

1 INTRODUCTION

The U.S. Department of the Interior (DOI), Bureau of Land Management (BLM), proposes to amend 12 land use plans in Colorado, Utah, and Wyoming to designate public lands managed by the BLM as available for application for commercial leasing for oil shale or tar sands development. This action is a land allocation decision. This programmatic environmental impact statement (PEIS), prepared pursuant to Section 102 of the National Environmental Policy Act of 1969 (NEPA) (*United States Code*, Title 42, Section 4321 et seq. [42 USC 4321 et seq.]), evaluates the impacts of amending these land use plans to make these land allocation decisions. Prior to issuance of any commercial leases on lands that may be designated as available for application, additional NEPA analysis will be required to analyze the direct, indirect, and cumulative environmental, cultural, and socioeconomic impacts of the proposed lease for development of oil shale or tar sands resources. Another similar NEPA review would also be undertaken before approval of a plan of development on a lease and would include approval of particular activities at the specific location where development would occur. Appropriate stipulations and mitigation measures would be identified as part of both of these additional NEPA analyses.

The BLM administers approximately 258 million acres of public lands and 700 million acres of subsurface mineral estate in the United States. Management of these public lands must be conducted in accordance with the requirements of the Federal Land Policy and Management Act of 1976 (FLPMA) (43 USC 1701 et seq.) and many other public laws. FLPMA requires the BLM to develop land use plans, also called resource management plans (RMPs), to guide the management of the public lands it administers. In order for a commercial leasing program to occur on the public lands, the land use plans for the areas where leasing could occur must be amended to provide for such leasing. This PEIS has been developed to analyze the effects of the amendment of 12 land use plans to allow for the application for commercial leasing for oil shale and tar sands development.

In August 2005, the U.S. Congress enacted the Energy Policy Act of 2005, Public Law (P.L.) 109-58. In Section 369 of this Act, also known as the “Oil Shale, Tar Sands, and Other Strategic Unconventional Fuels Act of 2005,” Congress declared that oil shale and tar sands (and other unconventional fuels) are strategically important domestic energy resources that should be developed to reduce the nation’s growing dependence on oil from politically and economically unstable foreign sources. In addition, Congress declared that both research- and commercial-scale development of oil shale and tar sands should (1) be conducted in an environmentally sound manner using management practices that will minimize potential impacts, (2) occur with an emphasis on sustainability, and (3) benefit the United States while taking into account concerns of the affected states and communities. To support this declaration of policy, Congress directed the Secretary of the Interior (the “Secretary”) to undertake a series of steps, several of which are directly related to the development of a commercial leasing program for oil shale and tar sands. Those steps, contained in paragraphs (d), (e), and (n) of the Act, directed that the Secretary shall:

- “...Complete a programmatic environmental impact statement for a commercial leasing program for oil shale and tar sands resources on public lands, with an emphasis on the most geologically prospective lands in Colorado, Utah, and Wyoming”;
- “...Not later than 6 months after completion of the programmatic environmental impact statement...the Secretary shall publish a final regulation establishing such program”;
- “...Consult with the Governors of States with significant oil shale and tar sands resources on public lands, representatives of local governments in such States, interested Indian Tribes, and other interested persons, to determine the level of support and interest in the States in the development of tar sands and oil shale resources”; and
- “If the Secretary finds sufficient support and interest exists in a State, the Secretary may conduct a lease sale in that State under the commercial leasing program.”
- Land Exchanges – (1)”... To facilitate the recovery of oil shale and tar sands, especially in areas where Federal, State, and private lands are intermingled, the Secretary shall consider the use of land exchanges where appropriate and feasible to consolidate land ownership and mineral interests into manageable areas”; (2) “...identify public lands containing deposits of oil shale or tar sands within the Green River, Piceance Creek, Uintah, and Washakie geologic basins, and shall give priority to implementing land exchanges in those basins.”; and, “a land exchange...shall be implemented in accordance with Section 206 of FLPMA.”

1.1 PURPOSE AND NEED

The BLM proposes to amend 12 land use plans in Colorado, Utah, and Wyoming to describe the most geologically prospective areas managed by the BLM in these states where oil shale and tar sands resources are present, and to decide which portions of those areas will be open to application for commercial leasing, exploration, and development. The BLM proposes to amend these land use plans to provide for the opportunity for application for leasing. The analyses in this PEIS have been developed to evaluate the effects of this proposed action and its alternatives. With the exception of the White River and Book Cliffs RMPs in Colorado and Utah, respectively, the current land use plans in the study area do not address development of oil shale resources. In Utah, the current land use plans do not address the development of tar sands separate and apart from combined hydrocarbon leases (CHLs). Therefore, plan amendments are required to identify those areas that will be available for application for leasing and that can be considered for future exploration and development of these resources. The plan amendments would open the areas in question for leasing. The phrase “available for application for leasing” is used above, and throughout the PEIS, rather than simply “available for leasing” to highlight that,

unlike the BLM's practice with respect to oil and gas leasing, additional NEPA analysis would be required prior to the issuance of any lease of oil shale or tar sands resources.

This *Proposed Oil Shale and Tar Sands Resource Management Plan Amendments to Address Land Use Allocations in Colorado, Utah, and Wyoming and Final PEIS* has been prepared to meet the requirements established by Congress in Section 369 of the Energy Policy Act of 2005. Preparation of this PEIS will comply with the requirements of FLPMA; NEPA; the President's Council on Environmental Quality's (CEQ's) NEPA implementing regulations; the BLM's land use planning regulations contained in Part 1600 of Title 43 of the *Code of Federal Regulations* (43 CFR Part 1600); the BLM's Land Use Planning Handbook (H-1601-1) (BLM 2005); and the BLM's NEPA Handbook (H-1790-1) (BLM 1988a, as revised 2008).

Section 369 of the Energy Policy Act of 2005 also requires that the BLM publish regulations establishing an oil shale and tar sands commercial leasing program. The BLM considered including an analysis of the potential environmental effects of the establishment of the leasing regulations in this PEIS but determined not to do so because development of the regulations involved different issues, was proceeding according to a different schedule, and would be better served by an environmental analysis prepared specifically to consider the rulemaking itself.

1.1.1 Evolution of the Purpose and Need of the PEIS since Publication of the Notice of Intent (NOI)

As described in the December 2005 NOI to prepare this PEIS, the BLM originally intended the PEIS to provide the NEPA analysis and documentation for both the amendment of land use plans and for issuance of commercial leases for the development of oil shale and tar sands resources. As part of the development of the PEIS, the BLM circulated an internal draft of the PEIS to its cooperating agencies for review and comment that included a commercial lease development scenario. Most of the cooperating agencies commented that the BLM's analysis did not contain enough information on the specific environmental, cultural, and socioeconomic effects of such development, and that it would be too speculative at this point to support a decision to issue any commercial leases. Therefore, consideration was given whether specific information was lacking on the effects of oil shale and tar sands leasing and development relevant to making an allocation decision.

Using comparable data, as a result of BLM's experience with surface-disturbing activities from other types of mineral development, the BLM determined that sufficient information on the nature of the effects for an allocation decision was known, but not the extent of the effect necessary to make a leasing decision. Therefore, the BLM decided to limit the scope of the PEIS to an allocation decision and to provide an analysis of potential impacts associated with oil shale and tar sands development in Chapters 4, 5, and 6 to disclose the potential impacts from future leasing and development to the extent currently possible. This analysis discloses potential effects associated with leasing and development to provide the decision maker the available, essential information for making the allocation decision. Because of the limited scope, the PEIS fulfills the requirement to take a "hard look" at the consequences of the allocation alternatives.

Consideration was also given to the possibility of future research, development, and demonstration (RD&D) leases. Section 369(c) of the Energy Policy Act of 2005 authorized the Secretary to make lands available to conduct R&D activities. Evaluating the analysis and potential impacts disclosed in Chapters 4, 5, and 6, the BLM determined that impacts from new RD&D projects are expected to be qualitatively similar to those of commercial oil shale projects, but smaller in scale until an RD&D lease is converted to a commercial lease and expanded to preference right acreage. Accordingly, while, in general, the PEIS refers to lands as being “available for application for commercial leasing,” this means that land that will be open for commercial oil shale leasing will also be open for RD&D leasing. This PEIS does not provide the NEPA analysis for new RD&D leasing or for conversion of RD&D leases to commercial leases.

The BLM also concluded that subsequent NEPA analysis at the leasing stage (whether oil shale, tar sands, or RD&D) will be required to determine the extent of the effect of oil shale and tar sands development when more specific information is known about the technology and associated environmental consequences.

The BLM anticipates that oil shale development would proceed in a three-step decision-making process similar to that used for federal onshore oil and gas: (1) land use planning (i.e., amending RMPs), (2) leasing, and (3) approval of a drilling permit or a plan of development. In the present experimental stage of the oil shale and tar sands industries, however, the BLM believes that the stages of NEPA compliance will be different from those used in oil and gas.

As a result of the maturity of the oil and gas industry, the BLM is usually able to include sufficient site-specific analysis in its NEPA documentation for amendments to RMPs so that an additional NEPA document is not required for issuing an oil and gas lease in conformance with the RMP. Nonetheless, the BLM also prepares a NEPA analysis before approving a plan of development or a drilling permit that would authorize significant disturbance of the leased area. The NEPA analysis for both decision levels includes cumulative effects analysis. Analysis of each oil and gas decision is based on technical information associated with the particular proposed action, as well as information about other reasonably foreseeable future actions in and near the area of the proposal.

In contrast, the present experimental state of the oil shale and tar sands industries does not allow this PEIS for land use plan amendments to include sufficient site-specific information or cumulative impact analysis to support issuance of a lease. Accordingly, prior to any actual oil shale leasing, additional NEPA analysis will be required. That NEPA analysis could result in decisions not to lease in specific areas or to lease in particular areas with stipulations, such as a stipulation precluding disturbance of the surface.

Therefore, the BLM determined to not offer specific parcels for lease on the basis of this PEIS. The BLM believes that this multistep decision-making process would create a balanced leasing program, consistent with the intent of Congress and address the concerns of the cooperating agencies.

As explained above, the BLM will not issue leases for commercial development on the basis of this PEIS. Rather, as explained above, the PEIS is analyzing an allocation decision, the amendment of 12 existing land use plans to designate certain public lands as open for application for future oil shale and tar sands leasing. Under both programmatic oil shale and tar sands alternatives, land use plans would be amended to (1) identify the most geologically prospective oil shale or tar sands resources within each planning unit, (2) designate lands within these most geologically prospective areas as available for application for leasing, (3) identify any technology restrictions, (4) establish requirements for future NEPA analyses and consultation activities, and (5) specify that the BLM will consider and give priority to the use of land exchanges to facilitate commercial oil shale development pursuant to Section 369(n) of the Energy Policy Act of 2005.

If and when applications to lease are received and accepted, the BLM will conduct additional NEPA analyses, including consideration of direct, indirect, and cumulative effects, reasonable alternatives, and possible mitigation measures, as well as what level of development may be anticipated. On the basis of that NEPA analysis of future lease application(s), the BLM will establish general lease stipulations and best management practices (BMPs) and amend those plans, if necessary. After a lease is authorized, actual development will require additional NEPA analysis to address the site-specific conditions of the proposed development and to develop mitigating measures.

1.2 SCOPE OF THE ANALYSIS

The NOI to prepare the *Oil Shale and Tar Sands Resources Leasing PEIS* was published in the *Federal Register* (70 FR 73791–73792) on December 13, 2005 (the title was subsequently changed to the *Oil Shale and Tar Sands Resource Management Plan Amendments to Address Land Use Allocations in Colorado, Utah, and Wyoming and PEIS*). The NOI contained information regarding the need for the project, opportunities for public involvement, supplementary information regarding the project, planning criteria that would underlie the PEIS, and invited the public to comment on the proposed PEIS. Planning criteria are the standards, rules, and other factors used in formulating judgments about data collection, analysis, and decision making associated with preparation of the PEIS. These criteria establish parameters and help focus preparation of the PEIS. The following are the planning criteria that were considered during the preparation of the PEIS and that were included in the NOI for the project:

- A. The PEIS and plan amendments will be completed in compliance with FLPMA and all applicable laws.
- B. The BLM will work collaboratively with the states of Colorado, Utah, and Wyoming; Tribal governments; county and municipal governments; other federal agencies; and all other interested groups, agencies, and individuals. Public participation will be encouraged throughout the process.
- C. The PEIS will amend the appropriate individual land use plans to address leasing of oil shale and tar sands resources on BLM-managed lands.

- D. A strategy to mitigate socioeconomic impacts, including the infrastructure, to accommodate the required workforce, will be addressed in the PEIS and plan amendments.
- E. Preparation of the PEIS and plan amendments will involve coordination with Native American Tribal governments and will provide strategies for the protection of recognized traditional uses.
- F. The BLM will coordinate with local, state, and federal agencies in the PEIS and plan amendments to strive for consistency with their existing plans and policies, to the extent practicable.
- G. The PEIS will comply with the legislative directives set forth in the Energy Policy Act of 2005.

As stated in the NOI, this PEIS evaluates the potential impacts of designating lands as available for commercial leasing of oil shale and tar sands resources that are located on public lands in Colorado, Utah, and Wyoming (Figures 1.2-1 and 1.2-2).

Specifically, the study area for the oil shale resources includes the most geologically prospective resources of the Green River Formation located in the Piceance, Uinta, Green River, and Washakie Basins.¹ The BLM has identified the most geologically prospective areas for oil shale development on the basis of the grade and thickness of the deposits. For the purposes of this PEIS, the most geologically prospective oil shale resources in Colorado and Utah are those deposits that yield 25 gal of shale oil per ton of rock (gal/ton) or more and are 25 ft thick or greater. In Wyoming, where the oil shale resource is not of as high a quality as it is in Colorado and Utah, the most geologically prospective oil shale resources are those deposits that yield 15 gal/ton or more of shale oil and are 15 ft thick or greater. Figure 1.2-1 shows the oil shale basins, which were mapped on the basis of the extent of the Green River Formation, and the most geologically prospective oil shale resources within those basins.²

¹ The Piceance Basin is not referred to or described consistently in published literature. Some publications describe the Piceance Basin as an area encompassing more than 7,000 mi² and consisting of a northern province and a southern province, which are roughly separated by the Colorado River and Interstate 70 (I-70). Other publications refer to the southern province as the Grand Mesa Basin. Oil shale is present in both provinces, with the richest oil shale deposits in the north, and smaller, isolated deposits in the south. Various authors have used the terms “Piceance Basin” and “Piceance Creek Basin” to refer to either the overall basin or the northern area. In this PEIS, the focus is on the northern province, where the richest and thickest reserves are located, and the study area will be referred to as the “Piceance Basin.”

² Numerous sources of information were used to define the boundaries of the Green River Formation basins and the most geologically prospective oil shale resources. The basin boundaries were defined by digital data provided by the U.S. Geological Survey (USGS) taken from Green (1992), Green and Drouillard (1994), and Hintze et al. (2000). The most geologically prospective oil shale resources in the Piceance Basin were defined on the basis of digital data provided by the USGS taken from Pitman and Johnson (1978), Pitman (1979), and Pitman et al. (1989). In Wyoming, the most geologically prospective oil shale resources were defined on the basis of detailed analyses of available oil shale assay data (Wiig 2006a,b). In Utah, the most geologically prospective oil shale resources were defined by digital data provided by the BLM Utah State Office.

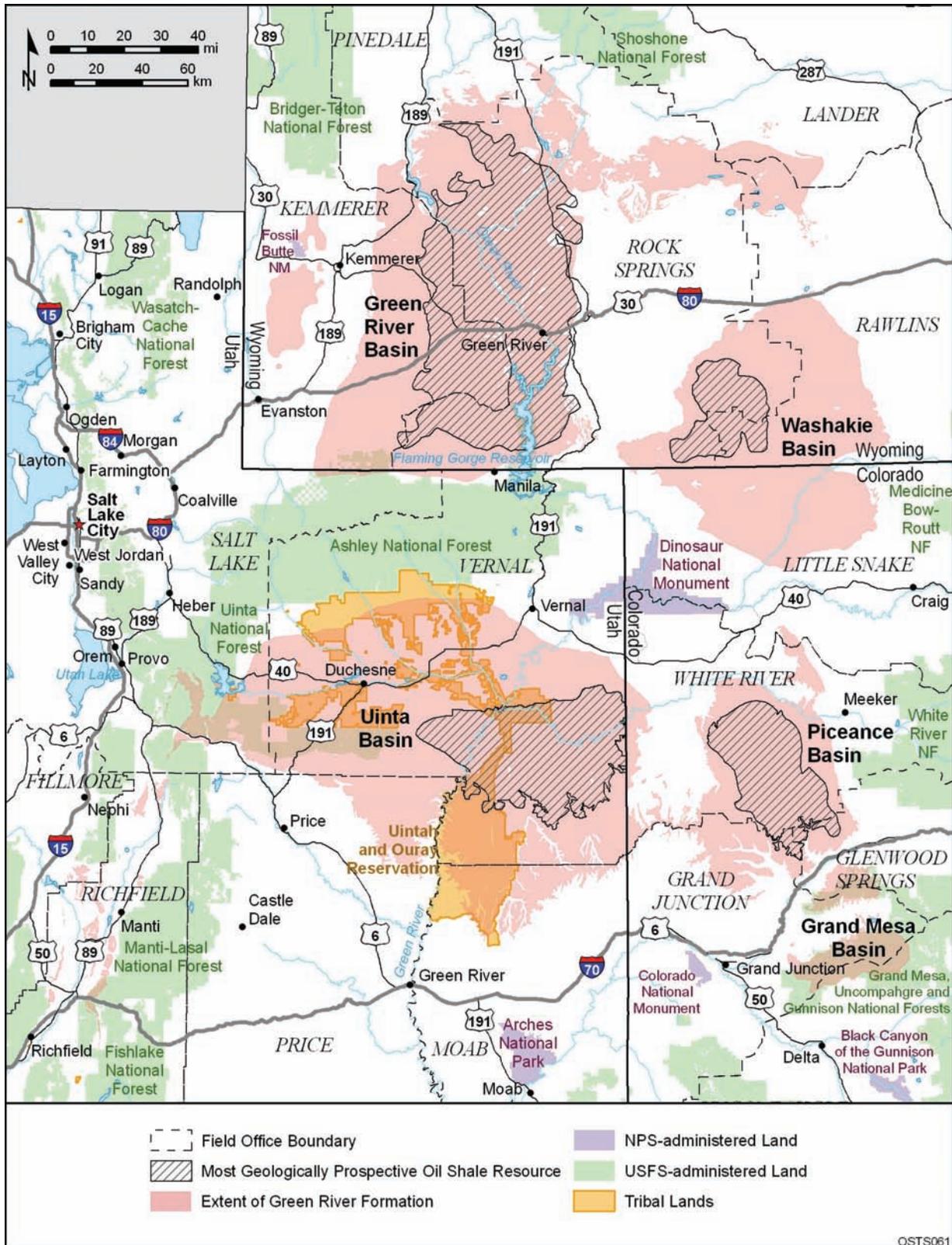


FIGURE 1.2-1 Most Geologically Prospective Oil Shale Resources within the Green River Formation Basins in Colorado, Utah, and Wyoming

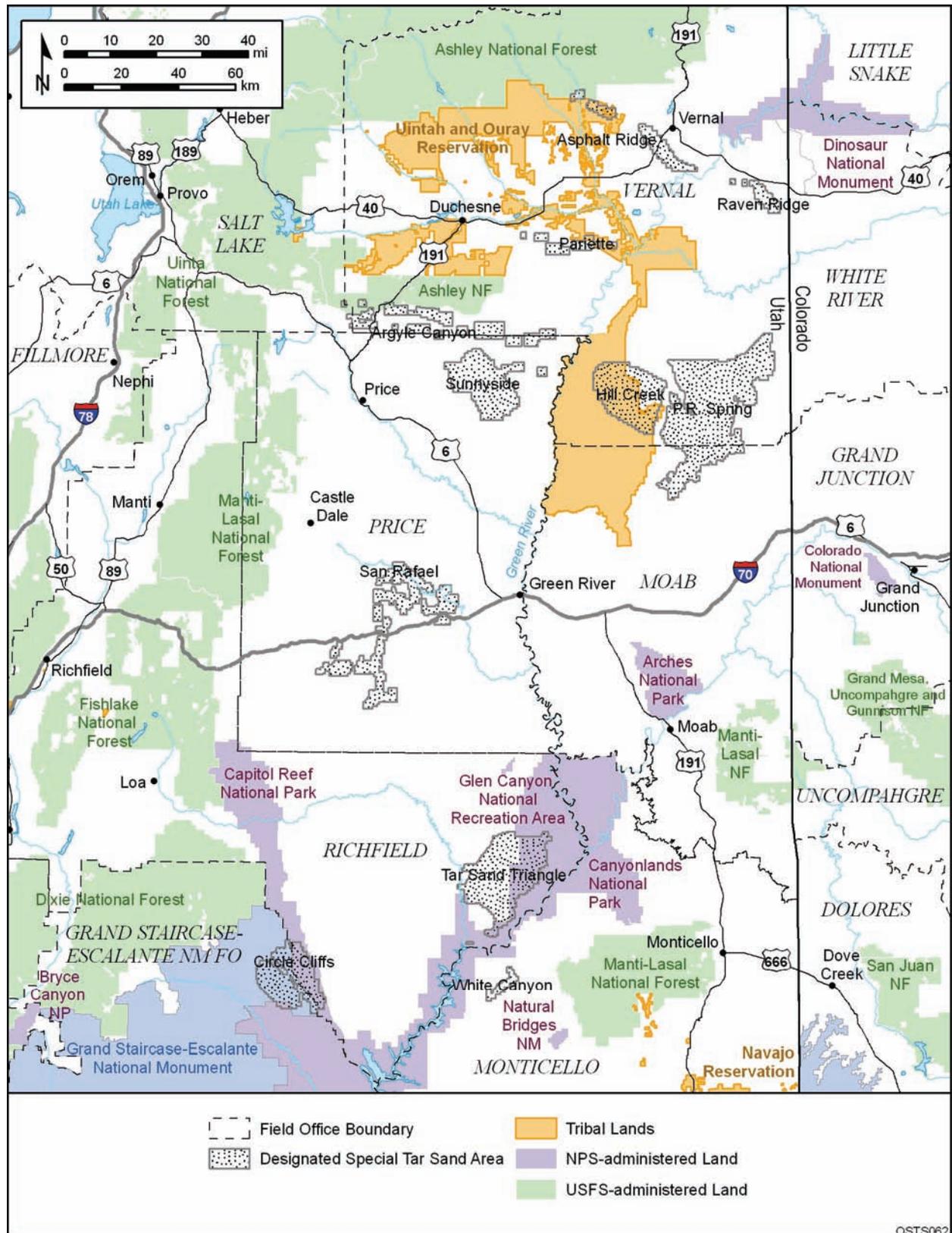


FIGURE 1.2-2 Special Tar Sand Areas in Utah

For tar sands resources, the study area includes those locations designated as Special Tar Sand Areas (STSAs) in the geologic reports (minutes) prepared by the USGS in 1980 (USGS 1980a–k) and formalized by Congress in the Combined Hydrocarbon Leasing Act of 1981 (P.L. 97-78).³ Eleven STSAs were identified across different sedimentary provinces in Utah (Figure 1.2-2): Argyle Canyon–Willow Creek (hereafter referred to as Argyle Canyon), Asphalt Ridge–Whiterocks and Vicinity (hereafter referred to as Asphalt Ridge), Circle Cliffs East and West Flanks (hereafter referred to as Circle Cliffs), Hill Creek, Pariette, P.R. Spring, Raven Ridge–Rim Rock and Vicinity (hereafter referred to as Raven Ridge), San Rafael Swell, Sunnyside and Vicinity (hereafter referred to as Sunnyside), Tar Sand Triangle, and White Canyon.

The oil shale and tar sands resources that fall within the defined study areas are located within the jurisdiction of 12 separate BLM field offices or administrative units. These include the Glenwood Springs, Grand Junction, and White River Field Offices in Colorado; the Moab, Monticello, Price, Richfield, and Vernal Field Offices and the Grand Staircase–Escalante National Monument (GSENM) in Utah; and the Kemmerer, Rawlins, and Rock Springs Field Offices in Wyoming.⁴ With the exception of the GSENM,⁵ this PEIS evaluates the alternatives that would include the amending of existing BLM land use plans in these units to designate lands as available for application for commercial leasing. The subsequent Record of Decision (ROD) will modify the decisions in the land use plans, as appropriate.

The scope of this PEIS includes public lands managed by the BLM where the federal government owns both the surface estate and subsurface mineral rights. In addition, BLM-managed lands where the federal government owns the subsurface mineral rights but the surface estate is owned by Tribes, states, or private parties (i.e., split estate lands) are included in the scope of this analysis. Tribal lands where both the surface estate and subsurface mineral estate are owned by the Tribe are not included in the scope of analysis of this PEIS.

The BLM has determined that certain lands within the oil shale and tar sands resource areas are excluded from commercial leasing on the basis of existing laws and regulations, Executive Orders (E.O.s), administrative land use plan designations as noted below, or withdrawals. As a result, commercial leasing is excluded from all designated Wilderness Areas, Wilderness Study Areas (WSAs), other areas that are part of the National Landscape

³ The boundaries of the designated STSAs were determined by the Secretary of the Interior's orders of November 20, 1980 (45 FR 76800–76801) and January 21, 1981 (46 FR 6077–6078).

⁴ Although the P.R. Spring STSA extends into the Moab Field Office boundary, this area is administered by the Vernal Field Office under a Memorandum of Understanding (MOU) with the Moab Field Office. Under this agreement, the Vernal Field Office administers all resources and programs, including land use planning, for the entire P.R. Spring STSA.

⁵ Like other National Monuments, the GSENM in Utah, which overlies the Circle Cliffs STSA, will be excluded from future leasing for tar sands development. However, at this time, there are two pending conversion leases within the GSENM that could potentially be converted to CHLs and developed under the Combined Hydrocarbon Leasing Program. For more information about the Combined Hydrocarbon Leasing Program and pending conversion leases for tar sands development, see Section 1.4.2. Because there will be no future tar sands leasing within the GSENM, the impacts of commercial tar sands leasing and development in the Circle Cliffs STSA are not evaluated in this PEIS.

Conservation System (NLCS) managed by the BLM (e.g., National Monuments, National Conservation Areas [NCAs], Wild and Scenic Rivers [WSRs], and National Historic and Scenic Trails), and existing Areas of Critical Environmental Concern (ACECs) that are currently closed to mineral development. As discussed in Chapter 2, additional areas are closed and will not be available for the future opportunity to lease for oil shale and tar sands on the basis of local planning decisions.

This PEIS is being prepared to meet the requirements established by Congress in Section 369 of the Energy Policy Act of 2005 and to meet the requirements of NEPA. It will amend 12 RMPs to designate lands as available for application for commercial leasing for oil shale and tar sands development on public lands in Colorado, Utah, and Wyoming managed by the BLM. Nine land use plans will be amended to designate lands available for commercial oil shale leasing, and six land use plans will be amended to designate lands available for commercial tar sands leasing. Three of the plans that are to be amended contain both oil shale and tar sands resources.

The oil shale and tar sands alternatives are described in Chapter 2 of the PEIS, including summary tables comparing the potential impact of the alternatives. For information purposes, the tables also include information on potential impacts that could accompany future commercial development of oil shale and tar sands resources. Chapter 3 describes the affected environment of the study area. The potential impacts of commercial oil shale and tar sands development are described in Chapters 4 and 5, respectively. Chapter 6 assesses the impacts of the different alternatives evaluated in this PEIS, provides a comparison of the alternatives, and provides an assessment of cumulative impacts. Chapter 7 contains a summary of the consultation and coordination associated with the PEIS and the comments from the BLM's cooperators on the Draft PEIS, along with the BLM's responses to those comments. Chapter 8 contains the list of preparers of the PEIS, and Chapter 9 is the Glossary. Appendices A and B provide overviews of the oil shale and tar sands technologies that might be used over the next 20 years. Appendix C details the proposed land use plan amendments associated with the proposed alternatives. Appendix D summarizes the potentially applicable federal, state, and county regulatory requirements for oil shale and tar sands development. Appendices E and F contain relevant biological data for the three-state study area and the proposed conservation measures for the preferred alternative. Appendix G details the methodology used for the socioeconomic assessment. Appendix H describes the approach used for interviewing selected residents of the oil shale and tar sands project area, and Appendix I provides the instream flow water rights in the Piceance Basin, Colorado.

The scope of the analysis for this PEIS does not include review of the decisions by the Secretary to issue the RD&D leases described in Section 1.4.1. Those leases authorize activities on six 160-acre parcels located in Colorado and Utah (see Figure 2.3-2) and also identify conditions under which commercial development could occur on 4,970 acres of preference right lease areas (PRLAs) included in the leases. A total of 30,720 acres may be developed under the terms of these leases. The RD&D leases are prior existing rights and are not the subject of decisions within this PEIS, with the exception that both Alternatives B and C address the subsequent availability of the lands contained in the leases should the initial leaseholder relinquish the existing leases.

In accordance with Section 369(n) of the Energy Policy Act of 2005, the BLM will consider and give priority to the use of land exchanges, where appropriate and feasible, to consolidate land ownership and mineral interests within the oil shale basins and STSAs. If the current BLM land use plan does not allow for exchanges, it may be amended to include specific language allowing land exchanges to facilitate commercial oil shale or tar sands development. However, because the possible locations for such future exchanges are unknown at this time, the scope of this PEIS does not include evaluations of potential impacts of such exchanges, and leasing for commercial development on these lands would be subject to additional NEPA review.

1.2.1 Direct, Indirect, and Cumulative Impact Analysis

The PEIS contains information on the impacts (effects) of the proposed amendment of land use plans to allow for application for commercial oil shale and tar sands leasing. It also contains information on the potential impact of future oil shale and tar sands development activities on resources and resource uses on BLM-managed public lands. Impacts that are discussed include those classified as direct, indirect, and cumulative. The CEQ regulations (40 CFR Part 1508) define these as:

- (a) Direct effects, which are caused by the action and occur at the same time and place.
- (b) Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.
- (c) Cumulative effects are impacts on the environment which result from the incremental impact of [a proposed] action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

Effects and impacts as used in the CEQ regulations are synonymous. “Impact” is the term used in this PEIS. Impacts include ecological (such as the impacts on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Impacts may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.

The direct, indirect, and cumulative analysis conducted in preparation of this PEIS was based on available and credible scientific data. As a programmatic evaluation, conducted in support of land use plan amendments, this PEIS does not address site-specific issues associated with individual oil shale or tar sands development projects. A variety of location-specific factors (e.g., soil type, watershed, habitat, vegetation, viewshed, public sentiment, the presence of threatened or endangered species, and the presence of cultural resources) will vary considerably

from site to site. In addition, the variations in extraction and processing technologies and project size will greatly affect the type and magnitude of the impacts from given projects. The combined effects of these location-specific and project-specific factors cannot be fully anticipated or addressed in this programmatic analysis because industry has not yet developed proven, commercially viable technologies. As a result, additional, site-specific NEPA analyses will be conducted prior to the issuance of commercial leases and the approval of specific plans of development. The BLM will invite other federal, state, local, and Tribal agencies to participate as cooperating agencies on these site-specific project-level NEPA documents.

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” In the case of this PEIS, the proposed action is to amend land use plans to allow certain lands to be considered further for commercial leasing. The scope and scale of the potential environmental consequences of amending the land use plans are key to an effective cumulative effects analysis at the programmatic level. The information necessary for analysis in this PEIS where land use plans are to be amended will differ from the information necessary to do effective cumulative effects analysis at the leasing level and at the project level. PEISs have been considered adequate without site-specific analysis when the federal action, as here, does not contain a site-specific or critical decision. Even where the land use plans have been amended to allow for consideration of applications for lease, development cannot occur until a leasing decision has been made and implemented (i.e., leases are issued). After leases are issued, additional permits and environmental analysis are required before operations can begin.

A reasonably foreseeable development scenario (RFDS) is an analytical tool, often used in the planning process, which can inform analyses prepared pursuant to NEPA. An RFDS is a reasonable projection of the most likely anticipated oil shale and tar sands activity supported by a clear level of assumptions. At this programmatic level, an RFDS was not developed, because information regarding possible development of these resources remains highly speculative. Analysis of the effects of development at the programmatic level will be qualitative in keeping with the limited scope of the planning decisions to be made, as well as to reflect the limited and/or highly speculative nature of the information available.

If and when applications to lease oil shale and tar sands resources for commercial development are received and accepted by the BLM, and where information is less speculative, it will be possible to develop an RFDS. That RFDS will be the critical component for performing a thorough cumulative effects analysis of oil shale and tar sands activities that could occur as a result of leasing. An RFDS for an area of proposed oil shale and tar sands leasing provides information for evaluating the type and extent of potential effects from oil shale and tar sands development that *could* occur. Effects analysis (direct, indirect, and cumulative) for leasing is broad and generalized because it is necessarily based on a *hypothetical* scenario of exploration and development.

At the project level, the plan of development provides the specific technical information necessary for the analysis of environmental consequences of these operations, including analysis of cumulative effects of the proposed action. An exploration or development permit is definitive for activities that will involve ground disturbance, unlike the speculative RFDS used to analyze

effects related to a leasing decision. Consequently, the nature and extent of effects from the proposed exploration or development action can be determined with a higher degree of accuracy and confidence than that associated with a planning/leasing level RFDS.

1.3 COOPERATING AGENCIES

The scope of the *Proposed Oil Shale and Tar Sands Resource Management Plan Amendments to Address Land Use Allocations in Colorado, Utah, and Wyoming and Final PEIS* is of interest to numerous federal, Tribal, state, and local governments. The BLM invited 50 agencies to participate in the preparation of the PEIS as cooperating agencies. Fourteen agencies expressed an interest in participating as cooperating agencies, and MOUs between these agencies and the BLM were established. The following agencies are participating as cooperating agencies in the preparation of this PEIS:

- National Park Service (NPS);
- Bureau of Reclamation (BOR);
- U.S. Forest Service (USFS);
- U.S. Fish and Wildlife Service (USFWS);
- State of Colorado, Department of Natural Resources and Department of Public Health and the Environment;
- State of Utah;
- State of Wyoming;
- Garfield County, Colorado;
- Mesa County, Colorado;
- Rio Blanco County, Colorado;
- Duchesne County, Utah;
- Uintah County, Utah;
- City of Rifle, Colorado; and
- Town of Rangely, Colorado.

The roles and responsibilities of these cooperating agencies, and the extent of interactions between them and the BLM, are discussed in Chapter 7.

1.4 RELATIONSHIP OF THE PROPOSED ACTION TO OTHER BLM AND COOPERATING AGENCY PROGRAMS, POLICIES, AND PLANS

1.4.1 BLM's Oil Shale Research, Development, and Demonstration Program

On June 9, 2005, pursuant to its authority under Section 21 of the Mineral Leasing Act (MLA) (30 USC 241), the BLM initiated an oil shale RD&D program under which small tracts of land could be leased in support of activities to demonstrate the technical and economic feasibility of oil shale extractive technologies (70 FR 33753–33759). The BLM solicited the nomination of parcels, not to exceed 160 acres, to be used for oil shale RD&D activities. Applicants also were allowed to identify an additional contiguous 4,960 acres of land to be reserved as a PRLA for future commercial development, to be awarded subject to the following terms:

- (a) Upon documenting to the satisfaction of the authorized officer that it has produced commercial quantities of shale oil from the lease, the Lessee has the exclusive right to convert the research and development lease acreage to a commercial lease and acquire any or all portions of the remaining preference lease area up to a total of 5,120 contiguous acres upon:
 - (1) Payment of a bonus based on the Fair Market Value of the lease, to be determined by the Lessor utilizing criteria to be developed through the rulemaking described in subsection (b) or other process for obtaining public input;
 - (2) Documentation of the Lessee's consultation with State and local officials to develop a plan for mitigating the socio-economic impacts of commercial development on communities and infrastructure;
 - (3) Provision of adequate bond to cover all costs associated with reclamation and abandonment of the expanded lease area; and
 - (4) BLM's determination, following analysis pursuant to the National Environmental Policy Act (NEPA), that commercial scale operations can be conducted, subject to mitigation measures to be specified in stipulations or regulations, without unacceptable environmental consequences.
- (b) Such commercial lease shall contain terms consistent with regulations to be developed by the Secretary pursuant to section 21 of the Act and stipulations developed through appropriate NEPA analysis.
- (c) Such commercial lease may be issued for a term of 20 years and so long thereafter as shale oil is produced from the Leased Lands in commercial quantities. Such commercial lease shall be subject to payment of rents and royalties to the Lessor at the established rates at the time of lease conversion,

or at such reduced rate that the Lessee demonstrates is necessary to permit the economic development of the oil shale resource. The royalty shall be subject to the readjustment of lease terms at the end of the 20th lease year and each 20 year period thereafter.

The 160-acre RD&D leases were issued for 10-year terms with an option to extend them up to another 5 years. Prior to beginning RD&D activities, the lessees also must obtain permits from the BLM and other governmental agencies (e.g., state-issued air quality permits). These RD&D leases and the conversion right to commercial operations on preference acreage represent a prior existing right that may be exercised upon compliance with the terms of the lease.

The BLM received and reviewed a total of 20 nomination packages. Ultimately, six projects were selected for further consideration, including preparation of environmental assessments (EAs) under NEPA. The projects that were selected included five projects in the Piceance Basin, Colorado (one each submitted by Chevron Shale Oil Company and EGL Resources, Inc. [EGL],⁶ and three submitted by Shell Frontier Oil & Gas), and one project in the Uinta Basin, Utah (submitted by Oil Shale Exploration Company [OSEC]). The RD&D leases for the five Colorado projects were issued January 1, 2007; the lease for the Utah project was issued in June 2007. The RD&D leases are part of the baseline activities under all alternatives considered in the PEIS. More information about these RD&D projects is provided in Section 2.3 and Appendix A.

Several commentors on the Draft PEIS urged the BLM to conduct additional RD&D leasing. In Section 369(c) of the Energy Policy Act of 2005, Congress expressly authorized the Secretary to make land available for leasing to conduct R&D activities with respect to technologies for the recovery of liquid fuels from oil shale. The Draft PEIS did not assume that there would be future rounds of RD&D leasing. The BLM finds that those comments have substantial merit. Additional RD&D leasing could promote development of new technologies to develop fuels from oil shale in ways that are both commercially viable and environmentally sound.

Under the authority of the Energy Policy Act, the BLM could publish in the *Federal Register* one or more additional requests for expressions of interest in RD&D leasing within one or more of the states of Colorado, Utah, and Wyoming. Any new RD&D lease would have to be consistent with the applicable BLM land use plans. Two BLM land use plans, Book Cliffs and White River, presently allow some oil shale RD&D leasing in certain areas. The impacts of new RD&D leasing are anticipated to be qualitatively similar to those of commercial oil shale leasing as analyzed in this PEIS.

The RD&D impacts, however, are anticipated to be smaller in scale than those of commercial projects, at least until any RD&D lease might be converted to a commercial oil shale lease and expanded to include preference right acreage. Therefore, the analysis in this PEIS for commercial oil shale projects also provides sufficient analysis of RD&D projects for purposes of amending land use plans. New RD&D leases would be issued, if at all, only after site-specific

⁶ Since the preparation of this PEIS, EGL Resources, Inc., is now American Shale Oil, LLC.

analysis under NEPA. Conversion to commercial leases would also require an individualized NEPA document.

1.4.2 Combined Hydrocarbon Leasing Program and the Interim Final Rule for Leasing in STSAs Issued under the Revised MLA

The Combined Hydrocarbon Leasing Act of 1981 (P.L. 97-78) amended the MLA to authorize the Secretary to issue CHLs in areas containing substantial deposits of tar sands, which were to be designated as STSAs. This Act further specified that a CHL was the only type of lease that could be offered in these STSAs, provided for the conversion of existing oil and gas leases or tar sands claims in these areas to CHLs, and established the maximum lease size as 5,120 acres. The CHL Act defined oil as all nongaseous hydrocarbons except coal, oil shale, gilsonite and other vein-type solid hydrocarbons. Eleven STSAs were designated in 1980 and 1981. The BLM published regulations implementing the leasing provisions of this Act in February 1983 at 43 CFR Part 3140. Subsequently, the BLM prepared the *Utah Combined Hydrocarbon Leasing EIS* (BLM 1984). Tar sands resources located outside of these STSAs were not subject to the requirements of 43 CFR Part 3140 and are available for development under oil and gas leases.

Under the authority of the Combined Hydrocarbon Leasing Act, six CHLs were issued in the mid-1980s within the Pariette and P.R. Spring STSAs in the Vernal Field Office; these leases remain in existence. Also in the mid-1980s, a number of operators holding oil and gas leases or tar sands claims within the designated STSAs applied to convert their leases to CHLs. In most instances, the conversion of these leases has not been completed; thus a number of pending conversion applications remain within the study area, specifically within the Circle Cliffs, Tar Sand Triangle, and P.R. Spring STSAs. The BLM is currently engaged in adjudication of these applications. Decisions in the ROD resulting from this PEIS regarding the availability of lands within the STSAs for future commercial leasing will not affect or be affected by the requirements established for tar sands leasing in the interim final rule.

On October 7, 2005, in response to Section 350 of the Energy Policy Act of 2005, which amended the MLA to allow separate oil and gas leases and tar sands leases in designated STSAs, the BLM issued an interim final rule on leasing in STSAs (70 FR 58610–58516). The interim final rule authorizes the BLM to issue separate leases for exploration for and extraction of tar sands, separate leases for exploration for and development of oil and gas, and separate leases for CHLs within designated STSAs. Under the proposed rule, all three types of leases would have primary terms of 10 years; CHLs and oil and gas leases would remain in effect as long thereafter as oil or gas is produced in commercial quantities; tar sands leases would remain in effect after the 10-year term as long as tar sands are produced in commercial quantities. The interim final rule increases the maximum acreage of CHLs or tar sands leases in a STSA from 5,120 to 5,760 acres, establishes the minimum acceptable bid for tar sands leases at \$2.00 per acre, and requires that tar sands leases be issued by competitive processes only. In addition, under the interim final rule, leasing STSAs in NPS units is allowed only where mineral leasing is permitted by law and where the lands are open to mineral resource disposition in accordance with any applicable Minerals Management Plan. The NPS Regional Director also must find that leasing

within an NPS unit would not result in any significant adverse impacts on the NPS unit or any contiguous unit.

1.4.3 Existing BLM Land Use Plans, Ongoing Planning Activities, and Resource Management Plan Revisions

The BLM develops land use plans to guide activities, establish management goals and approaches, establish land use allocations within a planning area, and provide management prescriptions for public lands. Current generation land use plans are called resource management plans (RMPs); in the past, such plans were called management framework plans (MFPs), and some MFPs are still in use. Decisions in existing BLM land use plans were incorporated into the analyses conducted in preparation of this PEIS and are discussed in Section 3.1.1. Of the existing land use plans within the study area, the BLM is currently engaged in planning efforts to revise, amend, or prepare new versions of nine of the plans. The existing plans within the PEIS study area include the following:

- Colorado
 - Glenwood Springs RMP (BLM 1988b, as amended by the 2006 Roan Plateau Plan Amendment [BLM 2006a, 2007, 2008])
 - Grand Junction RMP (BLM 1987)
 - White River RMP (BLM 1997a, as amended by the 2006 Roan Plateau Plan Amendment [BLM 2006a, 2007, 2008])⁷

- Utah
 - Book Cliffs RMP (BLM 1985)⁷
 - Diamond Mountain RMP (BLM 1994)⁷
 - Grand Staircase–Escalante National Monument (GSENM) RMP (BLM 1999)⁸
 - Henry Mountain MFP (1982)⁷
 - Price River Resource Area MFP, as amended (BLM 1989)⁷
 - San Rafael Resource Area RMP (BLM 1991a)⁷
 - San Juan Resource Area RMP (BLM 1991b)⁷

- Wyoming
 - Great Divide RMP (BLM 1990)⁷
 - Green River RMP (BLM 1997b, as amended by the Jack Morrow Hills Coordinated Activity Plan [BLM 2006b])
 - Kemmerer RMP (BLM 1986)⁷

⁷ These plans are currently undergoing revision, amendment, or replacement.

⁸ As noted in Section 1.2, lands within National Monuments, including the GSENM, will be excluded from future leasing for tar sands development. However, because one of the STSAs is located underneath the GSENM, the existing RMP is listed here and discussed in Section 3.1.

With the exception of the RMP for the GSENM, these existing BLM land use plans will be amended by decisions contained in the ROD for the PEIS. The proposed land use plan amendments are discussed in Chapter 2 and are shown in Appendix C.

When the amendments/revisions/replacements of eight of the nine RMPs were initiated, there was no reasonably foreseeable development projected for tar sands or oil shale over the life of these plans and for that reason, identification of areas available for potential oil shale or tar sands leasing has not been considered as part of those planning processes. The mineral reports prepared to accompany the eight RMPs did identify oil shale and tar sands resources, but did not project any leasing or development due to prevailing and anticipated economic factors. The ninth RMP effort, the amendment of the White River RMP, is being conducted specifically to consider the amendment of that RMP to allow additional oil and gas leasing activity. It was recognized at the time, that this PEIS would consider the issue of oil shale management for the White River RMP area.

Since the start of the RMP amendments/revisions by the field offices, Congress enacted the Energy Policy Act of 2005 and the Secretary of Interior is required to carry out various actions referenced above, including the preparation of this PEIS. On December 13, 2005, the BLM published a NOI in the *Federal Register* initiating a PEIS to support a commercial oil shale and tar sands leasing program on federal lands in these three states. Since that time, the scope of the PEIS has been revised. The BLM is no longer using the PEIS as the document that supports the NEPA requirements for leasing. Given that the development technologies for in situ production of oil shale are just emerging, there is a lack of information regarding resource use and associated impacts. Consequently, the BLM has changed this document to support only resource allocation decision making that identifies the BLM-managed lands for which applications to lease oil shale and tar sands resources would be accepted in the future. Although applications would be accepted, additional NEPA analysis would be performed before any leasing of the area would be considered.

The ROD for the Final PEIS will amend the land use plans existing at the time the ROD is implemented, identifying those areas designated as open for application for future oil shale and tar sands leasing.

As part of the site-specific NEPA analysis to be carried out prior to issuance of any oil shale or tar sands leases, the environmental consequences to specific resource values and uses within the areas and any alternative actions would be analyzed. At that time, at the site-specific level, the competing resource values will be analyzed and weighed as required by FLPMA and NEPA, and a decision will be made regarding management of the specific parcel of land. If, pursuant to this NEPA and land use planning process, the BLM determines that leasing and subsequent development of the oil shale or tar sands resources would cause significant impacts, the BLM can require the applicant to (1) mitigate the impact so that it is no longer significant, (2) move the proposed lease location, or, if neither of these options resolves the anticipated conflicts, (3) the BLM can decide either that the importance of development of the oil shale and tar sands resources outweighs protection of the competing resource value and approve the application, or vice versa.

This preleasing NEPA analysis would include the same opportunities for public involvement and comment that are part of this PEIS process and every other planning and NEPA process the BLM undertakes. The decisions associated with the PEIS will be incorporated into the ongoing RMPs as they are finalized or will amend the existing RMPs, depending on the order in which the documents are completed with respect to the completion of the PEIS.

Although the BLM's handbooks provide for stipulations for oil and gas leases to be made part of the land use plans, that guidance is not applicable to the present analysis to amend land use plans for development of oil shale or tar sands. Oil and gas is a mature industry where there is long experience with leasing stipulations to conserve and to protect affected resources. The present experimental stage of the oil shale and tar sands industries, however, weighs against emplacing lease stipulations in the RMPs at this time. Instead, the BLM will develop appropriate lease stipulations and either (1) include them in appropriate RMPs as part of future amendments, or (2) include them in commercial lease sale announcements. That will allow the BLM to refine lease stipulations over time based on the latest information regarding oil shale or tar sands technologies and their impacts, without unnecessary rounds of amendments to the land use plans. This PEIS does discuss various mitigation requirements, methods, and objectives that will inform both (1) the lease stipulations developed for particular lease sales or for future amendments to RMPs, and (2) the conditions of approval for plans of development.

1.4.4 Cooperating Agency Plans and Programs

As discussed in Section 1.3, this PEIS has been prepared in cooperation with 14 federal, state, and local governmental organizations. Management plans and programs established by these cooperating agencies have been considered in the preparation of this PEIS on the basis of information provided by the agencies. In consultation with the cooperating agencies, the nature and scope of the PEIS were modified from a leasing decision to an allocation decision. The allocation decision, by opening lands to leasing, only permits the BLM to consider applications to lease and does not grant any property right. It does not authorize any ground-disturbing activities nor is it an irreversible or irretrievable commitment of resources under NEPA. Therefore, the allocation decision does not conflict with any state, local, or Tribal plans. The BLM will, however, cooperate with state, local, and Tribal governments to promote consistency with their land use plans. Congress has authorized the Secretary to lease federal oil shale and tar sands resources and has declared them to be "strategically important domestic resources that should be developed" ... "to benefit the United States while taking into account affected States and communities" [Energy Policy Act of 2005, Section 369(b)(1),(3)]. As the BLM is bound by this and other federal law, however, it may be possible that oil shale or tar sands projects would occur that would not be completely consistent with all aspects of state and local plans. It remains too speculative at this time, though, to assess the consistency of any number, locations, or technologies of development projects that might become commercially viable in the future.

1.4.5 BLM and USFS Energy Corridor Designation

In accordance with Section 368 of the Energy Policy Act of 2005, the BLM and USFS are working with the U.S. Department of Energy (DOE) and U.S. Department of Defense (DoD) to prepare a PEIS to evaluate issues associated with the designation of energy corridors on federal lands in 11 Western states, including Colorado, Utah, and Wyoming. On the basis of this Draft West-wide Energy Corridors PEIS (DOE 2008), the BLM and USFS may amend their respective land use plans to designate a series of energy corridors across the western states. These potential amendments may include the planning areas that are included within the scope of this *Proposed Oil Shale and Tar Sands Resources Management Plan Amendments to Address Land Use Allocations in Colorado, Utah, and Wyoming and Final PEIS*. In addition, the potential designation of energy corridors is likely to impact energy development throughout the western United States, including commercial oil shale and tar sands development, because the location of energy corridors may facilitate development by removing administrative and planning barriers for potential pipelines, electric transmission lines, and associated infrastructure. Development of the Draft West-wide Energy Corridors PEIS is underway at this time; information regarding the PEIS, including its scope and schedule, is available at <http://corridoreis.anl.gov>.

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