

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA**

WESTERN ORGANIZATION OF)
RESOURCE COUNCILS, 220 South)
27th Street, Billings, MT 59101;)
FRIENDS OF THE EARTH, 1100 15th)
Street NW, 11th Floor, Washington, DC)
20005,)

Plaintiffs,)

v.)

SALLY JEWELL, in her capacity as)
Secretary of the Interior,)
DEPARTMENT OF THE INTERIOR,)
NEIL KORNZE, in his capacity as)
Director, Bureau of Land Management,)
BUREAU OF LAND)
MANAGEMENT,)

Defendants.)

_____)

Case No. 14-cv-1993

**COMPLAINT FOR
DECLARATORY AND
INJUNCTIVE RELIEF**

INTRODUCTION

1. This is an action for declaratory and injunctive relief challenging the failure of the Department of the Interior (Interior) and the Bureau of Land Management (BLM) to supplement its environmental impact analysis of the federal coal management program (Program) to assess the effect of the Program on the global climate, as required by the National Environmental Policy Act and the Administrative Procedure Act. Even though coal mined under the federal coal management program is one of the single greatest contributors to U.S. greenhouse gas emissions, constituting approximately 14% of annual carbon dioxide emissions and 11% of annual greenhouse gas emissions, BLM has unlawfully failed to evaluate and consider these environmental effects.

2. Anthropogenic climate change is one of the most important challenges facing humanity. The scientific community has reached a consensus that global climate change has occurred, continues to occur, and will continue to occur in the future unless humans reduce emissions of carbon dioxide and other greenhouse gases. The recent U.S. National Climate Assessment, authored by over 300 experts from the public and private sector and reviewed by the National Academy of Sciences, the 13 Federal agencies of the U.S. Global Change Research Program, and other bodies, observed:

Evidence for climate change abounds, from the top of the atmosphere to the depths of the oceans. Scientists and engineers from around the world have meticulously collected this evidence, using satellites and networks of weather balloons, thermometers, buoys, and other observing systems. Evidence of climate change is also visible in the observed and measured changes in location and behavior of species and functioning of ecosystems. Taken together, this evidence tells an unambiguous story: the planet is warming, and over the

last half century, this warming has been driven primarily by human activity.

U.S. Global Change Research Program, *Climate Change Impacts in the*

United States: The Third National Climate Assessment 7 (May 2014),

<http://nca2014.globalchange.gov/downloads> (“Nat’l Climate Assessment”).

3. The federal coal management program is administered by BLM, an agency within the Department of the Interior, according to various Acts of Congress, including the Mineral Leasing Act of 1920, 30 U.S.C. § 181 *et seq.*; Federal Coal Leasing Amendments Act of 1976, Pub. L. No. 94-377, 90 Stat. 1083; Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. § 1201 *et seq.*; and Federal Land Policy and Management Act of 1976, 43 U.S.C. § 1701 *et seq.* BLM has promulgated regulations implementing the Program at 43 C.F.R. Parts 3400-3480 and issued guidance supplementing these regulations, *see, e.g.*, BLM Handbook H-3070-1, Economic Evaluation of Coal Properties,

http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.29194.File.dat/h3070-1.pdf.

4. Pursuant to the federal coal management program, as of 2013, BLM manages 309 existing leases in 10 states across the United States and continually processes applications for new leases and modifications to existing leases. Under the Program the BLM grants a lease, typically after a bidding process, to a private party granting the right to mine coal from federal lands.

5. Coal mined from federal lands under the federal coal management program has doubled since 1990, accounting for approximately 40% of all U.S. coal extraction in 2013.

6. Nearly all coal mined from federal lands is burned at power plants to generate electricity.

7. In 2012, combustion of coal to generate electricity accounted for approximately 23% of total U.S. greenhouse gas emissions.

8. In 2009, the U.S. Environmental Protection Agency, heeding warnings in numerous prior National Climate Assessments and other reports by domestic and international governmental bodies, issued a finding under Section 202(a)(1) of the Clean Air Act, 42 U.S.C. § 7521, that emissions of carbon dioxide and five other greenhouse gases endanger public health and the environment. Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009) (“Endangerment Finding”). EPA cited a litany of public health and environment-related effects of greenhouse gases and “determined that the body of scientific evidence compellingly supports this finding.” 74 Fed. Reg. at 66,497. EPA reached this determination “by considering both observed and projected effects of greenhouse gases in the atmosphere, their effect on climate, and the public health and welfare risks and impacts associated with such climate change.” 74 Fed. Reg. at 66,497.

9. Despite scientific agreement that human activity is causing the Earth to warm, threatening damage to humanity and the environment of a scale not previously

experienced, Interior and the BLM have failed, in violation of the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321-4370h, to supplement their environmental impact analysis to assess the effect on climate change of greenhouse gas emissions resulting from the federal coal management program, or to consider policies that could reduce the effects.

10. NEPA is “our basic national charter for protection of the environment.” 40 C.F.R. § 1500.1(a). NEPA ensures informed decision-making by federal agencies by requiring agencies to study and evaluate the environmental impacts of proposed major Federal actions before undertaking those actions. 42 U.S.C. § 4332(2)(C). The “heart” of NEPA is its requirement that federal agencies prepare an environmental impact statement (EIS), in which the agency examines the proposed action and alternatives to the proposal and compares the environmental impacts of the proposed action and the alternatives. 40 C.F.R. § 1502.14.

11. Recognizing that it would be “incongruous” with NEPA’s objectives “for the blinders to adverse environmental effects, once unequivocally removed, to be restored prior to the completion of agency action,” *Marsh v. Ore. Natural Res. Council*, 490 U.S. 360, 371 (1989), NEPA requires federal agencies to supplement a past EIS whenever there are “significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.” 40 C.F.R. § 1502.9(c)(1)(ii). The obligation imposed by this regulation is mandatory and non-discretionary and is triggered whenever “the remaining governmental action would be environmentally significant.” *Marsh*, 490 U.S. at 372 (internal quotation marks omitted).

12. Because the federal coal management program “is a coherent plan of national scope, and its adoption surely has significant environmental consequences,” NEPA requires the agency to prepare a programmatic environmental impact statement for the Program as a whole. *See Kleppe v. Sierra Club*, 427 U.S. 390, 400 (1976).

13. BLM last conducted a comprehensive environmental analysis of the Program in 1979. *See* U.S. BLM, Final Environmental Statement: Federal Coal Management Program (Apr. 1979) (“1979 PEIS”). In the 1979 PEIS, BLM committed to maintaining two levels of NEPA analysis, “one to consider interregional and national impacts and one to consider site-specific and cumulative intraregional impacts.” 1979 PEIS, at 3-68. The document provided that “[t]he first level of analysis would be contained in this programmatic environmental impact statement, updated when necessary.” *Id.* The second level would consist of more frequent analyses focused on localized actions, such as lease sales, individual land use plans, and other actions. *Id.* at 3-68, 3-9.

14. Recognizing that NEPA required the document to be updated when necessary, BLM stated that the 1979 PEIS “would be updated when conditions change sufficiently to require new analyses of [national and interregional] impacts.” 1979 PEIS, at 3-9.

15. The 1979 PEIS only briefly discussed the then-nascent science of the effects of greenhouse gas emissions and the federal coal management program’s emissions. This discussion, which comprises approximately one page of text, does not

address the greenhouse gas emissions resulting from combustion of coal mined under federal leases, which far exceeds emissions resulting from mining activities.

16. The BLM has never supplemented the 1979 analysis with an evaluation of the federal coal management program's effect on climate change. The only supplement to the 1979 PEIS, prepared in 1985, did not address climate change.

17. New leases continue to be issued under the federal coal management program each year. In fiscal year 2013 alone, BLM issued four new competitive non-regional lease-by-application coal leases, in addition to other types of new leases. BLM also granted numerous applications for lease modifications to add acreage to existing leases and issued three coal exploration licenses in fiscal year 2013. U.S. BLM, *Public Land Statistics 2013*, Table 3-18, http://www.blm.gov/public_land_statistics/pls13/pls2013.pdf.

18. While BLM conducts some level of NEPA analysis for individual coal lease proposals, such analysis does not, and cannot, substitute for the analysis of the effect of the federal coal management program on climate change, and the alternatives available to BLM, that would be contained in a programmatic environmental impact statement.

19. Plaintiffs therefore request this court (1) to declare Defendants to be in violation of its duties under NEPA; (2) to order Defendants to undertake a thorough analysis, as required by NEPA, of the cumulative direct and indirect impacts on climate change of continued leasing of coal under the federal coal management program, and to analyze alternative policies to reduce the contribution of the federal coal management

program to climate change; (3) to enjoin Defendants from considering applications for, or issuing new coal leases or modifications to existing leases under the Program, until such time that Defendants come into compliance with NEPA; and (4) to provide certain other relief as requested below.

JURISDICTION

20. This Court has jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1346.

21. The relief requested is authorized pursuant to 28 U.S.C. §§ 1651 and 2201 to 2202. An actual and present controversy exists between the parties within the meaning of the Declaratory Judgment Act, 28 U.S.C. § 2201.

VENUE

22. Venue is proper in this judicial district pursuant to 28 U.S.C. § 1391(b) and (e). Defendants Department of the Interior and Bureau of Land Management reside in this judicial district. Plaintiff Western Organization of Resource Councils maintains offices in this judicial district, and Plaintiff Friends of the Earth maintains its principal offices in this judicial district. A substantial part of the events or omissions giving rise to the claims have occurred in this district due to decisions made by Defendants.

PARTIES

A. Plaintiffs

23. Western Organization of Resource Councils (WORC) is a non-profit corporation with principal offices in Billings, Montana and additional offices in Washington, DC and Montrose, Colorado. WORC is a regional network of grassroots

community organizations that includes 35 local chapters and 10,000 members, including farmers and ranchers affected by coal mining. WORC's mission is to advance the vision of a democratic, sustainable, and just society through community action. From its creation in the 1970s, WORC has been actively engaged in coal mining issues and assisting its members and chapters address the adverse impacts of mining.

24. Friends of the Earth (FoE) is a national non-profit environmental organization headquartered and incorporated in the District of Columbia. FoE has a nationwide membership of over 33,000 and over 440,000 activists. Among its missions, FoE works to eliminate U.S. reliance on fossil fuels to reduce the negative health, environmental, and economic effects of air pollution and global warming. To that end, FoE utilizes its institutional resources, including legislative advocacy, litigation, and public outreach and education, to minimize the effects of coal mining and combustion on its members and the general public.

25. Plaintiffs' members live, work, recreate, and conduct other activities in areas adjacent to tracts where coal mining occurs pursuant to leases issued under the federal coal management program. Plaintiffs' members are affected by poor air quality associated with mining, and have a substantial interest in insuring they breathe air that will not injure their health. Plaintiffs' members use and enjoy areas adjacent to tracts subject to leases under the federal coal management program for recreational, scientific, aesthetic, conservation and other public purposes, and are harmed by the local aesthetic and environmental impacts of coal mining there.

26. Plaintiffs' members live, work, recreate, and conduct other activities in areas affected by emissions from electric power plants that burn coal mined under leases issued under the federal coal management program. Plaintiffs' members are affected by poor air quality associated with combustion of coal, and have a substantial interest in insuring they breathe healthful air. Plaintiffs' members use and enjoy areas affected by emissions from power plants that burn coal mined under leases issued under the federal coal management program for recreational, scientific, aesthetic, conservation and other public purposes, and are harmed by the local aesthetic and environmental impacts of combustion of coal.

27. Plaintiffs and their respective members also have a substantial interest in insuring that Defendants comply with federal law, including the requirements of NEPA.

28. Plaintiffs and their respective members' interests have been, are being, and will continue to be irreparably harmed by Defendants' decision to issue new coal leases, modify existing leases, and take other actions under the federal coal management program.

B. Defendants

29. Defendant Department of the Interior manages approximately 450 million acres of federal land and mineral resources, including, through its Bureau of Land Management, federal lands designated for coal leasing.

30. Defendant Sally Jewell is sued in her official capacity as Secretary of the Interior. As Secretary of the Interior, Ms. Jewell has ultimate responsibility for Interior's activities and policies.

31. Defendant Bureau of Land Management administers approximately 245 million surface acres and 700 million acres of sub-surface mineral estate owned by the Federal government.

32. Defendant Neil Kornze is sued in his official capacity as Director of the Bureau of Land Management. As Director, Mr. Kornze oversees the agency's management of public lands.

LEGAL BACKGROUND

A. Administrative Procedure Act

33. The Administrative Procedure Act (APA) provides a right to judicial review to any “person suffering legal wrong because of agency action.” 5 U.S.C. § 702. The APA defines agency action to “include[] the whole or a part of an agency rule, order, license, sanction, relief, or the equivalent or denial thereof, or failure to act.” 5 U.S.C. §§ 551(13), 701(b)(2).

34. The APA provides that a court shall compel an agency action that is “unlawfully withheld or unreasonably delayed,” and shall hold unlawful and set aside agency actions found to be “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.” 5 U.S.C. § 706(1) & (2)(A).

B. National Environmental Policy Act

35. The National Environmental Policy Act establishes a “national policy [to] encourage productive and enjoyable harmony between man and his environment,” and was intended to reduce or eliminate environmental damage and to promote “the

understanding of the ecological systems and natural resources important to” the United States. 42 U.S.C. § 4321.

36. Accordingly, NEPA “establishes some important ‘action-forcing procedures.’” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989) (quoting 115 Cong. Rec. 40416 (remarks of Sen. Jackson)). The heart of NEPA is a procedural requirement instructing federal agencies to:

include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on—

- (i) the environmental impact of the proposed action,
- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,
- (iv) the relationship between local short-term 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.

42 U.S.C. § 4332(2)(C). This detailed statement is called an environmental impact statement or EIS.

37. The Council on Environmental Quality (CEQ), in the Executive Office of the President of the United States, has promulgated regulations providing guidance to federal agencies on when an EIS must be prepared and how it must be crafted. *See* 40

C.F.R. Parts 1500-1508. Interior has also promulgated its own regulations to use for compliance with CEQ's regulations. *See* 43 C.F.R. Part 46.

38. CEQ's regulations define a major Federal action to include "actions with effects that may be major and which are potentially subject to Federal control and responsibility." 40 C.F.R. § 1508.18.

39. An EIS "shall" be supplemented if "[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9(c)(1)(ii). An agency "[m]ay also prepare supplements when the agency determines that the purposes of the Act will be furthered by doing so." 40 C.F.R. § 1502.9(c)(2). In other words, "[i]f there remains 'major Federal actio[n]' to occur, and if the new information is sufficient to show that the remaining action will 'affec[t] the quality of the human environment' in a significant manner or to a significant extent not already considered, a supplemental EIS must be prepared." *Marsh*, 490 U.S. at 374 (quoting 42 U.S.C. § 4332(2)(C)).

40. Federal agencies are required to consider the "reasonably foreseeable" effects of the proposed major Federal action, including effects that are direct, indirect, or cumulative. 40 C.F.R. §§ 1508.7, 1508.8, 1508.25.

41. In analyzing cumulative impacts, Interior is required to consider the cumulative effects of past actions. Memo from James L. Connaughton, Chairman, CEQ, to Heads of Federal Agencies, "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis," June 24, 2005, at 1 ("CEQ Guidance Memo"); 43 C.F.R. § 46.115 (requiring Interior and its constituent agencies to consider effects of past actions

as part of cumulative effects analysis in accordance with CEQ regulations and the CEQ Guidance Memo). As part of its cumulative effects analysis, “review of past actions is required to the extent that this review informs agency decision-making regarding the proposed action.” CEQ Guidance Memo, at 1. Interior must include “analysis and a concise description of the identifiable present effects of past actions to the extent that they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal for action and its alternatives may have a continuing, additive and significant relationship to those effects.” *Id.*

42. Environmental impacts of a “national program” should be addressed in a program-level EIS, also called a programmatic EIS or PEIS. Preparation of a PEIS is appropriate where the major Federal action under analysis is a program made up of numerous project-level actions. 40 C.F.R. § 1508.28. A PEIS differs in scope from a project-level EIS in that a PEIS analyzes environmental impacts of the program at large; a project-level analysis focuses on impacts from that project.

43. The agency must “[r]igorously explore and objectively evaluate all reasonable alternatives” to the proposed agency action, including a “no-action” alternative. 40 C.F.R. § 1502.14(a), (d). The alternatives analysis is the “heart” of the EIS. 40 C.F.R. § 1502.14.

44. The agency must consider a reasonable alternative even if it is not currently within that agency’s power. 40 C.F.R. § 1502.14(c). “[F]or alternatives that were eliminated from detailed study, [the agency must] briefly discuss the reasons for their having been eliminated.” 40 C.F.R. § 1502.14(a). Each alternative must be “considered

in detail . . . so that reviewers may evaluate their comparative merits.” 40 C.F.R. § 1502.14(b).

45. The discussion of alternatives is to be based on information and analysis regarding the environment to be affected by the federal action and its environmental consequences. 40 C.F.R. § 1502.14; *see also* 40 C.F.R. §§ 1502.15, 1502.16.

The discussion will include the environmental impacts of the alternatives including the proposed action, any adverse environmental effects which cannot be avoided should the proposal be implemented, the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented.

40 C.F.R. § 1502.16.

46. In addition to alternatives, the EIS must “[i]nclude appropriate mitigation measures not already included in the proposed action or alternatives.” 40 C.F.R. § 1502.14(f).

STATEMENT OF FACTS

A. Federal Coal Leasing Today

47. Under the Mineral Leasing Act of 1920, as amended, the Secretary of the Interior has authority to lease public lands for coal mining operations after conducting a competitive bidding process. 30 U.S.C. § 201(a)(1).

48. Under the federal coal management program in place since the late 1970s, nearly all coal mining on federal lands today takes place through the leasing-by-application process. *See* 43 C.F.R. Pt. 3420. The process begins with BLM review of an

application filed by a mining company to lease a coal tract. *See* 43 C.F.R. Subpt. 3425. After the application is accepted, BLM formulates an estimated fair market value of the tract to be leased. This estimate is kept confidential in the case of new lease applications, but not in the case of lease modifications. BLM is prohibited from issuing a coal lease if the highest bid does not meet or exceed BLM's determination of fair market value. *See* 43 C.F.R. §§ 3422.1, 3422.3-2, 3425.4(b).

49. Under the leasing-by-application process, when a tract is nominated for lease companies submit sealed "bonus bids." The company that submitted the highest bonus bid that meets or exceeds BLM's fair market value determination is awarded the lease. Bonus bids generally vary depending on many factors, including amount of recoverable coal, coal quality, mine type (underground or surface), and the market price of coal at the time of sale.¹ *See* 43 C.F.R. § 3422.1.

50. New leases continue to be issued under the federal coal management program. BLM sold 107 new leases under the Program between 1990 and 2012, the most recent year for which data is available. Approximately 12 applications for coal leases or modifications to existing leases are currently pending before BLM.

51. Over 2 billion short tons of coal have been leased since the beginning of the Obama administration. In February 2013, the U.S. Geological Survey estimated that 162 billion short tons of recoverable coal remain in the Powder River Basin, much of which is

¹ The federal government also receives revenue from coal leasing in the form of annual royalties, calculated as a percentage of the gross sale value of mined coal, and annual rental payments. *See* 30 U.S.C. § 207(a); 43 C.F.R. §§ 3473.3-1, 3473.3-2.

on land owned by the federal government.² U.S. Geological Survey, “Assessment of Coal Geology, Resources, and Reserve in the Powder River Basin, Wyoming and Montana,” Fact Sheet 2012-3143 (Feb. 2013), <http://pubs.usgs.gov/fs/2012/3143/fs-2012-3143.pdf>.

B. Establishment of the Federal Coal Management Program and Prior Programmatic Environmental Impact Statements for the Program

i. The 1975 PEIS

52. In 1973, Interior introduced a new leasing program that, for the first time, took into account nationwide production and demand. BLM issued a final programmatic EIS for the program in September 1975. U.S. BLM, Final Environmental Impact Statement: Proposed Federal Coal Leasing Program (1975) (“1975 PEIS”).

53. The 1975 PEIS contained no analysis of emissions of greenhouse gases caused by construction of coal mines, extraction of coal, transportation of coal, or any use of coal, including combustion for electricity.

54. On the subject of “climate and air,” the 1975 PEIS stated:

Theoretically, properly conducted coal operation[s] should have no irreversible or irretrievable effects upon the atmospheric resource. Corrective measures required by coal lease terms should reduce adverse effects to a level within the natural capacity of the atmosphere to purify itself. In the interim, operating equipment will consume oxygen, and carbon dioxide and other gases will be released into the atmosphere.

² According to USGS, for “longer-term energy planning,” total *recoverable* coal “is a more important value than” economically recoverable estimates. USGS noted: “In 1990, for example, resources with a stripping ratio greater than 2:1 were not classified as reserve base. Yet today, coal being mined at stripping ratios of 3:1 to 4:1 obviously now would be classified as reserve base.”

1975 PEIS, at 7-3.

55. The 1975 PEIS was subsequently held to be inadequate under NEPA. *Natural Res. Def. Council v. Hughes*, 437 F. Supp. 981 (D.D.C. 1977). The district court ordered BLM to comply with NEPA and enjoined the agency from taking steps to implement the new coal leasing program. *Id.* at 992-94; *Natural Res. Def. Council v. Hughes*, 454 F. Supp. 148, 151 (D.D.C. 1978) (modifying the district court’s initial injunction following remand).³ The court noted that “[i]f regional or site-specific EIS’s [sic] are permitted to act as curative of programmatic deficiencies and as a substitute for a Final EIS, the policy of long-range environmental planning would be defeated.” 437 F. Supp. at 992.

ii. The 1976 Federal Coal Leasing Amendments Act

56. The Federal Coal Leasing Amendments Act of 1976, Pub. L. No. 94–377, 90 Stat. 1083 (1976) (FCLAA), led to the creation and implementation of the modern federal coal management program and, eventually, a new PEIS. The FCLAA made important and substantial changes to federal coal leasing policy by making the leasing process more competitive and prohibiting the BLM from accepting bids that did not equal or exceed a fair market value determination, as set by the BLM. *See* 30 U.S.C. § 201.

iii. The 1979 PEIS

57. Citing “significant changes in statutory and Presidential policy and in available data,” BLM decided not to prepare a supplement to the 1975 PEIS, as ordered

³ Interior initially appealed the district court’s injunction and withdrew its appeal after the parties agreed on a settlement, resulting in a modified injunction. *See* 1979 PEIS, at 1-14.

by the district court in *Natural Resources Defense Council v. Hughes*, and instead elected to prepare an entirely new PEIS. 1979 PEIS, at 1-13.

58. The 1979 PEIS considered the environmental impacts of seven alternatives:

- The preferred alternative;
- No new federal leasing;
- Process outstanding non-competitive preference right lease applications;
- Emergency leasing;
- Lease to satisfy industry's indications of need;
- State determination of leasing levels; and
- Lease to meet Department of Energy production goals.

1979 PEIS, at 1-2.

59. The 1979 PEIS outlined the scope of the document and the environmental impacts to be addressed:

National and interregional impacts of the Federal coal management program are analyzed in this programmatic environmental impact statement. The document would be updated when conditions change sufficiently to require new analyses of [national and interregional] impacts.

1979 PEIS, at 3-9.

60. The 1979 PEIS recognized the document's ongoing applicability and, therefore, the need to update it when necessary:

The preferred option is to maintain two separate levels of environmental impacts analysis, one to consider interregional and national impacts and one to consider site-specific and cumulative intraregional impacts. The first level of analysis

would be contained in this programmatic environmental impact statement, *updated when necessary*, and the second level of analysis would be made in environmental impact statements for each region . . .

1979 PEIS, at 3-68 (emphasis added).

61. In the 1979 PEIS, BLM recognized that the objectives served by the programmatic analysis could not be discharged by project-specific NEPA analysis: “[T]he issues analyzed are quite different from those discussed for a particular lease area. A broad statement of overall impacts of the program will allow the Department to make decisions concerning national and multiregional questions.” 1979 PEIS, at 1-3.

62. The 1979 PEIS contains minimal discussion and analysis of the Program’s effect on global climate. The document’s discussion of the subject, which appears in roughly one page of text, is limited almost entirely to climate-related effects of emissions occurring during coal production and transportation. *See* 1979 PEIS, at 5-88, 5-97, 5-107.

63. The 1979 PEIS describes its view of the state of climate change science and the federal coal management program’s relationship to it:

The National Research Council concluded that the primary limit on energy production from fossil fuels during the next few centuries may be the climatic effects associated with the release of carbon dioxide. Generally there are uncertainties about the carbon cycle, the net sources of carbon dioxide in the atmosphere, and the net effects of carbon dioxide on temperature and climate. Generally, about 40 percent of the carbon dioxide released to the air is absorbed by the land organic pool, about 20 percent is absorbed by the oceans, and about 40 percent remains in the air. Some experts feel that a doubling of carbon dioxide in the atmosphere will cause

about a 2° to 3° C rise in the average temperature of the lower atmosphere at middle latitudes.

1979 PEIS, at 5-88 (internal citations omitted).

64. The 1979 PEIS asserted that little was known about the greenhouse effect and the potential effects of rising atmospheric carbon dioxide levels on the global climate:

The impacts of increased coal utilization should be studied on a world-wide basis since even a 2° to 3°C global temperature rise could have profound climatic effects. For example, resultant warming of ocean waters could disrupt marine life and ocean circulation. In addition, changes in temperature distribution in the atmosphere could cause changes in other climate variables such as precipitation, cloud cover, winds, and humidity. World-wide agriculture production and distribution could be detrimentally affected. The accuracy of predicting future carbon dioxide levels in the atmosphere is limited by uncertainty about its final destination (fate).

1979 PEIS, at 5-107 (internal citation omitted).

65. The 1979 PEIS included statistics on region-specific projected greenhouse gas emissions under a no-new-leasing alternative under three projected production scenarios, *see* 1979 PEIS, at 5-104, and under other alternatives under a single projected production scenario, *see* 1979 PEIS, at 5-111.

iv. The 1979 Federal Coal Management Program Regulations

66. In 1979, following the issuance of the 1979 PEIS, BLM issued regulations implementing the federal coal management program. Coal Management; Federally Owned Coal, 44 Fed. Reg. 42,584 (July 19, 1979).

67. These regulations contemplated that coal would be leased under the Program primarily on a regional basis, based on recommendations regarding tracts and production targets from a regional coal team. *See* 44 Fed. Reg. at 42,588 (describing regulations to be codified at 10 C.F.R. Pt. 3420 establishing a regional leasing procedure).

68. The regulations also contemplated leasing by application in addition to the regional leasing scheme. 44 Fed. Reg. at 42,595, 42,656; 10 C.F.R. § 3425.1-5 (1979). The rule determined that there would be “no limit on the amount of coal offered for competitive sale in response to these applications.” 44 Fed. Reg. at 42,595.

v. The 1982 Rule Amending the Federal Coal Management Program Regulations

69. In 1982, BLM issued a final rulemaking amending regulations implementing the federal coal management program. Coal Management; Federally Owned Coal; Amendments to Coal Management Program Regulations, 47 Fed. Reg. 33,114 (July 30, 1982).

70. In the 1982 final rule, BLM reaffirmed the federal coal management program as developed in 1979:

This final rulemaking continues the principal aims of the 1979 Federal coal management program, including provisions for integration of the coal leasing program with the Bureau’s land use planning process and for public participation in the entire process. While the final rulemaking does represent a considerable improvement in the existing regulations, it does so while preserving the essential features of the existing Federal coal management program.

47 Fed. Reg. at 33,114.

71. In the rulemaking, BLM addressed comments questioning the absence of a new or supplemental PEIS to accompany the proposed rulemaking. BLM, “recognizing that its obligations under [NEPA] remain unchanged,” reaffirmed the continued applicability of the 1979 PEIS as the Program’s governing NEPA document and its duty to update or supplement the 1979 PEIS in accordance with NEPA: “[T]he Department must revise or update the [1979] Program EIS when its assumptions, analyses and conclusions are no longer valid.” 47 Fed. Reg. at 33,115.

72. BLM also reasoned that no new or supplemental PEIS was necessary because the small changes made to the program by the rulemaking were not significant enough to warrant additional NEPA analysis. BLM recognized that the changes, which shifted some emphasis from leasing based on regional coal planning to leasing based on industry’s indication of need, may result in increased total leasing, but determined that these changes did not require a new or supplemental PEIS. 47 Fed. Reg. at 33,115.

vi. The 1985 Supplemental PEIS

73. In October 1985, Interior issued a supplemental PEIS for the federal coal management program. U.S. BLM, Final Environmental Impact Statement Supplement: Federal Coal Management Program (1985) (“1985 SEIS”).

74. The 1985 SEIS followed two Congressional investigations and the release of a number of reports highlighting serious deficiencies in BLM’s coal leasing and valuation practices. *See* Report of the Commission, Fair Market Value Policy For Federal Coal Leasing 1-3 (Feb. 1984),

<http://babel.hathitrust.org/cgi/pt?id=mdp.39015055347564;view=2up;seq=1>; U.S.

General Accounting Office, “Analysis of the Powder River Basin Federal Coal Lease Sale: Economic Valuation Improvements and Legislative Changes Needed,” at 25, GAO/RCED-83-119 (May 11, 1983) (concluding that BLM had received \$100 million less than fair market value in a 1982 coal lease sale in the Powder River Basin). Following these reports, Congress imposed a moratorium on almost all coal leasing.

75. Citing “changes . . . made to or proposed for the federal coal management program” and changed economic and environmental conditions, the Secretary determined that a supplemental PEIS was necessary. 1985 SEIS, at 3. The 1985 SEIS was “prepared to analyze the cumulative impacts of managing federal coal under a modified existing program and three alternative programs.” 1985 SEIS, at 15.

76. Recognizing that the Program was a continuing major federal action notwithstanding certain changes to the Program, BLM intended the 1985 SEIS to supplement, not supersede, the 1979 PEIS. The document is not a comprehensive analysis of all the environmental impacts of the federal coal management program. Rather, “[t]he major focus of [the 1985 SEIS] is the Department of Interior’s program to manage federal coal with the primary emphasis on federal coal within the five regions and one subregion where BLM-initiated leasing will most likely be needed to meet management objectives in the next few years.” 1985 SEIS, at 16. Accordingly, the 1985 SEIS’s environmental impacts discussion does not address the climate change effects of the leasing alternatives discussed.

77. Indeed, the 1985 SEIS projects no irreversible, irretrievable, or long-term impacts on air quality resulting from the federal coal management program. 1985 SEIS, at 319.⁴

vii. Decertification of the Powder River Basin As a Coal Production Region

78. In 1990, BLM announced in a two-page notice in the Federal Register that it was decertifying the Powder River Basin as a Coal Production Region and, in accordance with regulations implementing the federal coal management program, would begin allowing leasing by application in the Powder River Basin. Decertification of the Powder River Coal Production Region, 55 Fed. Reg. 784 (Jan. 9, 1990). As a result of this action, regional leasing is no longer conducted in the Powder River Basin.

79. The announcement made no mention of NEPA or any environmental analysis conducted prior to or as a result of the decision to decertify.

viii. BLM Has Not Supplemented Or Revised Its Past Programmatic Analysis With A Discussion Of Climate Change

80. Although NEPA places upon agencies a mandatory, non-discretionary duty to supplement an EIS when there are “significant new circumstances or information relevant to environmental concerns and bearing on the proposed action,” 40 C.F.R. § 1502.9(c)(1)(ii), BLM has not supplemented its environmental impact analysis of the federal coal management program since 1985, even though it continues to issue leases under the Program. As the evidence has accumulated of the effects on the climate of burning coal, BLM has continued to issue coal leases under the federal coal management

⁴ Although climate change is not strictly an issue of air quality, this is nonetheless relevant because the 1979 PEIS treats climate change as an issue of air quality. *See* 1979 PEIS, at 5-85 to 5-107.

program as contemplated under the 1979 PEIS without any supplement to that analysis assessing the Program's effect on climate change.

81. None of the past PEISs issued by BLM satisfy NEPA's requirement to adequately evaluate the effects of the federal coal management program on climate change. The limited discussion in the 1979 PEIS of the Program's contribution to climate change and the resulting effects is utterly inadequate in light of today's scientific knowledge of climate change and its causes and effects, and specifically in light of the EPA's 2009 regulatory finding that greenhouse gas emissions "endanger" public health and welfare.

82. The 1979 PEIS describes BLM's intention that the document remain the overarching analysis, to be updated when necessary, for the environmental impacts of the federal coal management program, under which BLM continues to issue coal leases today. 1979 PEIS, at 3-68.

83. In June 2011, Plaintiff WORC and other environmental organizations submitted a memo to Bob Abbey, then BLM's Director, highlighting the agency's failure to conduct a programmatic NEPA review of the federal coal management program. WORC, Defenders of Wildlife, Natural Resources Defense Council, et al., "Options for BLM for Coal Leasing." The memo noted that BLM has not conducted a program-level analysis of alternatives and mitigation measures for the Program.

84. In September 2011, Plaintiff WORC and other environmental organizations submitted a letter to Director Abbey requesting the agency to conduct a programmatic NEPA review of its coal leasing program and specifically to consider greenhouse gas

emissions as part of its NEPA responsibilities. Letter from WORC, Defenders of Wildlife, Natural Resources Defense Council, et al. to Bob Abbey, Director of Bureau of Land Management, Sep. 21, 2011.

viii. Recent Lease-Specific EISs Do Not Analyze The Program-Wide Effects Of Greenhouse Gas Emissions From Combustion Of Coal Mined Under The Federal Coal Management Program

85. BLM periodically prepares a NEPA document to analyze the environmental impacts of a coal lease or a group of coal leases proposed under the Program.

86. Recent EISs prepared for individual leases or groups of leases contain varying amounts of discussion regarding the contribution of mining at the site or burning of coal mined at the site to climate change.

87. The analyses in these lease-specific EISs do not satisfy NEPA's requirement that Defendants prepare a supplemental PEIS. These EISs do not address the cumulative environmental impacts of greenhouse gas emissions from combustion of coal mined from the federal coal management program, or alternatives that could mitigate those impacts.

88. One recent EIS, prepared for a group of coal leases in the Wright Area of the Wyoming Powder River Basin, contains perhaps the most in-depth discussion by a recent lease-specific EIS of climate change-related impacts from coal-related activities. *See* U.S. BLM, Final Environmental Impact Statement for the Wright Area Coal Lease Applications (July 2010). The discussion in even this EIS, however, is limited to quantifying emissions from mining and combustion of coal mined from the sites under consideration and other sites in the immediate area. The Wright Area EIS contains

virtually no evaluation of the proposed action's climate change-related environmental effects, let alone effects of the Program writ large.

89. Using available data and its own calculations, the Wright Area EIS estimates the total CO₂ emissions in a single year, 2008, resulting from mining and combustion of coal. The EIS estimates 2008 CO₂ emissions from the U.S. electric power sector as a whole; from the U.S. coal electric power generation sector; and from combustion of coal mined from the Wyoming portion of the Powder River Basin, one of the areas in which coal is mined under the federal coal management program.⁵ *Id.* at 4-136–137. The Wright Area EIS also includes estimated levels of coal production and CO₂ emissions for 2010, 2015, and 2020 under two production scenarios. *Id.* at 4-138. The EIS contains no contextual information to give meaning to this data.

90. Although the Wright Area EIS contains a discussion of a “No Action” alternative, the document concludes that as to climate change,

[i]t is not likely that selection of the No Action alternative[] would result in a decrease of U.S. CO₂ emissions attributable to coal mining and coal-burning power plants in the longer term, because there are multiple other sources of coal that . . . could supply the demand for coal beyond the time that the [leases under consideration] complete recovery of the coal in their existing leases.

Id. at 4-141.

⁵ Total emissions from the Wyoming Powder River Basin were estimated by multiplying tons of coal mined by an estimated emissions factor developed by the Department of Energy.

91. An EIS prepared in 2009 for the proposed East Lynn Lake Coal Lease in Wayne County, West Virginia, contains less discussion of greenhouse gas emissions resulting from the proposed lease. The East Lynn Lake EIS first notes:

The assessment of so-called “greenhouse gas” (GHG) emissions and climate change is in its formative phase; therefore, it is not yet possible to know with confidence the net impact to climate. However, the Intergovernmental Panel on Climate Change (IPCC 2007) recently concluded that “warming of the climate system is unequivocal” and “most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic [man-made] greenhouse gas concentrations.”

U.S. BLM, Final Land Use Analysis and Final Environmental Impact Statement for the East Lynn Lake Coal Lease 264, EIS-ES-030-2008-0004 (Mar. 2009).

92. As to cumulative climate change-related impacts likely to occur from the proposed coal lease, the East Lynn Lake EIS states:

The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts.

.....

The use of coal as a national energy source would generate GHG emissions, however the location, combustion efficiency, and amount of GHG emissions potentially generated is beyond the scope of this analysis. Since the Proposed Action would simply extend the life of the Applicants’ existing, adjoining operations, it is unlikely total GHG emission[s] would change substantially. The No Action alternative could lower direct GHG emissions from mine transportation and processing equipment minimally, it is likely alternative sources would maintain the use of coal at national levels [sic].

Id. at 266.

93. Many of the recent lease-specific NEPA documents were prepared for proposed additions of adjacent tracts to existing mines. The analysis of environmental effects in these documents does not include a full analysis of the environmental effects of the entire mine, let alone effects of the federal coal management program at large. Instead, these documents focus on the effects caused by only the tract proposed to be added to the existing mining operation.

94. Site-specific NEPA documents also contain no discussion of alternatives to the federal coal management program, including, for instance, alternatives to the current leasing system.

C. Significant New Information About the Contribution of Greenhouse Gas Emissions From the Federal Coal Management Program to Climate Change

95. Since the 1979 PEIS and the 1985 SEIS were prepared, knowledge of the causes and seriousness of the effects of global warming have grown exponentially. Vast quantities of data have been gathered “using satellites and networks of weather balloons, thermometers, buoys, and other observing systems,” Nat’l Climate Assessment, at 7, that confirm that the atmosphere and the oceans are warming. Increasingly sophisticated computer modeling undertaken by governments around the world is identifying more clearly all the time the dimensions of the potentially catastrophic effects that will flow from continued use of fossil fuels and global warming on the environment, the economies of the world, and even the national security of the United States.

i. Greenhouse Gas Emissions From Mining And Combustion Of Coal

96. In 2012, fossil fuel combustion accounted for approximately 78% of the U.S. greenhouse gas emissions. U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2012 3-3,

<http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2014-Main-Text.pdf>. Fossil-fuel combustion to generate electricity accounted for approximately 2,022.7 million metric tons of CO₂, or approximately 31% of total U.S. economy-wide greenhouse gas emissions. *Id.* at ES-4, ES-11.

97. Electricity generation from combustion of coal alone accounted for 1,511.2 million metric tons CO₂, or approximately 23.2% of total U.S. greenhouse gas emissions. *Id.* at 2-1, 3-12. Combustion of coal for other uses resulted in an additional approximately 81.8 million metric tons CO₂, bringing total coal combustion emissions to 24.4% of total U.S. emissions in 2012. *Id.*

98. The coal extraction process also releases large amounts of greenhouse gases, particularly methane, through leakage from surface mines and from ventilation and degasification systems in underground mines. In 2012, 488 underground coal mines and 719 surface mines were operating in the U.S. *Id.* at 3-47. Underground mining, surface mining, and post-mining activities resulted in 55.8 million metric tons CO₂ equivalent⁶ in 2012. *Id.* at 3-47.

⁶ “The IPCC developed the Global Warming Potential (GWP) concept to compare the ability of each greenhouse gas to trap heat in the atmosphere relative to another gas. . . . The reference gas used is CO₂, and therefore GWP-weighted emissions are measured in teragrams (or million metric tons) of CO₂ equivalent (Tg CO₂ Eq.).” U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2012 ES-2 to 3. Carbon dioxide (CO₂) has a 100-year GWP of 1;

99. In addition, in 2012 abandoned coal mines contributed 4.7 million metric tons CO₂ equivalent. *Id.* at 3-51. Many abandoned mines are vented to the atmosphere to prevent underground buildup of methane.

ii. Greenhouse Gas Emissions From Combustion And Mining Of Coal Extracted From Federal Lands

100. Coal mined on federal lands accounted for 42.1% of all U.S. coal sold in 2012. U.S. Energy Information Administration, Sales of Fossil Fuels Produced from Federal and Indian Lands, FY 2003 through FY 2013 2 (June 2014). Coal mined from Indian lands contributed an additional 1.8%. *Id.* at 3.

101. Based on the methodologies to quantify GHG emissions used by the U.S. Energy Information Administration, EPA, and the Intergovernmental Panel on Climate Change (IPCC), combustion of coal produced and sold from federal and Indian lands in 2012 accounted for approximately 724 million metric tons CO₂ equivalent. These emissions represent approximately 11% of total U.S. greenhouse gas emissions in 2012.

D. Significant New Information About the Human Health Effects of Conventional Air Pollutants From the Federal Coal Management Program

102. In addition to emissions of CO₂ and other greenhouse gases, the mining and burning of coal mined under the federal coal management program has a number of adverse effects on human health and the environment that were not considered in the 1979 PEIS. Emissions of sulfur dioxide (SO₂) and nitrogen oxides (NO_x), which are pollutants in themselves and precursors to formation of ambient fine particulate matter

methane (CH₄), 21; nitrous oxide (N₂O), 310; and hydrofluorocarbons range up to and beyond 6,300. *Id.* at ES-3.

(particulate matter of a diameter equal to or less than 2.5 micrometers, or $PM_{2.5}$), as well as directly emitted fine particles. Coal burning also emits mercury and other substances classified as toxic under the Clean Air Act. SO_2 , NO_x , and $PM_{2.5}$ are associated with important and damaging effects on human health and the natural, agricultural, and built environments.

103. Because of their adverse health effects, SO_2 , NO_x , and $PM_{2.5}$ are subject to National Ambient Air Quality Standards under the Clean Air Act, which are designed to identify levels of air quality necessary to protect Americans from the adverse effects of air pollution.

104. Considering a substantial body of published scientific literature and reflecting thousands of epidemiological, toxicological, and clinical studies, the EPA has concluded that there is a causal relationship between premature mortality and both long-term and short-term exposure to $PM_{2.5}$.

105. EPA has also concluded that there is a causal relationship between respiratory health effects and short-term exposure to SO_2 . The immediate effect of SO_2 on the respiratory system in humans is bronchoconstriction. Asthmatics are more sensitive to the effects of SO_2 likely resulting from preexisting inflammation associated with this disease.

106. EPA has also concluded that there is a likely causal relationship between respiratory health effects and short-term exposure to nitrogen dioxide (NO_2).

107. In addition, in the presence of sunlight and volatile organic compounds, NO_x can undergo a chemical reaction in the atmosphere to form ozone. Ozone adversely

affects the human respiratory tract and has been associated with the onset of asthma. Ozone also affects adversely a number of agricultural crops. Reducing emissions of SO₂ and NO_x would also reduce ambient exposure to SO₂ and NO₂, respectively.

108. Mercury emitted from combustion of coal into the environment is transformed into a more toxic form, methylmercury (MeHg). Because mercury is a persistent pollutant, MeHg accumulates in the food chain, especially the tissue of fish. When people consume these fish, they consume MeHg. Emissions of mercury from the burning of coal are subject to EPA regulation as hazardous air pollutants.

E. Significant New Information About the Effects of Greenhouse Gas Emissions From the Federal Coal Management Program on Climate Change

109. In December 2009, following the Supreme Court's decision in *Massachusetts v. EPA*, 549 U.S. 497 (2007), EPA formally concluded that climate change substantially affects human health and the environment. Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009).⁷

110. Specifically, EPA found that six greenhouse gases—carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆)—taken in combination “may reasonably be

⁷ Section 202(a) of the Clean Air Act, 42 U.S.C. § 7521(a), provides in relevant part:

The Administrator shall by regulation prescribe (and from time to time revise) in accordance with the provisions of this section, standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.

anticipated both to endanger public health and to endanger public welfare.” 74 Fed. Reg. at 66,497. EPA, relying primarily on research by the U.S. Global Climate Research Program, the IPCC, and the National Research Council, found that “the body of scientific evidence compellingly supports this finding.” 74 Fed. Reg. at 66,497.

111. Among other impacts, EPA cited research linking climate change to:

- Mortality and morbidity associated with increases in average temperatures;
- Risk of extreme weather events such as hurricanes, floods, wildfires, and drought;
- Increased severity of coastal storm events due to rising sea levels;
- Changes in aeroallergens that could increase the potential for allergenic illnesses; and
- Increased risk of pathogen borne diseases.

74 Fed. Reg. at 66,497-98.

112. The agency “considered how elevated concentrations of the well-mixed greenhouse gases and associated climate change affect public welfare by evaluating numerous and far-ranging risks to food production and agriculture, forestry, water resources, sea level rise and coastal areas, energy, infrastructure, and settlements, and ecosystems and wildlife.” 74 Fed. Reg. at 66,498. EPA concluded that “[f]or each of these sectors, the evidence provides support for a finding of endangerment to public welfare.” 74 Fed. Reg. at 66,498.

113. The Endangerment Finding has been the direct or indirect basis for a wide range of federal rulemakings aimed at reducing U.S. greenhouse gas emissions. *See, e.g.,* Mandatory Reporting of Greenhouse Gases (Final Rule), 74 Fed. Reg. 56,260 (Oct. 30,

2009) (requiring reporting on GHG emissions from all sectors of the economy); Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards (Final Rule), 75 Fed. Reg. 25,324 (May 7, 2010); Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (Final Rule), 75 Fed. Reg. 31,514 (June 3, 2010); Standards of Performance for Greenhouse Gas Emissions From New Stationary Sources: Electric Utility Generating Units (Proposed Rule), 79 Fed. Reg. 1,430 (Jan. 8, 2014); Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (Proposed Rule), 79 Fed. Reg. 34,830 (June 18, 2014) (proposing guidelines for states to develop plans to reduce GHG emissions from existing fossil-fuel fired power plants).

114. The Fifth Assessment Report by the IPCC on the current state of climate change science, issued in 2013, found that the current literature indicated global warming is “unequivocal” and that the primary driver of this warming is increased atmospheric concentrations of carbon dioxide since 1750. Intergovernmental Panel on Climate Change, *Climate Change 2013: The Physical Science Basis* 4, 13 (2013), available at <http://www.ipcc.ch/report/ar5/wg1/> (“IPCC Physical Science Report”).⁸ The report also found that the primary cause of increased atmospheric carbon dioxide levels is fossil fuel combustion. *Id.* at 11.

⁸ The IPCC is an intergovernmental body jointly established in 1988 by the World Meteorological Organization and the United Nations Environment Program. IPCC Physical Science Report, at v. At approximately six-year intervals, the IPCC issues an Assessment Report in three volumes: the Physical Science Basis; Impacts, Adaptation, and Vulnerability; and Mitigation of Climate Change; plus a Synthesis Report. All four reports from the IPCC’s most recent Assessment Report, issued in 2013 and 2014, are available at <https://www.ipcc.ch/report/ar5/>.

115. The Third National Climate Assessment, authored by over 300 experts from the public and private sector and reviewed by numerous bodies, including the National Academy of Sciences, the 13 Federal agencies of the U.S. Global Change Research Program, reiterates the conclusions above that global average temperatures are warming and the cause of this warming is mostly anthropogenic:

Multiple lines of independent evidence confirm that human activities are the primary cause of the global warming of the past 50 years. The burning of coal, oil, and gas, and clearing of forests have increased the concentration of carbon dioxide in the atmosphere by more than 40% since the Industrial Revolution, and it has been known for almost two centuries that this carbon dioxide traps heat. Methane and nitrous oxide emissions from agriculture and other human activities add to the atmospheric burden of heat-trapping gases. Data show that natural factors like the sun and volcanoes cannot have caused the warming observed over the past 50 years. Sensors on satellites have measured the sun's output with great accuracy and found no overall increase during the past half century. Large volcanic eruptions during this period, such as Mount Pinatubo in 1991, have exerted a short-term *cooling* influence. In fact, if not for human activities, global climate would actually have cooled slightly over the past 50 years. The pattern of temperature change through the layers of the atmosphere, with warming near the surface and cooling higher up in the stratosphere, further confirms that it is the buildup of heat-trapping gases (also known as "greenhouse gases") that has caused most of the Earth's warming over the past half century.

Nat'l Climate Assessment, at 7.

116. The data, reports, studies, and findings above, considered individually and cumulatively, summarize the main body of "significant new circumstances or information relevant to environmental concerns and bearing on" the federal coal management

program. *See* 40 C.F.R. § 1502.9(c)(1)(ii). This new information triggered a mandatory, non-discretionary duty to supplement the prior programmatic analyses.

F. Significant New Information About the Effects of Global Climate Change

117. Experts agree that climate change caused by increased atmospheric greenhouse gas concentrations has already had dramatic effects on our human and physical environment and that these changes will continue and become more severe over time. Climate change is projected to cause warming of global average temperatures, melting of polar ice caps and ice sheets, rising sea levels across Earth, and a host of other direct and indirect physical effects. These physical effects are projected to cause, and in some cases have already caused, negative economic effects in the form of decreased food production and increased insurance costs, among others. Experts believe that global warming has also already contributed to recent political upheaval and will put increased stress on political and ethnic relationships, thereby causing political and ethnic violence.

118. Atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years. IPCC Physical Science Report, at 11. Carbon dioxide concentrations have increased by approximately 40% since pre-industrial times, while methane concentrations have increased by 150% over the same period. *Id.* These higher concentrations have resulted in a number of critical consequences.

119. The advancements in knowledge and scientific findings indicating that increased atmospheric greenhouse gas concentrations have harmed and will continue to harm humans and the environment constitute changed circumstances or new information

relevant to and bearing on environmental impacts of the federal coal management program as it was proposed in 1979 and continues today, requiring supplemental evaluation under NEPA. These findings were the basis for EPA's Endangerment Finding, which was the basis for EPA regulations limiting greenhouse gas emissions in a number of sectors.

120. In 2009, international political leaders agreed to limit the increase in global average temperature to 2°C (3.6°F) above its preindustrial baseline—an increase currently projected to occur in the mid-21st century—in order to limit the severity of the impacts described in this Complaint. The IPCC Fifth Assessment of the Physical Science Basis concluded that, to have a 50% likelihood of not exceeding an increase of 2°C (3.6°F), future CO₂ emissions could not exceed a cumulative total of 1100 billion metric tons of CO₂. Declaration of Michael C. MacCracken, Attachment 1, ¶ 32 (citing IPCC Physical Science Report, Summary for Policymakers, at 27). Currently, fossil fuel combustion results in annual CO₂ emissions of approximately 36 billion tons per year, suggesting that emissions at the current level could continue for about 30 years and would then need to be zero thereafter or, for a smoother transition, phasing down steadily to zero over 50 to 60 years. But annual global emissions continue to rise, necessitating an even sharper rate of reduction in order to have just a 50% likelihood that the 2°C goal is not exceeded. MacCracken Decl. ¶ 32.

121. Total U.S. coal resources are estimated at approximately 481 billion short tons. Of that amount, the U.S. Geological Survey estimates recoverable coal resources in

the Powder River Basin, the largest single area available for leasing under the federal coal management program, to be about 162 billion tons. U.S. Geological Survey, Assessment of Coal Geology, Resources, and Reserve Base in the Powder River Basin, Wyoming and Montana (Feb. 2013). According to the Energy Information Administration (EIA), combustion of one short ton of coal results in approximately 2.86 tons of CO₂ emissions. Combustion of recoverable coal in the Powder River Basin would therefore result in about 463 billion tons of CO₂ emissions, or about one-third of the cumulative worldwide “budget,” consistent with keeping average global temperature less than 2°C (3.6°F) above pre-industrial levels. Ultimate combustion of all U.S. coal resources would lead to emission of approximately 1375 billion tons of CO₂, well over the world’s “budget” of 1100 billion tons. MacCracken Decl. ¶ 33.

122. As developing countries continue to grow their economies, energy use is expected to rise. Thus the United States cannot expect to consume all, or even a majority, of the world’s remaining carbon “budget.” MacCracken Decl. ¶ 35.

i. Direct Physical Effects Of Emissions

Warmer Atmosphere, Oceans, & Land

123. The accumulation of greenhouse gases in the atmosphere has caused a rise in global average atmospheric, terrestrial, and ocean temperatures. Multiple independently produced datasets show an atmospheric warming of 0.85°C (1.53°F) over the period from 1880 to 2012. IPCC Physical Science Report, at 5. Each of the last three decades has been successively warmer than any preceding decade since 1850. *Id.*

124. In June 2014, global land and ocean surfaces temperatures, on average, were the highest since 1880, when temperature records began to be kept. U.S. National Oceanic and Atmospheric Administration, *Global Summary Information* (June 2014), <http://www.ncdc.noaa.gov/sotc/>. June 2014 was the “38th consecutive June and 352nd consecutive month with a global temperature above the 20th century average.” *Id.*

125. If current trends in fossil fuel use continue without change, average U.S. atmospheric temperatures are projected to rise another 2-4°F (1.1-2.2°C) over the next few decades. Nat’l Climate Assessment, at 8.

126. In the last 50 years, many places in the U.S., particularly urban areas, have experienced extended periods of hotter temperatures and higher nighttime temperatures. *Id.* at 9. As a result, areas are experiencing more and bigger wildfires and longer periods during which there is a risk of fire. *Id.* Extreme hot weather is becoming more common while extreme cold weather becomes less so. *Id.* The occurrence of extreme heat events is approximately twice as likely as a result of human-induced climate change. *Id.*

127. The rate of temperature change is more dramatic in higher latitudes. Changes in average temperature cause snow and ice cover to retreat, and frozen ground (permafrost) to thaw. Melting permafrost releases large amounts of carbon dioxide and methane into the atmosphere, producing a positive feedback loop that will accelerate warming of the atmosphere. MacCracken Decl. ¶ 30.

128. Warming at higher latitudes is already causing significant loss of ice from the Greenland and Antarctic ice sheets. As the rate of ice sheet melting accelerates, it has the potential to increase the rate of sea level rise from 8 inches per century during the

20th century to approximately 40 inches per century, plus or minus approximately 20 inches, in the 21st century. MacCracken Decl. ¶ 30.

129. Climatic records indicate that in the past sea level has been highly responsive to changes in climate. An increase in sea level such as that predicted for the 21st century would, over time, require abandonment of particularly low lying, highly populated areas (e.g., southern Florida, the underlying geology of which is limestone that is expected to dissolve as sea level rises). MacCracken Decl. ¶ 30.

ii. Effects on Human Health

Public Health Effects

130. Global warming will cause a wide range of adverse effects on public health, including decreased air quality, and increased incidence of foodborne and waterborne illness and insect-carried disease. Nat'l Climate Assessment, at 222. Increased carbon dioxide can elevate production of plant-based allergens, causing increased allergic sensitizations and asthma episodes, resulting in diminished production at work and school. *Id.*

131. Many of these effects are already being observed. In response to rising temperatures and later occurring late-fall or early-winter frost, ragweed pollen season length in the American Midwest has increased by as much as 11 to 27 days from 1995 to 2011. *Id.* at 223. Many cities have suffered dramatic increases in death rates during heat waves. *Id.*

132. Disease vectors are already becoming more prevalent due to less control by cold winter conditions. MacCracken Decl. ¶ 23(a). Local changes in temperature and

rainfall have already altered the distribution of water-borne illnesses and disease vectors.

Intergovernmental Panel on Climate Change, *Climate Change 2014: Impacts, Adaptation, and Vulnerability* 6 (2014), available at <https://www.ipcc.ch/report/ar5/wg2/> (“IPCC Impacts Report”).

133. The heat index will rise more rapidly than the temperature, adding threats from more intense, longer, and more frequent heat waves. MacCracken Decl. ¶ 23(a).

Effects On Food Production And Security

134. Agriculture and food production around the world will be disrupted by many aspects of the changing climate. Shifting season lengths, storm tracks⁹ and temperatures will force shifts in the locations where crops can be productively grown, forcing agriculture into regions where soils may not be as suitable. Even though a higher CO₂ level enhances water-use efficiency, greater evaporation due to higher temperatures will lead to more rapid loss of soil moisture and more frequent occurrence of drought stress. Heat and water stress will make animal raising more difficult and expensive. MacCracken Decl. ¶ 23(b).

135. The U.S. agricultural sector, which produces nearly \$330 billion per year in agricultural commodities, will be substantially disadvantaged by climate change, even

⁹ The conditions over the Great Plains in the spring/summer of 2012 and 2013 give an indication of the type of changing conditions that will challenge ranchers and farmers. In 2012, intense drought made it difficult, for example, for corn to mature, whereas in 2013, the unusually wet springtime conditions delayed and made planting difficult, allowing significantly fewer days for corn to reach maturity. Conditions representing the average of the departures from normal for the two years would have been much better than the sequence of the two years. There are reasons to think that rapid warming in the Arctic played a role in the two anomalies (e.g., see Francis, J. A. and S. J. Vavrus, 2012: Evidence Linking Arctic Amplification to Extreme Weather in Mid-Latitudes, *Geophysical Research Letters*, Vol. 39, L06801, doi:10.1029/2012GL051000).

under a reduced emissions scenario. The National Climate Assessment predicts that, if emission-restraining policies are not put into place, by the middle of this century temperatures will increase between 1°C and 3°C (1.8°F and 5.4°) and precipitation extremes will further intensify, which will cause declines in yields for major U.S. crops and farm profits. Nat'l Climate Assessment, at 152.

136. Increased carbon dioxide encourages weed growth, causing more competition between crops and weeds. *Id.* at 158. The U.S. already spends \$11 billion per year on weed control, and that cost is expected to rise as increased temperatures and carbon dioxide boost weed growth. *Id.* Glyphosate (also known as RoundUp), the most widely used herbicide in the U.S., loses its efficacy on weeds grown at carbon dioxide levels projected to occur in the next few decades. *Id.* Higher concentrations and more frequent sprayings of the chemical will be necessary to be effectual, increasing costs of food and environmental harm caused by chemical use. *Id.*

137. In some areas of the United States, climate change is projected to cause extreme precipitation marked by periods of heavy rain and drought. Such a precipitation pattern leads to soil erosion and potentially devastating effects on crop yields. *Id.* at 159. In Iowa, the number of days with heavy rainfall has already increased, even as total annual precipitation has not increased. *Id.* The new precipitation pattern has caused a decrease of three days in the number of workable days in the period from April to May and has forced farmers to install subsurface drainage systems at a cost of approximately \$500 per acre. *Id.*

iii. Physical Effects Of Higher Atmospheric Temperatures

Melting of Polar Ice Sheets and Rising Sea Level

138. Over the last two decades, the Greenland and Antarctic ice sheets have been losing mass, glaciers continue to shrink nearly worldwide, and Arctic sea ice decreased in extent. IPCC Physical Science Report, at 9. Summer sea ice extent has decreased over the period from 1979 to 2012 at a rate in the range 9.4% to 13.6% per decade. *Id.* Arctic summer sea ice is expected to virtually disappear before mid-century. Nat'l Climate Assessment, at 515.

139. Since 1880, global average sea level has risen by about eight inches. The rate of sea level rise since 1992 is approximately double that of the pre-1992 rate. *Id.* at 9. Accelerating sea level rise, combined with coastal storms, increases risk of erosion, storm surge damage, and flooding for coastal areas. *Id.* With continued warming, global sea levels are expected to rise an additional one to four feet by 2100. *Id.* at 469.

140. Sea level rise is causing damage to coastal infrastructure and property. Along the California coast, where sea levels have risen 6.7 to 7.9 inches in the last 100 years, high tides have damaged Highway 101 near San Francisco and caused seawater backup in San Francisco Bay Area sewage systems. *Id.* at 469. Sea levels in California are expected to rise 16 inches in the next 50 years. In Los Angeles, sea level rise threatens drinking water supplies by potentially contaminating groundwater with seawater and threatens to increase costs to protect coastal freshwater aquifers. *Id.* at 469.

141. Seas would rise by approximately 24 feet if the mile-thick ice sheet covering Greenland were to melt. There is little doubt that continued global warming

would cause such an event. The effects would be felt in the coastal cities where a great percentage of the world's population lives. U.S. coastal cities that would be partially inundated by sea level rise of 10 feet or more include Boston, Providence, New Haven, New York, Baltimore, Charleston, Miami, St. Petersburg, Tampa and many other Florida coastal cities, Mobile, New Orleans, Houston-Galveston, San Diego, Los Angeles, San Francisco, and Seattle. In Florida alone, \$950 billion of property lies within 10 feet of the high tide line; in New York and New Jersey, \$300 billion worth.

Reduced Fresh Water Supplies

142. Increasing evaporative losses, reduced runoff, reduced snowpack, and decreasing groundwater replenishment caused by warmer global temperatures reduce groundwater supply. *Id.* at 86. These conditions increase the risk of shortage of freshwater for existing uses. *Id.* at 86.

143. Groundwater is the primary water supply in large regions of the Southwest, Great Plains, Midwest, Florida, and other coastal areas. *Id.* at 76. Climate change will greatly impact the rate at which groundwater aquifers are restocked with fresh water. Drier soil will mean less water in the aquifer. *Id.* at 76. In several U.S. regions, such as the Great Plains, Southwest, and Southeast, seasonal soil moisture has already decreased in the winter and spring as a result of climate change, indicating adverse impacts on groundwater supplies. *Id.* at 76.

Altering Of Global Rainfall Patterns

144. Continuing accumulations of greenhouse gases in the atmosphere over the next 75 years will mean that periods of less rain and drier soil will become longer or

occur more often, or both. IPCC Impacts Report, at 3. Drier regions of the world will experience more intense droughts and stressed water supplies. *Id.* Historic droughts are currently being experienced in California and Australia, and were recently experienced in Texas.

Warming Permafrost Temperatures

145. Permafrost, an important component of Arctic and sub-Arctic landscapes, plays an important role in influencing landscape water balance and the design and maintenance of infrastructure. Eighty percent of Alaska's land (an area as large as the western contiguous U.S.) is underlain by permafrost. Nat'l Climate Assessment, at 520. In coastal Alaska, permafrost has warmed 4 to 5 degrees Fahrenheit at 65-foot depths since the late 1970s and 6 to 8 degrees Fahrenheit at 3.3-foot depths since the mid-1980s. *Id.* Thaw has already occurred in interior and southern Alaska and northern Canada. *Id.*

146. Uneven sinking of the ground in response to permafrost thaw is estimated to add between \$3.6 and \$6.1 billion to the cost of maintaining Alaska's public infrastructure in the next 20 years. *Id.* In rural Alaska, permafrost thaw will disrupt community water supplies and sewage systems, with harmful effects to human health. *Id.*

147. Thawing of permafrost is expected to create a pernicious feedback loop that will exacerbate the warming of the earth. As permafrost melts, it releases methane into the atmosphere. Methane is a global warming gas 21 times as powerful as carbon dioxide. The release of methane stored in the permafrost will therefore speed and exacerbate the effects of global warming. *See* MacCracken Decl. ¶ 30.

Species Migration

148. Global warming is accelerating changes in landscapes and seascapes and, as a result, many species may move out of their current regions or face extinction. Nat'l Climate Assessment, at 196. Currently forested areas of the southeastern U.S. will become grassland if warming continues, largely eliminating the timber industry in that region.

149. Migration of pest species will be of concern, as will new opportunities created by warming. Mountain pine beetles, formerly kept in check by cold winters, have now decimated approximately 3.4 million acres of forest in Colorado alone, and have spread throughout coniferous forests in the Rocky Mountains.

Ocean Acidification

150. Ocean acidification refers to the reduction in pH of the ocean over an extended period, caused primarily by uptake of carbon dioxide from the atmosphere. IPCC Physical Science Report, at 295. Since the beginning of the industrial revolution, the average pH of ocean surface waters has fallen by about 0.1 units, or about a tenfold decrease.¹⁰ IPCC Physical Science Report, at 295. This reduction in pH is caused primarily by an increase in atmospheric carbon dioxide, as seawater currently absorbs approximately 30% of the anthropogenic carbon dioxide from the atmosphere. *Id.* at 295-97. Unless emissions are curtailed, by the end of this century the average surface ocean pH is expected to 0.2 to 0.4 units lower than it is today. *Id.* at 297.

¹⁰ The pH scale is logarithmic, so a change of 1 unit represents a ten-fold change in hydrogen ion concentration. IPCC Physical Science Report, at 297.

151. Ocean acidification produces more corrosive seawater, which has dramatic effects on marine wildlife, including negative effects on shell formation for corals, plankton, and shellfish. IPCC Physical Science Report, at 295. The lower the pH, the greater the ability of ocean waters to dissolve sea shells and disrupt formation of coral reefs. The observed increase in atmospheric CO₂ concentration has already lowered pH enough to raise the depth in the ocean where sea shells dissolve. This has been evident first in colder waters because the lower the temperature, the more CO₂ it can hold, and so the lower the pH. Oyster farms along the coast of the Pacific Northwest have already experienced the impacts of lower pH, which has resulted in increased larva fatality rates. Projections indicate that the continued rate of rise of the CO₂ concentration will cause a further decrease in pH by 2050 that is likely to greatly degrade coral throughout the world's oceans. MacCracken Decl. ¶ 27. In Alaska, ocean acidification is predicted to have drastic effects on the local population's dependence on commercial and subsistence fisheries. Nat'l Climate Assessment, at 522.

152. Climate change and ocean acidification do not act independently. As oceans warm as a result a climate change, the solubility of carbon dioxide in seawater is reduced. *Id.* at 297. Thus, as oceans warm due to climate change, more carbon dioxide will remain in the atmosphere, potentially accelerating the onset and consequences of climate change.

iv. Economic Effects

Economic Cost of Extreme Weather Events

153. Analyses of the expected economic impact of global warming show that economic losses are currently being experienced as a result of drought, sea level rise, and more powerful storms. Unless warming is halted, the U.S. and the world will be required to expend significant fractions of GNP to attempt to mitigate effects and adapt to a changed climate.

154. Numerous reports and analyses point to high and rising economic losses, resulting from extreme weather events related to climate change, including three reports from the U.S. Government Accountability Office (GAO) issued in the last two years.

155. In 2013, the GAO identified the rise in extreme climate events as posing a significant financial risk to the federal government, due to its extensive ownership of infrastructure and role in providing financial and technical assistance to state and local infrastructure projects, and to being the largest provider of disaster relief aid. U.S. Government Accountability Office, *High-Risk Series: An Update* (Feb. 2013) <http://www.gao.gov/assets/660/652133.pdf>.

156. In 2014, GAO reported to Congress that the National Flood Insurance Program (NFIP) is unlikely to generate sufficient revenue to cover future catastrophic losses, or repay billions of dollars borrowed from the U.S. Treasury Department in recent years to cover insurance claims from previous disasters. Letter from U.S. Government Accountability Office to the Honorable Randy Neugebauer, Chairman, Subcommittee on Housing and Insurance, Committee on Financial Services (April 9, 2014),

<http://www.gao.gov/assets/670/662438.pdf>. As of the end of 2013, the program was \$24 billion in debt, in large part from Hurricanes Katrina and Sandy.

157. In response to the increasing unsustainability of NFIP, Congress passed the Biggert-Waters Flood Insurance Reform Act of 2012, designed to allow premiums to reflect actual risk and cover NFIP costs. Premiums have increased ten-fold since this legislation was passed. Thomas Ferraro, *U.S. Senate passes bill to delay hikes in flood insurance rates*, Reuters, Jan. 30, 2014, <http://www.reuters.com/article/2014/01/30/us-usa-insurance-flooding-idUSBREA0T1WK20140130>. Public outcry led to a new law, the Homeowners Flood Insurance Affordability Act of 2014, 42 U.S.C. § 4001, which repealed and modified portions of the Biggert-Waters Flood Insurance Reform Act.

158. In recent years, severe weather and climate risks have emerged as the leading cost for property insurers in North America, leading to a rise in premiums and dramatically changing industry practices. IPCC Impacts Report, at 1469. Many U.S. and Canadian insurers now use climate model data to help determine premiums and discounts. *Id.*

159. Insurance companies, citing rising costs caused by government's failure to meaningfully address climate change, have filed claims against municipal governments for damages. Illinois Farmers Insurance Company ("Farmers Insurance") recently filed putative class actions in Illinois state court against approximately nine counties and many more municipalities, seeking damages arising out of claims paid following disastrous flooding. Farmers Insurance and other insurer class members alleged that the governments should have been prepared for a high volume of rain due to 40 years of

observed climate changes in the area. *See* Geoff Ziezulewicz, *Insurance co. sues Will County, 12 towns over flood damage*, Chicago Tribune, Apr. 29, 2014, http://articles.chicagotribune.com/2014-04-29/news/ct-flooding-lawsuit-bolingbrook-plainfield-tl-0501-20140429_1_will-county-flood-damage-lawsuit.

160. The GAO found that climate change threatens our energy infrastructure at all major stages of the supply chain, posing significant economic risks. U.S. GAO, *Energy Infrastructure Risks and Adaption Efforts* (Jan. 2014) <http://www.gao.gov/assets/670/660558.pdf>. Electricity generation infrastructure, such as power plants, is vulnerable to severe weather and water shortages; transmission power lines are susceptible to severe weather and unusually high demand during heat waves; fuel transportation and storage infrastructure, including pipelines, barges, railways, and storage tanks, is susceptible to severe weather, melting permafrost, water shortages and flooding; and oil and gas platforms, refineries, and processing plants, often located near the coast, are vulnerable to sea level rise and coastal storms.

The Cost of Continued Global Warming to the U.S. Economy

161. In order to improve decision-making in the Executive Branch of the government, the President created an interagency body to consider how to reflect the costs to society of actions that increase emissions of greenhouse gases in government cost-benefit calculations. The Interagency Working Group on the Social Cost of Carbon (IWG) produced a range of estimates for the cost imposed on society by emissions of carbon and other greenhouse gases into the atmosphere. This estimate is contained in a dollar figure known as the “social cost of carbon.” Interagency Working Group on Social

Cost of Carbon, Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 (May 2013), http://www.whitehouse.gov/sites/default/files/omb/inforeg/social_cost_of_carbon_for_ria_2013_update.pdf.

162. The IWG used three of the most prominent and widely-used integrated models in the economics literature to derive its estimate, obtaining a central value for economic damages caused by a ton of carbon dioxide emitted in 2015 of approximately \$42 in current dollars, and rising over time.

163. The IWG's estimate does not take into account significant, but difficult to measure, additional costs associated with global warming caused by emissions of carbon and other greenhouse gases. These unquantified effects are those likely to cause the most economic harm (e.g. mass migration; intra- and interregional socioeconomic conflict from increased food and water scarcity; threats to international trade flows, financial markets and national security interests; inland flooding; wildfire; ecosystem degradation; fisheries impacted by ocean acidification; and known and unknown catastrophic outcomes, such as a collapse of a major ice sheet).

164. Other governments have addressed the costs imposed by excessive carbon emissions by adopting carbon pricing schemes. The United Kingdom,¹¹ France,¹²

¹¹ ECONOMICS GROUP, DEFRA, U.K., THE SOCIAL COST OF CARBON AND THE SHADOW PRICE OF CARBON: WHAT THEY ARE, AND HOW TO USE THEM IN ECONOMIC APPRAISAL IN THE UK 1 (2007); *see also* Ministry of Finance, Norway, Cost-Benefit Analysis: Carbon Price Paths, *available at* <http://www.regjeringen.no/en/dep/fin/Documents-and-publications/official-norwegian-reports-/2012/nou-2012-16-2/10.html?id=713585> (“The United Kingdom has changed its method for the valuation of greenhouse gas emissions. Prior to 2009, the estimated global social cost of carbon was used, but one

Germany,¹³ and Norway¹⁴ use a form of Social Cost of Carbon in their regulatory analyses. Other countries, such as Sweden, impose carbon taxes.¹⁵ Canada has used the IWG's Social Cost of Carbon value in developing carbon dioxide standards for its coal-fired power plants, estimating \$5.6 billion (Canadian dollars) worth of global climate benefits from reductions in carbon emissions.¹⁶

165. The International Monetary Fund has adopted the IWG's Social Cost of Carbon. David Roberts, *IMF says global subsidies to fossil fuels amount to \$1.9 trillion a year...and that's probably an underestimate*, Grist.org, Mar. 28, 2013,

[sic] has now switched over to pricing in line with the necessary marginal cost of meeting long-term domestic emission reduction targets in conformity with the EU Climate and Energy Package.”)

¹² See Balázs Égert, *France's Environmental Policies: Internalising Global and Local Externalities* 8-10 (OECD Economics Department Working Papers No. 859, 2011), available at <http://dx.doi.org/10.1787/5kgdpm0n9d8v-en> (discussing global impacts and France's history of calculating the SCC); Oskar Lecuyer & Philippe Quirion, funded by the European Union's Seventh Framework Programme, *Choosing Efficient Combinations of Policy Instruments for Low-Carbon Development and Innovation to Achieve Europe's 2050 Climate Targets—Country Report: France* at 8 (2013) (noting the prospects for a carbon tax in 2014-15, and explaining that “A 2009 stakeholder and expert group led by the ‘Conseil d'analyse stratégique’ (a public body in charge of expertise and stakeholder dialogue) set the optimal level of the carbon tax (the social cost of carbon) at € 32/tCO₂ in 2010, and rising to € 100 in 2030 and € 200 in 2050.”).

¹³ Testimony of Howard Shelanski, OIRA Admin., before the House Committee on Oversight & Government Reform's Subcommittee on Energy Policy, Healthcare, and Entitlements, July 18, 2013, at 3 (explaining that the global SCC value estimated by the IWG is consistent with values used by Germany and the United Kingdom).

¹⁴ See Ministry of Finance, *supra* note 11 (explaining that, for projects not already covered by a binding emission limitation, the carbon price should “be based on the marginal social cost of carbon,” meaning “the global cost of emitting one additional tonne of CO₂e”). Note that Norway has joined the E.U.'s trading scheme.

¹⁵ Henrik Hammar, Thomas Sterner & S. Åkerfeldt, *Sweden's CO₂ Tax and Taxation Reform Experiences*, in REDUCING INEQUALITIES: A SUSTAINABLE DEVELOPMENT CHALLENGE (Genevey, R. et al. eds., 2013).

¹⁶ Reduction of Carbon Dioxide Emissions from Coal-Fired Generation of Electricity Regulations, SOR/2012-167, 146 Can. Gazette pt. II, 1951, 2000, 2044 (Can.), available at <http://www.gazette.gc.ca/rp-pr/p2/2012/2012-09-12/html/sor-dors167-eng.html>.

<http://grist.org/climate-energy/imf-says-global-subsidies-to-fossil-fuels-amount-to-1-9-trillion-a-year-and-thats-probably-an-underestimate/>.

166. A recent privately funded study focused on the United States found that if the world continues on its current emissions path, by 2050, the U.S. is likely to suffer losses of gross domestic product in the range of 0.8% to 3.5% per year, with a 1 in 20 chance of costs being less than 0.3% or more than 5.4%.¹⁷ This is only a national average; some states were found to be especially vulnerable. For example, the most likely damages for Florida were 3.1% to 9.7% of gross state product, and Mississippi 3% to 9.7%.

167. These numbers are particularly disconcerting because, due to the same type of data limitations Social Cost of Carbon modelers confront, the researchers were only able to estimate a limited number of damages. Specifically, they estimated costs of only six types of damage: net decreases in agricultural production for four main crops, increased coastal storm damage, heat-related mortality costs, reduced labor productivity, increased crime, and net increases in electricity expenditures.

¹⁷ The Project, commissioned by two major investors (Michael Bloomberg and Tom Steyer) and former Treasury Secretary Henry Paulson, convened a large research group led by climate scientist Dr. Robert Kopp of Rutgers University and economist Dr. Solomon Hsiang of the University of California, Berkeley. The team of scientists and economists worked with Rhodium Group, an economic research firm specializing in analyzing disruptive global trends, and Risk Management Solutions, the world's largest catastrophe-modeling company for insurance, reinsurance, and investment-management companies around the world.

Delaying Policy Changes to Curtail Excessive Greenhouse Gas Emissions Will Drastically Increase the Economic Cost of Mitigation

168. The CEQ has stated that

[T]he costs of climate change increase nonlinearly with the temperature change. Based on Nordhaus's net damage estimates, a 3° Celsius temperature increase above preindustrial levels, instead of 2°, results in additional damages of 0.9 percent of global output. To put this percentage in perspective, 0.9 percent of estimated 2014 U.S. GDP is approximately \$150 billion. The next degree increase, from 3° to 4°, would incur additional costs of 1.2 percent of global output. Moreover, these costs are not one-time, rather they recur year after year because of the permanent damage caused by increased climate change resulting from the delay.

White House Council on Environmental Quality, *The Cost of Delaying Action to Stem Climate Change* 10-11 (July 2014) (internal citation and footnote omitted).

169. The net mitigation cost of delaying action to achieve a specified climate policy target (typically, a given concentration of greenhouse gases) will increase, on average, by approximately 40 percent for each decade of delay.

Impact on Global Economies

170. As the above studies show, the economic impacts of climate change are staggering and wide-ranging. The IPCC projects that entire countries, particularly low-lying countries and small island states, “are expected to face very high impacts that, in some cases, could have associated damage and adaptation costs of several percentage points of GDP.” IPCC Impacts Report, at 17. The manufacturing sector, which depends heavily on a supply of raw materials and transportation, is particularly sensitive to weather. *Id.* at 32. Extreme weather events such as hurricanes significantly disrupt

manufacturing activities, causing an untold amount of economic damage to local economies. *Id.*

v. National Security

171. The Department of Defense and other national security agencies of the U.S. government have identified climate change as extremely serious, contributing to destabilization of national governments, rising terrorism, and new geopolitical conflicts that will stress U.S. military resources.

172. In May 2014, the Center for Naval Analyses (CNA), a federally funded research and development center for the Navy and Marine Corps established in 1942, issued a report authored by the CNA Military Advisory Board titled “National Security and the Accelerating Risks of Climate Change.” Declaration of Stephen Dycus, Attachment 2, ¶ 38. Reflecting on U.S. military experience ranging from “containment and deterrence of the Soviet nuclear threat during the Cold War to political extremism and transnational terrorism, the report concluded that “[t]he national security risks of projected climate change are as serious as any challenges we have faced.” Dycus Decl. ¶ 38 (quoting CNA Military Advisory Board, *National Security and the Accelerating Risks of Climate Change* (2014), <http://cna.org/reports/accelerating-risks> (“CNA Report”)).

173. The 2014 CNA Military Advisory Board report and many other government, quasi-government, and non-government organizations have concluded that climate change represents a serious threat to national security. Dycus Decl. ¶¶ 15, 37.

Destabilization of Political Relationships

174. The many economic and environmental harms described above that flow from climate change pose a significant risk to the stability of international political systems. Desertification and drought, in particular, have become “threat multipliers” in Northern Africa, recognized by the U.S. military, leading to deterioration of relationships between ethnic groups and other non-state actors. CNA Report, at 13.¹⁸ For example, climate change-related desertification and food insecurity were two of the primary drivers of the 2012 government overthrow by an Al Qaeda-affiliated group in Mali. *Id.* Research has concluded that climate change was a catalyst in the political upheaval in Tunisia and Egypt in 2011.¹⁹ *Id.*; *see also* Dycus Decl. ¶ 18.

175. Increased risk of water and food scarcity will force mass migrations, causing increased risk of political upheaval associated with clashing of tribal and ethnic groups. In Bangladesh, increased coastal flooding caused by climate change “could force 30 million people to search for higher ground in a country already known for political violence.” Dycus Decl. ¶ 18 (quoting House Select Committee on Energy Independence and Global Warming, *Final Staff Report for the 110th Congress* 22-23, Oct. 31, 2008,

¹⁸ The CNA Military Advisory Board is a group of retired three- and four-star flag and general officers from the Army, Navy, Air Force, and Marine Corps. CNA, Military Advisory Board, <http://www.cna.org/centers/military-board>. *See also* Coral Davenport, *Climate Change Deemed Growing Security Threat by Military Researchers*, N.Y. Times, May 13, 2014, available at http://www.nytimes.com/2014/05/14/us/politics/climate-change-deemed-growing-security-threat-by-military-researchers.html?_r=0.

¹⁹ Although the 2011 “Arab Spring” uprisings may have benefitted the long-term political wellbeing of those nations, the violence caused by the uprisings resulted in thousands of deaths and forced mass evacuations to escape the violence.

http://www.markey.senate.gov/GlobalWarming/mediacenter/pressreleases_2008_id=0059.html#main_content).

Increased International And Domestic Terrorism

176. The economic and political consequences of climate change will lead to an increased risk of international and domestic terrorism. Dycus Decl. ¶ 37. As temperatures and sea levels rise, fresh water becomes more scarce, and crops more difficult to grow, the resulting political instability will exacerbate conflicts around the world, empowering non-state actors such as terrorist groups, extremists, gangs, and computer hackers who can launch crippling cyber attacks. CNA Report, at 13. These conditions “will influence resource competition while placing additional burdens on economies, societies, and governance institutions around the world. These effects are threat multipliers that will aggravate stressors abroad such as poverty, environmental degradation, political instability, and social tensions – conditions that can enable terrorist activity and other forms of violence.” U.S. Department of Defense, *Quadrennial Defense Review: 2014* 8, http://www.defense.gov/pubs/2014_Quadrennial_Defense_Review.pdf (“2014 Quadrennial Defense Review”); Dycus Decl. ¶ 18-19.

177. Accordingly, the Department of Defense has altered its defense strategy to take into account the unique and far-reaching threats posed by climate change:

[T]he Department will employ creative ways to address the impact of climate change, which will continue to affect the operating environment and the roles and missions that U.S. Armed Forces undertake. The Department will remain ready to operate in a changing environment amid the challenges of climate change and environmental damage. We have increased our preparedness for the consequences of environmental damage and continue to seek to

mitigate these risks while taking advantage of opportunities. The Department's operational readiness hinges on unimpeded access to land, air, and sea training and test space. Consequently, we will complete a comprehensive assessment of all installations to assess the potential impacts of climate change on our missions and operational resiliency, and develop and implement plans to adapt as required.

Climate change also creates both a need and an opportunity for nations to work together, which the Department will seize through a range of initiatives. We are developing new policies, strategies, and plans, including the Department's Arctic Strategy and our work in building humanitarian assistance and disaster response capabilities, both within the Department and with our allies and partners.

2014 Quadrennial Defense Review, at 25. This Department policy reflects the seriousness of the threats to national security and the U.S. military.

New Geopolitical Conflict Caused By Opening Of The Arctic

178. As the extent of summer sea ice in the Arctic continues to decline, increased access to the Arctic and its resources poses new economic and political opportunities and risks. During the minimum extent of the Arctic ice in September, the Northwest Passage through the Canadian Archipelago has opened up every summer since 2007, and the Northern Passage along Russia's coastline has opened up every summer since 2008.

179. The rapid decline in summer sea ice in the Arctic has driven increased interest and investment in oil and gas exploration, shipping, and fishing in the Arctic. Approximately 30% of the world's undiscovered gas and 13% of the world's undiscovered oil may be found in the Arctic. Center for Climate and Energy Solutions, *Climate Change and International Security: The Arctic as a Bellwether* 5 (2012),

<http://www.c2es.org/docUploads/arctic-security-report.pdf> (“C2ES Report”). As Arctic sea ice melts, states have begun positioning themselves for investment in these resources. Some Arctic states “have already begun rebuilding their Arctic military capabilities, and most of the others are drawing up plans to do so,” in the event that political cooperation in the region deteriorates. *Id.* at 3; *see* Dycus Decl. ¶ 33.

Stress On U.S. Military Resources

180. Many of the national security implications of climate change described above may require U.S. military intervention, causing stress to the military’s resources and requiring additional budget. CNA Report, at 21. In addition to situations requiring military intervention to preserve domestic national security, the military will be asked to provide humanitarian assistance and disaster response on a larger and more frequent scale. *Id.* at 23; Dycus Decl. ¶ 34.

181. The direct physical impacts of climate change described above, including extreme weather events, sea level rise, and melting permafrost, will place U.S. military assets at risk of damage. As noted in a House Select Committee report issued in 2008:

Many active U.S. coastal military installations around the world are at a significant and increasing risk of damage from storm surges and associated flooding and damages. For example, the U.S. airbase at Diego Garcia in the Indian Ocean, which is critical to operations in Iraq and the surrounding region, is an average of four feet above sea level and is threatened by sea level rise and storm surges.

Dycus Decl. ¶ 19 (quoting House Select Committee on Energy Independence and Global Warming, *Final Staff Report for the 110th Congress*, at 23-24).

G. Injury

182. Plaintiffs have been actually injured by BLM's sale of coal leases and other actions taken under the federal coal management program since 2009 without complying with NEPA.

183. Plaintiffs have been actually injured by mining activities conducted under the federal coal management program, and by combustion by power plants of coal mined under the Program.

184. Emissions from continued operation of mines under the federal coal management program and from power plants burning coal mined under the Program injure Plaintiffs' health and their aesthetic and recreational interests in using and enjoying land and air resources adversely affected by the mines and plants.

185. Plaintiffs stand to suffer actual and imminent injury by the approximately 12 applications for coal leases that are currently pending before BLM under the federal coal management program.

186. Emissions from operation of mines which stand to be constructed under the federal coal management program according to pending lease applications, and from power plants burning coal mined under these leases injure Plaintiffs' health and their aesthetic and recreational interests in using and enjoying land and air resources adversely affected by the mines and plants.

CLAIM FOR RELIEF

187. Plaintiffs incorporate by reference the allegations in all preceding paragraphs.

188. NEPA requires federal agencies to take a “hard look” at the direct, indirect, and cumulative impacts of proposed major Federal actions, and at alternatives that could reduce or eliminate those environmental impacts. 42 U.S.C. § 4332(2)(C)(i)-(ii); 40 C.F.R. §§ 1502.16, 1508.7, 1508.8, 1508.25. NEPA imposes a mandatory, non-discretionary duty on agencies to supplement an already completed analysis when “[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.” 40 C.F.R. § 1502.9(c).

189. BLM has failed to issue a supplemental PEIS or otherwise analyze the effect of greenhouse gas emissions from the mining and combustion of coal extracted under the continuing federal coal management program on global climate and on climate change-related direct and indirect effects.

190. Neither the 1979 PEIS, the NEPA document that continues to govern the federal coal management program, nor the supplemental EISs prepared in 1985 take the requisite “hard look” at the Program’s contribution to climate change or at the Program’s contribution to the effects of climate change.

191. None of the NEPA documents prepared to analyze environmental impacts of an individual lease or a group of leases proposed under the federal coal management program discharges BLM’s duty to evaluate the direct, indirect, and cumulative climate

change-related effects of the federal coal management program, or its duty to consider alternatives to the Program.

192. Despite the development of a significant body of scientific knowledge indicating that greenhouse gas emissions from mining and combustion of coal, including coal mined under the federal coal management program, causes or exacerbates climate change, BLM has failed to supplement prior PEISs with analysis of the federal coal management program's effect on climate change, in violation of 42 U.S.C. § 4332(2)(C) and 40 C.F.R. § 1502.9(c), and contrary to the standards of the APA, 5 U.S.C. § 706(1) & (2)(A).

193. This body of scientific knowledge, giving rise to an obligation to prepare a supplemental PEIS, has existed since EPA issued its Endangerment Finding in 2009 and was strengthened through the succession of IPCC reports and the Third National Climate Assessment in 2014.

194. BLM has continued to and will in the near future issue coal leases under the federal coal management program, as that Program was proposed and evaluated in the 1979 PEIS, without having conducted analysis required by NEPA. As such, sufficient major Federal action remains to occur under the federal coal management program such that an evaluation of the Program's climate change-related impacts would further the informed decision-making purposes of NEPA.

195. BLM's failure to supplement its prior environmental analyses of the federal coal management program in light of today's understanding of the causes and consequences of climate change violates NEPA, 42 U.S.C. § 4332(2)(C), and regulations

promulgated thereunder requiring that BLM analyze the direct, indirect, and cumulative effects of the program, 40 C.F.R. §§ 1502.16, 1508.7, 1508.8, 1508.25, contrary to the standards of the APA, 5 U.S.C. § 706(1) & (2)(A).

196. In failing to issue a supplemental PEIS in response to the significant new information and changed circumstances outlined above, BLM has unlawfully withheld and unreasonably delayed, contrary to the APA, 5 U.S.C. § 706(1) & (2)(A), the issuance of a supplemental PEIS addressing the effect of the federal coal management program on climate change.

197. BLM's failure to supplement the 1979 PEIS with analysis of the cumulative effects of the federal coal management program on climate change or on the direct and indirect effects of climate change constitutes agency action that is final and reviewable under the APA, 5 U.S.C. §§ 701(b)(2), 702, 704, and 706.

RELIEF REQUESTED

Plaintiffs respectfully request that this Court enter judgment in their favor and against Defendants and provide the following relief:

- a) Declare that Defendants violated NEPA by failing to issue a supplemental PEIS in light of the "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts" that has developed since the last revision of the BLM's PEIS;
- b) Issue a mandatory injunction requiring Defendants to comply with the provisions of NEPA;

- c) Issue an injunction ordering BLM not to accept, approve, or otherwise take action with regard to any application for a new lease or to modify an existing lease, now pending or to be filed in the future, unless and until Defendants comply with NEPA and regulations promulgated thereunder;
- d) Grant Plaintiffs such temporary restraining orders or preliminary injunctions as it may request;
- e) Retain jurisdiction of this action to ensure compliance with the Court's decree;
- f) Allow Plaintiffs to recover the costs of this action, including attorneys' fees; and
- g) Provide such other declaratory and injunctive relief as the Court deems just and proper.

Respectfully submitted this 24th day of November, 2014,

/s/ Richard E. Ayres

/s/ Jessica L. Olson

/s/ John H. Bernetich

Richard E. Ayres (DC Bar No. 212621)

Jessica L. Olson (DC Bar No. 497560)

John H. Bernetich (DC Bar No. 1018769)

AYRES LAW GROUP LLP

1707 L Street NW, Suite 850

Washington, DC 20036

T: (202) 452-9200 / F: (202) 872-7739

ayresr@ayreslawgroup.com

olsonj@ayreslawgroup.com

bernetichj@ayreslawgroup.com

Counsel for Plaintiffs