fact that these potential changes may complicate species survival because "a variety of other anthropogenic forces are simultaneously stressing natural systems."[105] "The net result of these pressures is that biological systems may already be in the early stages of a major extinction event that could result in the global loss of one-third of all species by 2100."[106]

Parmesan & Galbraith emphasize that adaptation of species to climate change could be compromised by the influence of "[m]odern, human-dominated landscapes":

> Natural ecosystems increasingly are confined to smaller and more isolated fragments, and population sizes of wild native species have generally declined (Groombridge, 2992). These constrictions have limited the options available to natural systems to contend with the predicted rapid changes in climatic extremes or in the frequency and intensity of disturbances. Reduced population sizes often result in diminished genetic variation, which could limit potential for local adaptation. The increased separation between natural habitat fragments decreases successful dispersal, thereby hindering simple shifts in species' distributions. Increased fragmentation also lowers the probability of successful recolonization of devastated areas after catastrophic disturbances because colonists not only have farther to travel, but they are coming from smaller source populations within impoverished communities. Consequently, modern ecological systems have lowered resiliency to the types of nonlinear climate dynamics predicted by scenarios of global climate change (Schneider and Root, 1996); Easterling et al., 2000a, b; Meehl et al., 2000 a, b; Parmesan e al., 2000; Alley et al., 2003).[107]

Parmesan & Galbraith recommend, as a general matter, the need for a "better understanding of which systems or species are most or least susceptible to projected climate change." Parmesan & Galbraith recommend several specific actions:

- "Reassess species and habitat classifications to evaluate their relative vulnerabilities to climate change."[108]
- "Design new reserves that allow for shifts in the distributions of target species," in particular by "protecting corridors or placing more value on areas with high topographic and

[103] Parmesan, C. & Galbraith, H., *Observed Impacts of Global Climate Change in the U.S.* at 1. Pew Center on Global Climate Change at 3 (2004) (attached to the BCA et al. June 2008 Lease Protest as Exhibit 89).
[104] *Id.* at 7.
[105] *Id.* at 10.
[106] *Id.*
[107] *Id.* at 39.
[108] *Id.* at 42.

elevational diversity."[109]

- "Promote native habitat corridors between reserves" to "aid the redistribution of wild species between preserved areas."[110]
- "Practice dynamic rather than static habitat conservation planning," in particular through "empirical adaptive management."[111]
- "Alleviate the effects of other stressors" given that "it may be easiest to reduce the overall stress on a species by mitigating some of the non-climate stressors."[112]

Relatedly, the Western Governors' Association ("WGA") has a Wildlife Corridors Initiative through which the WGA published an Oil & Gas Working Group Report (attached to the BCA et al. June 2008 Lease Protest as Exhibit 90). The report is related to the Western Governors' Association's resolution emphasizing the "importance of wildlife corridors and crucial habitat" and "asks the Western states, in partnership with important stakeholders, to identify key wildlife corridors and crucial wildlife habitats in the West and make recommendations on needed policy options and tools for preserving those landscapes." BCA et al. June 2008 Lease Protest Exhibit 90 at 1. As the Oil and Gas Working Group Report explains:

> Possible climate change poses further challenges for the region, with scientists projecting greater climate extremes, including increases in drought ... fast-paced changes [resulting from population growth, land-use impacts, energy development, transportation infrastructure, and climate change] are resulting in notable landscape impacts – including habitat loss and habitat fragmentation – ultimately impacting the West's wildlife and aquatic resources.

Id.

To further assist BLM in its efforts to address impacts to the ecosystem – and to craft management alternatives to address these impacts accordingly – three published, peer-reviewed studies are attached. The first, *Catastrophic Shifts in ecosystems* (BCA et al. June 2008 Lease Protest Exhibit 91) emphasizes that there can be "sudden drastic switches" in ecosystems and recommends that "strategies for sustainable management of ... ecosystems should focus on maintaining resilience."[113] The second, *Does Adaptive Management of Natural Resources Enhance Resilience to Climate Change* (attached to the BCA et al. June 2008 Lease Protest as Exhibit 92), notes in its abstract that "[e]merging insights from adaptive and community-based resource management suggest that building resilience into both human and ecological systems is an effective way to cope with environmental change characterized by policies and strategies for responding to climate change."[114] The third, *Forecasting the Effects of Global Warming on Biodiversity* (attached to the BCA et al. June 2008 Lease Protest as Exhibit 93), should provide

[109] Id.
[110] *Id.*
[111] *Id.*
[112] *Id.*
[113] Scheffer, M., *et al.*, *Catastrophic shifts in ecosystems*, Nature, Vol. 413:591-96 (October 11, 2001).
[114] Tompkins, Emma L. & Adger, W. Neil, Does Adaptive Management of Natural Resources Enhance Resilience toClimate Change?, Ecology & Society 9(2):10 (2004).

assistance to BLM once BLM begins to address the consequences of climate change to BLM public resources.[115]

Fortunately, recommended science-based management frameworks relevant to wildlands and wildlife conservation and recovery already exist.[116] One is cited here: the Heart of the West Conservation Plan[117] (attached as BCA June 2008 Lease Protest Exhibit 95). The Heart of the West Conservation Plan contains a wealth of information to inform BLM's analysis of impacts. Perhaps most importantly, it contains recommendations for protecting wildlands areas. These recommendations should form the basis for BLM alternatives designed to protect and improve ecological resiliency in the face of climate change. While the scale of the recommended actions contained within the Heart of the West Conservation Plan may be beyond BLM's capability, standing alone, to implement, it does contain specific recommendations pertaining to BLM lands; provides a basis for BLM to take a go-slow approach to further oil an gas leasing and development, if not take a timeout, to properly coordinate with federal and state partners; and provides a basis for understanding the impacts of climate change to the ecosystems within Wyoming and its environs implicated by the October 2008 lease sale. *See* 43 C.F.R. § 1601.0-8 (requiring BLM to address the impact of BLM activities "on local economies and uses" of both "non-Federal and non-public surface lands over federally-owned mineral interests").

Given their ecological importance, lease parcels falling within the Heart of the West wildand network system of cores and corridors are particularly strong candidates for withdrawal by BLM pending completion of the proper pre-lease analysis & decision-making. Existing stipulations simply do not account for climate change and, furthermore, development of whatever stipulations may just be inappropriate and unacceptable in these areas. Once this analysis and decision-making is completed, limited development within some of these units *may* be appropriate *if* subjected to proper stipulations and controls – e.g., spacing restrictions, requirements to use directional drilling, etc.

The Yellowstone, Snake River and Bonneville (Bear River) cutthroat trout species require clear, cold water, naturally-fluctuating flows, low levels of fine sediment in channel bottoms, well-distributed pools, stable streambanks, and abundant stream cover. These species are also imperiled. Given the observed and anticipated impacts of climate change to winter snowpack and Wyoming's rivers and streams, and given the fact that their populations have already been isolated and fragmented, these trout species may face an exceptionally difficult path to survival.

iv. Climate Change Impacts to Socioeconomic Conditions

Broadening out the discussion from biological and ecological impacts, the public depends

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[115] Botkin, Daniel B. *et al.*, *Forecasting the Effects of Global Warming on Biodiversity*, BioScience, Vol. 57 No.3:227 (March 2007).

[116] A fundamental purpose of wildlands networks is to conserve and preserve ecological resilience and thereby protect biodiversity. As one study concludes, "building and maintaining resilience of desired ecosystem states is likely to be the most pragmatic and effective way to manage ecosystems in the face of increasing environmental change." BCA et al. June 2008 Lease Protest Exhibit 93 at 591-596.

[117] *See* http://www.wildutahproject.org/Templates/submenu(Heart%20of%20the%20West for information on the Heart of the West Conservation Plan.

on the public lands and the ecological resources they contain, such as drinking water supplies, fish and game, and diversity of species to support local economies.[118] As the GAO explained, "[e]conomic and social effects of climate change include adverse impacts on recreation and tourism; infrastructure; water supplies; and fishing, ranching, and other resource-use activities." 2007 GAO Report at 6. The increased "frequency of extreme events, such as fire or drought, could limit recreational activities on federal lands." 2007 GAO Report at 30.

Climate change impacts – not only from extreme events but, also, degradation to aquatic and terrestrial ecosystems, detailed above – are already reducing fishing and hunting opportunities on the public lands. Some have predicted losses of western trout populations as high as 64 percent and of Pacific Northwest salmon of 20 to 40 percent by 2050.[119] *See also* 2007 IPCC Synthesis Report at 2 ("In some marine and freshwater systems, shifts in ranges and changes in algal, plankton and fish abundance are with *high confidence* associated with rising water temperatures, as well as related changes in ice cover, salinity, oxygen levels and circulation" (italics original)). In Montana, drought and higher temperatures have led to fishing closures and restrictions to sustain fish populations in eight out of the last ten years.[120] During the summer of 2007, closures were in force on 29 rivers in Montana by August 2. Since 2000, the number of annual fishing permits issued to Yellowstone National Park visitors has dropped by nearly a quarter, from 67,700 to 51,900, even as total park visitation remained steady.[121] One fly fisherman who has traveled from California each of the past 15 years to fish the Yellowstone River reacted to the decline: "I decided yesterday that I won't be back anymore. There just aren't enough fish to make it worthwhile."[122]

Moreover, "climate change could affect infrastructure and operational costs on federal lands." 2007 GAO Report at 31. In terms of "water supplies and quality":

> Snow and ice serve as natural reservoirs in mountainous areas and northern regions of the United States, gradually supplying water into the summer months. Much of the west relies on spring snowmelt to provide a steady stream of water into summer months, when demand is highest. However, warmer temperatures and chances in winter precipitation patterns from snow to rain are expected to continue causing reduced snowpack and early snowmelt. Water supply shortages will likely increase the cost of water. In addition, the experts said that water quality is likely to decline if harmful algal blooms, bacteria, or botulism occur as a result of increased temperature; such occurrences would likely result in

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[118] *See, e.g.*, M. Harris, P. Morton, Culver, *Natural Dividends: Wildland Protection and the Changing Economy of the Rocky Mountain West* (The Wilderness Society) (www.tws.org/Library/Documents/NaturalDividends.cfm) (attached to the BCA et al. June 2008 Lease Protest as Exhibit 95).

[119] J. Williams, Trout Unlimited, Testimony, U.S. Senate, Committee on Energy and Natural Resources, Subcommittee of Water and Power, June 6, 2007, http://www.livingrivers.org/pdfs/CongressionalTestimony/WilliamsTestimony.pdf (attached as Exhibit 96).

[120] Id.

[121] U.S. Department of the Interior, National Park Service, Yellowstone National Park, *Yellowstone Fish Reports*, 2000 to 2005, http://www.nps.gov/yell/planyourvisit/fishreports.htm and *Park Statistics*, http://www.nps.gov/yell/parkmgmt/statistics.htm.

[122] R. Tosches, *Warm waters deadly to Yellowstone trout*, Denver Post (July 29, 2007).

increased water treatment costs.

2007 GAO Report at 33; *see also* SEO/ISC Report. "Water issues are particularly significant in the southwestern United States ... According to experts discussing the fresh waters ecosystem, less surface water availability means lower groundwater recharge rates and further demand on the existing groundwater resources." "[R]eductions in groundwater could affect communities ... causing wells to dry up, thereby forcing people to abandon homes or greatly increasing the cost of living in the area" and may also cause "greater competition for water, which could have a negative economic impact on ranchers and some communities situated near federal lands." 2007 GAO Report at 33.

These conclusions are supported by the NM Water & Economy Report, which is informative regarding potential impacts in Wyoming. The Report explains that "[c]limate change introduces water supply changes – in these cases, reductions – that exacerbate relative scarcity and result in even larger price increases in order to induce water transfers from agriculture to urban water users." NM Water & Economy Report at 14. Additionally, "tourism, arts, and recreation, which together contribute $360 million to New Mexico's economy, might decline as the States' unique landscapes, environment, and scenic opportunities are potentially degraded by changes in riparian ecosystems and agrarian land use." *Id.*

In terms of the overall costs of climate change compared to the overall costs of climate change abatement, it is increasingly clear that abatement is not only economically feasible, but, economically, the only rational option. As the 2008 RMCO/NRDC Report explains:

> A new study by the business consulting firm McKinsey & Company, co-sponsored by NRDC, examines the cost and market potential of more than 250 greenhouse gas abatement technologies and concludes that the United States can do its part to stabilize the climate at little to no net cost, considering energy-efficiency savings. In sharp contrast, estimates of the annual benefits from stopping global warming range as high as 20 percent of total economic output. Moreover, the transition to a cleaner and more efficient energy economy will improve air and water quality, protect public health, and increase our energy security and productivity, all while we continue to grow our economy as forecasted, decade after decade.

RMCO/NRDC Report at 35.

Given the threats of climate change to public land resources, BLM faces an increasingly daunting challenge to protect the public resources for which BLM is responsible and to ensure that its actions do not compromise the interests of Colorado and the broader Rocky Mountain region. BLM should be cognizant of the fact that the impacts of global warming and climate change will likely "depend on the rate and magnitude of climate change" wherein "some changes will occur quickly and will be readily apparent, while others will occur gradually and be less apparent in the near term." 2007 GAO Report at 7. As the 2005 NM Climate Change Report explains on page 8:

> Surprises are inevitable .... Climate changes and ecosystem responses are not

always gradual, but can occur abruptly over a few decades or less. Complex human and natural systems often respond in a nonlinear manner to increasing stress. That is, they change gradually or not at all until a threshold ("tipping point") is reached, and then they change dramatically. Positive feedbacks can amplify the impacts of small changes into enormous effects, such as when a wildfire grows until it begins creating its own winds and "blows up" catastrophically.

These "[s]urprises" should not suggest that BLM can do nothing. As discussed above, taking action to improve the resiliency of ecological systems (in part by mitigation or eliminating impacts) by considering and adopting the conservation frameworks contained within the Heart of the West Conservation Plan is an essential management step. Such action does not require a precise understanding of climate change impacts. As noted in a report authored by New Mexico's State Engineer and the Interstate Stream Commission relative to water resources management, but equally relevant to BLM public lands management:

> Policy and managerial responses need not (and should not) wait for better climate predictions. It is already clear that temperatures are rising and that extreme events are becoming more common, so assessing the vulnerabilities of existing management strategies and resource availability can proceed without certainty about changes in precipitation. A close look at risk, even without firm quantification, can often lead to optimal solutions that may not be immediately apparent and that may avoid expensive missteps ...managers already operate within a context of uncertainty ... Climate change is thus not a stand alone issue. It will add an additional layer of uncertainty to the complexity ... Managers will thus need robust and resilient planning scenarios and processes, and highly adaptive management structures to adapt to changing predictions.

SEO/ISC Report at 37.

The evidence provided in this Protest is just the tip of an ever-growing iceberg – one that stands in stark contrast to the reality of shrinking icebergs and collapsing iceshelfs in the Antarctic. This evidence demonstrates that global warming and climate change has the potential if not the reality to cause severe, unprecedented, and game-changing impacts to BLM public lands and, more broadly, to the entire State of Wyoming and the Rocky Mountain West. If there is a silver lining, it is that these impacts can also be addressed and, hopefully, remedied through proactive land protection and management. Time, though, is running out.

5. BLM HAS FAILED TO ADDRESS GLOBAL WARMING, CLIMATE CHANGE, AND GREENHOUSE GAS EMISSIONS FROM FEDERAL ONSHORE OIL AND GAS DECISIONMAKING ACTIONS

The Protestors are unaware of any lease-stage NEPA analyses and therefore presume that BLM has completed Documentations of Plan Conformance and NEPA Adequacy that purport to justify the lease sale on the basis of RMPs and RMP-stage NEPA Analyses. As noted, it is unclear how existing RMP-stage NEPA Analyses as presently constructed can supplant lease-

stage NEPA requirements relative to BLM's duty to consider the option of not issuing leases, and BLM's duty to consider lease-specific stipulations rather than just standard lease terms and conditions.

In any event, not one of BLM's Resource Management Plans for the lease sale areas in Wyoming appear to address global warming, climate change, or GHG emissions from oil and gas leasing and development. This failure is stark given: (1) Secretarial Order 3226's explicit mandate, in section 3, to consider climate change "when making major decisions regarding the potential utilization of resources under the Department's purview" and in "planning and management activities associated with oil, gas and mineral development on public lands"; (2) FLPMA's mandates to protect the environment, prevent "permanent impairment," prevent "unnecessary or undue degradation," and "minimize adverse impacts" (43 U.S.C. §§ 1701(a)(8), 1702(c), 1732(b), 1732(d)(2)(A)); (3) NEPA's mandate that BLM consider the adverse environmental impacts of and reasonable alternatives to a proposed action; and (4) BLM's Public Trust Duty.

Across the Rocky Mountain West, BLM has failed to address the impacts of oil and gas leasing on climate change or the cumulative impacts of climate change, burying its head in the sand and ignoring the potential grave consequences of actions it permits. In New Mexico's Farmington RMP, for example, BLM provides no mention of climate change and global warming.[123] In the EIS for that RMP, BLM did respond to a comment submitted by the San Juan Basin Health Department which asked BLM to address the contribution of the proposed oil and gas development to CO_2 levels and greenhouse gas concerns by summarily stating: "Methods to determine the effects of the significance of greenhouse gas emissions (GGE) from individual projects to climate change do not exist and this issue is beyond the scope of this NEPA process."[124] Additionally, in response to a comment provided during the planning process for Colorado's Glenwood Springs Resource Area Oil and Gas Leasing and Development Final Supplemental EIS which requested that BLM consider the impacts of the plan on climate change, BLM responded that, "Methane, carbon dioxide, and several other atmospheric chemicals have been postulated to have an effect on global climate." "However, both the nature and the degree of this suspected relationship are unknown at this time."[125]

There are three problems with BLM's glib approach. First, as this Protest demonstrates, methods do exist to quantify and reduce climate change and other federal agencies – in particular MMS – are quantifying and reducing GHG emissions from oil and gas leasing and development at both the programmatic planning and leasing stages. Second, and perhaps more importantly, even if this were not the case, a presumed lack of methodology is not an excuse for barreling forward blindly. 40 C.F.R. § 1502.22. Third, global warming, climate change, and GHG emissions from oil and gas leasing and development are indisputably a component of BLM's legal responsibilities and cannot be waived away with an unsubstantiated ten-word statement that

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[123] Bureau of Land Management, *Farmington Resource Management Plan* (Dec. 2003).

[124] Bureau of Land Management, Farmington *Proposed Resource Management Plan and Final Environmental Impact Statement*, P-9 (Mar. 2003) (excerpts attached to the BCA et al. June 2008 Lease Protest as Exhibit 66).

[125] Bureau of Land Management, Glenwood Springs Resource Area Oil and Gas Leasing and Development Final Supplemental Environmental Impact Statement, 5-17 – 5-18 (January 1999) available at: http://www.blm.gov/co/st/en/BLM_Programs/land_use_planning/rmp/glenwood_springs/glenwood_springs_amendments.html (last accessed April 22, 2008).

they are beyond the scope of BLM's planning responsibilities.

Insofar as BLM management – through RMP implementation – affords BLM adaptive management capacity, adaptive management must be predicated on a foundation of planning and analysis that forthrightly addresses impacts and anticipated uncertainties to support and justify adaptive measures. Without such a foundation, BLM management would be relegated to a reactive posture that "can be ultimately more costly than making forward-looking responses that anticipate likely future conditions and events." SEO/ISC Report at 37. Moreover, such adaptive measures would be arbitrary and capricious as BLM management would violate a basic principle of management underlying Secretarial Order 3226, FLPMA, NEPA, and the Public Trust Duty: *look before you leap.*

III. CONCLUSION AND REQUEST FOR RELIEF

For the foregoing reasons the Parties request that the protested parcels not be offered for sale at the October 2008 Competitive Oil and Gas Lease Sale. If BLM declines to withdraw the protested parcels, then we request that at the minimum, full NEPA analysis be conducted on the impacts of oil and gas development on global warming and climate change and that ***adequate*** protective stipulations be placed on the leases before the lease sale in order to provide protection for wildlife, air quality, water quality, and other special resources.

Respectfully submitted,

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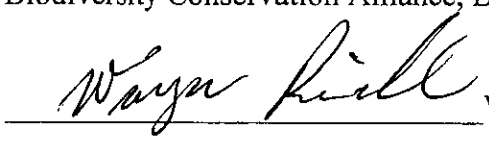
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Signing on behalf of:

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