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**A Mitigation-Based Rationale
for Incorporating a Climate
Change Impacts Fee into the
Federal Coal Leasing Program**

By Michael Burger

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EXECUTIVE SUMMARY

On January 15, 2016, Interior Secretary Sally Jewell announced the Department of the Interior (DOI or Interior) and Bureau of Land Management (BLM) would conduct a comprehensive environmental review of the federal coal leasing program and, if appropriate, update the regulatory and programmatic scheme for the first time in more than thirty years. The twin goals of the review are to ensure a fair return to the American people and to properly account for the program's environmental impacts, including climate change.

Arguably, the single best way for Interior and BLM to account for the climate impacts of the federal coal leasing program, to protect public lands from climate change impacts and to manage the program in such a way as to meet the United States' domestic and international climate goals is to make permanent the temporary moratorium on issuing new leases – to “leave it in the ground.” However, this is not the only potential management approach the agency may adopt. One alternative would be to impose a carbon price on federal coal. To assess its options, BLM can undertake an environmental review under the National Environmental Policy Act (NEPA) that accounts for greenhouse gas (GHG) emissions under a range of alternative scenarios and that uses the Social Cost of Carbon and Social Cost of Methane, or perhaps some other metrics, to assign a monetary value to associated climate impacts.

To complement this presumptive analytic framework, this paper develops an argument for using a mitigation-based rationale to deliver a climate change impacts fee on coal extracted from federal lands, and provides suggestions for how Interior and BLM can approach an analysis of the possibility in its programmatic environmental impact statement (Programmatic EIS). The paper makes several key points:

- 1. The federal government has a duty to mitigate climate impacts from downstream GHG emissions associated with the coal leasing program**

There are at least four potential non-statutory sources of the federal government's affirmative duty to mitigate greenhouse gas emissions and associated climate impacts from federal coal: the principles of international law and the requirements set forth under the United Nations Framework Convention on Climate Change; the public trust doctrine; the federal common law of public nuisance; and private nuisance under state common law. Although it is plausible that none

of these sources would result in an affirmative court decision holding the government liable for a breach of its duty, that shortfall does not negate the existence of the duty itself.

The statutes and regulations that govern Interior's management of public lands provide other, and potentially even more forceful, sources for a duty to mitigate upstream and downstream greenhouse gas emissions and associated climate change impacts arising from the federal coal leasing program. Pursuant to the Federal Land Policy and Management Act (FLPMA), the Mineral Leasing Act (MLA) and NEPA, BLM has a duty to analyze and implement mitigation measures for the adverse environmental, social and public health impacts attributable to its management of fossil fuels on public lands.

2. The federal government has the discretion to mitigate climate impacts from downstream GHG emissions associated with the coal leasing program

Even if the duty to mitigate is of uncertain scope or enforceability, FLPMA, the MLA and NEPA all confer a definite discretion to mitigate climate change impacts. The multiple use mandate and unnecessary and undue degradation prohibition of FLPMA, the public interest requirements of the MLA and the ambitious goals and specific analytical requirements of NEPA individually and taken together grant the agencies broad discretion to mitigate foreseeable impacts, and to require compensation for impacts that cannot be avoided or minimized.

3. The duties imposed on and remedies available against lessors under tort and property law offer a persuasive rationale for assigning a climate change impacts fee to federal coal

Climate change impacts from the coal leasing program's downstream GHG emissions will occur in locations, and to persons, both proximate to and remote from a given leased parcel. These impacted locations will include the leased parcel, other public lands and resources under BLM's jurisdiction, other federal lands and resources under Interior's jurisdiction, and private and public property within and outside the United States.

Impacts to federal lands—including the leased parcel and off-site lands—and even to the public fisc, more broadly writ, are compensable under the general principles of property law. For instance, it is a general principle of property law that tenants are required to restore leased property to its former condition, or else be subject to termination and/or damages. And although there may not be a hornbook principle along these lines to cite to, it makes profound sense that a

lessor has within its authority the ability to protect its other properties, or to require compensation for impacts to them, from activities it permits on its land.

Moreover, the federal government, as lessor to coal mining companies, could, in principle, be held liable for damages for the climate change impacts associated with downstream GHG emissions. Section 379A of the Restatement (Second) of Torts and Section 18(4) of the Restatement (Second) of Property maintain similar standards for lessor liability for remote nuisances or personal injuries attributable to lessees' activities. Because the federal government is consenting to the coal mining, and because the federal government is at this time well aware that coal leasing either involves an unreasonable risk or else contributes to the identifiable nuisance of climate change impacts, these principles of lessor liability put the government on the theoretical hook for damages.

4. Federal statutes, regulations and policy provide Interior and BLM with ample authority to adopt a fee as a form of compensatory mitigation

BLM has recognized that compensatory mitigation for unavoidable or residual climate change impacts arising from agency decisions is fully consistent with its mission and its multiple use mandate and that it possesses the discretion to require it, and has clarified that doing so is in fact the agency's policy. A climate change impacts fee for downstream GHG emissions fits within the agency's NEPA obligations and its compensatory mitigation policy.

The climate change impacts at issue in this paper are those that occur as a result of GHG emissions both at the coal mine and downstream, when the extracted coal is transported and eventually combusted for its end use. These downstream GHG emissions are considered "indirect effects" under NEPA, and the climate change impacts associated with those emissions are unavoidable or "residual" impacts. In undertaking the Programmatic EIS, Interior has recognized that NEPA requires it to analyze downstream emissions – a conclusion that comports with the current trajectory of courts' interpretations of NEPA. Under NEPA, then, the agency must also identify and assess appropriate mitigation measures for these emissions, including compensatory mitigation measures. The mitigation measures discussed in the Programmatic EIS should follow the "mitigation hierarchy," and should include both a "net zero" emissions offset program as well as a climate change impacts fee.

A climate change impacts fee would be consistent with recent directives, including the Presidential Memorandum *Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment*; Secretarial Order 3330, *Improving Mitigation Policies and Practices of the Department of the Interior*; and “Landscape-Scale Mitigation Policy,” a new chapter in its Departmental Manual, which effectively operationalizes Order 3330. The sum total of the White House and Interior guidance is that BLM can and should assess and potentially implement mitigation measures, which might operate through any number of mechanisms, including lease stipulations and chargeable fees, among other things. The mitigation measure should first seek to avoid GHG emissions and their climate impacts; second, seek to minimize emissions and impacts; and third, compensate for unavoidable impacts, as through a climate change impacts fee.

5. Technical issues that the agency should address in the course of assessing this course of action through the Programmatic EIS

There are a number of key questions to address in developing a mitigation framework in any context: 1) whether to mitigate; 2) when to mitigate; 3) what mitigation should be required; 4) technical issues surrounding how to mitigate. The question of whether to mitigate was addressed above. The question of when to mitigate is one of practical consequence: advance mitigation in this context, based on acreage or projected production, might result in overcharging lessees and so basing mitigation on actual production would seem to be a more reasonable approach. The questions of what mitigation should be required and what technical issues the agency will necessarily confront are more complex they are. They are treated in summary form below.

a. *What mitigation should be required*

The Presidential Memorandum *Mitigating Impacts from Natural Resource Development* identifies three types or categories of resources: irreplaceable resources; resources that are important, scarce or sensitive; and other resources managed consistent with an agency’s mission and objectives. There is an argument to be made that the climate in which human civilization took shape and in which we continue to exist constitutes an irreplaceable resource, and that the appropriate mitigation measure for continued GHG emissions and climate change impacts is avoidance. If BLM concludes that the climate is not an irreplaceable resource warranting avoidance to the maximum extent practicable the agency must conclude that it is nonetheless an important

and sensitive resource, and that the appropriate mitigation standard is a minimum of no net loss, and preferably a net benefit. Such mitigation could be pursued on a number of different scales: planetary, national or regional.

b. *How to calculate a climate change impacts fee*

The question of what the proper amount to charge for federal coal has been the subject of several economic analyses, and this paper does not seek to answer it. Rather, the paper identifies a number of fee-related issues Interior and BLM should consider in the environmental review. These include: whether to use the Social Cost of Carbon and the Social Cost of Methane or other metrics; how to account for intervening actors; how to account for regulations on power plants and other coal users; how to account for the different carbon intensity of coal; whether and how to account for historic emissions; whether and how to account for historic costs; and how to account for the impacts different prices will have on different companies, industry sectors, states, tribes, and local communities. The paper also looks at different mechanisms for compensatory mitigation—such as in lieu fees, mitigation banks and permittee-responsible measures.

6. A Sample Framework for Developing a National Compensatory Mitigation Strategy for the Federal Coal Leasing Program

In considering employing a climate change impacts fee as a compensatory mitigation strategy for the federal coal leasing program BLM will not be starting from scratch. The paper uses the bureau's Regional Mitigation Strategies for Solar Development as a template to develop an analytic framework for the coal leasing program. Accordingly, the paper offers one set of possible responses that result in establishment of a climate change impacts fee as a compensatory mitigation strategy.

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I. Introduction

Since the enactment of the Mineral Leasing Act (MLA) in 1920 the United States federal government has leased public lands to private companies to mine coal, often at a steep discount, and often with little or no accounting for the broad scope of coal’s environmental externalities.¹ The raft of environmental legislation that passed through Congress in the 1970s addressed these issues to some degree. For example, the Federal Coal Leasing Amendment Act required the United States to, among other things, recover “fair market value” for the leases; the National Environmental Policy Act (NEPA) required the federal government to assess, analyze and disclose potential adverse environmental impacts from federal actions, including cumulative and indirect effects; and the Clean Air Act and the Clean Water Act addressed aspects of air quality and water pollution by imposing new permit requirements on mining operations. To date, however, the coal leasing program has not adequately addressed the upstream and downstream impacts of federal coal leases — air pollution associated with the extraction, transportation and combustion of coal that contributes significantly to smog, acid rain and, most importantly here, climate change.

Climate change poses an enormous threat to the lives and well-being of individuals and communities across the world, and to ecosystems, wildlife and other natural and cultural resources.² The harmful impacts of global climate change include sudden-onset events that can devastate physical and social infrastructure and immediately threaten human lives and safety, as well as more gradual forms of environmental degradation that can over the course of time undermine access to homes, water, food, and other key resources that support the lives and livelihoods of individuals, communities and even entire nations. In the United States, climate change impacts—including increased average temperatures and heat waves, increased frequency and severity of extreme storm events, sea level rise and ocean acidification—pose numerous risks across many sectors, including but not limited to increased heat-related illnesses and deaths, dirtier air, damaged and disappearing coastlines, longer droughts, strains on water quantity and

¹ Although this paper addresses the coal leasing program specifically, the points made here are in many instances equally applicable to federal oil and gas leasing programs, as well. As the federal government pursues its climate goals it should prioritize making consistent its management of mineral resources, its oversight of fossil fuel transportation and nodes, and its regulation of greenhouse gas emissions.

² See generally INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2014: IMPACTS, ADAPTATION, AND VULNERABILITY (2014).

quality, increasingly frequent and severe floods and wildfires, invasive species, thawing permafrost and degraded fisheries and ecosystems.³ Public lands managed by the U.S. Department of the Interior and the U.S. Forest Service, among other federal agencies, share these risks, which threaten the environmental, economic, scientific, recreational and other uses to which our public lands are put.⁴

On January 15, 2016, Interior Secretary Sally Jewell issued Order No. 3338, declaring that the Department of the Interior (DOI or Interior) would conduct a comprehensive review of the federal coal leasing program and, if appropriate, update the regulatory and programmatic scheme for the first time in more than thirty years.⁵ Order No. 3338 also announced that Bureau of Land Management (BLM) would prepare a discretionary Programmatic Environmental Impact Statement (Programmatic EIS) under NEPA, which will provide a “vehicle” for considering “whether and how the program may be improved and modernized to foster the orderly development of BLM administered coal on Federal lands in a manner that gives proper consideration to the impact of that development on important stewardship values, while also ensuring a fair return to the American public.”⁶ Order No. 3338 specifically calls on the Programmatic EIS to consider “the climate impacts of continued Federal coal production and combustion and how to address those impacts in the management of the program to meet both the Nation’s energy needs and its climate goals, as well as how best to protect the public lands from climate change impacts.”⁷

³ U.S. GLOBAL CHANGE RESEARCH PROGRAM, CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT 195 (Jerry M. Melillo et al. eds., 2014).

⁴ See, e.g., Exec. Order No. 13,653, 78 Fed. Reg. 66,819, 66,819 (Nov. 6, 2013) (“The impacts of climate change—including an increase in prolonged periods of excessively high temperatures, more heavy downpours, an increase in wildfires, more severe droughts, permafrost thawing, ocean acidification, and sea-level rise—are already affecting communities, natural resources, ecosystems, economies, and public health across the Nation”); JESSICA E. HALOFSKY ET AL., CLIMATE CHANGE ADAPTATION IN UNITED STATES FEDERAL NATURAL RESOURCE SCIENCE AND MANAGEMENT AGENCIES: A SYNTHESIS (2015) (summarizing adaptation activities by natural resource management agencies in 2013–14).

⁵ Discretionary Programmatic Environmental Impact Statement to Modernize the Federal Coal Program, Sec’y of the Interior Order No. 3338 (Jan. 15, 2016).

⁶ *Id.* at 1.

⁷ *Id.* at 8. Order No. 3338 also establishes the related goals of ensuring that the American public receives fair market value (or a “fair return”) from the sale of the coal, and assessing whether the program “adequately accounts for externalities related to Federal coal production, including environmental and social impacts.”

Arguably, the single best way for Interior and BLM to account for the climate impacts of the federal coal leasing program, to protect public lands from climate change impacts and to manage the program in such a way as to meet the United States' climate goals is to make permanent the temporary moratorium on issuing new leases. The numbers on this point are telling: As part of its participation in the Paris Agreement to the United Nations Framework Convention on Climate Change (UNFCCC), the United States has committed to reduce economy-wide greenhouse gas (GHG) emissions by 26–28% below 2005 levels by 2025, which will put the country on a trajectory to achieve emission reductions of 80% or more by 2050.⁸ This emissions reduction target is part of a broader commitment on the part of the U.S. and the 177 other signatories of the Paris Agreement to limit global warming to “well below” a 2 °C increase above pre-industrial temperatures, and to seek to limit it to 1.5 °C.⁹ According to one recent study, in order to achieve this goal over 80% of global coal reserves and 92% of U.S. coal reserves must remain unused to have even a 50% chance of meeting the 2 °C target.¹⁰ Thus, the best way to avoid and/or minimize adverse climate change impacts from federal coal is quite simply to “leave it in the ground.”

Id. Greenhouse gas emissions are one of the externalities that should be accounted for when determining whether the American public is receiving fair market value from the sale of the coal. See EXECUTIVE OFFICE OF THE PRESIDENT OF THE U.S., THE ECONOMICS OF COAL LEASING ON FEDERAL LANDS: ENSURING A FAIR RETURN TO TAXPAYERS (2016); Alan Krupnick et al., *Should We Price Carbon from Federal Coal?*, RESOURCES, Spring/Summer 2015, at 16.

⁸ To achieve this, we must lower annual emissions to 5460–5312 million metric tons of carbon dioxide equivalent (MtCO_{2e}) by 2025 (a reduction of 1410–1558 MtCO_{2e} over 2014 levels). *U.S. Cover Note, INDC and Accompanying Information*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (Mar. 31, 2015), <http://www4.unfccc.int/submissions/INDC/Published%20Documents/United%20States%20of%20America/1/U.S.%20Cover%20Note%20INDC%20and%20Accompanying%20Information.pdf> (submitting the U.S.'s intended nationally determined contribution to the UNFCCC Secretariat). These figures are based on the EPA GHG inventory estimates for 2005 GHG emissions and 2014 emissions (which were used as a baseline for current emissions, since these are the most recent estimates). U.S. ENVTL. PROT. AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2014 (2016). Notably, even with the Clean Power Plan and other existing regulations, the U.S. is not yet on track to achieve these reductions—additional measures will be needed to meet the 2025 target. See JOHN LARSON ET AL., RHODIUM GROUP, TAKING STOCK: PROGRESS TOWARD MEETING US CLIMATE GOALS (2016); DOUG VINE, CTR. FOR CLIMATE & ENERGY SOLUTIONS, ACHIEVING THE UNITED STATES' INTENDED NATIONALLY DETERMINED CONTRIBUTION (2016), <http://www.c2es.org/docUploads/achieving-us-indc.pdf>.

⁹ U.N. Framework Convention on Climate Change, *Adoption of the Paris Agreement*, U.N. Doc. FCCC/CP/2015/L.9/Rev.1, art. 2 (Dec. 12, 2015) [hereinafter *Paris Agreement*].

¹⁰ Christophe McGlade & Paul Ekins, *The Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming to 2 °C*, 517 NATURE 187 (2015) (regional estimates of unburnable reserves were based on an “economically optimal” distribution).

However, a directive to “leave it in the ground” is not the only potential management approach the agency may adopt. To understand the implications of different approaches, BLM can and should calculate and assess the full scope of potential GHG emissions associated with the federal coal leasing program under a number of different alternatives, ranging from the “leave it in the ground” alternative to a worst-case, “burn it all” alternative. In addition, BLM can and should calculate and assess the full scope of potential climate change impacts attributable to those emissions. Although it remains difficult to attribute particular climate impacts to specific GHG emissions, and although any attribution remains to some degree uncertain, the federal government has developed the Social Cost of Carbon and the Social Cost of Methane to provide a robust, quantitative means by which to calculate and assess climate impacts.¹¹ For the purposes of analysis and focus, this paper assumes that BLM will undertake an appropriate environmental review that accounts for the full range of GHG emissions and that uses the Social Cost of Carbon and Social Cost of Methane to put a monetary value to associated climate impacts.

To complement this presumptive analytic framework, this paper develops an argument for using a mitigation-based rationale to deliver a climate change impacts fee on coal extracted from federal lands. Assuming that at least some new federal coal leases will be issued under the revised program, or that existing leases may be renewed, BLM has the legal authority to seek to compensate for the adverse environmental, social and public health impacts attributable to the resulting GHG emissions — and it makes policy sense to do so. Pursuant to NEPA and its implementing regulations, upstream GHG emissions—emissions from the extraction of coal from federal lands—are direct effects of a coal lease; downstream GHG emissions—emissions from the transportation and combustion of the coal—are indirect effects. The climate change impacts attributable to those upstream and downstream emissions, then, are unavoidable (or “residual”) impacts from a coal leasing program that involves the issuance of new leases or renewal of existing ones, and so properly the subject of compensatory mitigation, such as a climate change impacts

¹¹ See INTERAGENCY WORKING GRP. ON SOC. COST OF CARBON, TECHNICAL SUPPORT DOCUMENT—TECHNICAL UPDATE OF THE SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866 (2013, revised 2015); INTERAGENCY WORKING GRP. ON SOC. COST OF GREENHOUSE GASES, ADDENDUM TO TECHNICAL SUPPORT DOCUMENT ON SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866: APPLICATION OF THE METHODOLOGY TO ESTIMATE THE SOCIAL COST OF METHANE AND THE SOCIAL COST OF NITROUS OXIDE (2016).

fee.¹² As a matter of regulatory design, this climate change impacts fee could come as part of the bonus bid on a lease, as an in-lieu fee, as part of the regulatory rental fee, as a stand-alone lease condition, as part of the royalty calculation or in some other form. As a matter of environmental review, a climate change impacts fee could serve as an element of one of the alternatives being analyzed. However, it may be even more useful to analyze the concept as an independent alternative—that is, as an element of program design, or as an adder or overlay to all of the other alternatives.¹³ The latter approach would more easily allow the agency to assess the efficacy and repercussions of a range of different fees.

This paper proceeds in five parts, of which this Introduction is the first. Part II addresses the question of whether the federal government has either a duty to mitigate climate impacts from downstream GHG emissions associated with the coal leasing program or the discretion to do so. This section seeks to answer this question by examining the obligations and limitations imposed by international law, the public trust doctrine, our common law and relevant federal statutes. Part III argues that duties imposed on and remedies available against lessors under tort and property law offer a persuasive rationale for assigning a climate change impacts fee to federal coal. Part IV argues that federal statutes, regulations and policy provide Interior and BLM with ample authority to do so. Part V identifies some of the technical issues that the agency should address in the course of assessing this course of action through the Programmatic EIS.

II. The Federal Government’s Duty to Mitigate Climate Change Impacts

The federal government’s ownership of the federal public domain is absolute, analogous to though not precisely the same as title in fee simple.¹⁴ Congress, consistent with the authority granted by the Property Clause of the U.S. Constitution, possesses the powers both of “proprietor

¹² See *infra* Section II.C.

¹³ See Final Guidance for Federal Departments and Agencies on the Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact, 76 Fed. Reg. 3843 (Jan. 21, 2011); see also 43 CFR § 46.130(a) (2015) (“The mitigation measures can be analyzed either as elements of alternatives or in a separate discussion of mitigation.”).

¹⁴ See RESTATEMENT (THIRD) OF PROP.: WILLS AND OTHER DONATIVE TRANSFERS § 24.2 (AM. LAW INST. 2011) (discussing relationship of fee simple absolute to notions of inheritance).

and of legislature”; these powers are “subject to no limitations.”¹⁵ In its capacity as proprietor, Congress has the power to withdraw and reserve, dispose and convey, and otherwise limit the use of federal lands. In its capacity as regulator, Congress is empowered to “make all needful rules and regulations.”¹⁶

There are, of course, important limits on the federal government’s ownership, and these limits necessarily influence how Interior and BLM should approach the revision of the federal coal leasing program. After all, even title in fee simple absolute is not free rein to use property in any way. A private property owner possesses not only a bundle of rights but also a bundle of duties to others. Private property may not be used in a way that violates the others’ rights, and is restricted by common law doctrines such as nuisance, trespass and negligence. The federal government’s use of federal lands is also circumscribed by these common law doctrines—in principle if not as a matter of law per se. These principles abide because although the federal government is insulated from litigation in some instances that would allow others to enforce its obligations or else be liable for damages, and although the federal government has in the discretionary function defense a legal defense that will shut down most if not all lawsuits against it seeking damages for its land and natural resources management decisions, these legal escape-hatches do not obviate the government’s duties as proprietor and regulator of the public domain. Moreover, in managing the public lands under its jurisdiction, Interior and BLM act as agents of Congress, executing the laws pursuant to the discretion afforded them under federal legislation.

The remainder of this section addresses the question of whether Interior and BLM have either a duty to mitigate climate change impacts attributable to the coal leasing program’s upstream and downstream GHG emissions, or else the discretion to do so.

A. International Law, Public Trust and Common Law Sources of a Duty to Mitigate Climate Change Impacts

There are at least four potential sources of the federal government’s affirmative duty to mitigate greenhouse gas emissions and associated climate impacts from federal coal: international law, the public trust doctrine, the federal common law of public nuisance, and private nuisance

¹⁵ *Kleppe v. New Mexico*, 426 U.S. 529, 540 (1976); *Gibson v. Choteau*, 80 U.S. 92, 99 (1871).

¹⁶ *Kleppe*, 426 U.S. at 540.

under state common law. The discussion that follows illuminates a number of core principles embodied in these sources that ought to guide the federal government as it undertakes its comprehensive review of the federal coal leasing program.

a. International Law

Consistent with the international law principle of *sic utere tuo ut alienum non laedus*, which directs nations to avoid causing significant injuries to the environment of other nations, states in the international community have a duty to address transboundary environmental harms, including those that arise from use of state-owned property and from activities authorized by state action.¹⁷ This principle was recently upheld by the International Court of Justice (ICJ) in the *Pulp Mills* case, where the court noted that it is “every State’s obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States.”¹⁸ The *Pulp Mills* decision accords with the ICJ’s earlier declaration in the *Trail Smelter* case that “no state has the right to use or permit the use of its territory in such a manner as to cause injury . . . in or to the territory of another or of the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.”¹⁹ To facilitate compliance with this “no harm” rule there is a “principle of prevention” that requires a state to “use all the means at its disposal in order to avoid activities which take place in its territory, or in any area under its jurisdiction, causing significant damage to the environment of another State.”²⁰

Climate change plainly falls within the ambit of the “no harm” rule and its corollary obligations. As a technical matter, there is no question that GHGs emitted in the United States contribute to the planetary problem of climate change, injuring property and people in foreign countries. The science is straightforward: CO₂ and the other greenhouse gases become “well-

¹⁷ See RESTATEMENT (THIRD) OF THE FOREIGN RELATIONS LAW OF THE UNITED STATES § 601 (AM. LAW INST. 1987).

¹⁸ *Pulp Mills on the River Uruguay* (Arg. v. Uru.), Judgment, 2010 I.C.J. 14, ¶ 101 (Apr. 20) (quoting *Corfu Channel* (U.K. v. Alb.), Judgment, 1949 I.C.J. 4, 22 (Apr. 9)).

¹⁹ *Trail Smelter* (U.S. v. Can.), 3 R.I.A.A. 1938, 1963 (Trail Smelter Arb. Trib. 1941).

²⁰ *Pulp Mills*, 2010 I.C.J. 14, ¶ 101 (citing *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, 1996 I.C.J. 226, ¶ 29 (July 8)).

mixed” in the atmosphere and affect global climate.²¹ As the U.S. Environmental Protection Agency (EPA) has explained, “U.S. emissions have climatic effects not only in the United States but in all parts of the world.”²² Moreover, the problem is both historic and prospective. As the IPCC has concluded, “it is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century,” and that “[c]ontinued emissions of greenhouse gases will cause further warming and changes in all components of the climate system,” exacerbating climate change impacts and harms.²³

The UNFCCC’s establishment of climate change mitigation and adaptation obligations for nations party to the Convention concretizes nations’ duties under international law. As its overarching purpose, the Convention recognizes that all states share a duty to “prevent dangerous anthropogenic interference with the atmosphere.”²⁴ In the 2010 Cancun Agreements, the Conference of the Parties to the UNFCCC (COP) agreed that, to achieve this goal, they must “hold the increase in global average temperature below 2 °C above pre-industrial levels,” and that they should consider strengthening this long-term goal so as to hold the global average temperature increase to 1.5 °C.²⁵ In the more recent Paris Agreement, the COP strengthened their commitment, committing Parties to “[h]olding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursu[ing] efforts to limit the temperature increase to 1.5 °C above pre-industrial levels.”²⁶

Among its core principles, the Convention calls on the Parties to “take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse

²¹ See Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496, 66,536–40 (Dec. 15, 2009); see also *id.* at 66,540 (finding mobile sources comprising 4.3 percent of global greenhouse gas emissions in 2005 to cause or contribute to this pollution). See generally ULRICH CUBASCH ET AL., *Introduction to INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS* (Thomas F. Stocker et al. eds., 2013).

²² U.S. ENVTL. PROT. AGENCY, TECHNICAL SUPPORT DOCUMENT FOR THE ENDANGERMENT AND CAUSE OR CONTRIBUTE FINDINGS FOR GREENHOUSE GASES UNDER SECTION 202(A) OF THE CLEAN AIR ACT 157 (2009).

²³ Lisa V. Alexander et al., *Summary for Policymakers*, in CLIMATE CHANGE 2013, *supra* note 21, at 12, 14.

²⁴ U.N. Framework Convention on Climate Change art. 2, *adopted* May 9, 1992, 1771 U.N.T.S. 107 [hereinafter UNFCCC].

²⁵ U.N. Framework Convention on Climate Change, *The Cancun Agreements: Outcome of the Work of the Ad Hoc Working Group on Long-Term Cooperative Action Under the Convention*, U.N. Doc. FCCC/CP/2010/7/Add.1, Dec. 1/CP.16, ¶ 4 (Mar. 25, 2011).

²⁶ *Paris Agreement*, *supra* note 9, art. 2(1)(a).

effects.”²⁷ Consistent with these goals and principles, the Convention requires all Parties, keeping in mind their common but differentiated responsibilities and capabilities, to design and implement programs containing both mitigation and adaptation measures.²⁸ Mitigation measures may “cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors.”²⁹ A “reservoir” is defined by the Convention as “a component or components of the climate system where a greenhouse gas or a precursor of a greenhouse gas is stored.”³⁰ Climate change mitigation is most often conceived in relation to reducing emissions from sources such as smokestacks and tailpipes, or else capturing fugitive emissions from landfills and natural resources extraction; management of fossil fuel stocks (or “reservoirs”) and accounting for downstream emissions and impacts have not been central to nations’ mitigation and adaptation planning to date.³¹ However, there is no reason they cannot or should not be. Given the latitude afforded to nations by the UNFCCC and the broad scope of permissible mitigation measures, managing fossil fuel reserves, their upstream and downstream GHG emissions and associated climate change impacts can easily fit within the a nation’s program to comply with its duties under international law, including the Nationally Determined Contributions (NDCs) to be developed and employed under the Paris Agreement.³²

Courts around the world have begun to recognize that international law assigns governments an affirmative duty to mitigate GHG emissions and climate change impacts. In June 2015 the Hague District Court in the Netherlands issued a decision holding that the domestic law

²⁷ UNFCCC, *supra* note 24, art. 3(3) (emphasis added).

²⁸ *Id.* art. 4(1)–(2).

²⁹ *Id.* art. 3(3).

³⁰ *Id.* art. 1(7).

³¹ See generally INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, 2006 IPCC GUIDELINES FOR NATIONAL GREENHOUSE GAS INVENTORIES (Simon Eggleston et al. eds., 2006).

³² *Paris Agreement, supra* note 9, art. 4.2. It bears noting, here, that several nations have explicitly referenced coal mining in the submission of their NDCs. See, e.g., *Bangladesh’s Intended Nationally Determined Contributions*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (Sept. 25, 2015), http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Bangladesh/1/INDC_2015_of_Bangladesh.pdf; *Intended Nationally Determined Contribution of Viet Nam*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (Sept. 30, 2015), <http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Viet%20Nam/1/VIETNAM’S%20INDC.pdf>.

of that country requires the government to accelerate its emission reduction efforts in order to fulfill a duty of care to its citizens.³³ In reaching its decision, the court cited, though it did not directly apply, various components of international law, including the “no harm” rule, the doctrine of hazardous negligence, the principle of fairness, the precautionary principle, and the sustainability principle embodied in the UNFCCC. In September 2015 an appellate court in Pakistan found that both international law and domestic law required the government to implement its national climate change policy—which included mitigation and adaptation objectives—in order to protect the fundamental rights of its citizens.³⁴ Cases alleging a violation of fundamental rights as a result of governmental inaction on climate change have been also filed in Belgium³⁵ and the Philippines.³⁶ In addition, cases specifically challenging domestic coal policies and their impacts on certain fundamental rights have been filed in Pakistan³⁷ and, as discussed in the next section, the United States.³⁸

³³ RB-Den Haag [Hague Dist. Ct.] 24 juni 2015, ECLI:NL:RBDHA:2015:7196 (Stichting Urgenda/Nederlanden) [Urgenda Found. v. Netherlands].

³⁴ Leghari v. Fed’n of Pak., W.P. No. 25501/2015 (Lahore High Ct., Green Bench).

³⁵ See KLIMAATZAAK [CLIMATE CASE], <http://klimaatzaak.eu/nl> (last visited Sept. 10, 2016) (providing an overview of litigation brought by a nonprofit organization, Klimaatzaak, against the government of Belgium); see also Summons to the Ministers of Flanders, Wallonia, Brussels, and the Fed. State of Belg. (April 27, 2015), <http://klimaatzaak.eu/wp-content/uploads/2015/04/Dagvaarding.pdf>.

³⁶ See Petition submitted by Greenpeace Se. Asia & Phil. Rural Reconstruction Movement to the Comm’n on Human Rights of the Phil. (Sept. 22, 2015), <http://www.greenpeace.org/seasia/ph/PageFiles/105904/Climate-Change-and-Human-Rights-Complaint.pdf> (asking the Commission to investigate “the human rights implications of climate change and ocean acidification and the resulting rights violations in the Philippines”).

³⁷ See Constitution Petition, Ali v. Fed’n of Pak. (SC Apr. 2016), <http://elaw.org/system/files/Pakistan%20Climate%20Case-FINAL.pdf> (challenging approval of plan to develop coal fields located in the Thar desert region anticipated to increase Pakistani coal production from 4.5 to 60 million metric tons per year).

³⁸ See Complaint, Juliana v. United States, No. 6:15-cv-01517 (D. Or. Aug. 12, 2015). As discussed below, this complaint and other recent cases in the U.S. also allege that federal and state governments have violated their public trust obligation by failing to adequately mitigate the GHG emissions that contribute to climate change. These cases have not yet been successful at compelling government action, but they have resulted in at least one decision holding that the state government (New Mexico) had a public trust responsibility to protect the atmosphere (though the court also found that this responsibility had been met through compliance with the state air quality act), *Sanders-Reed v. Martinez*, 350 P.3d 1221 (N.M. Ct. App. 2015), and one decision holding that the public trust doctrine required the state to undertake climate action because of impacts to ocean and coastal resources, *Foster v. Wash. State Dep’t of Ecology*, 362 P.3d 959 (Wash. 2015).

b. The Public Trust Doctrine

The public trust doctrine traces its origins to Roman civil law and its legal development to the English common law on public navigation and fishing rights in rivers, oceans and tidelands, but it is not so limited in its scope.³⁹ It has often been acknowledged, by courts and the government, that the federal government holds title to public lands in trust for current and future generations.⁴⁰ However, there is an open question over whether there is a federal public trust doctrine, and if so what obligations arise pursuant to that doctrine in regards to the management and administration of public lands, in general, and the federal coal leasing program, in particular, in the the age of climate change.

This question is the subject of ongoing litigation in federal district court in Oregon. In that lawsuit, plaintiffs allege that they are “beneficiaries of rights under the public trust doctrine, rights that are secured by the Ninth Amendment and embodied in the reserved powers doctrines of the Tenth Amendment and the Vesting, Nobility, and Posterity Clauses of the Constitution.”⁴¹ According to plaintiffs, these rights include the right to “essential natural resources,” including “our country’s life-sustaining climate system, which encompasses our atmosphere, waters, oceans, and biosphere.”⁴² Plaintiffs argue that the federal government has an affirmative, sovereign duty not to “substantially impair” the climate, and that past, present and continued extraction of fossil fuels from federal lands constitute a violation of this duty.⁴³ The federal government has argued that it is settled law that, as the U.S. Supreme Court has stated, “the public trust doctrine remains a matter of state law,”⁴⁴ and that the public trust doctrine is inapplicable to federal lands

³⁹ Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970).

⁴⁰ See *Shively v. Bowlby*, 152 U.S. 1, 57 (1894) (“Upon the acquisition of a territory by the United States, whether by cession from one of the states, or by treaty with a foreign country, or by discovery and settlement, the same title and dominion passed to the United States, for the benefit of the whole people, and *in trust* for the several states to be ultimately created out of the territory.”) (emphasis added).

⁴¹ Amended Complaint ¶ 308, *Juliana*, No. 6:15-cv-01517.

⁴² *Id.*

⁴³ *Id.* ¶¶ 309–10.

⁴⁴ *PPL Montana, LLC v. Montana*, 132 S. Ct. 1215, 1235 (2012); see also *Alec L. ex rel. Loortz v. McCarthy*, 561 F. App’x 7, 8 (D.C. Cir.) (per curiam), *cert. denied*, 135 S. Ct. 774 (2014) (finding no precedent “standing for the proposition that the public trust doctrine—or claims based upon violations of that doctrine—arise under the Constitution or laws of the United States”); *United States v. 32.42 Acres of Land, More or Less, Located in*

management. In April 2016, a federal magistrate judge rejected the federal government’s argument and recommended that the district court allow the public trust claim to proceed to trial.⁴⁵

Interior and BLM need not await the courts’ resolution of this issue to grasp its import. A finding that there is no federal public trust doctrine applicable to federal lands management would not settle the broader question of what the federal government’s duties in managing lands it holds in trust for the public are, particularly in regard to foreseeable, if indirect, climate change impacts. Similarly, even if the courts conclude that Supreme Court precedent does not foreclose a federal public trust doctrine claim, and eventually concludes that the continued extraction of fossil fuels from public lands is a violation of this duty, they are in any event unlikely to determine the precise contours of the federal coal leasing program. As the federal magistrate judge in Oregon recognized, “it is not for the courts to say how the trust in resources and the territory shall be administered, that is for Congress to determine.”⁴⁶ And, as discussed in Sections II.B and IV below, Congress has spoken at length on this topic. In either event—whether the trust obligation be specifically tied to the public trust doctrine or to a more general one—it would be wholly reasonable for a court or the agencies themselves to conclude that Interior and BLM have a duty as trustees of federal lands to provide a proper accounting to the public of environmental externalities associated with the federal coal leasing program, including greenhouse gas emissions and associated climate change impacts, and to mitigate against them.⁴⁷

c. Public Nuisance

The Restatement (Second) of Torts defines a public nuisance as “an unreasonable interference with a right common to the general public.”⁴⁸ According to the Restatement, an interference may be unreasonable when “the conduct involves a significant interference with the

San Diego Cty., 683 F.3d 1030, 1038 (9th Cir. 2012) (stating that while the equal-footing doctrine is grounded in the Constitution, “the public trust doctrine remains a matter of state law”).

⁴⁵ Order and Findings & Recommendation at 17–24, *Juliana*, No. 6:15-cv-01517.

⁴⁶ *Id.* at 22 (citing *Alabama v. Texas*, 347 U.S. 272, 273 (1954); *United States v. California*, 332 U.S. 19, 27 (1947)).

⁴⁷ See Nevin D. Holmberg & Robert Misso, *Mitigation: Determining the Need*, NAT’L WETLANDS NEWSL., Sept.–Oct. 1986, at 10 (noting the resource mitigation concept to be appropriate given the government’s public trust responsibilities, and intrinsic environmental, social and economic values).

⁴⁸ RESTATEMENT (SECOND) OF TORTS § 821B (AM. LAW INST. 1979).

public health, the public safety, the public peace, the public comfort or the public convenience,”⁴⁹ or else when “the conduct is of a continuing nature or has produced a permanent or long-lasting effect, and, as the actor knows or has reason to know, has a significant effect upon the public right.”⁵⁰ Where a public nuisance is found, a plaintiff may be able to obtain either injunctive relief or an award of damages. Thus, a landowner may be said to owe a duty to others to not undertake or allow activities that unreasonably interfere with a right common to the general public.

The federal government has not been sued to limit or cease coal leasing under a public nuisance theory. It could be. As a preliminary matter, the federal government may properly be the subject of a federal public nuisance lawsuit.⁵¹ Moreover, the outcome of this claim has not been definitively resolved, despite the U.S. Supreme Court’s ruling in *American Electric Power Co. v. Connecticut*⁵² and the Ninth Circuit’s subsequent decision in *Native Village of Kivalina v. ExxonMobil Corp.*⁵³ In *AEP v. Connecticut*, plaintiff states, cities and non-governmental organizations claimed that the CO₂ emissions from four private power companies and the Tennessee Valley Authority contribute to global warming and therefore constitute a public nuisance under federal law, and sought an injunction ordering the companies to lower their emissions. The Supreme Court determined that any existing federal common law cause of action had been displaced by the Clean Air Act, which authorizes EPA to regulate GHG emissions from power plants and other sources.⁵⁴ In *Native Village of Kivalina*, the Ninth Circuit extended this holding to a federal public nuisance claim against a number of energy producers—including ExxonMobil, BP, Chevron and other fossil fuel companies—for climate change damages associated with defendants’ activities.⁵⁵ Notably, plaintiffs in *Native Village of Kivalina* alleged that *direct* emissions associated with the energy companies’ operations contributed to climate change—they did not address indirect, or downstream, emissions associated with defendants’ extractive activities, such as those that would

⁴⁹ *Id.* § 821B(2)(a).

⁵⁰ *Id.* § 821B(2)(c).

⁵¹ *Michigan v. U.S. Army Corps of Eng’rs*, 758 F.3d 892, 901–02 (holding that U.S. Army Corps of Engineers “can be held to account” under federal common law public nuisance if plaintiffs can establish liability).

⁵² *Am. Elec. Power Co. v. Connecticut*, 564 U.S. 410 (2011).

⁵³ *Native Vill. of Kivalina v. ExxonMobil Corp.*, 696 F.3d 849 (9th Cir. 2012).

⁵⁴ *Am. Elec. Power*, 564 U.S. at 424.

⁵⁵ *Kivalina*, 696 F.3d at 858.

be at issue in a case against Interior and BLM for coal leasing. The difference being that direct emissions are regulated under the Clean Air Act, while downstream emissions are not.

Without engaging in an extensive analysis of the question, fair reasoning could conclude that a federal common law public nuisance suit against Interior and BLM for climate impacts arising from federal coal would also be found to be displaced by federal legislation, most likely the Federal Land Policy and Management Act and/or the Mineral Leasing Act, which, as discussed further below, grant the agencies the authority to lease—or to not lease—based on numerous factors, including their downstream GHG emissions. Yet, the displacement of the legal claim does not fully resolve the question of whether a duty of care exists, especially in regards to a sovereign landowner. On this point, the most important legal guidance may be garnered from the Second Circuit decision in the *AEP v. Connecticut* litigation. In a portion of the Second Circuit opinion which was not addressed by the Supreme Court, the appellate panel found that problems associated with climate change fall well within the outer limits of public nuisance doctrine.⁵⁶ Under this precedent, the federal government’s coal leasing program is quite likely contributing to an ongoing public nuisance. Regardless of the likelihood of success in a suit brought against it, as a sovereign landowner the government should undertake efforts to mitigate that nuisance.

d. Private Nuisance

The Restatement (Second) of Torts defines a private nuisance as “a nontrespassory invasion of another's interest in the private use and enjoyment of land.”⁵⁷ Liability may follow if the complained-of action is the legal cause of the invasion, and the invasion is “either (a) intentional and unreasonable, or (b) unintentional and otherwise actionable under the rules controlling liability for negligent or reckless conduct, or for abnormally dangerous conditions or activities.”⁵⁸ Thus, a landowner may be said to owe a duty to others to not undertake or allow activities that intentionally and unreasonably interfere with another’s private use and enjoyment of land, that unintentionally and negligently or recklessly do so, or else that create abnormally dangerous conditions or comprise abnormally dangerous activities.

⁵⁶ *Am. Elec. Power. Co. v. EPA*, 582 F.3d 309, 331, 349–71 (2d Cir. 2009).

⁵⁷ RESTATEMENT (SECOND) OF TORTS § 821D (AM. LAW INST. 1979).

⁵⁸ *Id.*

In *Comer v. Murphy Oil USA*, plaintiff property owners alleged that certain power and chemical companies' GHG emissions contributed to climate change, which in turn exacerbated the harmful effects of Hurricane Katrina, constituting a private nuisance (as well as a public nuisance, trespass, negligence, unjust enrichment, fraudulent misrepresentation and civil conspiracy).⁵⁹ The case involved a convoluted procedural history, featuring a dismissal in district court, a reversal at the Fifth Circuit, an en banc decision to vacate the reversal due to failure to muster a quorum, plaintiffs' filing a writ of mandamus asking the Supreme Court to reinstate the panel decision, the denial of the writ, plaintiffs' re-filing their case in district court, and dismissal based on res judicata grounds – though not on the merits.⁶⁰ For present purposes, the important decision is the first Fifth Circuit decision, in which that court found that plaintiffs had standing to bring an action for private nuisance and that the political question doctrine did not bar such a suit.⁶¹ Salient here, the court found that a diversity suit brought under state common law for damages was materially distinguishable from public nuisance claims brought under federal common law and seeking an injunction.⁶² The court did not address the merits of the private nuisance claim, leaving that for a prospective trial.⁶³

Though the analyses differ as between public and private nuisance, it may well be that a court would find a private nuisance suit against the federal government on climate change grounds preempted for much the same reasons as a court might find a federal public nuisance suit displaced or a state public nuisance suit preempted.⁶⁴ However, as with public nuisance, preemption of the legal claim does not resolve the question of whether a duty of care exists, especially in the case of a sovereign landowner. Here, the question would be whether the federal

⁵⁹ *Comer v. Murphy Oil USA*, 607 F.3d 1049, 1054 (5th Cir. 2010), *petition for writ of mandamus denied sub nom. In re Comer*, 562 U.S. 1133 (2011).

⁶⁰ *See Comer v. Murphy Oil USA, Inc.*, 839 F. Supp. 2d 849, 855–68 (S.D. Miss. 2012) (dismissing re-filed complaint on preemption, political question, standing, res judicata and collateral estoppel grounds), *aff'd*, 718 F.3d 460 (5th Cir. 2013).

⁶¹ *Comer v. Murphy Oil USA*, 585 F.3d 855 (5th Cir. 2009).

⁶² *Id.* at 879.

⁶³ *Id.*

⁶⁴ *See e.g.*, *Comer v. Murphy Oil USA, Inc.*, 839 F. Supp. 2d 849, 865 (S.D. Miss. 2012), *aff'd*, 718 F.3d 460; *see also* Matthew Morrison & Bryan Stockton, *What's Old Is New Again: State Common-Law Tort Actions Elude Clean Air Act Preemption*, 45 *Env'tl. L. Rep.* (Env'tl. Law Inst.) 10,282 (Apr. 2015).

coal leasing program is negligent, reckless, or abnormally dangerous, and the unintentional cause of the invasion of private property. There are strong arguments to be made that continuing to issue new coal leases and to authorize the continued extraction of fossil fuels is, in substance, negligent, or perhaps even reckless or abnormally dangerous, and that causality can be adequately demonstrated.⁶⁵ Thus, as above, the federal government in its capacity as a sovereign landowner should undertake efforts to mitigate that private nuisance.

B. Statutory Sources of a Duty to Mitigate Climate Change Impacts

The statutes and regulations that govern Interior’s management of public lands provide other, and potentially even more forceful, sources for a duty to mitigate upstream and downstream greenhouse gas emissions and associated climate change impacts arising from the federal coal leasing program, and a definite discretion to do so. This section examines key provisions in the Federal Land Policy and Management Act (FLPMA), the Mineral Leasing Act (MLA) and the National Environmental Policy Act (NEPA) that direct and inform Interior and BLM’s activities, coal leasing program requirements and environmental review responsibilities, and which either require or authorize mitigation.

a. FLPMA: The BLM’s Organic Act

According to FLPMA, the BLM must manage public lands for multiple use and sustained yield,⁶⁶ must receive “fair market value” for use of public lands,⁶⁷ and must avoid “unnecessary or undue degradation of the lands.”⁶⁸ In addition, BLM must manage public lands “in a manner that will protect the quality of scientific, scenic, historical ecological, environmental, air *and atmospheric*,

⁶⁵ GREENPEACE USA, *LEASING COAL, FUELING CLIMATE CHANGE: HOW THE FEDERAL COAL LEASING PROGRAM UNDERMINES PRESIDENT OBAMA’S CLIMATE PLAN* (2014); JAYNI FOLEY HEIN & PETER HOWARD, *INST. FOR POLICY INTEGRITY, ILLUMINATING THE HIDDEN COSTS OF COAL: HOW THE INTERIOR DEPARTMENT CAN USE ECONOMIC TOOLS TO MODERNIZE THE FEDERAL COAL PROGRAM* (2015); DUSTIN MULVANEY ET AL., *THE POTENTIAL GREENHOUSE GAS EMISSIONS OF U.S. FEDERAL FOSSIL FUELS* (2015); Paul R. Epstein et al., *Full Cost Accounting for the Life Cycle of Coal*, 1219 ANNALS N.Y. ACAD. SCI., Feb. 2011, at 73.

⁶⁶ 43 U.S.C. §§ 1701, 1732(a) (2012).

⁶⁷ *Id.* § 1701(a)(9).

⁶⁸ *Id.* § 1732(b); *see also* Rocky Mountain Oil & Gas Ass’n v. Watt, 696 F.2d 734, 739 (10th Cir. 1982) (“In general, the BLM is to prevent unnecessary or undue degradation of the public lands.”).

water resource, and archeological values.”⁶⁹ When preparing land use plans, the agency must consider present and future uses and the relative scarcity of values, and weigh long-term benefits against short term benefits.⁷⁰ Government agencies and other commentators have analyzed how BLM might alter pricing in the coal leasing program to incorporate a price on carbon and obtain “fair market value.”⁷¹ The focus, here, in contrast, is on how the multiple use and unnecessary and undue degradation standards implicate a duty to mitigate climate impacts.⁷²

Multiple use is defined in FLPMA as:

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 resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; 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.⁷³

The unnecessary or undue degradation requirement is undefined in the statute, but has been defined by BLM in the hardrock mining context to include, among other things, compliance with standards of performance set forth in BLM regulations, with the terms and conditions set

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

⁷⁰ *Id.* § 1712(c).

⁷¹ U.S. GOV'T ACCOUNTABILITY OFF., GAO-14-140, COAL LEASING: BLM COULD ENHANCE APPRAISAL PROCESS, MORE EXPLICITLY CONSIDER COAL EXPORTS, AND PROVIDE MORE PUBLIC INFORMATION (2013); THE ECONOMICS OF COAL LEASING ON FEDERAL LANDS, *supra* note 7; JAYNI FOLEY HEIN & PETER HOWARD, INST. FOR POLICY INTEGRITY, RECONSIDERING COAL'S FAIR MARKET VALUE: THE SOCIAL COSTS OF COAL PRODUCTION AND THE NEED FOR FISCAL REFORM (2015); OFFICE OF INSPECTOR GEN., U.S. DEP'T OF THE INTERIOR, FINAL EVALUATION REPORT—COAL MANAGEMENT PROGRAM, U.S. DEPARTMENT OF THE INTERIOR (2013); Krupnick et al., *supra* note 7.

⁷² The agency's discretion to mitigate impacts is beyond question. As the agency has recognized, “[i]n accordance with FLPMA, the BLM can include mitigation requirements as terms and conditions in the authorizations it issues for appropriate use of public lands.” BUREAU OF LAND MGMT., TECHNICAL NOTE: PROCEDURAL GUIDANCE AND FRAMEWORK FOR DEVELOPING SOLAR REGIONAL MITIGATION STRATEGIES 10 (2013).

⁷³ 43 U.S.C. § 1702(c).

forth in an approved operations plan and with federal and state environmental laws.⁷⁴ Notably, standards of performance set forth under these regulations include the prevention of adverse impacts on threatened or endangered species and their habitats,⁷⁵ and “mitigation measures specified by BLM to protect public lands.”⁷⁶ The Secretary has separately defined “undue and unnecessary degradation” in the wilderness study area review context as “impacts greater than those that would normally be expected from an activity being accomplished in compliance with current standards and regulations and based on sound practices, including use of the best reasonably available technology.”⁷⁷ Courts have held that the Secretary of the Interior has broad discretion to define “undue and unnecessary degradation,”⁷⁸ and in application courts routinely uphold land management actions that cause degradation of the public lands, so long as adequate measures are taken to reasonably mitigate the level of degradation to be allowed.⁷⁹

The broad imperatives of the multiple use mandate—including the directive to protect atmospheric values for future generations—and the prohibition against unnecessary and undue degradation each imply a statutory duty to mitigate climate impacts, and plainly confer a great deal of discretion on the agency to do so. Multiple use requires the agency to consider intergenerational equity, authorizes the agency to adapt to changing needs and conditions, and explicitly refuses to require the agency to manage lands in a way that maximizes profitability or short-term economic production. The unnecessary or undue degradation regulations specifically require the use of mitigation measures that will protect threatened or endangered species and the

⁷⁴ 43 C.F.R. § 3809.5 (2015).

⁷⁵ *Id.* § 3809.420(b)(7).

⁷⁶ *Id.* § 3809.420(a)(4).

⁷⁷ *Id.* § 3802.0-5(I).

⁷⁸ See *Gardner v. U.S. Bureau of Land Mgmt.*, 638 F.3d 1217, 1222 (9th Cir. 2011) (stating that section 1732(b) of FLPMA “leaves BLM a great deal of discretion in deciding how to achieve” its goal of preventing unnecessary and undue degradation “because it does not specify precisely how the BLM is to meet [its goal], other than by permitting the BLM to manage public lands by regulation or otherwise” (internal quotation marks and alteration omitted)); *Mineral Policy Ctr. v. Norton*, 292 F. Supp. 2d 30, 44–45 (D.D.C. 2003).

⁷⁹ See, e.g., *S. Fork Band Council of W. Shoshone v. U.S. Dep’t of the Interior*, 588 F.3d 718, 724–25 (9th Cir. 2009) (finding that BLM adequately determined that unnecessary or undue degradation would not occur as a result of mining projects despite finding that some facilities would fail to meet relevant visual impact standards); *Theodore Roosevelt Conservation P’ship v. Salazar*, 744 F.Supp.2d 151, 158–59 (D.D.C. 2010) (upholding BLM’s finding that unnecessary or undue degradation would not occur where development activity was subject to monitoring and mitigation measures, including the concentration of development activity in already-impacted areas).

public lands. As climate change poses significant risks to threatened and endangered species and to the quality of public lands and their value, Interior and BLM would be well within the scope of its regulations in seeking mitigation to avoid, minimize or mitigate against unnecessary or undue degradation.

BLM has itself recognized its obligation and authority under FLPMA to mitigate the off-site impacts of its actions, in guidance going back to at least 2008.⁸⁰ As BLM explained then:

The BLM's authority to address the mitigation of impacts on public lands associated with a use authorization issued by the BLM derives from the Federal Land Policy and Management Act (FLPMA). Additional authority can be found in the statutes governing specific uses of the public lands such as the Mineral Leasing Act. The congressional declaration of policy for FLPMA states that "the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource and archeological values..." FLPMA §102(a)(8). In addition, the use, occupancy and development of public lands must be regulated by the Secretary through easements, permits, leases, licenses, or other instruments. FLPMA §302(b).

The BLM may take into account actions that are physically removed or that take place at a different location from the immediate project area, either on or off BLM-managed lands, that could serve to protect or preserve BLM resources and values in deciding whether to approve a specific use on the public lands. In some cases, the applicant's offer to undertake certain mitigating actions may be a significant consideration in the BLM's decision. While the BLM does not have the authority to require an applicant to undertake mitigation offsite, the BLM can enforce the terms of a contract in which the applicant agrees to undertake specific mitigating actions offsite in order to receive the BLM's approval of a particular use on the public lands. The BLM may expressly condition its approval of the permit on the applicant's commitment to take those actions, and the BLM may, if necessary, seek appropriate enforcement action to ensure the terms of the contract are met.⁸¹

⁸⁰ Bureau of Land Mgmt., *Offsite Mitigation*, Instruction Memorandum No. 2008-204 (Sept. 30, 2008) (noting that "BLM has an obligation to approve only land use authorizations that are consistent with its mission and objectives" and that "[t]his may mean that the BLM may be unable to permit certain land use authorizations without appropriate mitigation measures").

⁸¹ *Id.*, attachment 1-1 (addressing the question of BLM's authority to require mitigation).

b. Mineral Leasing Act

Federal coal leasing is principally governed by Section 201 of the Mineral Leasing Act, which authorizes the Secretary of the Interior to “in his discretion, upon the request of any qualified applicant or on his own motion, from time to time, offer such lands for leasing.”⁸² Today, most coal leasing proceeds by application, rather than through a regional management process.⁸³ Importantly, the Mineral Leasing Act requires that all coal leasing be done in the public interest.⁸⁴ The Secretary of the Interior’s interpretive authority is, again, broad: Interior has capacious legal authority to discern what is in the public interest, and how to ensure that coal leases adequately protect it: “The Secretary of the Interior is authorized to prescribe necessary and proper rules and regulations and to do any and all things necessary to carry out and accomplish the purposes of this chapter.”⁸⁵

This broad authority to determine what measures are in the public interest is important, as it relates the question of duty and authority to mitigate back to the historic development of resource mitigation, more generally, and to the history of wetland mitigation, in particular. The earliest manifestations of resource mitigation included mitigation directed at impacts of dams, including construction of fish hatcheries and fish passages,⁸⁶ and replacement of lost recreation

⁸² 30 U.S.C. § 201 (2012).

⁸³ See *Coal Operations*, BUREAU OF LAND MGMT., http://www.blm.gov/wo/st/en/prog/energy/coal_and_non-energy.html (last visited Aug. 23, 2016) (“[B]ecause demand for new coal leasing in recent years has been associated with the extension of existing mining operation on authorized federal coal leases, all current leasing is done by application.”).

⁸⁴ See, e.g., 30 U.S.C. § 201 (directing the Secretary to divide coal leasing into leasing tracts of such size as he finds appropriate and in the public interest); *id.* § 226(m) (permitting the Secretary to authorize and modify cooperative oil and gas leases, so long as he has consent from lessees and the modifications are “necessary or proper to secure the proper protection of the public interest”); *id.* § 208 (permitting the Secretary to authorize the take of coal from public lands without payment if it will “safeguard the public interests”); *id.* § 2015 (permitting the Secretary to authorize consolidation of leases if it is in the public interest); *id.* § 192 (permitting the Secretary to reject bids for oil and gas that is paid as royalty to the United States if accepting the offer would not serve the public interest).

⁸⁵ *Id.* § 189. See also *Arnold v. Morton*, 529 F.2d 1101, 1105 (9th Cir. 1976) (“It is quite evident that the Secretary has no obligation to issue any lease on public lands.”); *WildEarth Guardians v. Salazar*, 783 F. Supp. 2d 61, 63 (D.D.C. 2011) (finding that the Secretary is “permitted” but not required to lease particular tracts for coal mining).

⁸⁶ Edward T. Laroe, *Wetland Habitat Mitigation: An Historical Overview*, NAT’L WETLANDS NEWSL., Sept.–Oct. 1986, at 9.

days with new facilities, such as fishing piers.⁸⁷ With the growth of the environmental movement, the concept re-oriented away from single-species considerations and recreational trade-offs, and expanded to include broader notions of mitigation, including habitat preservation to compensate for habitat destruction; the creation, restoration or enhancement of ecosystem services to replace ones lost to development; and reductions in water and air pollution from existing sources to compensate for new sources.⁸⁸ A key turning point in this brief history came in the 1967. The U.S. Army Corps of Engineers (the Corps) had been administering the River and Harbors Act section 10 permit program for decades. Section 10 includes a review that allows the Corps to reject permit applications for work in navigable waters that were shown to be against the public interest. The Corps did not explicitly or regularly include environmental criteria until 1967, when the U.S. Fish and Wildlife Service (FWS) began to insist that the terms of the 1939 Fish and Wildlife Coordination Act required the Corps to consider damage to habitat as part of the public interest review. Since that time, public interest review has regularly included environmental considerations.⁸⁹

Contemporary understandings require a further extension of the public interest analysis to encompass downstream GHG emissions and climate change impacts attributable to them.

c. NEPA: Cross-Cutting Requirements for Impact Assessment and Mitigation

The National Environmental Policy Act, enacted on Earth Day in 1970, is an ambitious statute. Among other things, it makes it a national policy to “create and maintain” a “productive harmony” between “man and nature” and to “fulfill” the obligations imposed by the principle of intergenerational equity.⁹⁰ The statute requires the federal government—again, among other things—to “improve and coordinate” its activities in order to better serve as a “trustee of the environment;” to assure “safe, healthful, productive, and esthetically and culturally pleasing surroundings;” to protect against “undesirable and unintended consequences;” and to preserve

⁸⁷ Holmberg & Misso, *supra* note 47.

⁸⁸ Laroe, *supra* note 86.

⁸⁹ Palmer Hough & Morgan Robertson, *Mitigation Under Section 404 of the Clean Water Act: Where It Comes From, What It Means*, 17 WETLANDS ECOLOGY & MGMT. 15, 16–17 (2009).

⁹⁰ 42 U.S.C. § 4331(a) (2012).

historic, cultural and natural resources.⁹¹ Each and every one of these goals requires a federal agency to consider the relationship between a proposed action and climate change. In the context of fossil fuel extraction, they require the leasing, licensing or permitting agency to consider reasonably foreseeable upstream and downstream GHG emissions and associated climate impacts.⁹²

NEPA delivers on its broad ambitions through the process of environmental impact review. Section 102(2)(C) of the statute requires all federal agencies to prepare a “detailed statement” on the environmental impacts of major federal actions significantly affecting the quality of the human environment.⁹³ The resulting Environmental Impact Statement (EIS) must discuss: (i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, (iii) alternatives to the proposed action, (iv) the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity, and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.⁹⁴ Notably, the alternatives analysis required under section 102(2)(C) requires BLM to “rigorously explore and objectively evaluate” an adequate range of alternatives.⁹⁵ This evaluation extends to considering more environmentally protective alternatives and mitigation measures.⁹⁶ In addition, section 102(2)(E) requires an alternatives analysis for “any proposal which involves unresolved conflicts concerning alternative uses of available resources.”⁹⁷ And section 102(2)(F) requires federal agencies to take a global view of environmental problems, and, “where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the

⁹¹ *Id.* § 4331(b).

⁹² Michael Burger & Jessica Wentz, *Downstream and Upstream Emissions: The Proper Scope of NEPA Review*, ___ HARV. ENVTL. L. REV. ___ (forthcoming 2016) (available at http://web.law.columbia.edu/sites/default/files/microsites/climate-change/downstream_and_upstream_ghg_emissions_-_proper_scope_of_nepa_review.pdf).

⁹³ 42 U.S.C. § 4332(2)(C).

⁹⁴ *Id.*

⁹⁵ See 40 C.F.R. §§ 1502.14(a), 1508.25(c) (2016).

⁹⁶ See, e.g., *Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1122–23 (9th Cir. 2002) (and cases cited therein).

⁹⁷ 42 U.S.C. § 4332(2)(E).

quality of mankind's world environment." ⁹⁸ Moreover, NEPA requires that BLM discuss mitigation measures in the Programmatic EIS.⁹⁹

The Programmatic EIS must fulfill each of these requirements. To do so, it must address (1) the GHG emissions and climate change impacts resulting from the coal leasing program under a range of alternatives, (2) how these alternatives and their comparative emissions and impacts relate to the sustainability of our domestic and planetary socio-ecological systems, (3) whether the extraction and eventual combustion of federal coal in the different alternative scenarios represents an "irreversible and irretrievable commitment[] of resources," (4) whether and how the federal coal leasing program can support the nation's international climate commitments, and (5) mitigation measures.

NEPA defines mitigation as follows:

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
- (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- (e) Compensating for the impact by replacing or providing substitute resources or environments.¹⁰⁰

In 2011, the Council on Environmental Quality (CEQ) issued guidance on the appropriate use of mitigation in the development of environmental impact review documents, including EISs.¹⁰¹ At the outset, CEQ notes that "[m]itigation is an important mechanism Federal agencies can use to minimize the potential adverse environmental impacts associated with their actions."¹⁰²

⁹⁸ *Id.* § 4332(2)(F).

⁹⁹ 40 C.F.R. §§ 1502.14(f), 1502.16(f), (h).

¹⁰⁰ *Id.* § 1508.20.

¹⁰¹ Final Guidance for Federal Departments and Agencies on the Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact, 76 Fed. Reg. 3843 (Jan. 21, 2011).

¹⁰² *Id.* at 3847.

Importantly, the guidance states that an agency should only look at mitigation measures for which there is legal authority, and resources to ensure monitoring and implementation.¹⁰³

It is often said that NEPA is a procedural, not a substantive, statute. While it is quite likely that this long-standing approach to interpreting the statute misconstrues the original Congressional intent, it is nonetheless, at this point, settled law. Accordingly, it would be difficult to argue that NEPA imposes a substantive requirement that requires Interior and BLM to mitigate climate change impacts associated with upstream and downstream emissions from coal leasing. It does, however, impose a duty to identify, assess and disclose mitigation measures for those impacts. It also anticipates that in order to achieve the statute's broad and ambitious goals mitigation measures—moving along the spectrum from avoidance to compensation—will be adopted and implemented.

III. Common Law Rationale for a Climate Change Impacts Fee as Compensation

The discussion in Part II established that international law, common law principles and statutory requirements imposed by Congress arguably imbue DOI with a legal duty to mitigate the climate change impacts attributable to downstream GHG emissions that are the indirect effects of the federal coal leasing program, and without question confer upon the agency the discretion to do so. This section turns to the question of whether the common law principles that pertain to lessor liability support a prospective decision to compensate for those impacts that cannot be avoided or minimized through imposition of a climate change impact fee.

Climate change impacts from the coal leasing program's downstream GHG emissions will occur in locations, and to persons, both proximate to and remote from a given leased parcel. These impacted locations will include the leased parcel, other public lands and resources under BLM's jurisdiction, other federal lands and resources under Interior's jurisdiction, and private and public property within and outside the United States. For the sake of analysis this section narrows the scope to look at the different theoretical rationales for imposing a climate change impact fee to mitigate for damages to federal property and to other property.

¹⁰³ See, e.g., *id.* at 3847–48.

It bears reiterating, here, that this analysis is not intended to serve as a litigation risk screening. The question addressed here is one of principle and duty, not legally enforceable obligations subject to court enforcement. The difficulties involved in proving out a tort case for climate change damages, and the obstacles posed by immunity and discretionary function defenses, have been addressed at length in the scholarly and professional literatures, and do not warrant in-depth review here.¹⁰⁴ However, in considering appropriate forms of mitigation the principles of tenant and lessor liability and the theoretical remedies available may prove useful.

A. Damages to Federal Property

It is a general principle of property law that tenants are required to restore leased property to its former condition, or else be subject to termination and/or damages.¹⁰⁵ This principle is integrated into the federal coal leasing program through the Surface Mining Control and Reclamation Act's (SMCRA) bonding and reclamation requirements,¹⁰⁶ and the authority BLM possesses under the Mineral Leasing Act to impose lease conditions it deems appropriate.¹⁰⁷ Although SMCRA does not necessarily accommodate the environmental complexity of climate impacts on leased property attributable to downstream emissions, BLM's authority to impose lease conditions is broad, and liability for damages clauses are not atypical.

Moreover, the federal government owns a vast territory that is exposed and vulnerable to climate change impacts, including national parks, national wildlife refuges, national forests, BLM lands, designated wilderness areas, designated wilderness study areas, roadless areas, military bases, designated historic sites, and so on. Although there may not be a hornbook principle along these lines to cite to, it makes profound sense that a lessor has within its authority the ability to protect its other properties, or to require compensation for impacts to them, from activities it permits on its land.

¹⁰⁴ See, e.g., Michael B. Gerrard & Joseph A. MacDougald, *An Introduction to Climate Change Liability Litigation and a View to the Future*, 20 CONN. INS. L.J. 153 (2013); David Hunter & James Salzman, *Negligence in the Air: The Duty of Care in Climate Change Litigation*, 155 U. PA. L. REV. 1741 (2007); Douglas Kysar, *What Climate Change Can Do About Tort Law*, 41 ENVTL. L. 1 (2011).

¹⁰⁵ RESTATEMENT (SECOND) OF PROP.: LANDLORD AND TENANT § 12.2(3) (AM. LAW INST. 1977).

¹⁰⁶ See 30 U.S.C. § 1259 (2012); 30 C.F.R. pt. 800 (2016).

¹⁰⁷ See 30 USC § 207(a) ("The lease shall include such other terms and conditions as the Secretary shall determine.").

B. Damages to “Persons Outside of the Land”

The Restatements of Torts and Property make clear that the federal government, as lessor to coal mining companies, could, in principle, be held liable for damages for the climate change impacts associated with downstream GHG emissions.

The Restatement (Second) of Torts states that “A lessor of land is subject to liability for physical harm to persons outside of the land caused by activities of the lessee...if, but only if, (a) the lessor at the time of the lease consented to such activity or knew that it would be carried on, and (b) the lessor knew or had reason to know that it would unavoidably involve such an unreasonable risk, or that special precautions necessary to safety would not be taken.”¹⁰⁸ This tort principle is consistent with the Restatement (Second) of Property Section 18(4), which includes nearly identical language.¹⁰⁹ Indeed, the two are meant to be read together.¹¹⁰

The comments from the Restatement (Second) of Property are illuminating. As an example of lessor liability, the Restatement offers the following: “L leases property to T for use as a stone quarry. In the course of operating the quarry, T’s blasting operations cause physical harm to a person outside the leased property. If L knows or has reason to know that any such blasting will involve an unreasonable risk of physical harm to those outside the leased property, L is subject to liability to the injured person.¹¹¹ What’s more, “[t]he liability stated in this section cannot be avoided by a clause in the lease exonerating the landlord from all responsibility or liability.”¹¹²

The standards for lessor liability for nuisance are similar to those for physical harm. The Restatement (Second) of Torts notes that a lessor is subject to liability for nuisance “caused by an activity carried on upon the land while the lease continues and the lessor continues as owner, if the lessor would be liable if he had carried on the activity himself, and (a) at the time of the lease the lessor consents to the activity or knows or has reason to know that it will be carried on, and (b) he then knows or should know that it will necessarily involve or is already causing the nuisance.”¹¹³

¹⁰⁸ RESTATEMENT (SECOND) OF TORTS § 379A (AM. LAW INST. 1979).

¹⁰⁹ RESTATEMENT (SECOND) OF PROP.: LANDLORD AND TENANT § 18.4.

¹¹⁰ *Id.* cmt. a.

¹¹¹ *Id.* cmt. b, illus. 2.

¹¹² *Id.* cmt. d.

¹¹³ RESTATEMENT (SECOND) OF TORTS § 837(1).

The principles of lessor liability, then, as inscribed in both domestic tort and property law, put the government on the theoretical hook for damages resulting from the climate impacts to offsite individuals and property attributable to fossil fuel extraction on federal lands. The elements here are easily met: First, the federal government is consenting to the coal mining through the terms of the lease. Second, the federal government is at this time well aware that coal leasing either involves an unreasonable risk (the standard for physical injury) or else that federal coal leasing contributes to the identifiable nuisance of climate change impacts.

C. Types of Damages

Damages to federal property, and to the federal estate, provide one type of damages for which the federal government, as owner of the leased land, could seek insurance in the form of a climate change impacts fee. If litigation for off-site damages to other landowners or persons were allowed to proceed, and liability found, the federal government would be potentially liable for a range of damages available under tort and property law. Individuals and their family members have suffered and will continue to suffer a range of personal injuries from climate change, from health effects exacerbated or caused by climate change-altered conditions such as extreme heat and drought to deaths caused by disasters made more likely, more frequent and/or more severe by climate change. Accordingly, damages could in theory be available for wrongful death, medical expenses, future earning capacity/lost wages and pain and suffering. Similarly, climate change impacts on real property are manifold. Damages theoretically available could include restoration costs for damage to land (or perhaps the costs of adaptation of affected land to conditions created by the nuisance of climate change), temporary and permanent damages to land, damages to structures on land, and damage to vegetation. These would be the same sorts of damages the government might seek to insure against in regard to public lands.

IV. Statutory Authority for a Climate Change Impacts Fee as Compensatory Mitigation

The BLM's mission is "[t]o sustain the health, diversity, and productivity of America's public lands for the use and enjoyment of present and future generations."¹¹⁴ Pursuant to FLPMA's multiple use mandate, the agency pursues this mission by managing public land resources for a variety of uses, including energy development, while protecting a wide array of natural, cultural, and historical resources, including air and atmospheric values, and ensuring that they are passed along to the future. The agency has recognized the realities of climate change and the extraordinary threats it poses to America's public lands.¹¹⁵ The agency has also recognized its obligation to account for climate change impacts in its decision-making.¹¹⁶ Moreover, the agency has recognized that compensatory mitigation for unavoidable or residual climate change impacts arising from agency decisions is fully consistent with its broadly stated mission and its multiple use mandate and that it possesses the discretion to require it, and has clarified that doing so is in fact the agency's policy.¹¹⁷ This section explores how a climate change impact fee for downstream GHG emissions fits within the agency's NEPA obligations and its compensatory mitigation policy.

A. Compensatory Mitigation under NEPA

As previously noted, the climate change impacts at issue in this paper are those that occur as a result of GHG emissions both at the coal mine and downstream, when the extracted coal is transported and eventually combusted for its end use. These downstream GHG emissions are considered "indirect effects" under NEPA, and the climate change impacts associated with those emissions are unavoidable or "residual" impacts.

¹¹⁴ *About the BLM*, BUREAU OF LAND MGMT., http://www.blm.gov/wo/st/en/info/About_BLM.html (last updated Jan. 26, 2012).

¹¹⁵ See *Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources*, Sec'y of the Interior Order No. 3289 (Sept. 14, 2009).

¹¹⁶ See *Improving Mitigation Policies and Practices of the Department of the Interior*, Sec'y of the Interior Order No. 3330 (Oct. 31, 2013) [hereinafter SO 3330]; see also Bureau of Land Mgmt., *Guidance—Use of Air Emissions Estimating Tools*, Instruction Memorandum No. 2015-020 (Nov. 24, 2014) (announcing availability to BLM of the Greenhouse Gas & Climate Change NEPA (GHGCC-NEPA) toolkit, the Medford District toolkit and the BLM Planning Stage Emissions Inventory (BLM-PSEI) toolkit for estimating GHG emissions).

¹¹⁷ SO 3330, *supra* note 116; DEP'T OF THE INTERIOR, *Chapter 6: Implementing Mitigation at the Landscape-Scale* (Oct. 23, 2015), in DEPARTMENT MANUAL [hereinafter *Mitigation Chapter*].

In undertaking the Programmatic EIS, Interior has at least implicitly recognized that NEPA requires it to analyze downstream emissions associated with the federal coal leasing program. This conclusion comports with the current trajectory of courts' interpretations of NEPA. Since 2014, there have been five district court decisions regarding the scope of downstream emissions that must be evaluated in NEPA reviews for coal lease modifications and other approvals involving the extraction of coal from federal lands.¹¹⁸ In four of these cases, district courts in Colorado and Montana determined that the responsible agencies failed to take the requisite "hard look" at downstream emissions from the combustion of the coal.¹¹⁹ In the fifth case, a district court in Wyoming held that the agency's analysis of downstream emissions was adequate, in part because the agency had already disclosed emissions from coal combustion.¹²⁰ Notably, all of the cases have found that there is a sufficient causal connection between the extraction of coal and the downstream greenhouse gas emissions from the processing, transportation, and end-use of the extracted coal. With regards to foreseeability, the courts have often held that agencies have sufficient data and tools to estimate greenhouse gas emissions from the combustion of coal. They have also recognized that tools are available to evaluate how the extraction of coal will influence

¹¹⁸ *Dine Citizens Against Ruining Our Env't v. U.S. Office of Surface Mining Reclamation & Enf't*, 82 F. Supp. 3d 1201 (D. Colo. 2015); *Wild Earth Guardians v. U.S. Forest Serv.*, 120 F. Supp. 3d 1237 (D. Wyo. 2015); *WildEarth Guardians v. U.S. Office of Surface Mining, Reclamation & Enf't*, 104 F. Supp. 3d 1208, 1230 (D. Colo. 2015); *Wildearth Guardians v. U.S. Office of Surface Mining, Reclamation & Enf't*, No. CV 14-103-BLG-SPW, 2015 WL 6442724 (D. Mont. Oct. 23, 2015), *report and recommendation adopted in part, rejected in part sub nom.* *Guardians v. U.S. Office of Surface Mining, Reclamation & Enf't*, No. CV 14-103-BLG-SPW, 2016 WL 259285 (D. Mont. Jan. 21, 2016); *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174 (D. Colo. 2014).

¹¹⁹ *Dine Citizens*, 82 F. Supp. 3d 1201 (finding that DOI's Office of Surface Mining (OSM) must consider downstream emissions from coal combustion); *WildEarth Guardians v. United States Office of Surface Mining, Reclamation & Enf't*, 104 F. Supp. 3d 1208, 1230 (D. Colo. 2015) (finding that OSM must consider downstream emissions from coal combustion); *Wildearth Guardians v. U.S. Office of Surface Mining, Reclamation & Enf't*, No. CV 14-103-BLG-SPW, 2015 WL 6442724 (D. Mont. Oct. 23, 2015) (finding that OSM failed to take hard look at environmental impacts when issuing FONSI, including downstream greenhouse gas emissions); *High Country*, 52 F. Supp. 3d 1174 (finding that the Forest Service must consider downstream emissions from coal combustion); *see also* *S. Fork Band Council of W. Shoshone v. U.S. Dep't of the Interior*, 588 F.3d 718 (9th Cir. 2009) (requiring analysis of downstream emissions from transporting and processing gold in the EIS for a proposed gold mine).

¹²⁰ *Wild Earth Guardians v. U.S. Forest Serv.*, 120 F.Supp.3d 1237 (D. Wyo. 2015).

coal markets.¹²¹ These court decisions are fully consistent with CEQ's final guidance on considering climate change in environmental review under NEPA.¹²²

As NEPA requires individual coal extraction projects to account for downstream emissions it necessarily requires a programmatic review to account for those same emissions. Indeed, the programmatic review is the better scale at which to analyze potential downstream emissions, in the first instance, as it allows the agency the opportunity to consider the cumulative effects of individual leasing decisions and to craft a program that is consistent with our national climate policy and international climate commitments. Moreover, under NEPA the agency can identify appropriate mitigation measures for these emissions, including compensatory mitigation measures. Greenhouse gas emissions lead inexorably—indirectly, cumulatively—to climate change impacts. NEPA requires that the Programmatic EIS fully disclose such indirect and cumulative impacts and appropriate mitigation measures.¹²³ Accordingly, the Programmatic EIS must assess mitigation measures in accordance with CEQ's guidance:

The mitigation measures discussed in an EIS must cover the range of impacts of the proposal. The measures must include such things as design alternatives that would decrease pollution emissions, construction impacts, esthetic intrusion, as well as relocation assistance, possible land use controls that could be enacted, and other possible efforts. Mitigation measures must be considered even for impacts that by themselves would not be considered "significant." Once the proposal itself is considered as a whole to have significant effects, all of its specific effects

¹²¹ Courts have not directly addressed whether GHG emissions from coal transportation and processing are also "reasonably foreseeable" though several cases that have touched on this issue. *See, e.g., Dine Citizens*, 82 F. Supp. 3d at 1213 (noting that transportation-related impacts had already been accounted for in the EIS); *Wild Earth Guardians v. U.S. Forest Serv.*, 120 F. Supp. 3d 1237 (D. Wyo. 2015) (upholding an agency's analysis of downstream emissions, and noting that transportation emissions had been briefly discussed but not quantified); *S. Fork Band Council*, 588 F.3d 718 (requiring analysis of emissions from gold transportation and processing where information was available to calculate those emissions).

¹²² Council on Environmental Quality, *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews*, Memorandum for Heads of Federal Departments and Agencies 13–14, 16 (Aug. 1, 2016), https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf.

¹²³ *See* U.S. ENVTL. PROT. AGENCY, CONSIDERATION OF CUMULATIVE IMPACTS IN EPA REVIEW OF NEPA DOCUMENTS (1999).

on the environment (whether or not “significant”) must be considered, and mitigation measures must be developed where it is feasible to do so.¹²⁴

Thus, NEPA requires that BLM discuss climate change impacts, alternatives that would mitigate those impacts and other mitigation measures, even if the agency determines (presumably based on a market analysis that demonstrates other, potentially worse fossil fuels would substitute for federal coal) that the federal coal leasing program’s GHG emissions are not a significant impact, or that the climate change impacts attributable to those emissions are not significant. The overall action undoubtedly has significant effects, and so feasible mitigation measures must be discussed for all impacts. The mitigation measures discussed in the Programmatic EIS should follow the “mitigation hierarchy,” discussed further below. The discussion should include measures that would avoid harm (such as requiring coal extracted from public lands be combusted in power plants equipped with carbon capture, utilization and storage technology), those that would lessen harm (such as requiring coal extracted from public lands be combusted at power plants that meet the New Source Performance Standards for coal-fired power plants), as well as those that would compensate for harm.

One might argue that although upstream and downstream emissions are foreseeable effects of coal leases the impacts attributable to those emissions are simply too remote or uncertain to mitigate. Consistent with this view, the BLM could plausibly quantify emissions, identify those emissions as a significant environmental impact and develop a program to minimize those impacts through, for instance, a “net zero” emissions offset program. Such a program would be eminently reasonable, and in theory could be designed to interact with other emissions and emissions credit markets. However, BLM need not limit itself by doing so. The Social Cost of Carbon and the Social Cost of Methane provide valuations to climate change impacts associated with GHG emissions, providing at least one potential basis by which to establish a compensatory mitigation plan that extends beyond emissions offsets. As discussed further in Part V below, a compensatory mitigation plan consistent with NEPA could also include emissions offsets in the form of mitigation banks for carbon sequestration as well as other elements.

¹²⁴ Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations, 46 Fed. Reg. 18,026, 18,031 (March 23, 1981) (citing 40 C.F.R. §§ 1502.14(f), 1502.16(h), 1508.14 (2016)).

B. Departmental Mitigation Policy

The Department of the Interior and BLM are guided in their approach to mitigation by a number of policy directives and internal guidelines. In November 2015 the Office of the White House issued *Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment*, a Presidential Memorandum that announced President Obama's view that the agencies implementing statutes and regulations relating to natural resources management and environmental pollution control can achieve the goals of promoting economic and energy development and protecting environmental values by undertaking "the planning necessary to address harmful impacts on natural resources by avoiding and minimizing impacts, then compensating for impacts that do occur."¹²⁵ The Memorandum sets forth four key policies in regards to the present analysis:

- It makes the "mitigation hierarchy" national policy applicable across the natural resource and environmental agencies.
- It recognizes that there are some resources that "are of such irreplaceable character that minimization and compensation measures, while potentially practicable, may not be adequate or appropriate," and therefore impacts should be avoided altogether.
- It establishes a "no net loss" minimum standard for resources that are "important, scarce or sensitive, or wherever doing so is consistent with agency mission and established natural resources objectives."
- It integrates the principles of consistency, durability, additionality and transparency into mitigation policy.

The Presidential Memorandum is consistent with Interior's internal mitigation policies. In Fall 2013, Secretary Jewell released Secretarial Order 3330, *Improving Mitigation Policies and Practices of the Department of the Interior*. Order 3330 directed the Department and each of its bureaus to follow a common set of principles for its mitigation decisions; to use a landscape-scale approach to guide compensatory mitigation efforts; to consider mitigation early in project planning and design;

¹²⁵ *Mitigating Impacts on Natural Resources From Development and Encouraging Related Private Investment*, 80 Fed. Reg. 68,743, 68,743 (Nov. 3, 2015).

to ensure durability, transparency and consistency in mitigation decisions; and to “focus on mitigation efforts that improve the resilience of our Nation's resources in the face of climate change.”¹²⁶ In walking through the mitigation hierarchy, Secretarial Order 3330 states that “for impacts that cannot be avoided or effectively minimized, the Department should seek ways to offset or compensate for those impacts to ensure the continued resilience and viability of our natural resources over time.”¹²⁷ Moreover, Order 3330 affirms that “[a]s the Department continues to review development projects and identify associated mitigation, it must consider the effects of climate change and incorporate landscape-level strategies to address these impacts into any mitigation framework.”¹²⁸ Ultimately, Order 3330 leaves the Department and its bureaus with broad discretion to develop and implement mitigation strategies “through the use of landscape-level planning, banking, in-lieu fee arrangements, or other possible measures,” including regional mitigation plans that “address mitigation for multiple resources, such as biological, ecological, cultural, and scenic resources, as well as socioeconomic factors, as appropriate.”¹²⁹

On October 23, 2015, Interior released “Landscape-Scale Mitigation Policy,” a new chapter in its Departmental Manual, which effectively operationalizes Order 3330.¹³⁰ The chapter “establishes Departmental policy and provides guidance to bureaus and offices to best implement mitigation measures associated with legal and regulatory responsibilities and the management of Federal lands, waters, and other natural and cultural resources under the jurisdiction of the Department of the Interior.”¹³¹ The purpose of the new policy is to:

effectively avoid, minimize, and compensate for impacts to Department-managed resources and their values, services, and functions; provide project developers with added predictability, efficient, and timely environmental reviews; improve the resilience of our Nation’s resources in the face of climate change; encourage strategic conservation investments in lands and other resources; increase compensatory mitigation effectiveness, durability, transparency, and consistency; and better utilize mitigation measures to help achieve Departmental goals.¹³²

¹²⁶ SO 3330, *supra* note 116, § 1.

¹²⁷ *Id.* § 2.

¹²⁸ *Id.*

¹²⁹ *Id.* § 4(a).

¹³⁰ *Mitigation Chapter*, *supra* note 117.

¹³¹ *Id.* § 6.1

¹³² *Id.*

Different mechanisms for compensatory mitigation—such as in lieu fees, mitigation banks and permittee-responsible measures—are to be held to equivalent standards.¹³³

One of the core principles set forth in the Departmental Manual is that mitigation necessitates the identification and promotion of “mitigation measures that help address the effects of climate change and improve the resilience of our Nation’s resources and their values, services, and functions.”¹³⁴ Among the ways the Department and its bureaus can act consistent with this principle is to “[c]onsider greenhouse gas emissions in project design, analysis, and development of alternatives.”¹³⁵ Other efforts may include protecting habitat, maintaining ecosystem services, slowing the spread of invasive species, protecting and restoring habitats that store carbon and accounting for uncertainty and risk in compensatory mitigation design.¹³⁶

The sum total of the White House and Interior guidance is that BLM can and should assess and potentially implement mitigation measures, which might operate through any number of mechanisms, including lease stipulations and chargeable fees, among other things. The mitigation measure should first seek to avoid GHG emissions and their climate impacts; second, seek to minimize emissions and impacts; and third, compensate for unavoidable impacts, as through a climate change impacts fee.

V. Employing a Climate Change Impacts Fee as a Programmatic Compensatory Mitigation Strategy for the Federal Coal Leasing Program: Design and Technical Issues

This section identifies and discusses some of the key design and technical issues that BLM should address in the course of evaluating the potential of employing a climate change impacts fee. This fee would appear as a compensatory mitigation strategy or plan, consistent with recent agency guidance and practice. As such, it would seek to “compensate for remaining unavoidable impacts after all appropriate and practicable avoidance and minimization measures have been applied, by replacing or providing substitute resources or environments...through the restoration,

¹³³ *Id.* §§ 6.6(C)(3)(b), 6.7.

¹³⁴ *Id.* § 6.6(F).

¹³⁵ *Id.* § 6.6(F)(7).

¹³⁶ *See id.* § 6.6(F).

establishment, enhancement, or preservation of resources and their values, services, and functions.”¹³⁷ The intention here is not to set forth a single proposal but to outline an array of considerations and issues for BLM to identify, solicit further comment on and consider in the Programmatic EIS.

There are a number of key questions to address in developing a mitigation framework in any context: 1) Whether to mitigate. 2) When to mitigate. 3) What mitigation should be required. 4) Technical issues surrounding how to mitigate.¹³⁸ This section looks at these questions in turn, and concludes by providing a sample analysis, using the framework developed for and employed in the regional compensatory mitigation strategies in BLM’s Western Solar Plan.

A. Whether to Mitigate

The question of whether to mitigate was the subject of Part II, where the question was conceived as one of the government’s duty and discretion. For the reasons set forth in detail above, BLM has under the common law and federal legislation both a duty to mitigate climate change impacts resulting from upstream and downstream GHG emissions and the discretion to do so. The question has also been broached here as a narrower question of criteria: Are these impacts the sort of impacts for which mitigation, and compensatory mitigation in particular, is appropriate? As discussed in Part IV, under NEPA and Interior’s and BLM’s compensatory mitigation policies the answer is plainly yes. And, as discussed in Part III, common law doctrines pertaining to lessee and lessor liability reinforce this conclusion.

Moreover, it makes policy sense to require coal lessees to compensate for the unavoidable impacts of their extractive industry in the form of a climate change impacts fee. Indeed, doing so is to the industry’s benefit, as compensatory mitigation might allow coal mining companies to continue their existing business, rather than taking more drastic (though arguably necessary) action, such as imposing a permanent moratorium on the issuance of new coal leases. Moreover,

¹³⁷ *Id.* § 6.4(C).

¹³⁸ *See* Laroe, *supra* note 86, at 9.

this approach would achieve the public benefit, economic efficiency and environmental equity that come with internalizing the external costs of coal extraction.¹³⁹

B. When to Mitigate

The question of when to require, or allow, compensatory mitigation will, in this context, bleed into questions of form. A climate change impacts fee could be assigned via BLM's determination of fair market value, as part of the bonus bid, through the rental fee, in a lease stipulation, as part of the royalty rate or potentially in some other form. Each of these potential moments would calculate the fee amount and result in payment and receipt at a different point in the lease process. BLM should consider the pros and cons of calculating and requiring payment at each of these different points.

As a starting point, it may be noted that the mitigation policies set forth by President Obama, Interior and BLM all advocate for advance mitigation where possible, in order to provide certainty to the private sector and to help ensure the effectiveness of compensatory mitigation. Here, however, advance compensatory mitigation could result in over-charging lessees for downstream GHG emissions and climate change impacts. If projected quantities of recoverable coal prove overly optimistic, or if the company's efforts produce less coal than estimated, a fee tied to projected amounts of coal or to acreage would over-charge the lessee. A climate change impacts fee based on actual production, as measured, for instance, on an annual or bi-annual basis, would avoid this scenario. The use of a consistent metric, such as the Social Cost of Carbon and the Social Cost of Methane, which can be readily applied to production, would provide a degree of certainty

¹³⁹ Those seeking to challenge a compensatory mitigation regime for federal coal might raise the "perfect substitute" argument. The "perfect substitute" argument posits that the extraction of fossil fuels will not actually cause an increase in consumption, because the same quantity of the fuel would be produced elsewhere and eventually transported and consumed, even if the agency did not approve the proposal at issue. Notably, the Eighth Circuit Court of Appeals explicitly rejected this proposition in relation to a proposed coal rail line, noting that it is "illogical at best" because the "increased availability of inexpensive coal will at the very least make coal a more attractive option to future entrants into the utilities market when compared with other potential fuel sources, such as nuclear power, solar power, or natural gas" and thus the project will "most assuredly affect the nation's long-term demand for coal." *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549 (8th Cir. 2003). The federal district court in Colorado has also rejected the "perfect substitution" argument in relation to fossil fuel extraction proposals. *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174, 1198 (D. Colo. 2014). *But see Wild Earth Guardians v. U.S. Forest Serv.*, 120 F. Supp. 3d 1237 (D. Wyo. 2015).

to the private sector and offer a consistent and transparent programmatic approach to calculating appropriate compensation.

C. How to Mitigate

Designing a compensatory mitigation strategy for the federal coal leasing program will require BLM to make two preliminary determinations: how to categorize the atmospheric and other resources adversely affected, and what the appropriate scale for mitigation is. Program design will also require BLM to make a number of more technical decisions, including how to calculate a fee, what types of mitigation mechanisms the fee might be put into and how to manage such mitigation mechanisms. This sub-section seeks to encourage a dialog on a climate change impacts fee by briefly addressing these design questions in turn.

a. Categorization of Federal Coal's Climate Change Impacts

The BLM should consider how to categorize the climate and other natural resources adversely impacted by the federal coal leasing program, as doing so may affect the form and degree of mitigation the agency requires. The Presidential Memorandum *Mitigating Impacts from Natural Resource Development* identifies three types or categories of resources: irreplaceable resources; resources that are important, scarce or sensitive; and other resources managed consistent with an agency's mission and objectives.¹⁴⁰ The preferred means of mitigating impacts on irreplaceable resources is avoidance. For important, scarce or sensitive resources the Presidential Memorandum establishes a minimum "no net loss" standard, and a preference for a "net benefit." The DOI's mitigation policy adopts these categories and standards.¹⁴¹

There is an argument to be made that the climate in which human civilization took shape and in which we continue to exist constitutes an irreplaceable resource, and that the appropriate mitigation measure for continued GHG emissions and climate change impacts is avoidance. Irreplaceable resources are those that have been "recognized by legal authorities as requiring particular protection from impacts and that because of their high value or function and unique

¹⁴⁰ *Mitigating Impacts on Natural Resources From Development and Encouraging Related Private Investment*, 80 Fed. Reg. 68,743, 68,745 (Nov. 3, 2015).

¹⁴¹ *Mitigation Chapter*, *supra* note 117, § 6.6(b).

character cannot be restored or replaced.”¹⁴² Legal authorities—including the UNFCCC and the Clean Air Act—have recognized the need to provide particular protections to the climate. The high value and function of the climate system—to the extent there was ever a real question about it—has been documented by EPA and others,¹⁴³ and becomes more and more evident as the increasing extent and severity of climate impacts continue to emerge. What’s more, it is entirely unclear that the climate can be restored through technological innovations in direct air capture or geoengineering; clearly, though, it cannot be replaced.

If BLM concludes that the climate is not an irreplaceable resource warranting avoidance to the maximum extent practicable the agency must conclude that it is nonetheless an important and sensitive resource, and that the appropriate mitigation standard is a minimum of no net loss, and preferably a net benefit. There is no other reasonable conclusion—the climate is important. In recent years, due to the quantity of anthropogenic GHG emissions, it has also become sensitive, and it is at serious risk of breaching tipping points that could fundamentally alter life on earth. Pursuant to BLM’s policies, the appropriate mitigation for a resource that fits into this category is “a no net loss outcome for impacted resources and their values, services, and functions, or, as required or appropriate, a net benefit in outcomes.”¹⁴⁴ This language affords BLM a good deal of discretion in crafting a compensatory mitigation strategy that makes use of a climate change impacts fee. As discussed in Section V.C.d below, the no net loss/net benefit standard could apply directly through an emissions offset requirement, or somewhat more indirectly through fees that would address other “outcomes” related to the “values, services and functions” impacted by the coal leasing program, including through adaptation efforts aimed at increasing resilience by decreasing socioeconomic impacts or funding infrastructure or nature-based adaptations.

b. The Scale of a Compensatory Mitigation Strategy

Secretarial Order 3330 directs Interior and its bureaus to adopt a landscape-scale approach to mitigation. It also requires the Department to “consider the effects of climate change and

¹⁴² Mitigating Impacts, 80 Fed. Reg. at 68, 744.

¹⁴³ See e.g., U.S. ENVTL. PROT. AGENCY, CLIMATE CHANGE IN THE UNITED STATES: BENEFITS OF GLOBAL ACTION (2015).

¹⁴⁴ *Mitigation Chapter*, supra note 117, § 6.6(B).

incorporate landscape-level strategies to address these impacts into any mitigation framework.”¹⁴⁵ The Departmental Manual offers more specific guidance on implementing this directive, and affirms the preference for landscape-scale approaches and landscape-scale plans and strategies for impact mitigation.¹⁴⁶

The appropriate landscape-scale in which to seek mitigation for climate change impacts is most likely planetary. Interior defines “landscape” as “an area encompassing an interacting mosaic of ecosystems and human systems characterized by a set of common management concerns.”¹⁴⁷ A landscape is not geospatially limited; it “is not defined by the size of the area, but rather by the interacting elements that are relevant and meaningful in a management context.”¹⁴⁸ The climate is a whole Earth phenomenon, and managing the climate change problem is a fully international affair.

Moreover, the “landscape-scale approach applies the mitigation hierarchy for impacts to resources and their values, services, and functions at the relevant scale, however narrow or broad, necessary to sustain, or otherwise achieve established Departmental goals for those resources and their values, services, and functions.”¹⁴⁹ In developing a landscape-scale strategy or plan, BLM is charged with identifying “clear management objectives for targeted resources and their values, services, and functions at landscape-scales, as necessary, including across administrative boundaries, and employ[ing] the landscape-scale approach to identify, evaluate, and communicate how mitigation can best achieve those management objectives.”

BLM would have ample room to craft a mitigation program that designates the planet as the appropriate landscape-scale, takes a planetary-scale approach to mitigation and developing planetary-scale mitigation strategies. Most importantly, this approach would empower BLM to directly link the federal coal leasing program’s GHG emissions to the United States’ international climate commitments and goals. It could also allow BLM to operate in explicit reference to the concept of a carbon budget. At the same time, a planetary-scale approach to mitigation would still

¹⁴⁵ SO 3330, *supra* note 116, § 2.

¹⁴⁶ *Mitigation Chapter*, *supra* note 117, § 6.6(D), (E).

¹⁴⁷ *Id.* § 6.4(D).

¹⁴⁸ *Id.*

¹⁴⁹ *Id.* § 6.4(E)

preserve the agency's discretion to develop a compensatory mitigation framework that targets national, or even regional, management objectives.

Alternatively, BLM might designate the United States as the appropriate landscape-scale, or even adopt a fully regional approach.

c. Calculating a Climate Change Impacts Fee

The question of what the proper amount to charge for federal coal has been the subject of several economic analyses.¹⁵⁰ This paper does not seek to set any particular amount; rather, the purpose here is to begin to identify fee-related issues Interior and BLM should consider in the environmental review. As noted previously, the Social Cost of Carbon/Social Cost of Methane provides one possible means to calculating a climate change impacts fee. In offering a science-driven metric that provides transparency, consistency and predictability to the private sector and to the American public the Social Cost of Carbon/Social Cost of Methane would be consistent with the United States' existing climate policies, and with the White House and Interior mitigation policies discussed above. In offering a court-tested metric, it provides at least some assurance that the action will survive legal challenge.¹⁵¹

However, the Social Cost of Carbon/Social Cost of Methane is also something of a political flashpoint, and need not be taken as the end of the discussion. As noted above, as landowner the federal government possesses the right to recover from its lessee for damages to the leased property and the freedom to insure against damages to its other properties resulting from its lessee's activities, including but not limited to natural and other resources on public lands. In establishing a fee based on the federal government's own expenses, Interior and BLM could seek to calculate the amounts paid out in recent years and expected to be paid out in the future for climate change adaptation and disaster management, and allocate an appropriate percentage to the carbon

¹⁵⁰ See THE ECONOMICS OF COAL LEASING ON FEDERAL LANDS, *supra* note 7; HEADWATERS ECONOMICS, AN ASSESSMENT OF U.S. FEDERAL COAL ROYALTIES: CURRENT ROYALTY STRUCTURE, EFFECTIVE ROYALTY RATES, AND REFORM OPTIONS (2015); VULCAN PHILANTHROPY, FEDERAL COAL LEASING OPTIONS: EFFECTS ON CO2 EMISSIONS AND ENERGY MARKETS (2016); Krupnick et al., *supra* note 7; see also Todd Gerarden et al., *Federal Coal Program Reform, the Clean Power Plan, and the Interaction of Upstream and Downstream Climate Policies* (Nat'l Bureau of Econ. Research, Working Paper No. 22,214, 2016).

¹⁵¹ *Zero Zone Inc. v. U.S. Dep't of Energy*, 2016 WL 4177217 (7th Cir. 2016). See also *High Country Conservation Advocates v. U.S. Forest Serv.*, 52 F. Supp. 3d 1174 (D. Colo. 2014).

being extracted under the lease. This would be a lesser amount than the full Social Cost of Carbon, and may well reflect a percentage of the costs already incorporated into that tool, but it offers an alternative conceptual approach to the establishment of the fee.

Even a decision to use the Social Cost of Carbon is not the end of the issue. There are other technical questions BLM will inevitably need to consider in deciding not only how to calculate a climate change impacts fee but also what the ultimate fee should be. These include, but are not limited to:

- *How to account for intervening actors:* The extraction of coal from the ground is the beginning, not the end, of the trajectory that results eventually in GHG emissions and associated impacts for which mitigation is warranted. What percentage of the overall cost of the emissions should be allocated to coal production?
- *How to account for regulations on power plants and other coal users:* Assignment of a climate change impacts fee is tantamount to assignment of responsibility for emissions from the fossil fuel. Under the Clean Power Plan and other regulations, downstream emitters are also being “charged” for the use of fossil fuels through regulatory costs. Although there may be sound ecological and equity reasons to charge both coal companies full price for the GHG emissions and climate change impacts associated with their activities there is also a reasonable economic basis for concern about so-called double-counting of emissions. How should a fee be structured to prevent against potential economic inefficiencies and other concerns pertaining to double-counting of emissions?
- *How to account for the different carbon intensity of coal:* Coal located in different regions, and coal located in different places within regions, and coal located in different spots on a leased parcel, might contain different degrees of carbon intensity and/or energy efficiency. To what extent should climate change impact fees be sensitive to these differences, and how should these differences be accounted for?
- *Whether and how to account for historic emissions:* Climate change is already at an advanced stage, due in no small part to the combustion of coal mined in the United States. Should compensatory mitigation for new leases seek to recover costs associated with historic emissions? If so, what percentage of the overall cost should be allocated to new coal production?
- *Whether and how to account for historic costs:* Climate change has already resulted in extraordinary costs incurred by the American public, including but are not limited to disaster recovery costs from events such as Hurricanes Sandy and Katrina, forest fire management costs, and adaptation costs incurred by federal agencies, and emissions that will occur from existing coal leases will only add to those costs. Should

compensatory mitigation for new leases seek to recover costs associated with these historic and locked-in costs? If so, what percentage of the overall cost should be allocated to new coal production?

- *How to account for the impacts different prices will have on different companies, industry sectors, states, tribes, and local communities:* Ultimately, the amount charged through a climate change impacts fee could influence the economics of the coal industry and economic and financial situations of the states, tribes, local communities and individuals engaged with it. How should the agency balance these competing interests and concerns in setting a fee?

d. Permissible Forms and Management of Compensatory Mitigation

Pursuant to agency policy, different mechanisms for compensatory mitigation—such as in lieu fees, mitigation banks and permittee-responsible measures—are to be held to equivalent standards.¹⁵² A climate change impacts fee might be allocated and expended in any of these ways. It could be paid in to the government as an in lieu fee. It could be paid into a government- or privately-managed GHG emissions mitigation bank. Or it could remain with the lessee as a permittee-responsible mitigation requirement. BLM should consider whether to select a preferred form of mitigation, or whether to allow for multiple forms.

An in lieu fee could provide the government with a dedicated fund to expend on programs and projects designed to achieve climate change mitigation or adaptation goals. These funds could go to any number of uses. For instance, the funds could be used to pay for federal adaptation efforts on public lands. The funds could be used to preserve carbon stocks and sinks, or to invest in energy efficiency and renewable energy development. Given the federal government's ownership of extensive carbon resources, a fund created by in lieu fees could be used not only to acquire new stocks or sinks but also to help pay for the impacts of preserving ones already owned by the federal government, such as by increasing community resilience in coal-impacted communities by funding adaptation projects and economic transition programs.

A mitigation bank might be designed to operate in a way similar to those established for wetlands under Section 404 of the Clean Water Act. The bank could be limited to mitigating downstream emissions through sequestration and other offsets. Of course, such a program would

¹⁵² *Mitigation Chapter, supra* note 117, §§ 6.6(C)(3)(b), 6.7.

encounter the same technical issues as other GHG emissions offsets programs. BLM must seek to ensure that offsets are real, quantifiable, additional, verifiable and permanent. As with calculating the fee itself, an offsets program may need to designate an appropriate ratio of offsets to emissions. And, BLM should seek to ensure that there is no double-counting of emissions.

D. A Sample Framework for Developing a National Compensatory Mitigation Strategy for the Federal Coal Leasing Program

In considering employing a climate change impacts fee as a compensatory mitigation strategy for the federal coal leasing program BLM will not be starting from scratch. The bureau's Regional Mitigation Strategies for Solar Development provide something of a template. There, BLM committed to seek to avoid and/or minimize adverse impacts associated with solar development on public lands in the American Southwest, and for those impacts that cannot be avoided or minimized develop regional mitigation plans for each solar energy zone analyzed in the Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Solar PEIS).¹⁵³ The regional mitigation strategies were from the outset authorized to incorporate compensation in the form of funding for identified conservation priorities.¹⁵⁴

The Regional Mitigation Strategies issued in March 2016 provide further useful detail. Among other things, for instance, the Arizona Regional Mitigation Strategy provides (1) a recommended method for calculating a regional compensatory mitigation fee that can be assessed to developers choosing to contribute to a mitigation fund, and an explanation of how it was calculated for each of the solar energy zones in the state;¹⁵⁵ (2) preliminary information on management of mitigation obligation revenues;¹⁵⁶ and (3) recommended regional compensatory mitigation sites, action(s), and desired outcomes.¹⁵⁷

¹⁵³ BUREAU OF LAND MGMT., APPROVED RESOURCE MANAGEMENT PLAN AMENDMENTS/RECORD OF DECISION (ROD) FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES 19 (2012).

¹⁵⁴ *Id.* at 165–68.

¹⁵⁵ BUREAU OF LAND MGMT., REGIONAL MITIGATION STRATEGY FOR THE ARIZONA SOLAR ENERGY ZONES 44–48 (2016).

¹⁵⁶ *Id.* at 49.

¹⁵⁷ *Id.* at 49–53.

There are important differences between BLM's Solar Energy Program and the federal coal leasing program. First, the direct impacts of the Solar Energy Program are, for the most part, to leased lands or areas immediately surrounding them, and indirect effects are largely if not entirely limited to the geographic region or ecoregion and to protected wildlife within it. Second, the limited geographic scope of impacts weighs in favor of mitigation efforts that are similarly situated, and that directly comport with relevant regional management plans. Third, the nature and extent of the impacts and appropriate mitigation, then, are most easily determined on the project-specific level. Climate change, by contrast, has indirect effects that are essentially unbounded. GHGs emitted by coal extracted from federal lands and combusted in the US have the same climate effect as GHGs emitted by coal extracted elsewhere and combusted elsewhere. This likely weighs in favor of a more uniform approach to compensatory mitigation that can be determined at a programmatic level.

Nonetheless, the BLM's approach to developing the regional mitigation strategies for solar energy offers a useful template. Here, the paper adopts the overall approach described in the Final Solar PEIS,¹⁵⁸ and recorded in the BLM Draft Procedural Guidance for Developing Solar Regional Mitigation Strategies, to describe the necessary elements of a climate change impacts fee compensatory mitigation strategy for the federal coal leasing program:

1. *Description of the baseline conditions against which unavoidable impacts are assessed:* BLM should consider comments already submitted and further comments on the appropriate baseline by which to measure GHG emissions and associated climate change impacts. At a minimum, the BLM should establish a baseline condition that accounts for domestic policies and plans aimed at reducing greenhouse gas emissions and dependence on fossil fuels. That is to say, under no circumstance should the the baseline condition correspond with "business-as-usual" trajectories for GHG emissions, but rather trajectories that are consistent with our greenhouse gas reduction targets, and which reflect the effects of current and planned regulations on fossil fuel consumption. Alternatively, the agency might consider setting a carbon budget fully consistent with the international goal of a 2 degree or 1.5 degree limit to global warming.

¹⁵⁸ BUREAU OF LAND MGMT. & U.S. DEP'T OF ENERGY, FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (PEIS) FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES app. A, § A.2.4 (2012).

2. *Assessment of unavoidable impacts:* BLM should consider all GHG emissions resulting from the federal coal leasing program unavoidable impacts. In so doing, the agency should acknowledge that downstream emissions from the transportation, processing and combustion of the resource are indirect effects of the action, and should quantify downstream emissions tied to the estimated amount of coal to be extracted in the alternatives to be analyzed in the Programmatic EIS. BLM can estimate downstream emissions from combustion by multiplying the amount of the resource to be extracted by the CO₂ emission factor for the fuel. BLM can also estimate emissions from the transportation and processing of the resource. This inventory of downstream greenhouse gas emissions could be supplemented by a market analysis of how the predicted increase in the supply of fossil fuels will affect prices and consumption vis-à-vis alternative fuel sources. The market analysis should not be used as a substitute for a complete inventory of downstream emissions. Rather, it should serve as a tool for determining whether the proposed action will displace the production and consumption of other fuel sources, thus resulting in a net increase in greenhouse gas emissions that may be less than the gross emissions from downstream processing, transportation and consumption. In other words, the market analysis should inform the agency's understanding of the extent to which the project will actually increase greenhouse gas emissions as compared with the no action baseline.¹⁵⁹
3. *Identification of unavoidable impacts that warrant mitigation:* As a matter of policy, BLM should identify *all* upstream and downstream emissions as unavoidable impacts that warrant mitigation. The climate is in crisis, and there is literally no room for error if we have any hope of meeting the 1.5 degree or even 2 degree targets.
4. *Method for calculating mitigation fees for unavoidable impacts that warrant mitigation:* Emissions themselves may constitute the unavoidable impact requiring mitigation and the appropriate form of mitigation, in the form of carbon sequestration. The agency should consider how to calculate appropriate emissions offsets on public and private lands. Emissions may also be monetized by looking at their impacts. The Social Cost of Carbon provides one viable method for calculating mitigation fees for unavoidable climate change impacts that warrant mitigation. Another

¹⁵⁹ Resources on downstream emissions calculations are available in Burger & Wentz, *supra* note 92.

approach may be to calculate climate change adaptation and disaster management costs incurred by the federal government and to apportion some responsibility for them to individual coal leases. Other approaches may be available, and should also be considered.

5. *Identification and recommendation of management structure to hold and apply mitigation investment funds:* Climate change impacts fees may be paid in the form of in lieu fees into a government fund or as credits in a government- or privately-owned mitigation bank.

6. *Appropriate mitigation investment locations, objectives and/or actions:* Different investment locations, objectives and actions are available to the government fund and mitigation banks. For example, the government fund may make domestic investments in carbon capture and utilization research; adaptation in coal communities including preparation for climate impacts (wildfire, drought, etc.) as well as economic development for transition away from coal extraction;¹⁶⁰ and investments in carbon sequestration projects in the US and internationally that could provide for net zero emissions. Mitigation banks may make domestic or international investments in carbon sequestration projects.

VI. Conclusion

The programmatic review of the federal coal leasing program will provide a critical opportunity to evaluate the effects of federal coal on climate change and to identify measures that could be implemented to mitigate those effects. The imposition of a climate change impacts fee on federal coal leases is a prime example of a mitigation measure that should be contemplated in the review. This paper presents the policy and legal rationales for introducing such a fee, explains why BLM has ample discretion to pursue this course of action, and highlights some technical questions that warrant further consideration during the environmental review. The paper is thus intended as a starting point for a much more detailed assessment of this important mitigation opportunity.

¹⁶⁰ See BUREAU OF LAND MGMT., NATIONAL ENVIRONMENTAL POLICY ACT HANDBOOK § 6.8.4 (2008) (“Mitigation measures can be applied to reduce or eliminate adverse effects to biological, physical, or socioeconomic resources. Mitigation may be used to reduce or avoid adverse impacts, whether or not they are significant in nature.”).