ADAPTIVE MANAGEMENT
AS APPLIED TO OIL AND NATURAL GAS DEVELOPMENT ON ONSHORE FEDERAL LANDS

PREPARED FOR
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EXECUTIVE SUMMARY

Adaptive management is being applied with increasing frequency by federal land managers to implement long-term monitoring plans for resource management. This report seeks to define the adaptive management process, determine how the process has historically developed and analyze the current application of adaptive management to regulate oil and gas development. It is Phase I of a two-part study of adaptive management. The next phase of this study is to develop a range of approaches to adaptive management as applied to wildlife resources on federal lands impacted by oil and gas development. Monitoring protocols will be developed which are science-based and which will provide a basis for adjustment of wildlife mitigation requirements in light of monitoring results.

The adaptive management approach, if carefully crafted and applied could expedite decision-making allowing federal managers to proceed with oil and gas leasing and permitting where limited resource information is available and where there is scientific uncertainty as to project impacts. Adapting mitigation requirements and federal policies in response to science-based monitoring could improve the protection of the environment, lead to a more effective "net-effects" mitigation and allow elimination of unnecessary or ineffective requirements.

ADAPTIVE MANAGEMENT

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INTRODUCTION

Members of the American Petroleum Institute (**"API"**), and Public Lands Advocacy ("**PLA**"), are seeking to develop an industry model to use adaptive management as an effective tool to monitor environmental impacts and, where necessary, "adapt" oil and gas operations to minimize impacts on federal lands. API has engaged the law firm of Snell & Wilmer to provide the legal and policy basis for an industry model of adaptive management.

WHAT IS ADAPTIVE MANAGEMENT?

A. A Process for Monitoring and Responding to Development Impacts

British Columbia ecologists developed the term "adaptive management" in the 1970's as "a systematic process for continually improving management policies and practices by learning from the outcome of operational programs."[1] Since inception, several definitions of "adaptive management" have been developed to identify a process that uses scientific methods to test management policies by monitoring impacts and adjusting subsequent actions in light of monitoring results.[2] The term is being applied with increasing frequency by federal land managers to implement long-term monitoring plans for resource management. One of the chief criticisms of adaptive management is the lack of a uniform definition or common understanding

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[1] Vera Sit and Brenda Taylor, editors, "Statistical Methods for Adaptive Management Studies," British Columbia, Ministry of Forest Research Program (1998) at 2 (ecologists J. B. Nyberg and B. Taylor are credited with this definition); British Columbia Forest Service, "Definitions of Adaptive Management" on the web at http://www.for.gov.bc.ca/hfp/amhome/AMDEFS.HTM.

[2] The term "adaptive management" is more narrowly defined in the technical literature as employing experimental management programs to compare alternative hypotheses about the system being managed. *See* Bradley C. Karkkainen, "Toward a Smarter NEPA: Monitoring and Managing Government's Environmental Performance." 102 Colum. L. Rev. 903, n 148.

by federal agencies and stakeholders regarding its application.[3] As broadly defined in the context of this study, "adaptive management" involves the development of a science-based monitoring plan or process to detect changes in the environment which may be caused by oil and gas operations and associated activities and to adapt management policy in response. Monitoring results may be used to revise "outdated" and "one-size-fits-all" land management policies on mitigation requirements. This definition is distinct from the concept of "active adaptive management" applied in the technical literature of ecology as employing experimental management programs to compare alternative hypotheses about the system being managed.[3.5]

Adaptive management is most simply defined as a process for monitoring and adjusting land and resource management decisions in response to development impacts. The monitoring and mitigation of development impacts are standard requirements imposed by federal land managers on oil and gas operations through land use plans, lease stipulations and permit conditions, such as the application for permit to drill (**"APD"**), the plan of development required under Onshore Order No. 1 and Habitat Conservation Plans (**"HCPs")** associated with an incidental take permit under the Endangered Species Act (**"ESA"**). Adaptive management takes monitoring one step further to change land management policies and mitigation plans in response to monitoring.

Adaptive management is currently an evolving concept as applied to the management of resources on federal lands. For example, while the term "adaptive management" is not defined by statute under the ESA, monitoring is a condition to issuing an incidental take permit ("**ITP**")

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[3] G. H. Stankey, "Adaptive Management and the Northwest Forest Plan, Rhetoric and Reality", J. of Forestry, V. 101, No. 1, Jan/Feb. 2003.

[3.5] B. C. Karkkainen at note 2.

under the ESA and implementing regulations.[4] As discussed herein, post-permit monitoring plans and the adaptive management process are specifically authorized in U.S. Fish & Wildlife Service ("**F&WS**") regulatory criteria for the issuance of ITPs. Adaptive management is also specifically defined by U.S. Forest Service ("**USFS**") planning regulations consistent with the continuous monitoring and sustainability requirements of the National Forest Management Act. With less clear definition, the Bureau of Land Management ("**BLM**") is also attempting to apply adaptive management concepts to monitor resource management plans **("RMPs")** and large-scale oil and gas development projects. The Council on Environmental Quality ("**CEQ**") is proposing to define adaptive management under CEQ rules implementing the National Environmental Policy Act of 1969 ("**NEPA**").[5] CEQ is also seeking to apply this process to allow agencies to develop and enforce mitigation and monitoring plans after the final agency decision to approve the proposed action.[6] In the context of NEPA guidance, the U.S. Department of the Interior ("DOI") has also recently proposed a definition of "adaptive management."

B. Regulatory Definitions of Adaptive Management and Post-Decision Monitoring Affecting Oil and Gas Leasing and Development

1. Habitat Conservation Plan ("HCP") and Implementation Agreement

As a condition of obtaining an "incidental take permit" ("**ITP**") to allow actions affecting a species under section 9 of the ESA, an operator must work with the F&WS to identify

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[4] Adaptive management has been authorized by statute in the context of a specific ecosystem at the Glen Canyon Dam. *See* Section 1802, Grand Canyon Protection Act of 1992, Pub. L. 102-575 directing the Secretary to establish and implement long-term monitoring programs. *See* Glen Canyon Dam Adaptive Management Work Group, Federal Advisory Committee Charter, filed Jan. 27, 2003.

[5] 43 U.S.C.A. §§ 4321-4345 (2003); 40 C.F.R. Part 1500 (2003).

[6] Exec. Office of the Pres. Council on Environmental Quality, "The National Environmental Policy Act: A Study of its Effectiveness After Twenty-five Years" (1997) ("**CEQ Report**") at 32.

environmental impacts and develop a HCP.[7] The HCP must assure that following issuance of the permit, steps will be taken to "monitor, minimize and mitigate such impacts" and identify the funding available to implement such measures.[8] This requirement essentially incorporates adaptive management to assure monitoring and compliance after permit issuance. Monitoring provides feedback on the mitigation requirements to verify that the measures are needed and remain effective. This feedback is required at specific milestones over the term of the permit.[9]

When long-term mitigation and monitoring is anticipated, the F&WS must confirm that funding is available for implementation of the HCP.[10] The "no surprises" rule helps to assure that a permittee is not subject to an open-ended HCP funding obligation.[11] The rule currently distinguishes between reasonably anticipated "changed circumstances" which must be funded and "unforeseen circumstances" causing additional mitigation. Until recently, the F&WS has not required the permittee to commit to additional funding beyond that needed to address reasonably anticipated circumstances. The "no surprises" rule was recently remanded to F&WS by the U.S. District Court for the District of Columbia in *Spirit of the Sage Council v. Norton*.[12] The Court vacated the "permit revocation" rule, 64 Fed. Reg. 32,712, 32,714 (June 17, 1999) due to F&WS failure to take public comment during promulgation and remanded the "no surprise rule" for further consideration along with the permit revocation rule.[13] Upon publication of the proposed rule, plaintiffs have indicated that they will request the agency to consider providing additional guidance on the use of adaptive management to implement the HCP.[14]

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7 ESA § 10(a)(1)(B); 16 U.S.C.A. § 1539(a)(1)(B) (2003).

8 50 C.F.R. § 17.22(b)(1)(iii) (2003); 50 C.F.R. § 222.22(5)(b)(iii) (2003).

9 50 C.F.R. §§ 17.22(b)(1), 17.32(b)(i), 222.302 (2003).

10 *See Sierra Club v. Babbitt,* 15 F. Supp. 2d 1274 (S.D. Ala. 1998) (blocking issuance of incidental take permits because the HCP contained inadequate mechanisms for funding off-site mitigation).

11 *See* preamble, 63 Fed. Reg. 8,859 (Feb. 23, 1998), rule codified at 50 C.F.R. §§ 17.22, 17.32, 222.3, 222.22 (2003).

12 Memorandum Opinion and Order of District Judge Sullivan, Civil Action No. 98-1873, dated December 11, 2003.

13 *Id.* at 31.

14 Plaintiffs' counsel, Eric Glitzenstein, Meyer & Glitzenstein, Washington, DC, ABA Teleconference, "Surprise! How the *Spirit of the Sage Council v. Norton* Decision Impacts HCP "No

2. USFS Forest Plans

The National Forest Management Act of 1976 (**"NFMA")** authorizes interdisciplinary teams of scientists to assist the USFS to prepare forest plans based on an inventory of resources that is continuously updated and maintained.[15] In this context, the Committee of Scientists, charged with the duty of studying USFS planning regulations, in March, 1999, recommended rule changes to strengthen the connection between science and management by "adapting management practices in response to scientific monitoring."[16] In response to this recommendation, the USFS planning rules adopted in 2000, define the term "adaptive management" as:

> An approach to natural resource management wherein the effects of policies, plans and actions are monitored for the purpose of learning and adjusting future management actions. Successive iteration of the adaptive process is essential in contributing to sustainability.[17]

The regulations encourage scientists to take a proactive role in the adaptive management process and work with land and resource managers in information gathering and assessment, design and review of monitoring protocols and evaluation of monitoring results.[18] Notably, the Bush Administration has delayed implementation of the 2000 planning rules and in December 2002, proposed changes to the Clinton-era rules.[19] Until final adoption of the 2002 proposed rules, the 2000 rules have been indefinitely suspended.[20]

Surprises Assurances," Tuesday, Jan. 27, 2004; Nat'l Center for Ecological Analysis and Synthesis, American Inst. Biological Sciences, "Using Science in HCPs", (Jan. 1999) on the web at http://www.nceas.ucsb.edu/nceas-web/projects/97KAREI2/hcp-1999-01-14.pdf.

[15] 16 U.S.C.A. §§ 1603, 1604(f)(3) and (5) (2003); USFS Land and Resource Management Plans are termed herein as "Forest Plans."

[16] Committee of Scientists, Final Report (March 15, 1999).

[17] 36 C.F.R. § 219.36 (2000).

[18] *Id.*

[19] 67 Fed. Reg. 72,770 (Dec. 6, 2002).

[20] 67 Fed. Reg. 35,431 (May 20, 2002).

As defined above, the USFS considers the continuous application, i.e., "successive iteration" of the adaptive process as an essential contribution to sustainability under the NFMA. The term "sustainability" has emerged as a point of difference between the 2000 and the 2002 proposed rules. The 2000 rules define "sustainability" as interdependent ecological, social and economic elements, but give first priority in planning to "ecological sustainability."[21] The 2002 proposed rules eliminate this priority and make "ecological sustainability" co-equal with other components, consistent with the multiple use principles of NFMA.[22] Therefore, presumably, USFS's adaptive management process will give equal weight to ecological, social and economic elements in mitigation plans implementing new Forest Plans.

With respect to oil and gas leasing, USFS leasing decisions are divided into two steps as defined at 36 C.F.R. § 228 Part 102(d) and (e), which may be incorporated into the land and resource management process under 36 C.F.R. Part 219.[22.5] Forest-wide leasing decisions follow the planning requirements at 36 C.F.R. Part 219 to define areas open and closed to leasing, alternatives to leasing, determine the amount of post-leasing activity that is reasonably foreseeable for each alternative (termed "RFD" scenarios), lease stipulations and the terms and conditions of leasing.[23] The second stage of leasing occurs when a specific tract is proposed for lease, at which time the USFS reviews the first phase, forest-wide leasing decision, verifies that

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[21] 36 C.F.R. § 219.2(a), 219.1(b)(3) (2000).

[22] 67 Fed. Reg. 72,770 at 72,795 (Dec. 6, 2002) (to be codified at 36 C.F.R. § 219.2(b)(6) & 219.13).

[22.5] Industry has commented on these rules, noting that to meet the legal requirements of the Mineral Leasing Act, the Energy Security Act and the Federal Onshore Oil and Gas Lease Reform Act, it is essential for direction to be included in the planning regulations establishing standards for making both the 36 C.F.R. § 288 Part 102(d) and (e) leasing decisions, availability and specific lands decisions, in the planning process. In the opinion of industry, Part 102(c) of the existing rule requires only a single analysis for making both the (d) and (e) decisions. Therefore, a key element of the process must be that the forests make both of these decisions during planning to avoid the unnecessary and costly supplemental NEPA documents often required to make the "specific-lands" leasing decision.

[23] 36 C.F.R. § 228.102(c)(d) (2002).

the lease is consistent with the Forest Plan and assures that the lease has been adequately analyzed under NEPA.[24] Under the 2002 rules, the USFS has discretion to determine whether an environmental impact statement ("**EIS**") is required at the programmatic forest-wide leasing stage but is required to conduct a NEPA analysis at the site-specific stage of leasing.[25] Whether or not a site-specific NEPA analysis results in a monitoring plan, the lease will be monitored as an impact under the Forest Plan adaptive management process.[26] Under the 2002 proposed rules, Forest Plans would be automatically updated by a site-specific leasing decision.[27]

3. Continuous Monitoring of Bureau of Land Management ("BLM") Resource Management Plans ("RMPs")

As with the NFMA, § 202 of the Federal Land Policy and Management Act (**"FLPMA")** requires that BLM manage public lands under multiple use principles and consistent with land use plans, termed Resource Management Plans ("**RMPs**"), based on resource inventories which are continuously updated.[28] BLM's planning rules require the agency to adopt a monitoring plan and schedule to evaluate the implementation of baseline decisions under the RMP.[29] The RMP governs long-term multiple use objectives and the use of resources on federal lands. BLM has not specifically defined the term "adaptive management" in its planning regulations. However, FLPMA provides authority for continuous monitoring and update of RMPs. As discussed herein, BLM's recent RMP revisions in the Powder River Basin have incorporated long-term monitoring and adaptive management procedures. In addition, adaptive management has been

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[24] 36 C.F.R. § 228.102(e) (2002).

[25] 36 C.F.R. § 219.6 (2002) (plan amendment); 36 C.F.R. § 219.9(c) (2002); 67 Fed. Reg. 72,770 at 72,797 (Dec. 6, 2002) (to be codified at 36 C.F.R. § 219.6).

[26] *See* Powder River Basin Coal Bed Natural Gas Interagency Work Group (**PRW IWG**), Charter and Memorandum of Understanding **("MOU")** (Dec. 2003), which provides a forum for local, state and federal government, including the USFS, to monitor the impact of coalbed methane ("**CBM")** activities in the Powder River Basin and assess the effectiveness of mitigation measures identified in the RMP EIS RODs for Montana and Wyoming and Montana's Wildlife Monitoring and Protection Plan.

[27] 67 Fed. Reg. 72,770, 72,798 (Dec. 6, 2002) (to be codified at 36 C.F.R. § 219.10(d)(3).)

[28] 43 U.S.C.A. §§ 1712; 1712(c)(1); 1732(a) (2003).

[29] 43 C.F.R. § 1610.4-9 (2002); BLM Handbook H-1601.

considered by the Wyoming BLM to monitor the impacts of conventional oil and gas development projects, including the Continental Divide/Wamsutter II Natural Gas Project, the Pinedale Anticline Oil and Gas Exploration and Development Project and the Jack Morrow Hills Coordinated Activity Plan. As discussed herein, the adaptive management process has been defined and applied differently in each case. In an effort to provide some consistency for BLM and other agencies within the Department, the DOI has revised Departmental NEPA policies to define adaptive management as:

> A system of management practices based on clearly identified outcomes, monitoring to determine if management actions are meeting outcomes, and, if not, facilitating management changes that will best ensure that outcomes are met or to re-evaluate outcomes.[30]

In the context of oil and gas leasing, the RMP authorizes areas open and closed to leasing, lease stipulations and mitigation alternatives.[31] BLM and the USFS both predict post-leasing oil and gas impacts based on reasonably foreseeable development ("**RFD**") scenarios that reflect the number of wells anticipated and the cumulative effects of activities on surface disturbance.[32] RFD scenarios are developed for each leasing alternative in the proposed land use plan EIS, projecting the potential for future oil and gas wells based on historic drilling activity and current geologic data.[33] The RFD scenarios are used to identify potential development impacts and to establish mitigation measures implemented as lease stipulations. Following

[30] DM 4.16 "Adaptive Management," adopted at 69 Fed. Reg. 10,866, at 10,880, Mar. 8, 2004; *see* OEPC, ESMO3-6, "Procedures for Implementing Adaptive Management Practices," July 2, 2003. While this is a final policy, DOI's policies reflect the CEQ Task Force Report recommendations and CEQ may propose revisions to CEQ rules at the conclusion of regional roundtable discussion on the Report and accept public comment at that time.

[31] BLM Manual H-1624-1.

[32] BLM Manual 1624.2, 1624.22; H-1624-1, § IIIA; Forest Service Manual, ch. 1950; Forest Service Handbook 1909.15; 36 C.F.R. § 228.102(c)(3) and (4) (2003); IM No. 2004-089, "Policy for RFD Scenario for Oil and Gas," Jan. 16, 2004, attachment 1-5.

[33] Among other sources, recent land use plans in the Rocky Mountain West have relied on the inter-agency inventory of onshore federal oil and gas reserves prepared in January, 2003 pursuant to the Energy Policy and Conservation Act (**"EPCA")** Amendments of 2000, Pub. L. No. 106-649 § 604, 114 Stat. 2029; EPCA Inventory, "Scientific Inventory of Onshore Federal lands' Oil and Gas Resources and Reserves and the Extent and Nature of Restrictions on Their Development," (Jan. 2003); *see also* I.M. No. 2003-137, Integration of EPCA Implementing Results into Land Use Planning and Energy Use Authorization (April 3, 2003), both available at http://www.blm.gov.

leasing, site-specific conditions of approval and mitigation plans are developed after further NEPA analysis prior to approval of the APD. As the result of monitoring and updated resource inventories, RMPs should be continuously updated. Industry has urged land management agencies to monitor land use plans and project implementation to recognize the "net effects" of partially reclaimed production sites, properly plugged and abandoned wells and reclaimed roads and facility sites. Under the industry approach, agency attention would shift away from well count thresholds and focus on "net effects" which would recognize that plugged and reclaimed wells have no adverse effect on the environment, should be excluded from surface disturbance calculations and may justify reduction or elimination of mitigation requirements. For example, the BLM Craig District Office implements the White River RMP by using a simplified monitoring approach to perform annual inspections of reclamation activity.[34] The results of reclamation monitoring are used as a guideline for land management rather than relying on a specific "well count" figure. Historically, land management agencies have viewed RFD well numbers as caps on the amount of development that is in conformance with an RMP. Cumulative impacts are more properly analyzed on a "net effects" basis[34.5] and this approach was recently adopted by BLM in IM No. 2004-089 which incorporates a net surface disturbance analysis recognizing total acres reclaimed over the period covered by the RFD.[34.6] Monitoring and adaptive management may provide science-based justification for allowing more wells to be drilled in an area without exceeding defined limits of acceptable change.

In addition, the RMPs must be periodically revised[35] and BLM is currently undertaking RMP revisions throughout the Rocky Mountain West with priority given to energy-related "time sensitive" plans. BLM's recently revised RMPs for the Powder River Basin have incorporated

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34 White River ROD and Approved RMP, July 1997.

34.5 *See Southern Utah Wilderness Alliance,* 159 IBLA 220 at 234, June 16, 2003, confirming that although BLM's forecast of 40-80 wells per year in the Book Cliffs RMP had been exceeded, this forecast did not establish a limit on the number of wells within the Book Cliffs Resource Area.

34.6 IM No. 2004-089, "Policy for RFD Scenario for Oil and Gas," Jan. 16, 2004, attachment 1-5.

35 RMPs may be modified by maintenance, amendment or complete revisions, 43 C.F.R. § 1610.4-9 (2002); BLM H-1601-1 VI.

monitoring plans and adaptive management procedures.[36] In December 2003, BLM adopted a charter and MOU establishing an interagency work group to monitor the impact of CBM projects on public land uses within the Powder River Basin. Task groups will develop and implement monitoring plans for water resources, air resources and wildlife resources. To the extent that these RMPs are updated and kept current, through adaptive management, they may provide a basis for "tiering" or cross reference, thereby serving as a basis for future oil and gas leasing decisions, eliminating or reducing the need for new NEPA analysis.[37]

Notably, the Bonneville Power Administration ("**BPA**") has adopted just such a tiered approach in the ROD on its Fish and Wildlife Implementation Plan ("**FWIP**") EIS.[38] This plan addresses BPA's obligation under the Pacific Northwest Electric Power Planning and Conservation Act, the federal Clean Water Act ("**CWA**") and the ESA to enhance fish and wildlife populations impacted by the Columbia River Power System. Mitigation and recovery actions are identified in the EIS as "sample implementation actions" for alternative policy directives. The FWIP EIS ROD articulates a policy directive for implementation and funding of fish and wildlife recovery efforts. If future recovery efforts were identified in the EIS as "sample implementation actions" or are otherwise consistent with this policy, BPA will prepare tiered RODs to cover these actions, without additional NEPA analysis.[39]

HISTORY OF ADAPTIVE MANAGEMENT

Although adaptive management concepts have been applied to ecosystem management and complex environmental issues since the 1970s, the science is still in its infancy. Ecologist

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[36] On April 30, 2003, Wyoming BLM approved amendments to the Buffalo and Platte River RMPs and the Montana BLM approved amendments to the Powder River and Billings RMPs. *See* PRB IWG MOU and Charter (Dec. 2003), supra at n. 18, available on web at http://www.wy.blm.gov/info.

[37] *Utah Wilderness Alliance*, 124 IBLA 162, 166 (1992) (NEPA analysis may tier to the RMP/EIS if the analysis is specific enough to address the site-specific proposal); I.M. 99-149, Determination of Land Use Conformance and NEPA Adequacy, upheld in *Pennaco Energy, Inc. v. DOI,* 266 F. Supp. 2d 1323 (D. Wyo. 2003).

[38] Bonneville Power Administration, Fish and Wildlife Implementation Plan ROD, Oct. 31, 2003; FWIP EIS, DOE/EIS-0312, April, 2003, available on the web at http://www.efw.bpa.gov.

[39] BPA FWIP ROD at 14.

C. S. Holling and his co-workers at the University of British Columbia and the International Institute for Applied Systems Analysis are credited with developing adaptive management.[40] This process has been applied to a range of issues from rehabilitation of salmon stocks in the Columbia River Basin to the ecosystem impacts of the release of water from Glen Canyon Dam. Only recently has the concept been specifically applied to the development of oil and gas on public lands. The term has been broadly applied to monitoring responses ranging from the reactive "learning by doing" approach to the complex "active" adaptive management model seeking to develop new policies as the result of multiple hypothesis testing and experimentation.[41] Initial efforts to apply adaptive management at the ecosystem level were criticized for their failure to proceed beyond the initial stage of model development to actual field experimentation and application.[42] The USFS has observed that there are still few examples of large scale monitoring plans that have been fully implemented.[43]

After initial development of adaptive management in British Columbia, the process was first applied in the United States in 1984 by the Northwest Power Planning Council to protect and enhance Pacific salmon in the Columbia River Basin. These efforts were sidetracked by

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[40] Dr. C. S. Holling, editor, Adaptive Environmental Assessment and Management, John Wiley and Sons, London (1978), at pp. 98-100, 109-10, 136-37.

[41] Sierra Nevada Forest Plan Amendment, FEIS, Vol. 4, Appx. E-4, Ch. 2 Adaptive Management Strategy.

[42] Carl Walters, Fisheries Centre, University of British Columbia, "Challenges in Adaptive Management of Riparian and Coastal Ecosystems," (copyright 1997 The Resilience Alliance), Conservation Ecology, available at http://www.conselcd.org/voll/iss2/art1. Mr. Walters notes that these experimental policies were seen as too costly or risky, particularly in relation to monitoring costs and risk to sensitive species.

[43] *See* Sierra Nevada Forest Plan Amendment, at Ch. 2.1, acknowledging that there are few examples of large scale multi-resource monitoring plans that have been developed, implemented and validated.

litigation under the ESA that prevented implementation of the experimental phase of the Columbia River project.[44]

The USFS was the first federal land management agency to specifically define "adaptive management" and has integrated the concept into its land use planning rules adopted in 2000 under the National Forest Management Act.[45] A precursor to these regulations, the Forest Plan for the Pacific Northwest forests created Adaptive Management Areas (**"AMAs")** to facilitate regional planning by a Forest Ecosystem Management Team ("**FEMAT")**.[46] Ten AMAs covering some 1.5 million acres, approximately 6 percent of the planning area, were designated "to encourage the development and testing of technical and social approaches to achieving desired ecological, economic and other social objectives," and to help agencies "learn how to manage on an ecosystem basis in terms of both technical and social challenges."[47] These efforts have been criticized as being adaptive management in name only and for failing to implement experimentation.[48] Some nine years after the 1994 ROD adopting adaptive management in the Northwest Forest Plan, a comprehensive study of AMA coordinators, scientists and policy makers confirmed a lack of consensus and training on how adaptive management should be implemented.[49] AMA research proposals were rejected due to concern that salmon populations

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[44] K. N. Lee, "Appraising Adaptive Management," Conservation Ecology Vol. 3, Iss. 2, Art. 3, on the web at http://www.consecol.org/vol3/iss2/art3 (1999).

[45] Sierra Nevada Forest Plan Amendment, FEIS, Vol. 4, Appx. E-4, Ch. 2.; Sierra Nevada Forest Plan Amendment, Record of Decision **("ROD")** (Jan. 2001).

[46] FEMAT, "Forest Ecosystem Management: An Ecological, Economic and Social Assessment," Report of the FEMAT Team, July 1993, on the web at http://pnwin.nbii.gov/hwfp/FEMAT. The Forest Plan for the Pacific Northwest forests was ultimately upheld in *Seattle Audubon Soc'y v. Lyons,* 871 F. Supp. 1291 (W.D. Wash. 1994).

[47] G. H. Stankey, "Adaptive Management and the Northwest Forest Plan, Rhetoric and Reality," J. of Forestry, Vol. 101, No. 1, 40 at 41, Jan./Feb. 2003, quoting the 1994 ROD.

[48] *Id.*; K. N. Lee, "Appraising Adaptive Management," Conservation Ecology Vol. 3, Iss. 2, Art. 3, on the web at http://www.consecol.org/vol3/iss2/art3.

[49] G. H. Stankey, note 52.

would be jeopardized by experimentation, even under controlled field conditions.[50] In 1998, following a loss of funding, USFS Region 6 withdrew financial support from the lead adaptive management scientists.[51]

Despite these results, the USFS was motivated to refine the adaptive management process by a General Accounting Office ("**GAO")** report issued in 1997 which was critical of the USFS for giving low priority to monitoring, approving projects without adequate monitoring and for failure to monitor implementation of Forest Plans as required by NFMA.[52] The USFS followed the 1999 recommendations of the Committee of Scientists and incorporated adaptive management into its new planning regulations adopted in 2000 and codified at 36 C.F.R. § 219. The 2000 planning rules also require development of a monitoring plan in conjunction with development, revision or amendment of a Forest Plan.[53]

CEQ first addressed adaptive management in its 1997 study entitled "The National Environmental Policy Act: A Study of its Effectiveness After Twenty-Five Years" (the **"CEQ Report**").[54] The CEQ Report suggests that agencies move from a traditional environmental analysis as a "one-time event" in an EA or EIS accompanying an agency's decision to "continuous" monitoring and adaptive environmental management following the agency decision.[55] In CEQ's view, the traditional environmental management process under NEPA includes three steps reflected in the EIS and ROD: predict, mitigate and implement. The

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50 *Id.*
51 *Id.*
52 Sierra Nevada Forest Plan Amendment, FEIS, note 50, at Ch. 1.3.
53 36 C.F.R. § 219.
54 CEQ Report at 32.
55 *Id.* at 31, citing GAO Testimony on "Forest Service: Issues Related to its Decision-making Process," Jan. 25, 1996.

adaptive management process would add two more steps after the final agency action: monitor and adapt.[56]

CEQ's current Chairman, James C. Connaughton, convened a NEPA Task Force which further expanded the adaptive management concept in its recent September, 2003 report, "Modernizing NEPA Implementation"[57] ("**Task Force Report**"). CEQ acknowledges that not all federal actions lend themselves to active adaptive management or monitoring. NEPA and CEQ rules currently support development and analysis of mitigation plans in the EIS and record of decision prior to project implementation. In certain circumstances, when science is uncertain regarding environmental impacts, CEQ is urging federal agencies to conclude their NEPA analysis with a plan to monitor the impacts of the proposed action and develop responsive (i.e., adaptive) mitigation measures after the decision is approved and as the action is implemented.

This adaptive management approach, if carefully crafted and applied, could expedite decisionmaking by allowing federal managers to proceed with project approval where limited resource information is available and where there is scientific uncertainty as to project impacts. Adaptation of mitigation requirements as the result of post-decision, science-based monitoring could improve protection of environmental resource concerns, lead to more effective mitigation and perhaps even allow the elimination of unnecessary or ineffective requirements. Further, if the adaptive management process results in the continuous updating of Forest Plans and RMPs, this current information may allow agencies to tier NEPA analyses to expedite site-specific decisions. However, as currently written, CEQ rules require the development of mitigation measures prior to the agency's final decisionmaking. If CEQ amends its rules to apply adaptive

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[56] *Id.* at 32.

management post-decision, this process presents the possibility that impacts not fully considered in the EA or EIS may require supplemental NEPA analysis that could delay or derail the action.

CEQ acknowledges that new guidance and regulations are necessary to define adaptive management and to determine how best to incorporate it into the NEPA process.[58] CEQ is proposing to convene a work group to develop such guidance and is currently taking public comment on this and other recommendations of the Task Force Report[59]. Among these recommendations is the suggestion that environmental management systems **("EMS")** such as the ISO 14001 international EMS standard and ISO 19011 auditing standard be used to enforce mitigation plans.[60]

Although the CEQ Task Force recommendations are still preliminary, the DOI has already relied on the Task Force Report in finalizing proposals to incorporate adaptive management into its NEPA implementation procedures.[61] DOI's revision adopts adaptive management as "the preferred method of management, when knowledge about natural resource systems is uncertain."[62] However, DOI's guidance leaves agencies the discretion to determine when it is appropriate to apply adaptive management. Because all decisionmaking involves some uncertainty, if not carefully applied, agencies may use the adaptive management process

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57 The NEPA Task Force Report to the CEQ, Ch. 4 "Adaptive Management and Monitoring" available at http://ceq.eh.doe.gov/ntf/report; *see generally,* James L. Connaughton, "A More Effective and Timely NEPA," 49 Rocky Mt. Min. L. Inst. 2 (2002).

58 *Id.* Task Force Report at 46; *see* discussion of Task Force recommendations at V. herein.

59 CEQ's most recent public meeting on the Task Force Report was held on January 8-9, 2004, at Copper Mountain, Colorado. 68 Fed. Reg. 70013, Dec. 16, 2003.

60 Task Force Report at 54 and 56. *See* James L. Connaughton, "A More Effective and Timely NEPA," 49 Rocky Mt. Min. L. Inst. 2.02[6] (2002); Exec. Order No. 13148, 65 Fed. Reg. 24,595 (April 21, 2000) calls on federal agencies to adopt EMS by 2005; *see* Int'l Org. for Standardization, "Business Benefits of ISO 14000," on the web at http://www.iso.ch/iso/en/iso9000-14000/tour/benef.

61 69 Fed. Reg. 10,866, Mar. 8, 2004.

62 *Id.,* 516 DM 4.16.

improperly to defer decisions and allow projects to proceed without adequate analysis of their impacts.

To help clarify these issues, the White House Task Force on Energy Project Streamlining **("Streamlining Task Force")** is currently preparing its own adaptive management guidance document specific to energy-related activities for public release.[63] The Streamlining Task Force is independent from CEQ's NEPA Task Force and was established by the May 18, 2001 Executive Order addressing the National Energy Policy.[64] The Task Force is also seeking to integrate BLM's APD permit streamlining policies including geographic NEPA analysis into these adaptive management guidelines.[65]

EXAMPLES OF ADAPTIVE MANAGEMENT MODELS APPLIED TO OIL, GAS AND ENERGY-RELATED DEVELOPMENT

Until recently, adaptive management has been applied to complex-multi-resource ecosystem planning, rather than to single resource uses such as oil and gas development. Federal land managers have applied mitigation measures to oil and gas operations in the form of federal lease stipulations, conditions of approval to the APD and through the HCP that is a condition to issuance of an ITP. Traditionally, mitigation plans are developed primarily by the government in consultation with industry at two stages of approval: (1) mitigation measures developed in conjunction with the land use planning and oil and gas leasing phase; and (2) site-specific mitigation measures developed through site-specific project level NEPA analysis.[66]

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63 Telephone interview, January 15, 2004, with Diana Whittington, Streamlining Task Force.

64 Exec. Order No. 13212, 66 Fed. Reg. 28, 357 (May 18, 2001), on the web at http://ceq.eh.doe.gov/nepa/regs/executiveorders.html.

65 Telephone interview, Diana Whittington, note 69

66 *See* discussion *infra* at Section III herein.

A. Continental Divide/Wamsutter II Natural Gas Project

The BLM and the Wyoming oil and gas industry were first introduced to the more complex adaptive management process by the Environmental Protection Agency (**"EPA")**. The concept was proposed in EPA's comments on the proposed Continental Divide/Wamsutter II Natural Gas Project, Sweetwater and Carbon Counties, Wyoming.[67] Rather than depending upon communications between BLM and the operators, EPA recommended that BLM adopt a formal adaptive environmental management plan to ensure implementation of mitigation measures.[68] EPA recommended three models of adaptive management: reactive, passive and active.[69] The reactive model involves one intra-agency technical work group composed of BLM and cooperating governmental agencies tasked to monitor selected key ecosystem indicators. Mitigation plans would be developed by the governmental group, subjected to "independent scientific review" and provided for comment to stakeholders and the public. The passive model includes two technical work groups, the original intra-agency governmental group and an extra-agency group of independent scientists and economists. The governmental group would develop a management approach for monitoring environmental conditions and proposed resource management plans. The independent group would propose monitoring of pristine conditions and means to monitor changes to these conditions. Both groups' work would be subject to peer review by the National Academy of Sciences and subject to stakeholder and to public review. The active model involves three technical groups, the intra-agency governmental group, the

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[67] *See* BLM Rawlins and Rock Springs Field Offices, Continental Divide/Wamsutter II Natural Gas Project, Sweetwater and Carbon Counties, Wyoming, ROD, EIS, Appx. H-5-6 and H-10 (May 2000); FEIS, Continental Divide/Wamsutter II Natural Gas Project, Section 7.2.93.1, Letter 93--Cynthia Code, USEPA, (Dec. 1999).

[68] *Id.,* FEIS, Section 7.2.93.1; citing R.A. Carpenter, "The Case for Continuous Monitoring and Adaptive Management Under NEPA," Environmental Policy and NEPA, R. Clark and L. Carter ed., St. Lucie Press, 1997, pgs. 163-180.

[69] *Id.*

independent panel of scientists and economists and a third group of contract environmental consultants, which conduct peer review on the effectiveness of mitigation measures to achieve non-degradation and reclamation objectives.[70] BLM's Continental Divide FEIS rejects all three EPA models, narrowly defining adaptive management as "changed mitigation actions" incorporated into a reclamation plan, transportation plan and wildlife protection plan.[71]

B. Pinedale Anticline Oil and Gas Exploration and Development Project

Adaptive management was more fully embraced by the BLM Pinedale Field Office in approving the Pinedale Anticline Oil and Gas Exploration and Development Project, Sublette County, Wyoming.[72] BLM's ROD selected a restrictive resource protection alternative to limit well pad density, utilize centralized production facilities and impose restrictive site-specific mitigation requirements.[73] Referring to EPA's adaptive management models from the Continental Divide Project, BLM initially chose the "passive" model involving: (1) an intra-agency technical work group of BLM cooperating agency scientists and economists; and (2) an extra-agency work group of independent scientists and economists.[74] The ROD expanded the adaptive management plan originally proposed in the DEIS by adopting adaptive management "teams" which are more collaborative and less technically oriented, comprised of citizen groups, BLM, cooperating governmental agencies and operator representatives rather than utilizing primarily scientists and economists.[75] The teams are not divided into strictly government and non-government groups, but rather include a cross-section of both divided into an "oversight"

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70 *Id.*

71 Continental Divide FEIS, § 7.2.93.2 at 7-124 (Letter 93, comment response), Dec. 1999.

72 BLM Wyoming State Office, BLM Pinedale Field Office, Pinedale Anticline Oil and Gas Exploration and Development Project, DEIS at 1-2, Nov. 1999 (**"Pinedale DEIS").**

73 Pinedale DEIS at ch. 2; Pinedale ROD/EIS at 1, July, 2000.

74 DEIS at § 2.11, pg. 2-52.

75 Pinedale ROD, App. C.

working group and "task groups" for each mitigation plan. This adaptive management process was applied to mitigation plans for: reclamation, wildlife, water resources, cultural resources, air quality and transportation.[76] BLM candidly acknowledged in the ROD that it lacked funding to implement these plans and stated "the majority of costs to implement these monitoring programs will have to be borne by the operators."[77] In response to a federal district court challenge filed by Yates Petroleum Corporation ("**Yates**")[78], the Pinedale Field Office adopted a charter detailing the purpose, composition and funding sources of the adaptive management teams under the Federal Advisory Committee Act ("**FACA")**.[79] Although the charter has been approved, the representatives appointed to the task groups have yet to be confirmed by the DOI.[80] In the meantime, operators have continued to develop traditional monitoring plans with the BLM and cooperating agencies and to report monitoring results consistent with those plans.[81]

C. Jack Morrow Hills Coordinated Activity Plan ("CAP")

The BLM Rock Springs Field Office proposed an anomalous adaptive management process in January 2003 in the Supplemental DEIS for the Jack Morrow Hills CAP/Draft Green River RMP Amendment.[82] The Green River RMP adopted in October 1997, deferred for further study fluid mineral leasing issues regarding the Jack Morrow Hills (JMH) area in Southeastern Wyoming.[83] The CAP will extend resource and land use decisions of the RMP into site-specific management decisions for the JMH area, a small geographic area within the Green River RMP.

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76 *Id.*

77 *Id.* at C-5.

78 *Yates v. Norton,* 00-CV-206J (D.Wyo. filed Nov. 6, 2000); FACA, 5 U.S.C.A. App. 2 (2002).

79 Pinedale Anticline Working Group and Task Groups Charter, Aug. 15, 2002.

80 Telephone interview, Diana Whittington, note 69.

81 Telephone interview, Gene George, Yates' Consultant, Nov., 2003.

82 Supplemental DEIS for Jack Morrow Hills CAP/Draft Green River RMP Amendment, BLM Rock Springs Field Office, Jan. 2003, on the web at http://www.wy.blm.gov.

83 *Id.* at § 1.3 Purpose and Need, p. 1-2.

Oil and gas leasing decisions were deferred throughout the 622,000 acres JMH study area, including two areas of critical environmental concern (ACECs) for the Greater Sand Dunes ACEC, the Steamboat Mountain ACEC and overlapping big game habitats. BLM determined that adaptive management should be used in the CAP due to the "speculative nature of use, exploration and development" in that area . . . "in particular, the extent and nature of mineral reserves."[84] The Rock Springs Field Office defines adaptive management as, "a systematic process for continually improving management policies and practices by learning from the outcomes of actions over time."[85] However, as initially proposed, industry is concerned that the process abrogated valid existing lease rights by utilizing a staged approach to leasing and development through protracted lease suspensions initiated by the agency.[85.1]

1. Six Adaptive Management Steps

Although industry views BLM's application of active adaptive management to the JMH as overly restrictive, the supplemental DEIS provides some insight into the adaptive management process. The BLM proposes to apply adaptive management to the JMHCAP in six steps: (1) planning; (2) design; (3) implementation; (4) monitoring; (5) evaluation; and (6) adjustments.[86] During planning and design stages, the scope of the management problem, objectives and actions are defined. Key indicators for each management objective are identified and a management plan and monitoring programs are designed. The BLM initiated the planning stage by development of the preferred alternative under the supplemental DEIS, including development of a preliminary list of resource indicators. Under the preferred alternative BLM

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84 JMH CAP SEIS, note 88, App 17 – Preliminary Adaptive Management Implementation Strategy at A17-1.

85 *Id.*; BLM Rock Springs Field Office follows the definition developed by Nyberg; *see* note 1.

85.1 By letter dated February 3, 2004, the Petroleum Assn. of Wyoming urged BLM to recognize valid existing lease rights in all management areas.

proposed to use an adaptive management approach to determine whether to remove existing lease suspensions within portions of the JMH and allow new oil and gas leasing.[87] Until monitoring demonstrates compliance with specific resource indications, existing leases are held in suspense in the interest of conservation of natural resources pursuant to 43 C.F.R. § 3103.4-4.[88]

2. Oil and Gas Development within Management Areas

BLM's strategy to implement adaptive management initially called for dividing the JMH planning area into three areas. One management area would be open to oil and gas activities including drilling on existing leases and new leasing and development. A second management area would allow activity on existing leases but only allow new leasing with stipulations that are consistent with the goals of the JMH CAP. The third and most restrictive management area would continue to suspend existing leases and allow no new leasing until adaptive management monitoring demonstrates that activities can occur within acceptable parameters identified in JMH CAP.[89] The lifting of lease suspensions in this area would be considered only on a case-by-case basis. The petroleum industry views this application of adaptive management as unduly restrictive and violative of valid existing lease rights.[89.5]

3. Resource Indicators: Monitoring and Evaluation

The BLM is developing adaptive management resource indicators tied to oil and gas leasing, phased development, wildlife, transportation, recreation use and rangeland health. The

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86 *Id.*

87 *Id.* at p. A-17-3.

88 Under 43 C.F.R. § 3103.4-4(b) (2002) the term of the suspended lease is extended by the period of suspension and no lease shall be deemed to expire during suspension.

89 *Id.* at A17-4; *see* map A17-1, Adaptive Management Implementation.

application of adaptive management to a single resource in these areas is viewed by industry as overly burdensome and inappropriate because oil and gas is not the only activity potentially affecting resources of concern. However, industry does support development of science-based resource indicators as the basis for monitoring and future decisionmaking. These resource indicators are recognized as key to the entire process because they will become the measurable, science-based attributes upon which future decisions will be based. Within the planning area, these resource indicators reflect elk distribution, elk numbers, mule deer distribution, mule deer numbers, standards for healthy rangelands, roads and trails recreation, road density, changes in the stability of the Greater Sand Dunes, disruptive activity and surface disturbance and recreational use.[90] Certain standards already contain specific indicators, which will be applied by BLM such as those developed for healthy rangelands and livestock grazing.[91]

Following adoption of the ROD, a list of resource indicators will be finalized and a specific monitoring plan will be developed and implemented for each indicator to determine the cumulative oil and gas effects of development on habitat and uses by native wildlife, public health and safety and other resources. The BLM Team will review monitoring results once a year with adjustments to management decisions as necessary.[92] The BLM Management Team is composed of governmental agencies, but contemplates the development of a public participation plan for the adaptive management strategy. The FEIS and ROD for JMH CAP have yet to be finalized by BLM.

89.5 Letter dated Feb. 3, 2004, the Petroleum Assn. of Wyoming, note 91.5.

90 *Id.,* Table A17-1 Resources Indicators.

91 JMH CAP SEIS, note 88 at App. 10.

92 *Id.,* note 1 at A-17-7.

D. RMP Revisions for the Powder River Basin

BLM's recently revised RMPs for the Montana and Wyoming Powder River Basin utilize a more conventional monitoring process implemented by an intra-agency governmental work group. Under the new oil and gas leasing analysis, BLM, USFS and cooperating federal agencies have developed RFD scenarios for coal bed methane ("**CBM**") development.[93] Although the Montana FEIS proposed a preferred alternative subjecting CBM leasing to resource protection requirements on both a site-specific and ecosystem-specific basis, the ROD narrowed the RMP to site-specific application.[94] On April 30, 2003, the BLM issued RODs amending RMPs within the Powder River Basin **("PRB")** in Wyoming and Montana to allow leasing on the basis of the new RFD scenarios.[95] The RFD scenario for the Buffalo and Platte River RMPs forecast 51,000 CBM wells over the next ten years. The RMPs are amended to specifically address CBM development and to adopt new operational requirements and mitigation measures to reduce the impacts of CBM activities.[96]

The RFD scenario for the Powder River and Billings RMPs forecast drilling 4,500-15,600 CBM wells.[97] These new RFD thresholds also result in new mitigation requirements. The PRB FEIS lists standard lease terms and conditions applied by BLM and the USFS to oil, gas and CBM development.[98] The ROD for the Montana FEIS and RMP amendments requires monitoring of: (1) the land use plan implementation; (2) site-specific implementation of

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93 PRB FEIS, BLM Jan. 2003; Montana FEIS, released by BLM, Dec. 2002.

94 Montana FEIS, n. 22, ch. 2, SUM-6.

95 ROD and RMP Amendments for the PRB Oil and Gas Project (Apr. 17, 2003); ROD for the final Statewide Oil and Gas EIS and Proposed Amendment of the PRB and Billings RMPs (Apr. 17, 2003).

96 ROD and RMP amendments for PRB Oil and Gas Project, at 1, 6; *see, e.g.,* CBM Programmatic Wildlife Monitoring and Protection Plan, Statewide Oil and Gas EIS and Proposed Amendment of PRB, Billings RMP.

97 Montana FEIS Vol. II at MIN-5, MIN-6.

98 PRB FEIS App. P, review of leases, lease notices and lease stipulations.

projects, and (3) resources impacted by oil, gas and CBM development.[99] A resource monitoring table attached to the ROD as Appendix C lists a series of resources which must be monitored, including air quality, water quality, wildlife and cultural resources. The ROD then establishes an interagency work group for CBM development. Affected federal, state and local governments are to appoint representatives to work with BLM in the PRB to develop monitoring and mitigation measures to assure plan compliance.[100] As set forth below, this interagency work group includes both the Wyoming and Montana PRB, termed the Powder River Basin Interagency Work Group on Coalbed Natural Gas Development ("**PRB IWG**").

The ROD for the Wyoming PRB FEIS adopts a comprehensive mitigation monitoring and reporting plan ("**MMRP")** incorporated into the ROD at Appx. E. The MMRP states that due to the uncertainties associated with CBM development, "mitigation measures may need to be modified as development evolves."[101] Consistent with the ROD, the BLM Buffalo Field Office Manager has implemented the MMRP by establishing a charter under a memorandum of understanding ("**MOU**") for the PRB IWG.[102] The PRB IWG MOU proposes to provide a forum for local, state, tribal and federal government agencies to discuss issues of common concern regarding CBM permitting and monitoring. The charter defines the overall mission of the work group as including the development of best management practices and monitoring of the impact of CBM activities and assessment of the effectiveness of mitigation measures. The geographic scope of work to be addressed by the group is defined as the Powder River Basin within Montana and Wyoming[103] and sub-groups have been established for each state. The BLM Buffalo Field Manager leads the Wyoming working group and the Montana working group is headed by the Miles City Field Manager. The working groups oversee three task groups on

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99 ROD Montana FEIS, at 11.
100 ROD Montana FEIS, at 14.
101 ROD PRB FEIS, Appx. E, E-1.
102 PRB IWG MOU and Charter, Dec. 2003.
103 *Id.*

specific resources, including water resources, air resources and wildlife resources to assess existing monitoring plans and develop new monitoring plans where necessary.

Of particular interest is the task group on wildlife resources, which will develop a wildlife monitoring and protection plan based on the Montana plan (which is already in effect), addressing the species and habitats outlined in the ROD. The wildlife task force will develop key indicators triggering additional actions, develop a monitoring protocol to assess reclamation/restoration habitat and provide technical assistance on wildlife issues as requested.[104] The next phase of API's adaptive management project undertaken by Larry D. Hayden-Wing, Ph.D., will focus on developing monitoring protocols for wildlife resources that could be proposed to the PRB IWG and other land managers.

APPLICATION OF ADAPTIVE MANAGEMENT AND COMPARISONS WITH CEQ PROPOSALS TO REVISE NEPA REGULATIONS

As set forth above, the adaptive management process in its "active" form compares a variety of management programs and has been applied to monitor complex, multi-resource ecosystems.[105] By contrast, industry is contemplating a straightforward approach to adaptive management. Under this simplified approach, agencies would use adaptive management to test the effectiveness of their land management plans, oil and gas policies, and mitigation requirements. Adaptive management would require the use of science-based monitoring protocols, monitoring on the basis of these standards, reporting of monitoring results and, most importantly, changing management decisions on the basis of this data.[105.5]

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[104] Charter, Dec. 9, 2003, Appx. 3, Task Group on Wildlife Resources.

[105] Barry L. Johnson, "The Role of Adaptive Management as an Operational Approach for Resource Management Agencies," Conservation Ecology Vol. 3, Issue 2, Article 8, 1999, on the web at http://www.consecol.org/vol3/iss2/art8. *See* K. N. Lee, Appraising Adaptive Management, note 50; *See also*, C. Winters, note 48.

[105.5] *See* discussion at pp 1-2 and note 2.

NEPA remains an obstacle to implementing adaptive management. Adaptive management has been applied only recently, and haphazardly, in the context of NEPA analyses of "major federal actions" involving large-scale oil and gas projects. As discussed below, neither NEPA nor the CEQ rules have been amended to specifically authorize adaptive management. Therefore, at present, adaptive management is only authorized in conjunction with laws other than NEPA that require post-decision monitoring of effects to resources such as air or water quality. These provisions include mitigation measures traditionally applied to oil and gas operations in the form of federal lease stipulations, environmental permit conditions, APD conditions of approval and terms of the HCP that condition an ITP. However, if adaptive management is contemplated by an agency to test alternative policies, after project approval and consistent with NEPA, alternatives must be fully addressed in the NEPA analysis. As set forth below, the CEQ NEPA Task Force has recommended guidance and rule changes which, if adopted, may more clearly define when adaptive management may be most appropriately applied within the constraints of NEPA.

A. CEQ Proposals to Apply Adaptive Management to NEPA

NEPA is a procedural statute requiring federal agencies to address the significant environmental impacts of a "major federal action" prior to making a decision.[106] Under CEQ's regulations, and the NEPA procedures of federal land managers, mitigation measures not otherwise included in the proposed action or alternatives, must be identified in an environmental assessment ("**EA**") or environmental impact statement (**"EIS"**). This information must be available to the public and the agency before the decision is made or any action is taken. *See* 40

[106] NEPA § 102(2)(C); 42 U.S.C.A. § 4332(2)(C) (2003); *See Vermont Yankee Nuclear Power Corp. v. Natural Res. Def. Council*, 435 U.S. 519, 558(1978) (holding that the enforceable requirements of NEPA are "essentially procedural").

C.F.R. § 1500.1(b).[106.5] As set forth above, mitigation measures regarding oil and gas development are identified as the result of NEPA analysis at both the land use plan stage (prior to leasing) and the site-specific phase (prior to permitting and drilling). BLM is also undertaking project-level decisionmaking within proposed or defined oil and gas fields and grouping APDs on a geographic basis to allow consideration of cumulative impacts and to streamline NEPA analysis.[107] Mitigation measures identified in the EA or EIS are enforced as lease stipulations, conditions of approval that are attached to permits, or in connection with an HCP to obtain an ITP under the ESA, but not as the result of NEPA.[108] The courts have reinforced that NEPA is a procedural statute and does not require that an agency actually implement such mitigation measures following its final decision. *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350-353 (1989).

By contrast, the CEQ is proposing adaptive management as a means to require the development and implementation of mitigation measures after project approval, although NEPA itself remains a pre-decisional procedural statute.[109] The statutory authority cited for continuous monitoring and assessment under NEPA is relatively vague.[110] Section 102(2)(B) of NEPA calls for "methods . . . which will insure that presently unquantified environmental amenities and values may be given appropriate consideration." In addition, CEQ rules at 40 C.F.R. § 1505.2(c)

106.5 An EA provides analysis to determine whether a full EIS or a finding of no significant impact ("**FONSI**") is required. 40 C.F.R. §§ 1501.4, 1508.9. Public review of the EA or FONSI is not generally required, although public notice of availability is required. 40 C.F.R. §§ 1501.4(e), 1506.6. Public notice and comment is required for the DEIS and FEIS. 40 C.F.R. §§ 1508.22, 1502.19.

107 IM No. 2003-152, April 16, 2003, APD Process Improvement (Geographic NEPA), on the web at www.blm.gov/nhp/efoia/wo/fy03/im2003-152.htm.

108 40 C.F.R. § 1505.

109 *See* recommendations of the CEQ Task Force Report, Ch. 4, "Adaptive Management and Monitoring," on the web at http://ceq.eh.gov/ntf/report. *See* discussion at V. herein.

110 Authority for adaptive management cited by BLM in ROD, EIS for the Pinedale Anticline Project, App. C, Pinedale Field Office, July 2000; SDEIS for Jack Morrow Hills Coordinated Activity Plan/Draft Green River RMP Amendment, BLM Rock Springs Field Office, Jan. 2003, App 17 at A17-6.

provide that if mitigation plans are required in a final agency action, "a monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation." However, in the context of oil and gas development, mitigation measures are generally enforced as permit conditions of approval or lease stipulations under authorities other than NEPA. *See* 40 C.F.R. § 1505.

The CEQ Task Force is currently seeking to develop a definition of adaptive management for inclusion at 40 C.F.R. Part 1508 of the CEQ rules. The CEQ Task Force is also proposing to amend its rules and adopt guidance to integrate adaptive management into the NEPA process as follows:

- 40 C.F.R. § 1502.14, 1505.1(e): include adaptive management measures in alternatives discussed in NEPA analysis when the significance of impacts is uncertain;
- 40 C.F.R. § 1502.22(b): use adaptive management when means to obtain data are unknown;
- 40 C.F.R. § 1502.2(c): use adaptive management as a mitigation monitoring and enforcement program; use environmental management systems (EMS) and EMS audits to enforce mitigation and monitoring;
- 40 C.F.R. § 1501.3: use EMS to implement mitigated FONSIs dependent on adaptive management. [111]

CEQ is currently conducting a series of regional roundtable discussions on these recommendations. If CEQ's rules are proposed for amendment to reflect adaptive management policies, the rules will be subject to further public notice and comment.

B. Resolve Uncertainty Regarding the Significance of Impacts

CEQ is proposing to amend its rules at 40 C.F.R. § 1502.14 or adopt guidance to allow agencies to apply adaptive management where alternative impacts identified in an EA or EIS

"involve uncertainty in the ability to predict the significance of impacts."[112] CEQ has recognized that adaptive management is not applicable to all decisions and should not be used by agencies to defer decisionmaking. Decisions involving the need to predict impacts to multiple resources over a long period will require monitoring and adaptive management. When adaptive management is applied, the approach requires a more detailed analysis of alternatives and a complex decisionmaking process. In such cases, alternatives discussed in the NEPA analysis should fully address the scope of each alternative adaptive management measure.

For example, the USFS used adaptive management in the Sierra Nevada Forest Plan EIS and ROD to address the long-range impacts of the Forest Plan that could not be predicted at the time the EIS was prepared.[113] The Sierra Nevada Forest Plan EIS sets forth a range of scenarios anticipating alternative impacts that might be observed during mitigation monitoring. If significant impacts not analyzed in the alternative impact scenario are detected in later monitoring, then a supplemental or new EIS must be prepared. However, if the impacts remain within the parameters of the alternatives reviewed in the EIS, supplemental NEPA analysis would not be required. *See* 40 C.F.R. § 1505.1(e). In addition, adaptive management was well suited to the Forest Plan because the NFMA authorizes continuous monitoring and the USFS has specifically defined the term "adaptive management" in this context.[114]

Similarly, as discussed earlier, adaptive management was recently applied by the BPA in a regional FWIP for the Columbia River Basin.[115] The EIS for this ROD was detailed and

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111 CEQ Task Force Report at 4.7, p. 55-56.

112 *Id.* at 46.

113 Regional Forester of Pacific Southwest Region, Intermountain Region, U.S. Forest Service, Dep't. of Agriculture, Sierra Nevada Forest Plan DEIS, June 4, 1999; Sierra Nevada Forest Plan Amendment ROD, June, 2001.

114 36 C.F.R. §219.36 (2000).

115 BPA FWIP ROD, Oct., 2003, n. 38.

complex, describing five different policy direction alternatives with a variety of sample implementation actions which could be taken consistent with a given policy direction. This comprehensive adaptive management strategy was authorized under the Pacific Northwest Electric Power Planning and Conservation Act, the CWA and the ESA and utilized only when other regional planning efforts had failed.[116]

C. Address Incomplete Data

CEQ also suggests that its rules be amended to allow adaptive management to substitute for the use of theoretical approaches or research when data necessary to evaluate the significance of impacts is incomplete or unknown. *See* 40 C.F.R. § 1502.22. Under the current CEQ rules, agencies must summarize and evaluate available, credible scientific evidence in determining reasonably foreseeable significant adverse effects. *Id.* The proposal to change this rule would allow the monitoring of actual impacts after a decision to proceed with a project. Rather than relying on theoretical models to predict impacts prior to approval, "in field" monitoring results would be used to confirm that significant adverse impacts have not occurred. If monitoring revealed significant impacts beyond those authorized in the EIS and ROD, an SEIS would be prepared. The Energy Streamlining Task Force is currently drafting agency guidance discouraging the use of adaptive management to defer decisionmaking in the absence of data and to assist agencies to determine when it is more appropriate to utilize models or scientific theories to reach a decision.[117]

The Glen Canyon Dam Adaptive Management Program presents an example of the type of scientific uncertainty and data gap that may justify application of adaptive management. The

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116 *Id.* at 14.

117 Telephone interview, Diana Whittington, note 69.

Bureau of Reclamation ("**BOR**") is using an adaptive management process to analyze the experimental release of large quantities of water from Glen Canyon Dam to determine the downstream ecosystem impacts. The release of water was proposed as a means of rebuilding riparian habitat in the Grand Canyon and was accompanied by a substantial monitoring effort. Adaptive management[118] is specifically authorized for this program by § 1802 of the Grand Canyon Protection Act, 102 P.L. 575.

D. Post-Decision Enforcement

CEQ is also considering rule changes to allow use of adaptive management as a "mitigation, monitoring and enforcement" program under 40 C.F.R. § 1505.2(c). Under the current rules, if mitigation measures are incorporated into an EIS and final ROD, "a monitoring and enforcement plan shall be adopted . . . where applicable for any mitigation." Further, CEQ rules provide that agencies "may monitor to assure their decisions are carried out" 40 C.F.R. § 1505.3 (emphasis added). Notably, although CEQ's recommendation is preliminary, the DOI has already revised its NEPA guidance to require that its bureaus and agencies "[s]hall use adaptive management (*see* 516 DM 4.16) to fully comply with 40 C.F.R. § 1505.2 which requires a monitoring and enforcement program to be adopted, where applicable, for any mitigation activity."[119] Therefore, it appears that DOI's guidance would require BLM and other agencies to use adaptive management when a monitoring and enforcement plan is adopted in the ROD. As indicated above, CEQ has acknowledged that adaptive management is not appropriate for all agency decisions.

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118 *See* Charter, Glen Canyon Dam Adaptive Management Task Group, note 4.

119 NEPA Revised Implementing Procedures, 1.3.D.(7), 69 Fed. Reg. 10,866 at 10,873-74 (Mar. 8, 2004).

NEPA itself does not incorporate a private right of action to enforce its terms or the mitigation measures identified in the EA or EIS. Under current CEQ rules, mitigation is imposed by the agency decision through "appropriate conditions in grants, permits or other approvals." 40 C.F.R. § 1505.3(a)(b) (2003). Therefore, currently statutes other than NEPA must be relied upon to enforce the mitigation plan. For instance, by contrast to NEPA, the ESA specifically mandates implementation of mitigation plans as a condition to issuance of the ITP. While a NEPA analysis is used to identify impacts of the ITP, the HCP specifies the monitoring measures an applicant must implement after the decision is made to issue the ITP under § 9 of ESA.[120] In addition, both FLPMA and NFMA contemplate a science-based approach to develop and continuously update RMPs and Forest Plans.[120.5]

Incorporation of adaptive management into CEQ's rules and DOI's guidelines may give NEPA substantive "teeth" which it does not presently have. Adaptive management allows projects to proceed conditioned upon the post-decision monitoring of impacts and contemplates that significant impacts not anticipated in the initial NEPA analysis will require additional review in a supplemental EIS ("SEIS"). Where an agency commits to preparing an SEIS in the EIS and ROD, the threat of an SEIS could become an enforcement tool. In this regard, adaptive management may be problematic when applied to USFS's two-stage decisionmaking process governing oil and gas leasing requiring NEPA analysis first at the determination of lands availability stage and once again at the specific lands leasing decision stage. If the adaptive

120 ESA § 10(a)(1)(B); 16 U.S.C. § 1539(a)(1)(B) (2003); 50 C.F.R. § 17.22(b)(1)(iii)(A)(B).

120.5 § 202(c) FLPMA, 43 U.S.C. § 1712(c); § 6(b) Forest and Rangeland Renewable Resources Act, 16 U.S.C. § 1604(b).

management process is applied after the agency's final leasing decision and monitoring shows a significant impact deviating from the alternative predicted, an SEIS may be required. [121]

Unless carefully applied, the use of adaptive management as a post-decision monitoring and enforcement tool could prove disruptive and contravene valid existing lease rights. The U.S. Supreme Court has recognized federal oil and gas leases as contract rights granting definitive well field development rights. *Mobil Exploration v. U.S.,* 503 U.S. 604 (2000). Once BLM issues an oil and gas lease, the agency cannot unilaterally change the terms or conditions of the contract.[121.5] Therefore, the Energy Streamlining Task Force is preparing guidelines encouraging agencies to "front-load" the EA or EIS with adequate information to address the full range of alternative impacts and alternative adaptive management approaches that may result from post-decision monitoring. The guidelines will emphasize the substantial responsibility expected of federal agencies to develop a full range of alternatives necessary to avoid subsequent NEPA analysis.[122]

E. Application of Adaptive Management to EAs and Mitigated Findings of No Significant Impacts ("FONSIs")

The CEQ Task Force confirms the increasing use of mitigated FONSIs[123] and suggests the possible use of adaptive management in an EA supporting a mitigated FONSI.[124] Adaptive management may be applied to EAs which use mitigation plans to avoid significant impacts.[125]

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121 *See e.g.,* Pinedale Resource Management Plan, FEIS at 8 (1987); by contrast, EPA has suggested that new adaptive management options be incorporated by BLM into the APD. Comment letter from EPA Regional 8, Pinedale Anticline DEIS, FEIS Pinedale Findings (May 2000) at 5.

121.5 BLM may only impose additional mitigation measure consistent with lease rights previously granted to an operator and has determined that relocation of proposed operations of up to 200 meters, or timing limitations of up to 60 days, are consistent with granted lease rights. I.M. 92-67, dated December 5, 1991.

122 Telephone interview, Diana Whittington, note 69.

123 While some 50,000 EAs are prepare annually, only 500 EISs/year are prepared. CEQ Report, 19.

124 CEQ Task Force Report at 55.

125 Bradley C. Karkkainen at n.1.

These mitigated EAs are often accompanied by the agency's FONSI approving the proposed action. Courts have held that if an EA requires mitigation to reach a FONSI, mitigation measures may be enforced after issuance of the agency decision.[126] By contrast, if the agency prepares a full EIS, it must identify mitigation measures, but is not required by NEPA to implement the measures.[127]

F. Use of EMS in Adaptive Management

Although not currently mandated by federal law, the CEQ Task Force Report strongly recommends use of the Environmental Management Systems ("**EMS**") as an approach to implementing mitigation plans.[128] The EMS is a voluntary and relatively complex system of record keeping, training and management for pollution prevention and waste reduction programs.[128.5] International EMS standard ISO 14001 and the EMS audit standard ISO 19011 are suggested by CEQ as a means to enforce mitigation plans. ISO 14001 is even suggested as a substitute for part or all of the mitigation plan. CEQ Chairman Connaughton has also supported this concept in his presentation to the Rocky Mountain Mineral Law Foundation in San Diego, California.[129] The CEQ Chairman explains that EMS maximizes NEPA's goal of integrated decisionmaking in six steps: (1) the entity must identify the key components of its activities that interact with the environment; (2) policies, objectives and targets are established for each such aspect; (3) procedures for accomplishing these objectives are identified; (4) procedures must be communicated to those who implement them; (5) the procedures must be implemented, then monitored and audited; and (6) the entity must review the EMS periodically, correct deficiencies

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126 *See e.g., Maryland-Nat'l Capital Park & Planning Com'n v. U.S. Postal Service,* 487 F.2d 1029 (D.C.Cir. 1973); *Cabinet Mountains Wilderness v. Peterson,* 685 F.2d 678 (D.C. Cir. 1982).

127 *Robertson v. Methow Valley Citizens Council,* 490 U.S. 332, 350-353 (1989).

128 40 C.F.R. § 1508.9.

128.5 Int'l Org. of Standardization, "Business Benefits of ISO 14000," on the web at http://www.iso.ch/isolen/iso9000-140001/tour/benef.

and identify opportunities for improvement.[130] In response to this proposal, it is important to note that EMS is not a legal requirement of the oil and gas industry in the United States. Such systems have been developed and institutionalized by many operators, and as such, this model may be considered a "best practice." However, the ISO 14001 does provide a concrete model for implementation and may be explored by industry as a possible substitute for a less defined and more burdensome implementation plan.

G. Appropriate Use and Funding of Adaptive Management Work Groups

As initially developed and applied by the USFS, adaptive management was designed to be science-based with a strong reliance on technical work groups to develop and review monitoring plans. The three models of adaptive management proposed by EPA to the Wyoming BLM are also all technically-based, involving governmental agencies, to develop monitoring and implementation plans, independent review by a panel of scientists further subject to peer review by the National Academy of Sciences, and monitoring by environmental consultants.[131] By contrast, the CEQ and DOI have proposed less technical, more collaborative work groups. The CEQ Task Force recommends a collaborative adaptive management process involving affected agencies, regulators and stakeholders.[132] The DOI has also adopted procedures for implementing "consensus-based" management in agency planning and operations.[133] This policy requires "direct community involvement in bureau activities subject to NEPA analyses, from initial scoping to implementation."[134] In addition, DOI's March 8, 2004 revisions to its NEPA

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129 James L. Connaughton, note 63.
130 *Id.* at 2-21 to 22.
131 Continental Divide ROD EIS, note 73.
132 CEQ Task Force Report, Ch. 2 at 24; Ch. 4.3.2 at 51.
133 DOI Environmental Statement Memorandum No. ESM03-7, July 2, 2003.
134 *Id.* at 1.

implementing procedures[135] suggest a further objective "to achieve early consensus on the scope of NEPA compliance and the methodologies for collecting needed baseline data."[136]

The composition and function of adaptive management work groups must be carefully constructed to avoid improper delegation of governmental authority under NEPA and to prevent undue influence by stakeholders consistent with FACA.[137] Under current CEQ rules, issues regarding the EIS alternatives analysis, baseline data collection and development and implementation of monitoring plans are the responsibility of the lead agency and cooperating agencies and cannot be delegated to the public or stakeholders.[138] The Federal Advisory Committee Act ("**FACA**") seeks to reduce the influence of special interest groups on federal agencies, keep decisionmaking open and control costs.[139] Therefore, adaptive management work groups that include non-federal agency members must have an approved charter defining the formation of the committee, its membership and funding sources.[140]

BLM's proposed collaborative adaptive management work groups in the Pinedale Anticline were challenged by one operator as an improper delegation of governmental responsibilities.[141] Although this lawsuit was ultimately settled following BLM's acquisition of a FACA charter, the collaborative model of the work groups raised serious concerns. Although nominally subject to BLM oversight, these stakeholders were authorized to prepare and oversee the implementation of monitoring plans for reclamation, wildlife, water resources, cultural

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135 69 Fed. Reg. 10,866, Mar. 8, 2004.

136 516 DM 2.2D, 69 Fed. Reg. 10,876, Mar. 8, 2004.

137 *See* Bruce Shindler, "Monitoring and Evaluating Citizen – Agency Interactions: A Framework Developed for Adaptive Management" USFS, General Tech. Rpt. PNW – GTR – 452, April, 1999.

138 40 C.F.R. § 1501.5 (lead agencies), § 1501.6 (cooperating agencies), § 1501.2 (record of decision), § 1505.3 (implementing the decision), § 1506.5 (agency responsibility).

139 5 U.S.C. App. 2 (2003).

140 5 U.S.C. App. 2 § 2(b)(4) (2003); BLM H-1601, App. B at 4.

141 *Yates v. Norton,* 00-CV-206J (D. Wyo. filed Nov. 6, 2000).

issues, air quality and transportation.[142] Without adequate oversight, operators were concerned that other stakeholders could unduly influence BLM. Further concerns were raised that public stakeholders may not have the technical expertise in these areas and their involvement in implementation and citizen enforcement activities could encourage litigation. Some of these concerns were addressed by the Pinedale Anticline Adaptive Work Group Charter that more clearly defines the work group function, duration, membership, meeting schedule and funding mechanisms.[143]

When citizen representatives are involved in monitoring and evaluation, the governmental agency must maintain oversight and ultimate responsibility for decision-making. The USFS recommends that agency and citizen representatives collaborate as an assessment team to prevent evaluation by one party providing a limited or biased perspective.[144] Information must be tracked across site-specific projects to document cumulative impacts, and must be widely shared among members of the adaptive management team and inter-agency.[145]

A further barrier to implementation of complex adaptive management process is cost.[146] The cost of modeling and monitoring alternative management processes prevented full implementation of the Northwest Forest Plan due to funding cuts in 1998 and these expenses are frequently cited by commentators as an impediment.[147] This issue has been addressed in the context of HCPs by rules requiring the identification of funding sources as a precondition to approval of the ITP. As indicated earlier, the applicant has assurance under the "no surprises"

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142 Pinedale ROD at 14, 15, App. C.
143 41 C.F.R. Part 105-54 (2003); Charter, Aug. 15, 2002, note 85.
144 B Shindler, note 140 at 23-24.
145 *Id.*
146 G.H. Stankey, note 3; C. Walters, note 48, K.N.Lee, note 50.
147 *Id.*

rule that costs will be limited to those necessary to fund identified mitigation plans.[148] No such limitation was proposed by the BLM Pinedale Field Office that suggested that industry would bear the cost of monitoring in the BLM Pinedale Anticline. To avoid the funding problems experienced by the USFS in implementation of the Northwest Forest Plan and to avoid unfairly burdening industry with area-wide monitoring costs, the ROD adopting an adaptive management strategy needs to clearly identify funding sources and a fair means of cost allocation among the parties.

CONCLUSION

In sum, this report seeks to provide the historical, legal and policy context in which adaptive management was developed and describe how it is being applied by federal land managers to regulate oil and gas development. Ecologists first devised adaptive management as a systematic means of employing experimental management programs to compare alternative hypotheses about the system being managed. This "active" model of adaptive management is science-based and has been applied with varying success to complex, multi-resource ecosystem management. A more simplified model of adaptive management appears to be developing. Due to the continuous monitoring and update requirements of Forest Plans and RMPs, adaptive management has been proposed as a means to allow land managers to modify policies in response to monitoring results. In this context, adaptive management may help land managers to identify management objectives and resources of concern and the key measurable resource indicators upon which monitoring plans can be designed and future decisions will be based. These resource indicators must be grounded in science, performance-based and measurable. For example, RFD scenarios based on the number of wells drilled in a planning area should recognize the "net effects" of partially reclaimed production sites, properly plugged and

[148] *See* discussion at II.B.1, HCP and Implentation Agreement.

abandoned wells and reclaimed roads and facility sites. Industry is generally supportive of the simplified approach to monitoring employed by the BLM Craig District Office for the White River RMP. BLM performs annual inspections of reclamation activity and relies on these reclamation results in determining the appropriate level of oil and gas development.

Where adaptive management is appropriate and authorized by law, members of API and Public Lands Advocacy seek to develop an adaptive management process which:

- Allows for the development and funding of a system to track monitoring efforts, reporting results and facilitating information exchange among agencies, i.e. through resource data inventories using Geographic Information Systems;
- Provides a quality control and assurance process to ensure that resource management objectives and acceptable levels of change are clearly stated, science-based and measurable;
- Identifies measurable management objectives for determining when supplemental NEPA analysis may be required; and
- Involves a management team directed and controlled by federal agencies consistent with NEPA and FACA.

The next phase of this study of adaptive management is to develop a range of approaches to adaptive management as applied to wildlife resources on federal lands impacted by oil and gas development. Monitoring protocols will be developed which are science-based and which will provide a basis for adjustment of wildlife mitigation requirements in light of monitoring results.

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