

CHAPTER 1 - INTRODUCTION

The purpose of this chapter is to explain the overall structure of this document, to explain the purpose and need for the Proposed Action and provide a brief overview of the Proposed Action, and to discuss the regulatory environment for a decision regarding the Proposed Action. In particular, this chapter contains a discussion of the conformance of the Proposed Action to applicable federal agency land use plans. An important part of the chapter is a discussion of public involvement in the scoping process and a determination of issues of concern affecting a decision about the Proposed Action.

1.1 SUMMARY

This Environmental Assessment (EA) discusses the purpose, need, and potential short- and long-term environmental impacts of the Big Porcupine Coalbed Methane (CBM) Project. The Proposed Action involves the development of 226 coalbed natural gas wells on approximately 18,000 acres of federal, state, and private leases within and adjacent to the Thunder Basin National Grassland, Campbell County, Wyoming. The majority of the Proposed Action, including 182wells, would be developed on federal leases.

The Proposed Action is located adjacent to active surface coal mines and to CBM development on state and private leases. Leakage of coalbed natural gas through the active mine highwalls and drainage of federal gas by adjacent non-federal wells represents a loss of revenue to the United States. Development of the Proposed Action would capture these revenues and would contribute to the maintenance of an available natural gas supply for the national market.

Impacts from the Proposed Action would principally involve surface disturbances from construction or improvement of roads, construction of well sites and drilling of wells, development of pipelines and buried utilities, and construction of associated production facilities. Discharge of produced water into local ephemeral drainages would have effects on associated wetlands and riparian corridors and on wildlife dependent on those habitats. Produced water would also be beneficially used for wildlife and stock watering and for industrial purposes.

Federal jurisdiction of the Project is divided between the U.S. Department of Agriculture Forest Service (USFS), the lead agency, and the U.S. Department of Interior Bureau of Land Management (BLM), a cooperating agency. Decision Records for this EA will be separately issued by each agency. The decision makers will determine:

- Whether the analysis contained within this document is adequate for the purposes of reaching informed decisions regarding Project development;
- Whether the Proposed Action involves the potential for significant impacts;
- Whether the Proposed Action is in conformance with applicable land and resource management plans and programmatic plans developed under the National Environmental Policy Act (NEPA); and
- What Conditions of Approval (COAs) may be attached to Project authorization.

1.2 DOCUMENT STRUCTURE

O&G Environmental Consulting, LLC, prepared this EA under the direction of the USFS in compliance with NEPA and other relevant federal and state laws and regulations and in conformance with the *Thunder Basin National Grassland Land and Resource Management Plan 2002 Revision (2002 RMP)*. This EA discloses the direct, indirect, and cumulative environmental impacts that would result from the Proposed Action and alternatives. The document is organized into the following parts:

Introduction (Chapter 1) - This section includes information on the history of the Project proposal, the purpose of and need for the Project, and the agency's proposal for achieving that purpose and need. This section also details how the USFS informed the public of the proposal and how the public responded.

Comparison of Alternatives, including the Proposed Action (Chapter 2) - This section provides a more detailed description of the agency's Proposed Action as well as possible alternative methods for achieving the stated purpose. These alternatives are developed based on major issues raised by the public and other agencies. This discussion also includes possible mitigation measures and monitoring. Finally, this section provides a summary table of alternatives which were considered, but which were not analyzed in detail.

Affected Environment and Environmental Consequences (Chapter 3) - This section describes the direct and indirect environmental effects of implementing the Proposed Action and other alternatives. This analysis is organized by resource. Within each section, the affected environment is described first, followed by the effects of the Proposed Action, other alternatives that may have been considered, and the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives.

Cumulative Effects (Chapter 4) - This section builds upon Chapter 3 by describing additional impacts derived from other development within or adjacent to the Project Area. The analysis is organized by general resource area or areas.

Consultation and Coordination (Chapter 5) - This section provides a list of preparers and agencies consulted during the development of this EA.

Appendices: The appendices provide more detailed information to support the analyses presented in the EA.

Additional documentation, including more detailed analyses of the Project Area resources, may be found in the project planning record located at the Douglas, Wyoming, Ranger District Office.

1.3 BACKGROUND

The Bill Barrett Corporation (the Company) holds valid federal oil and gas leases on a portion of the Thunder Basin National Grassland (TBNG) located in the Powder River Basin of Wyoming (**Figure 1-1**). These leases were acquired from Independent Production Company when the latter

Figure 1-1 Big Porcupine CBM Project Area and Drainage Basin

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was purchased by the Company on March 21, 2003. These leases have created contractual and property rights for the Company from the United States to develop oil and natural gas resources.

The Company's leases, totaling approximately 14,995 acres, are contained within a larger area of approximately 17,940 acres. Within that area are oil and gas leases which are not held by the Company. Because non-leased acreage is interspersed with the Company's leases, the Project Area has been defined as the 17,940-acre block for the purposes of this EA.

The Company proposes to extract and transport natural gas from its approximately 14,228 gross acres of federal oil and gas leases in the Project Area, including 12,185 net acres of these leases contained within the Project boundary, as well as from State of Wyoming and from private oil and gas leases. Surface ownership within the Project Area, including areas not leased by the Company, includes 13,069 acres located within the TBNG, an administrative unit of the Medicine Bow/Routt National Forest: 1,393 acres belonging to the State of Wyoming, and 3,478 acres owned by private interests. Mineral ownership within the Project Area includes 12,185 acres administered by the BLM, 892 acres administered by the State of Wyoming, and 1,918 acres owned by private interests. Surface ownership in the Project Area is indicated on **Figure 1-2**. Minerals ownership is indicated on **Figure 1-3**.

Development of CBM from federal, state, and private leases within the Powder River Basin has been occurring for a number of years. In November 1999, the BLM issued its Record of Decision (ROD) on the *Final EIS for the Wyodak Coal Bed Methane Project*. This decision authorized the development and production of CBM on federal lands within the Wyodak Project Area. The total level of development authorized in the ROD was 5,000 new productive CBM wells (Pierson, 1999). The Wyodak Project Area encompasses the TBNG and the Project Area for the Company's Big Porcupine CBM Project.

By August 2000, the number of new productive CBM wells reached the level of development authorized in the ROD for the Wyodak Coal Bed Methane Project, and the BLM discontinued the approval of new federal permits to drill CBM wells (Stenger, 2000). However, interest in and demand for CBM in the Powder River Basin continued to increase, and oil and gas companies continued to develop new CBM wells on state and private leases. As a consequence, the BLM and the USFS determined this development was draining CBM from federal leases. To address this issue of drainage, the BLM conducted a drainage analysis, which is documented in the *Wyodak Drainage Coal Bed Methane Environmental Assessment* (Wyodak Drainage EA). The Decision Record for this EA, released on March 26, 2001, authorized the development of 2,500 additional CBM wells on federal leases within the Wyodak Project Area (Stenger, 2001).

Development of these wells addressed the problem of drainage of CBM from federal leases in the near term. Permitting of CBM wells located on federal surface or minerals continued under terms of the Wyodak Drainage EA until February 28, 2003, at which time all wells authorized had been allocated. CBM development also continued on private and state lands, with more than 10,000 CBM wells producing in Wyoming at the end of 2002. The vast majority are located in the Powder River Basin (WOGCC, 2003 online data).

Because of the continuing interest in CBM development, the BLM and USFS completed another NEPA evaluation assessing continued development of CBM from federal leases in the Powder

River Basin. The *Powder River Basin Oil and Gas Project Final EIS* (PRB O&G FEIS) was released on January 17, 2003 (BLM, 2003). A ROD for this EIS was issued by the BLM on April 30, 2003 (Bennett, 2003). A ROD from the USFS is pending.

The Company's Big Porcupine CBM Project (Proposed Action) consists of wells located primarily within the area evaluated by the Wyodak Drainage EA and completely within the area evaluated by the PRB O&G FEIS. The proposed wells lie within areas where the BLM estimates drainage has occurred, but where an estimated 40 to 70 percent of the CBM remains (Stenger, 2001).

1.3.1 Relationships Among Agencies

A number of federal, state, and local governmental agencies have authority over various aspects of oil and gas development in the Project Area. They include the USFS, BLM, and State of Wyoming.

Because federally-administrated TBNG lands predominate within the Project Area, the USFS is the lead agency involved in this NEPA process. According to the terms of the 1920 Mineral Leasing Act, the BLM is the agency authorized to manage federal mineral interests on federal or split estate lands. The majority of wells planned under the Proposed Action would be drilled into federal minerals; therefore, the BLM is a cooperating agency in this process. The Douglas Ranger District Office in Douglas, Wyoming manages the USFS surface within the Project Area. The Buffalo Field Office of the BLM in Buffalo, Wyoming manages federal mineral interests in the Project Area. In much of Wyoming and within the Project Area, ownership of the surface estate is severed from that of the mineral estate. In many cases, federal mineral interests underlie private or State of Wyoming surface.

Programmatic environmental concerns are addressed during USFS land and resource management planning processes. The objective of the land and resource management plan is to guide all natural resource management activities and establish management standards and guidelines. The USFS contributes to the nation's demand for minerals by encouraging responsible mineral development. The USFS administers the mineral laws and regulations to minimize surface resource impacts while supporting sound energy and minerals exploration and development.

The USFS has no statutory responsibility for issuing and supervising lease applications and oil and gas operations, but makes recommendations to the BLM to protect surface resources and to prevent conflicts with other plans, activities, and programs of the TBNG. For mineral licenses, permits, and leases, the USFS cooperates with the BLM to ensure that its management goals and objectives are achieved, that impacts upon the surface are mitigated to the maximum degree possible, and that the land affected is rehabilitated. The USFS responds to BLM proposals to issue mineral leases and permits after a review of the TBNG land management plan. In doing so, the USFS conducts a well-specific environmental analysis using the procedures in FSM 1950 as authorized by the Federal Onshore Oil and Gas Leasing Reform Act of 1987 to evaluate what impacts the Proposed Action would have on surface resources and other users.

Figure 1-2 Surface Ownership, Big Porcupine CBM Project

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Figure 1-3 Mineral Ownership, Big Porcupine CBM Project

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Mineral leasing decisions made by the BLM result in a contractual commitment from the United States to allow for development by the Company in accordance with stipulations and restrictions incorporated within the lease. The BLM operates in accordance with the Federal Land Policy and Management Act of 1976 (FLPMA), which mandates that the BLM consider multiple uses for the lands it administers. FLPMA specifies that the BLM considers the land's inherent natural resources as well as its mineral resources when making land management decisions. Pursuant to FLPMA, the BLM has the authority to protect the environmental resources associated with federal oil and gas leases; therefore, environmental protections may be imposed as lease conditions based upon USFS directives and recommendations.

The BLM's responsibility extends to environmental protection, public health, and safety associated with oil and gas operations on public lands. Lease rights granted by the BLM include the right to occupy as much of the lease surface as is reasonable to extract the resource and the right to remove oil and/or gas. The BLM is responsible for permitting, inspection, and enforcement programs related to oil and gas production in the Project Area. Responsibilities include processing Applications for Permit to Drill (APD); conducting pre-drill inspections of the proposed drill sites; assessing the status of cultural and threatened or endangered species clearances; conducting compliance inspections and enforcement actions for lease terms and conditions, safety, production verification, and site maintenance; and abandonment inspections of drilling locations. The BLM incorporates USFS management objectives as lease stipulations. BLM also uses Onshore Orders and Notices to Lessees to regulate oil and gas development.

The lessee's right to drill and develop the leasehold cannot be denied; however, the BLM has the authority to deny individual APDs and the USFS has the authority to deny Special Use Permits necessary to secure rights-of-way (ROWs). Agency-imposed COAs that would render a proposed operation economically or technically unfeasible are not consistent with the lessee's rights and cannot be required (BLM Instruction Memorandum 92-67 1991).

The State of Wyoming would play a significant role in the regulatory oversight of the Proposed Action. The Wyoming Department of Environmental Quality (WDEQ) exercises jurisdiction over issues relating to air and water quality. In 1972, the Clean Water Act (CWA) was enacted, requiring that any discharge of potential pollutants from a point source to surface waters of the United States be regulated through issuance of a National Pollutant Discharge Elimination System (NPDES) permit. The NPDES permit process would apply to the surface discharge of CBM-produced water. The state would also administer Section 402(p) of the CWA requiring permits for the discharges of stormwater associated with industrial activity. The office of the Wyoming State Engineer (WSEO) would be responsible for regulating the appropriation of water and construction of reservoirs. The WDEQ also administers the Clean Air Act (CAA), which regulates emissions associated with compressors. The Wyoming State Historic Preservation Office (SHPO) would supervise the management and disposition of cultural resource properties on state lands.

1.3.2 Applicable Laws Relating to Minerals Development

The development of oil and gas resources on federal lands is managed by numerous laws and regulations affecting the recovery of resources as well as management of the surface. Among the more important regulations relating to minerals development are:

- *Mineral Leasing Act (1920)(30 USC 181-263, as amended)* – Authorizing the Secretary of the Interior to issue leases for the disposal of certain minerals (currently coal, phosphate, sodium, potassium, oil, oil shale, gilsonite, and gas), including leases beneath National Forest surface.
- *Mineral Leasing Act for Acquired Lands (1947)(30 USC 351-359 as amended)* - Stating that all deposits of coal, phosphate, oil, oil shale, gas, sodium, potassium, and sulfur that are owned or may be acquired by the United States shall be leased by the Secretary of the Interior under the same provisions as contained in the mineral leasing laws.
- *Mining and Minerals Policy Act (1970) (30 USC 21)* - Emphasizing the need for the ongoing development of stable domestic mining and minerals industries.
- *National Materials and Minerals Policy Research and Development Act of 1980 (30 USC 1601 et seq.)*- Directing the Secretary of Agriculture, regardless of current management plan status, to process applications for leases and permits to explore, drill, and develop resources on National Forest System (NFS) lands in a timely manner.
- *Federal Onshore Oil and Gas Leasing Reform Act (1987) (30 USC 195, 226-3)* - Granting the Secretary of Agriculture expanded authority over oil and gas leasing decisions on USFS lands and requiring USFS approval of BLM issued leases and approval of surface disturbance.

The following applicable BLM regulations, orders, notices, standard COAs, and general requirements constitute the range of standard procedures and environmental protection measures that are applied to individual operators and projects and are authorized by 43 CFR 3160.

Onshore Oil and Gas Orders:

- Onshore Order No.1 - Approval of Operations
- Onshore Order No. 2 - Drilling Operations
- Onshore Order No. 3 - Site Security
- Onshore Order No. 4 - Measurement of Oil
- Onshore Order No. 5 - Measurement of Gas
- Onshore Order No. 6 - Hydrogen Sulfide Operations
- Onshore Order No. 7 - Disposal of Produced Water
- Onshore Order No. 8 - Well Completions/Workovers/Abandonment (Proposed Rule)
- Onshore Order No. 9 - Waste Prevention and Beneficial Use of Oil and Gas (Not Published)
- Notices to Lessees

- BLM COAs for Coalbed Methane Completions
- BLM General Requirements for Oil and Gas Operations on Federal and Indian Lands.

A listing of agencies that could be involved in the Proposed Action and their respective regulatory authorities is shown in **Table 1-1**. The regulations listed in Table 1-1 include those that provide protection of surface resources.

Table 1-1 Federal, State, and County Permits, Approvals, and Authorizing Actions

Agency	Permit, Approval or Action	Authority
U.S. Forest Service (USFS)	Approval of Plan of Development for surface use of well pad	<i>Federal Onshore Oil and Gas Leasing Reform Act of 1987, FSM 1950</i>
	Concurrence with BLM's APD approval process on USFS administered land	FSM 1500
	Special Use Permit for access road ROW, road decommissioning, and pipeline	Forest Service Handbook (FSH) 1509.11
	Special Use Permit to utility company for installation and operation of powerline	Federal Register Notice 5-22-95
	Antiquities and cultural resource permits on USFS-administered land	<i>Antiquities Act of 1906, as amended (16 U.S.C. 431-433); Archaeological Resources Protection Act of 1979, as amended (16 U.S.C. Sections 470aa-470ll); Preservation of American Antiquities, as amended (43 C.F.R. 3)</i>
Bureau of Land Management (BLM)	Permit to drill, deepen, or plug back on BLM-managed land or minerals (APD process)	<i>Mineral Leasing Act of 1920, as amended (30 U.S.C. 181 et seq.) Requirements for Operating Rights Owners and Operators, as amended (43 C.F.R. 3162)</i>
	Authorization for flaring and venting of natural gas on BLM-managed land or minerals	<i>Mineral Leasing Act of 1920, as amended (30 U.S.C. 181 et seq.); Requirements for Operating Rights Owners and Operators, as amended (43 C.F.R. 3162)</i>
	Plugging and abandonment of a well on BLM-managed land or minerals	<i>Mineral Leasing Act of 1920, as amended (30 U.S.C. 181 et seq.); Requirements for Operating Rights Owners and Operators, as amended (43 C.F.R. 3162)</i>

Agency	Permit, Approval or Action	Authority
U.S. Army Corps of Engineers (COE)	Section 404 permits and coordination regarding placement of dredged or fill material in area waters and adjacent wetlands	Section 404 of the <i>Clean Water Act of 1972</i> , as amended (33 U.S.C. 1344); EPA-administered Permit Programs: The National Pollutant Discharge Elimination System (NPDES), as amended (40 C.F.R. 122); state program requirements (40 C.F.R. 123); Section 404(b)(1) Guidelines for Specific Disposal Sites for Dredged or Filled Material, as amended (40 C.F.R. 230)
U.S. Fish and Wildlife Service (USFWS)	Coordination, consultation, and impact review on federally listed threatened and endangered (T&E) species	<i>Fish and Wildlife Coordination Act</i> (16 U.S.C. 661-666c), Section 7 of the <i>Endangered Species Act of 1973</i> , as amended (16 U.S.C. 1536); <i>Bald Eagle Protection Act</i> (16 U.S.C. 668-668dd)
	Migratory bird impact coordination	<i>Migratory Bird Treaty Act</i> (16 U.S.C. 704)
U.S. Department of Transportation (DOT)	Control pipeline maintenance and operation	Transportation of Natural and Other Gas by Pipeline, Annual Reports, Incident Reports, and Safety Related Condition Reports, as amended (49 C.F.R. 191); Transportation of Natural and Other Gases by Pipeline: Minimum Safety Standards, as amended (49 C.F.R. 192)
Wyoming Department of Environmental Quality - Water Quality Division (WDEQ-WQD)	Permits to construct settling ponds and waste water systems, including groundwater injection and disposal wells	<i>Wyoming Environmental Quality Act</i> , Article 3, Water Quality, as amended (W.S. 35-11-301 through 35-11-311)
	Regulate disposal of drilling fluids from abandoned reserve pits	<i>Wyoming Environmental Quality Act</i> , Article 3, Water Quality, as amended (W.S. 35-11-301 through 35-11-311)
	NPDES permits for discharging produced water and stormwater runoff	WDEQ-WQD Rules and Regulations, Chapter 18; <i>Wyoming Environmental Quality Act</i> , Article 3, Water Quality, as amended (W.S. 35-11-301 through 35-11-311); Section 405 of the <i>Federal Water Pollution Control Act (Clean Water Act)</i> (codified at 33 U.S.C. 1345); EPA-

Agency	Permit, Approval or Action	Authority
		administered Permit Programs: NPDES, as amended (40 C.F.R. 122); State Program Requirements (40 C.F.R. 123); EPA Water Program Procedures for Decision-making, as amended (40 C.F.R. 124)
	Administrative approval for discharge of hydrostatic test water	<i>Wyoming Environmental Quality Act</i> , Article 3, Water Quality, as amended (W.S. 35-11-301 through 35-11-311)
Wyoming Department of Environmental Quality - Air Quality Division (WDEQ-AQD)	Permits to construct and permits to operate	<i>Clean Air Act</i> , as amended (42 U.S.C. 7401 et seq.); <i>Wyoming Environmental Quality Act</i> , Article 2, Air Quality, as amended (W.S. 35-11-201 through 35-11-212)
Wyoming Department of Environmental Quality - Land Quality Division (WDEQ-LQD)	Mine permits, impoundments, and drill hole plugging on state lands	<i>Wyoming Environmental Quality Act</i> , Article 4, Land Quality, as amended (W.S. 35-11-401 through 35-11-437)
Wyoming Department of Environmental Quality - Solid Waste Division (WDEQ-SWD)	Construction fill permits and industrial waste facility permits for solid waste disposal during construction and operations	<i>Wyoming Environmental Quality Act</i> , Article 5, Solid Waste Management, as amended (W.S. 35-11-501 through 35-11-520)
Wyoming Department of Transportation (WDOT)	Permits for oversize, overlength, and overweight loads	Chapters 17 and 20 of the Wyoming Highway Department Rules and Regulations
	Access permits to state highways	Chapter 13 of the Wyoming Highway Department Rules and Regulations
Wyoming Oil and Gas Conservation Commission (WOGCC)/Wyoming Board of Land Commissioners/ Land and Farm Loan Office	Approval of oil and gas leases, ROWs for long-term or permanent off-lease/off-unit roads and pipelines, temporary use permits, and developments on state lands	Public Utilities, W.S. 37-1-101 et seq.
WOGCC	Permit to drill, deepen, or plug back (APD process)	WOGCC Regulations, Chapter 3, Operational and Drilling Rules, Section 2 Location of Wells
	Permit to use earthen pit (reserve pits)	WOGCC Regulations, Chapter 4, Environmental Rules, Including Underground Injection Control Program Rules for Enhanced Recovery and Disposal Projects, Section

Agency	Permit, Approval or Action	Authority
		1, Pollution and Surface Damage (Forms 14A and 14B)
	Authorization for flaring or venting of gas	WOGCC Regulations, Chapter 3, Operational and Drilling Rules, Section 45 Authorization for Flaring or Venting of gas
	Permit for Class II underground injection wells	Underground Injection Control Program: Criteria and Standards, as amended (40 C.F.R. 146); state Underground Injection Control Programs, State-administered program - Class II Wells, as amended (40 C.F. R. 147.2551)
	Well plugging and abandonment	WOGCC Regulations, Chapter 3, Section 14, Reporting (Form 4); Section 15, Plugging of Wells, Stratigraphic Tests, Core, or Other Exploratory Holes (Form 4)
	Change in depletion plans	<i>Wyoming Oil and Gas Act</i> , as amended (Form W.S. 30-5-110)
Wyoming State Engineer's Office (WSEO)	Permits to appropriate groundwater (use, storage, wells, dewatering)	W.S. 41-3-901 through 41-3-938, as amended (Form U.W. 5)
	Permits to construct dams and reservoirs	W.S. 41-3-301 et seq., as amended (Forms SW3, SW4)
Wyoming State Historic Preservation Office (SHPO)	Cultural resource protection, programmatic agreements, consultation	Section 106 of <i>National Historic Preservation Act of 1966</i> , as amended (16 U.S.C. 470 et seq.) and Advisory Council Regulations on the Protection of Historic and Cultural Properties, as amended (36 C.F.R. 800)
Campbell County	Construction/use permits	County Code and Zoning Resolution
	Conditional use permits	County Code and Zoning Resolution
	Road use agreements/oversize trip permits	County Code
	County road crossing/access permits	County Code/Engineering Department
	Small wastewater permits	County Health Department
	Hazardous material recordation and storage	County Code

Agency	Permit, Approval or Action	Authority
	Zone changes	Zoning Resolution
	Filing Fees	County Code
	Noxious weed control	County Code

1.3.3 Leases and Stipulations

The Proposed Action encompasses 37 oil and gas leases of the federal mineral estate, as well as additional leases of private and state mineral interests. The federal leases would allow drilling 156 wells on federal surface, eight wells on state surface, and 18 wells on private surface. A summary of the surface and minerals ownership for wells that would be drilled under the Proposed Action is listed in **Table 1-2**.

Table 1-2 Count of Proposed Wells by Surface and Mineral Ownership, Proposed Action

Ownership	Federal Minerals	State of Wyoming Minerals	Private Minerals	Total
Federal Surface	156	0	0	156
State of Wyoming Surface	8	10	0	18
Private Surface	18	3	31	52
Totals	182	13	31	226

A summary of the locations, acreage, and effective date of each of the federal leases is included in **Appendix A**. The locations, lease numbers, and well numbers of each of the 182 federal wells that would be drilled under the Proposed Action are included in **Appendix B**. The locations and identifications of Project federal leases are illustrated in **Figure 1-4, Project Federal Lease Maps**.

Management of National Forest System lands is achieved through development of Resource Management Plans (RMPs). These plans include conditions, which are attached as stipulations to the lease, on oil and gas leasing decisions and development. Stipulations affecting current leasing decisions for the TBNG are described in the *Record of Decision and Revised Thunder Basin National Grassland Land and Resource Management Plan (2002 Grassland RMP)* (USFS, 2001a). A complete listing of oil and gas stipulations for the TBNG is indicated in **Appendix D** of the 2002 RMP. Most of the RMP stipulations that would affect oil and gas leasing decisions are biological in nature. These have been summarized in **Table 1-3** below. Leases granted under previous RMPs may not have stipulations from subsequent plans retroactively applied.

In addition to lease stipulations, USFS may recommend that BLM attach Conditions of Approval (COAs) to issued drilling permits. COAs may apply to an entire project or be site-specific. For the Proposed Action, the standard COA and programmatic mitigation measures determined applicable for surface disturbing activities which are contained in the BLM ROD and Resource Management Plan Amendments for the PRB FEIS were considered, and applicable ones required. A listing of standard COAs for CBM wells for the TBNG has been included as **Appendix C**.

1.4 PURPOSE AND NEED

The objective of the Proposed Action is for the Company to develop natural gas (methane) from coalbeds pursuant to rights of the Company under existing oil and gas leases granted by the BLM. National mineral leasing policies recognize the statutory rights of lessees to develop federal mineral resources to meet continuing national needs and economic demands so long as undue and unnecessary environmental degradation is avoided. Development and production of privately owned gas in the general Project Area will almost certainly continue regardless of development on federal lands.

Implementation of the Proposed Action would accomplish three objectives:

1. Development of the Project's CBM wells would contribute to the maintenance of an available natural gas supply for the national market;
2. Development of the Project's CBM wells would prevent additional drainage of the federally owned gas resource to adjacent, nonfederal wells; and
3. Development of the Project's CBM wells would facilitate the extraction of coal in adjacent areas.

Natural gas is an integral part of the U.S. energy future due to its ready availability from domestic sources, the presence of an existing market delivery infrastructure, and the environmental advantages associated with this clean-burning fuel. Developing the abundant domestic reserves of natural gas helps to reduce national dependence on potentially unstable foreign suppliers and ensures an adequate, stable supply. Production of domestic natural gas ensures that the nation will maintain its economic well-being and promotes national security. The environmental advantages of natural gas combustion versus other conventional fuels are emphasized in the 1990 Clean Air Act amendments (42 USC 7671 *et seq.*)

The increasing fraction of natural gas production represented by CBM is an important part of national efforts to maintain a stable domestic supply. In 1999, CBM represented approximately 6.7 percent of total U.S. dry gas production. At the end of 2002, national CBM production reached nearly 4 billion cubic feet (BCF) daily, approximately 20 percent of which was supplied by Powder River Basin wells. The proportion of CBM comprising total national dry gas production rose to approximately 7.4 percent at that time. CBM development constituted 57 percent of U.S. natural gas production growth during the 1990's. (Energy Information Administration, 2002 online data). CBM natural gas represents an increasingly important contribution to U.S. energy security.

Development of the Project Area CBM wells would also prevent drainage of federal gas from loss to non-federal wells in the surrounding area and from loss through the highwalls of adjacent, active surface coal mines in the area. Loss of natural gas to adjacent developed leases represents a loss of revenue to the United States, as analyzed in the Wyodak Drainage EA (BLM, 2000 pg. 1-12).

Figure 1-4-1 Federal Lease Map

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Figure 1-4-2 Federal Lease Map

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Figure 1-4-3 Federal Lease Map

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Development of the Proposed Action is also important in facilitating adjacent coal mining. Surface mining of coal requires dewatering of the mined section prior to excavation. Completion of the Proposed Action would assist in advancing the development of existing coal mines and thus contributing to another important factor in national energy security.

1.5 MANAGEMENT PLAN CONFORMANCE

The 1985 *Medicine Bow National Forest Land and Resource Management Plan* provided direction for the Medicine Bow National Forest, Douglas Ranger District, for managing the TBNG and for implementing the requirements of the Mineral Leasing Act and the Federal Onshore Oil and Gas Leasing Reform Act (FOOGRA) on the district's surface lands and federal mineral estate. This plan was amended by the April 22, 1994 ROD for the *Oil and Gas Leasing on the Thunder Basin National Grassland*, which provides stipulations for oil and gas leases, and standards and guidelines for oil and gas development on NFS lands. Resource management in the TBNG was updated with the issuance of the *Record of Decision and Revised Thunder Basin National Grassland Land and Resource Management Plan* (2002 Grassland RMP), and the 2002 *FEIS for the Northern Great Plains Management Plans Revisions* (USFS, 2001a) for which a ROD was subsequently issued; however, this decision is currently under appeal. This EA tiers to the latter two documents. Conformance of the Proposed Action with the TBNG Land and Resource Management Plan is indicated in **Appendix N**.

Lease stipulations included at the time a lease was granted cannot be modified to include more restrictive stipulations included under a new RMP. The USFS can, however, append COAs to APDs in order to implement more restrictive environmental protections. COAs are designed to protect specific resource areas such as soils, water, or wildlife and would be applied on a well-specific basis. The result is that the 2002 RMP standards and guidelines may effectively augment lease stipulations through the application of COAs. Because, however, the results of the analysis and conclusions made by the USFS are considered "best science," the Company has chosen to voluntarily incorporate the new standards and guidelines by reference. These standards and guidelines are indicated in **Table 1-3**.

Table 1-3 TBNG 2002 RMP Oil and Gas Standards and Guidelines Voluntarily Incorporated by the Company into the Proposed Action

Timing Limitations (TL)	Start	End	2002 RMP	Waivers and Exceptions
Ferruginous and Swainson's hawk nests	3/1	7/31	0.5-mile radius (LOS)	No nesting activity past 7 years
Golden eagle nests	2/1	7/31	0.5-mile radius(LOS)	No nesting activity past 7 years
Merlin nests	4/1	8/15	0.5-mile radius(LOS)	No nesting activity past 7 years
Sharp-tailed grouse leks	3/1	6/15	1.0-mile radius(LOS)	No display activity past 2 years or no current activity by May 1

Timing Limitations (TL)	Start	End	2002 RMP	Waivers and Exceptions
Sage grouse leks	3/1	6/15	2.0-mile radius(LOS)	No display activity past 5 years or no current activity by May 2, max noise 49 dBA
Mountain plover nest areas	3/15	7/31	0.25-mile radius(LOS)	No nests or no active nesting by 6/10
Black-footed ferret habitat	3/1	8/31	0.125-mile radius of prairie dog colonies potentially inhabited by BFF(LOS)	Survey clearances
Swift fox dens	3/1	8/31	0.25 mile radius(LOS)	No dens or demonstration of acceptable impacts
Controlled Surface Use (CSU)			2002 RMP	Waivers and Exceptions
Black-footed ferret habitat	80-ac spcg, lost habitat replace 1 yr, minimize new roads, daylight ops.			Unlikely
Mountain Plover habitat	80-ac spcg, lost habitat replace 1 yr, minimize new roads, 9am-5pm ops.			Unlikely
No Surface Occupancy (NSO)			2002 RMP	Waivers and Exceptions
Mountain plover nests and nest areas	0.25-mile known nests			Unlikely
Bald eagle nests	1.0-mile known nests(LOS)			Demonstration of non-occupation last 7 years
Bald eagle winter roosts	1.0-mile known roosts(LOS)			Roost no longer active or acceptable impact
Golden eagle, burrowing owl, merlin, ferruginous hawk, Swainson's hawk nests	0.25-mile known nests(LOS)			Demonstration of non-occupation last 7 years
Sharp-tailed and sage grouse leks	0.25-mile active leks(LOS)			Demonstration of non-activity last 2 seasons (sharp-tailed) or 5 seasons (sage), or acceptable impacts

LOS - Line of Sight

The Proposed Action conforms to the goals and objectives outlined in the 2002 RMP, Chapter 1, page 1-1 (USFS, 2002) and helps move the Project Area toward desired conditions described in that plan. Applicable goals include:

- Goal 1: Ensure sustainable ecosystems
- Goal 2: Multiple benefits to people
- Goal 3: Scientific and technical assistance

A set of Standards and Guidelines are detailed in the 2002 RMP (Chapter 1, page 1-9) to facilitate achievement of the goals. Standards are actions that must be followed or are required limits to activities in order to achieve Grassland-wide objectives. Guidelines are advisable actions that should be followed to achieve those same goals.

The 2002 Grassland RMP describes, in general terms, the desired condition of the Grassland and allocates land into Management Areas. Management Areas are defined by their resources that could be optimally administered to achieve a particular emphasis or theme. Each Management Area is characterized by a prescription that would facilitate the achievement of the desired conditions consistent with the theme. Resource goals, objectives, standards, and guidelines provide land managers a set of parameters that guide implementation of projects on the surface. The mix of Management Area prescriptions in the 2002 Grassland RMP provides for continued coal, oil and gas development, livestock grazing, and other uses.

The Project Area is entirely contained within what the 2002 Grasslands RMP terms the Hilight Bill Geographic Area (100,780 acres). Dominant management area prescription allocations for this area are Category 6.1, *Rangeland with Broad Resource Emphasis* (51,440 acres) and Category 8.4, *Mineral Production and Development* (47,993 acres). Activities in the Hilight Bill Area include recreational big game hunting and significant extraction of coal, uranium, oil, and gas. Areas classified as Category 6.1 “will display low to high levels of livestock grazing developments (such as fences and water developments), oil and gas facilities, and roads (USFS, 2002, page 3-25).” Areas classified as Category 8.4 will emphasize “mineral operations of all types” “to effectively remove available commercial mineral resources, concurrent with other ongoing resource uses and activities (USFS, 2002, page 3-26).” The Proposed Project is consistent with Management Area Prescriptions as outlined in the 2002 Grassland RMP.

The Proposed Project is consistent with Management Area Prescriptions as outlined in the current RMP.

During oil and gas exploration and development, an EA is prepared in conjunction with each APD and all ROW applications for roads, pipelines, electrical utilities, etc. Onsite inspections of proposed wells and production facilities were conducted by the USFS and BLM during the summer of 2002, and mitigative avoidance and environmental protection measures developed during those inspections have been incorporated into the Proposed Action and are included in this EA analysis. Operations conducted to develop the Proposed Action would conform to all applicable federal, state, and local statutes and regulations. Further, it is the intention of the Company to abide by the stipulations in the 2002 RMP.

1.6 PROPOSED ACTION OVERVIEW

The Company proposes to drill, complete, operate, and reclaim 226 CBM wells from the Fort Union Wyodak Coal reservoir in the Project Area, which lies primarily within the Porcupine Creek watershed. Surface and mineral ownership of the proposed wells would be divided among the United States, State of Wyoming, and private land owners, as indicated in **Table 1-2**. Approximately 156 wells would be located on federal surface, and an additional 27 wells would be drilled on either private or State of Wyoming surface overlying federal minerals. State of Wyoming surface would contain 18 wells, including 8 drilled to federal minerals. Private surface would contain 53 wells, including 18 drilled to federal minerals and 3 to State of Wyoming minerals. One test well was previously drilled on Project acreage in 1999, completed, and shut in (SENE Section 16, T42N, R70W).

As is typical of most oil and gas projects, the Big Porcupine CBM Project has evolved over time. The number of wells included in the Proposed Action is less than the 453 wells discussed in the Project scoping statement, mailed February 25, 2002. At the time of scoping, the Project was proposed by Independent Production Company (IPC). Subsequently, and prior to onsite inspections in the summer of 2002, IPC changed the proposed well spacing for most of the Project Area from 40 acres to 80 acres. In May, 2003, IPC and the Big Porcupine Project, were acquired by the Company.

The western portion of the original Project Area was located on both private surface overlying private minerals and private surface overlying federal minerals. Federal wells in this area are under the jurisdiction of BLM, not the USFS. This portion of the original Project Area, termed the Porcupine POD, also included acreage acquired by the Company subsequent to the issuance of the Project scoping notice. In July, 2003, the Porcupine POD, comprising 29 well locations on private surface overlying federal minerals was submitted to BLM for approval. Approval to develop this POD was received from BLM by the Company in January, 2004. NEPA analysis for the Porcupine POD was conducted by the BLM and those wells have been excluded from this EA.

Finally, since issuance of the Draft EA, the Company has decided to drop six federal wells from the Proposed Action for operational reasons. The removal of these wells represents a reduction of approximately 2.5% of the surface disturbances associated directly with well locations. In the interest of simplicity, it was decided not to recompute all of the disturbance levels based upon this small reduction in the total well count, although the actual number of wells has been corrected in this Final EA. The reader may assume that actual disturbances will, in many cases, be slightly less than the values indicated in the various tables.

In addition to wells, the Company would also construct ancillary facilities needed to support these wells. These facilities include access roads, small diameter pipelines for collecting gas and produced water, electrical utilities, facilities for compressing gas, facilities for discharging produced water, and larger diameter pipelines for delivering gas to a higher-pressure gas collection system and ultimately to a transmission pipeline. This transmission pipeline would deliver the gas to market.

The federal wells would be connected by low-pressure buried gas collection pipelines to five first-stage compressor stations, all of which would be located on USFS surface. These stations would be connected by buried high pressure gas pipelines to a single second and third-stage compressor station located on state surface. Connection to interstate gas transmission lines would be made from the latter station. Most pipelines would be buried in common utility corridors that would also contain pipelines transporting produced water and 480-volt electrical wiring.

Produced water would be piped to 14 discharge facilities where it would be released into Porcupine Creek or the ephemeral stream channels that are tributary to it. The produced water would be directed to and collected in and/or pumped to one of several reservoirs owned by the NARC surface coal mine for use in industrial applications. Water would also be beneficially released for use in stock and wildlife watering. The total length of the utility corridors on federal surface that would contain commonly-buried pipelines and electrical lines, plus the length of separately buried utilities, would be approximately 112 miles, including approximately 79 miles on federal surface.

New roads would be constructed, and some existing roads would be upgraded. Roads would represent most of the long-term disturbance associated with the Proposed Action. Total length of new and upgraded roads to be constructed would be approximately 41 miles, including approximately 24 miles on federal surface. Construction of the Proposed Action is expected to occur over a period of 16 to 18 months after all required approvals are acquired.

Most Project wells would be spaced at one well per 80 acres. Spacing of most wells near the existing coal mines would be one well per 40 acres. Implementation of the Proposed Action would result in both short-term and long-term (18 months or longer, typically for Project duration) disturbances to the surface. Some disturbed areas would be reclaimed after a well is initially drilled and put on production. Drilling of the proposed wells and construction of support roads and other facilities would initially disturb approximately 938 acres within the Project Area, of which approximately 647 acres would occupy USFS surface. This initial disturbance would encompass about five percent of the Project Area.

Interim reclamation would occur after a well is drilled and after installation of pipelines and compressor stations. After interim reclamation takes place, the Proposed Action's long-term disturbance would be reduced to approximately 114 acres, of which approximately 72 acres would occupy USFS surface. The long-term disturbance of federal surface is an 89 percent reduction from the short-term disturbance. Roads comprise most of the long-term disturbance. Productive well life is estimated to range from 4 to 7 years.

1.7 DECISION FRAMEWORK

The Proposed Action represents the largest CBM development on National Forest System lands (Moncrief, 2003 personal communication). The Project was designed as a unity and, because of its size, overlaps lands of USFS, State of Wyoming, and private surface jurisdictions. Mineral ownership is divided between BLM, State of Wyoming, and private interests, with numerous split estate situations. Because USFS surface represents the bulk of the Project Area, the USFS

is the lead agency for this NEPA analysis. USFS surface encompasses 156 federal wells. An additional 27 wells will be drilled on federal mineral ownership in split estate situations. As such, the BLM is a cooperating agency in the NEPA process. forty-four wells will be drilled on acreage with no federal involvement, but have been included in this analysis as connected actions. Because the USFS and BLM have separate authorities over portions of the Project Area, the NEPA process will result in separate decisions by each agency.

The decision-makers for the USFS (the Medicine Bow/Routt National Forests Supervisor) and BLM (the Buffalo Field Office Manager) will determine whether the analysis presented in this NEPA document is complete and whether the Proposed Action or an alternative present the probability of significant impacts to the TBNG or to non-federal surface overlying federal minerals. In the event of a finding of probable significant impacts, a decision to proceed with more detailed analysis in a subsequent EIS would be made. In the event of a Finding of No Significant Impact (FONSI), the Proposed Action or an alternative would be approved. Approval, however, might be made in the context of additionally required mitigative measures. The decision-makers may reach different conclusions regarding the level of impacts, so that a FONSI could be issued by one decision-maker and not by the other.

The decision-makers would also consider the alternative of No Action, selection of which would amount to a denial of the Project. However, as discussed subsequently, the ability of the decision makers to select the No Action Alternative is severely constrained. Denial of the Project would violate the contractual rights granted to the Company by the United States.

Decisions on this EA will also be made in the context of other NEPA actions. With the February 28, 2003 expiration of the Wyodak Drainage EA, a programmatic NEPA document addressing CBM development within the Project Area did not exist. The USFS has released the 2002 RMP, FEIS, and ROD for the TBNG (USFS, 2002a; USFS, 2001; Cables, 2002). This decision is currently under appeal; however, the Company has agreed to conform to the standards and guidelines contained in the 2002 RMP revision. The BLM and USFS have jointly issued an FEIS for oil and gas development within portions of the Powder River Basin that includes the TBNG (BLM, 2003), the PRB O&G FEIS. A ROD for this FEIS was issued by the BLM on April 30, 2003 (Bennett, 2003). A ROD from the USFS is pending, and the USFS has adopted the analysis in the PRB O&G FEIS for the purposes of lease decisions. The analysis in this EA references that in the PRB O&G FEIS.

1.8 PUBLIC INVOLVEMENT

Public involvement was initiated when the Proposed Action was listed on the Douglas Ranger District Schedule of Proposed Actions and the Scoping Notice letter was mailed by the USFS on February 25, 2002 to approximately 120 addressees. A copy of the Scoping Notice is included in **Appendix D**. A listing of the addressees is included as **Appendix E**. Comments were received from 12 respondents prior to the close of the 30-day public scoping period on March 27, 2002. A summary of the comments received, the identity of the respondents, and a reference to the page number in the EA in which the comment is discussed are contained in **Appendix F**. Originals of the communications from respondents are available for inspection at the Douglas District Ranger Office, Douglas, Wyoming.

1.9 ISSUES

The USFS separated scoping issues into significant and non-significant groups. Significant issues were defined as those directly or indirectly caused by implementing the Proposed Action. Non-significant issues were identified as those:

1. Outside the scope of the Proposed Action;
2. Already decided by law, regulation, Forest Plan, or other higher level decision;
3. Irrelevant to the decision to be made; or
4. Conjectural and not supported by scientific or factual evidence.

The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." A list of non-significant issues and reasons regarding their categorization as non-significant are in **Appendix G**.

The USFS identified a number of significant issues raised during scoping. These issues were organized by resource areas. As is typical for CBM projects, surface water and groundwater issues were the primary concerns. Surface impacts associated with drilling and producing over 200 wells were the second most commonly cited concerns. Significant issues identified are summarized and listed by resource area in **Table 1-4**. These issues form the core of Chapter 3 of this EA, which addresses environmental consequences of the Proposed Project. Each issue has been analyzed in the appropriate section of Chapter 3 and these analyses have been used to formulate recommended mitigation measures.

Table 1-4 Significant Issues Determined from Scoping

Resource	Issue
Geology, Paleontology, Minerals, and Geologic Hazards	Potential adverse effects on human health and safety, vegetation, and local fish and wildlife populations resulting from methane seepage accompanying reduction in hydrostatic pressure from coal dewatering.
	Possible increased risk of combustion and fire in dewatered coals resulting in potential for grassland fires, slumping of overburden, possibility of toxic gas emissions, and loss of natural resource-related values.
	Potential for coal mines experiencing increased difficulty handling produced water leading to high wall and spoil pile instability.
	Potential damage to soils, livestock, wildlife, or human health and safety resulting from ice jams and flooding created by produced water.
	Possible deleterious effects of CBM development on future coal leasing and ongoing mining operations.

Resource	Issue
<p>Surface Water</p>	<p>Effects of surface discharge of produced water containing high concentrations of dissolved salts. Both the effects of high salinity and high SAR are of concern regarding suitability for irrigation, sodification of soils, and potential toxicity to native plants. Any degradation of downstream water quality has potential effects into South Dakota.</p>
	<p>Possible increased sedimentation and channel erosion, potential loss of floodplain biodiversity, and effects on stream temperature resulting from high volumes (up to an estimated maximum of nearly 4 million gallons per day) of produced water discharged to local ephemeral stream channels.</p>
	<p>Restriction of spring recharge of downstream wetland/riparian areas and evaporative concentration of salts resulting from storage of produced water in impoundments.</p>
	<p>Necessity for mandatory water and soil testing at discharge points, along ephemeral drainages, and along receiving perennial streams.</p>
	<p>Potential deleterious effects of discharge of produced water with selenium concentrations exceeding 2 µg/L.</p>
<p>Groundwater</p>	<p>Possible deleterious effects of infiltration from impoundments of saline water on near surface aquifers.</p>
	<p>Potential depression of the water table in near-surface aquifers resulting from dewatering of coals.</p>
	<p>Potential methane contamination of shallow aquifers from seepage accompanying coal dewatering or contamination of other aquifers by produced water.</p>
<p>Air Quality</p>	<p>Possible increase in toxic emissions, including sulfur dioxide, nitrous oxide, carbon monoxide, carbon dioxide, and formaldehyde from operation of natural gas-powered compressors.</p>
	<p>Possible degradation of air quality from increased vehicle traffic and associated dust and resultant negative effects on wildlife, vegetation, human health, and visibility</p>
<p>Soils</p>	<p>Potential for increased erosion associated with high volumes of discharged water.</p>
	<p>Possibility of degradation and sodification of soils resulting from discharge of highly sodic waters, in particular in areas of closed basins or areas of poor soil drainage, leading to poor reclamation potential.</p>
<p>Vegetation and Land Cover</p>	<p>Potential disturbance of riparian vegetation from degraded water quality, changed water levels, and altered sedimentation resulting from discharge of large volumes of produced water.</p>
	<p>Insufficiency of current plant inventories for use in long-term monitoring of any deleterious effects of CBM development.</p>
	<p>Possibility of degradation and sodification of local soils resulting in loss of native plant species and increased potential for invasion of weeds and salt-</p>

Resource	Issue
	tolerant species.
Wildlife	Potential disturbance of breeding areas and migration routes and fragmentation of habitat, in particular sage grouse habitat, associated with roads and production facilities resulting from CBM development.
	Possible deleterious effects on wildlife populations resulting from increased human presence, vehicular traffic, and other activities on the Grassland.
	Potential for increased power line-related mortality among raptors and waterfowl and of increased sage grouse mortality resulting from new utility pole raptor perches near leks.
	Potential for negative impacts to fisheries resulting from reduced water quality, altered water temperatures, and increased sedimentation associated with high volumes of discharged produced water.
	Insufficiency of current wildlife and habitat inventories and baseline studies for use in long-term monitoring of any deleterious effects of CBM development.
Cultural Resources	No specific concerns were received.
Land Use and Transportation	Potential for negative short- and long-term effects on irrigated crops resulting from degradation of soils by highly sodic discharged produced water.
	Possibility of negative effects on stock-raising and coal mining activities associated with significant surface disturbance.
Visual Resources	Potential impairment of visual quality standards resulting from dust associated with increased vehicular traffic.
Recreational Resources	Possible disruption and displacement of big game animals resulting from development leading to reduced hunting opportunities.
Noise	Possible increase in noise levels associated with operation of gas compressors would negatively affect human and animal life in the area.
Socioeconomics	The Proposed Action could contribute to the generation of significant income to the local population.
	Project would likely negatively affect surface coal mining operations through increased water handling costs, interruptions and delays in mine development, and possibly increased leasing expenses. The economic benefit of coal mining is greater than that from CBM development.

1.1	SUMMARY	1
1.2	DOCUMENT STRUCTURE.....	2
1.3	BACKGROUND	2
1.3.1	Relationships Among Agencies.....	6
1.3.2	Applicable Laws Relating to Minerals Development.....	12
1.3.3	Leases and Stipulations.....	17
1.4	PURPOSE AND NEED.....	18
1.5	MANAGEMENT PLAN CONFORMANCE.....	25
1.6	PROPOSED ACTION OVERVIEW	28
1.7	DECISION FRAMEWORK.....	29
1.8	PUBLIC INVOLVEMENT	30
1.9	ISSUES	31
	Table 1-1 Federal, State, and County Permits, Approvals, and Authorizing Actions	13
	Table 1-2 Count of Proposed Wells by Surface and Mineral Ownership, Proposed Action.....	17
	Table 1-3 TBNG 2002 RMP Oil and Gas Standards and Guidelines Voluntarily Incorporated by the Company into the Proposed Action	25
	Table 1-4 Significant Issues Determined from Scoping.....	31