BTA Oil Producers Bravo Field Development, Green River Resource Area, Environmental Assessment

United States Department of the Interior Bureau of Land Management

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The Bureau of Land Management is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield to produce a combination of uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness, and natural, scenic, scientific, and cultural values.
This Environmental Assessment (EA) on BTA Oil Producers (BTA) proposed natural gas development project is submitted for your review and comment. This EA has been prepared to analyze the impacts from BTA’s project within the Bravo Unit located approximately 22 miles northeast of Point of Rocks, Wyoming, on Interstate 80. BTA and its partners have drilled four exploration wells to characterize the natural gas reservoir in the development area. Three wells confirmed that commercial quantities of hydrocarbons exist in the development area. A fourth well was a dry hole. BTA would like to proceed with development of its leases by drilling 10 additional natural gas wells and a water supply and pipelines. The drilling, construction, and reclamation activities would be conducted between 1995 and 2005.

If you wish to comment on the EA, we request that you make your comments as specific as possible. Comments will be more helpful if they include suggested changes, sources, or methodologies. Comments that contain only opinions or preferences will not receive a formal response; however, they will be considered and included as part of the BLM decision making process. Comments should be submitted in writing by June 6, 1995 to:

Bureau of Land Management
Bill McManus, Project Coordinator
P.O. Box 1869
Rock Springs, Wyoming 82902-1869

This EA was prepared pursuant to the National Environmental Policy Act, and other regulations and statutes, to address possible adverse environmental and socioeconomic impacts which could result from the project and to solicit public comments and concerns. This EA is not a decision document. Its purpose is to inform the public of the potential impacts associated with implementing BTA’s proposal and to evaluate alternatives to the proposal. This EA is also intended to provide information to other regulatory agencies for use in their decision making process for other permits required for implementation of the project.

Please retain this copy of the EA for future reference. A copy of the EA has been sent to affected government agencies and to those persons who responded to scoping or otherwise indicated to BLM that they wished to receive a copy of the EA. The EA may also be reviewed at the following locations:

Bureau of Land Management
Wyoming State Office
2515 Warren Avenue
Cheyenne, WY 82001

Bureau of Land Management
Rock Springs District Office
Highway 191 North
Rock Springs, WY 82901

Bureau of Land Management
Green River Area Office
1993 Dewar Drive
Rock Springs, WY 82901

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Area Manager
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List of Abbreviations

ACEC Area of Critical Environmental Concern
ANSI American National Standards Institute
AO Authorized Officer (BLM Green River Resource Area Manager)
APD Application for Permit to Drill
API American Petroleum Institute
AUM Animal Unit Month
BLM Bureau of Land Management
BOP Blowout Preventer
BTA BTA Oil Producers (including contractors and subcontractors)
Bu British Thermal Units
CEQ Council on Environmental Quality
CO Carbon Monoxide
COE U.S. Army Corps of Engineers
DBA Decibels
EA Environmental Assessment
EIS Environmental Impact Statement
EO Executive Order
EPA Environmental Protection Agency
FEMA Federal Emergency Management Agency
FLPMA Federal Land Policy and Management Act
H₂S Hydrogen Sulfide
MLA Mineral Leasing Act
NEPA National Environmental Policy Act
NGLs Natural Gas Liquids
NO₃ Nitrogen Oxides
NPDES National Pollutant Discharge Elimination System
NRHP National Register of Historic Places
NSA Noise Sensitive Areas
NWI National Wetlands Inventory
PLS Pure Live Seed
PO Plan of Operations
PSD Prevention of Significant Deterioration
RCRA Resource Conservation and Recovery Act
RMP Green River Resource Management Plan
ROD Record of Decision
ROW Right-of-Way
RSGA Rock Springs Grazing Association
SCS Soil Conservation Service
SO₂ Sulfur Dioxide
SPCC Spill Prevention, Control and Countermeasures Plan
TCLP Toxicity Characteristic Leaching Procedure
TDS Total Dissolved Solids
TUP Temporary Use Permit
CHAPTER ONE
INTRODUCTION

1.1 OVERVIEW OF PROPOSED ACTIVITIES

This Environmental Assessment (EA) was prepared to evaluate and disclose potential environmental impacts associated with the Bravo field development proposed by BTA Oil Producers and its partners (BTA) in Sweetwater County, Wyoming. BTA has tested and confirmed the existence of substantial quantities of natural gas on Federal oil and gas leases within its Bravo Unit and on adjacent lands (hereafter referred to as the "development area"). BTA would like to proceed with development of its existing oil and gas leases and other developments necessary to serve future oil and gas production. BTA would be assisted in this effort by contractors and its partners. For purposes of this EA, reference to BTA as the project proponent includes all partners, contractors and subcontractors that may be involved in the design, development and implementation of the proposed development.

The proposed development would involve 10 natural gas wells, a water supply well, gas processing plant, tank batteries, roads and pipelines. Construction activities would disturb an established 180.6 acres of which 33.7 acres would be converted to oil and gas production facilities. Areas not required for production activities (e.g., a portion of well pads and buried pipeline rights-of-way) would be reclaimed.

The project would develop Federal minerals; however, one section of State minerals is within the development area. BTA currently holds Federal and State oil and gas leases on lands within the development area. To proceed with development BTA must apply to the BLM for the following:

- An application for permit to drill (APD) for each proposed well and associated facilities located on Federal land;
- Rights-of-way across Federal land for pipelines and access roads; and,
- Permits for the proposed gas processing facility and a central tank battery.

If the project is approved and these approvals are issued, this EA will guide the implementation of project activities.

1.2 OIL AND GAS ACTIVITIES IN THE BTA DEVELOPMENT AREA AND VICINITY

Four wells have been drilled in the BTA development area one of which was a dry hole. Existing roads and two-track trails in the development area were upgraded to access these well sites. Extensive oil and gas development has also occurred in the vicinity of the development area. Existing development is discussed in greater detail in Chapter Three.
1.3 PURPOSE AND NEED

The purpose of BTA’s Proposed Action and Freighter Gap Pipeline Alternative is to efficiently recover energy resources from lands already under Federal oil and gas lease in the Bravo development area. Private exploration and development of Federal minerals is authorized and encouraged by the Mineral Leasing Act (MLA) and Federal Land Policy and Management Act (FLPMA). BTA and its partners have drilled four exploration wells to characterize the natural gas reservoir in the development area. Three wells confirmed that commercial quantities of hydrocarbons exist in the development area. A fourth well was a dry hole. Federal mineral leasing encourages development of domestic oil and gas reserves to reduce dependence on foreign energy supplies.

1.4 LOCATION

The Bravo development area is located in Sweetwater County, Wyoming approximately 30 miles north of Interstate 80 (Figure 1-1). It is located within the BLM’s Green River Resource Area of the Rock Springs District. Access to the development area is from Exit 152 on Interstate 80 and the Bar X Road, also known as County Road 21. The development area is about 3.5 miles west of the Bar X Road (see Figure 2-1). Access to the gas sales pipeline route is from the development area, the existing Frontier Pipeline right-of-way and the Nine Mile Road. Access within the development area is provided by existing roads (see Figure 2-2). There are no permanent buildings, structures or residences within or adjacent to the development area.

1.5 DEFINITIONS

For the purposes of this EA, the following terms are defined as follows:

Affected Lands. Affected lands include the Bravo development area and lands affected by the construction of the proposed permanent, natural gas sales pipeline and the condensate pipeline.

Development Area. This refers to the Bravo Unit and adjacent lands which would be affected by well drilling, gas processing and other activities focused on the development of the natural gas reservoir and Federal oil and gas leases.

Baseline Development, Disturbance and Impacts. In many cases project activities would occur in areas previously disturbed by human activities. For example, portions of the permanent gas sales pipeline would follow an existing pipeline corridor. Therefore, it is important to distinguish between existing disturbance and new disturbance associated with implementation of BTA’s Proposed Action. Baseline development, disturbance and impacts are defined as activities which would have occurred prior to the initiation of proposed activities. In essence, this is a description of the environment prior to field development. (Baseline development, in relation to BTA’s Proposed Action, is evident from Figures 2-1, 2-2 and 3-3).
Proposed Action: This category is defined as the development, disturbance and impacts associated with the drilling, completion and production of 10 natural gas wells and associated roads, pipelines, a central tank battery, water well and a gas processing facility as described in Chapter Two of this EA.

Construction-Related Disturbance. This category refers to the number of acres of surface that would be directly affected in some way, even temporarily, by construction and drilling activities.

Production-Related Disturbance. This category is associated with activities that change existing land uses to industrial use for the life of the project. Included in this category is the gas processing facility site, central tank battery, road surfaces and portions of well pads needed for production equipment. Surface not needed for production activities (e.g., pipeline corridors) would be reclaimed.

Cumulative Development, Disturbance and Impacts. Council on Environmental Quality (CEQ) guidelines define a cumulative impact as the impact on the environment which results from the incremental impact of the 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 (40 CFR Part 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. No other oil and gas activities are proposed for the development area or adjacent lands.

Freighter Gap Pipeline Alternative. Initially, BTA considered routing its permanent gas sales pipeline to a tie-in point adjacent to an existing well in the Freighter Gap area. This alternative is analyzed because it is technically feasible and would reduce the amount of pipeline and surface disturbance required to connect the development area with a sales point. This alternative is shown in Figure 2-1.

1.6 CONFORMANCE WITH LAND USE PLANS

In 1981 BLM adopted certain management actions for oil and gas activities to protect resources and land uses in the Green River Resource Area. These management actions are listed in the Big Sandy/Salt Wells Oil and Gas EA. Since 1981 several of these actions have been modified. The Proposed Action would comply with the management actions, as modified. Although the Big Sandy Management Framework Plan is the existing, approved land use plan, environmental protection measures and standards found in the draft Green River Resource Management Plan—which have been coordinated with the Wyoming Game and Fish Department, and other State and local agencies—represent best management practices for the resource protection. The final Resource Management Plan for the Green River Resource Area (when issued) would direct activities on BLM-administered lands. The proposed activities would be consistent with the draft RMP as discussed in Appendix A. The proposed activities would not affect or foreclose implementation of alternatives analyzed in the environmental impact statement prepared on the draft RMP. As discussed in Chapter Two and as shown in Appendix A, BTA would implement the Proposed Action in conformance with resource management goals, guidelines and environmental protection measures discussed in the draft RMP.

1.7 IMPACT AVOIDANCE AND MITIGATION

BTA’s Proposed Action already incorporates activities, practices and procedures intended to reduce, avoid or mitigate impacts to the environment. BTA has agreed to implement all mitigation measures developed as part of this EA. For example, pipeline routes would follow existing roads or existing pipeline corridors where feasible to minimize new disturbance and cumulative impacts. Where located within crucial winter range, project activities would be scheduled to avoid the crucial winter range period. An existing access road would be used to access the development area and gas processing facility.

1.8 AUTHORIZING ACTIONS

A list of key permits, approvals and authorizing actions necessary to construct, operate, maintain and abandon BTA’s Proposed Action and alternatives (except the No Action Alternative) is included as Table 1-1. A brief summary of key permits and requirements follows.

1.8.1 Federal Permits

Permitting on Federal minerals is subject to BLM’s Onshore Oil and Gas Order No. 1 (43 CFR Part 3164). BTA’s drilling program would require BLM approval for each well prior to the commencement of drilling. Federal review of the drilling program would be accomplished through the APD process. BLM Onshore Order No. 1 requires an applicant to comply with the following requirements:

- Operations must result in the diligent development and efficient recovery of resources;
- All activities must comply with applicable Federal laws and regulations and with State and local laws and regulations to the extent that such State and local laws are applicable to Federal leases;
- All activities must contain adequate safeguards to protect the environment;
- Disturbed lands must be properly reclaimed;
- Underground sources of fresh water must be protected from fluid injection operations; and,
- All activities must protect public health and safety.

Onshore Order No. 1 specifically states that “lessees and operators shall be held fully accountable for their contractor’s and subcontractor’s compliance with the requirements of the approved permit and/or plan.”

Pipeline and road rights-of-way and permits on BLM-managed lands would be issued under the authority of the Mineral Leasing Act of 1920 or Federal Land Policy and Management Act of 1976. The right-of-way grant authorizing BTA to construct access roads and pipelines would grant the company certain rights subject to the terms and conditions incorporated by the BLM into the grant.
<table>
<thead>
<tr>
<th>Issuing Agency/Permit Name</th>
<th>Nature of Permit</th>
<th>Authority</th>
<th>Applicable Project Component</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Federal Agencies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bureau of Land Management</td>
<td>Controls drilling for oil and gas on Federal onshore lands; regulates reserve pits on drilling locations</td>
<td>Mineral Leasing Act of 1920 (30 U.S.C. 181 et seq.); 43 CFR 3162; 43 CFR 3164. Onshore Oil and Gas Order No. 1</td>
<td>Well pad construction and drilling, testing and completion activities, plug and abandon well</td>
</tr>
<tr>
<td>Plugging and Abandonment of a Well</td>
<td>Establishes procedures for permanently abandoning a well</td>
<td>Mineral Leasing Act of 1920 as amended 43 CFR 3162.3-4 (Well Abandonment)</td>
<td>Abandonment of wells</td>
</tr>
<tr>
<td>Authorizing Flaring or Venting of Gas</td>
<td>Regulates flaring and venting of gas</td>
<td>Mineral Leasing Act of 1920 as amended, NTL 4A (Royalty or Compensation for Oil and Gas Lost)</td>
<td>Emergencies: well testing and evaluation</td>
</tr>
<tr>
<td>Antiquities and Cultural Resource Permits</td>
<td>Issue antiquities and cultural resources use permit to excavate or remove cultural resources from BLM-managed lands</td>
<td>Antiquities Act of 1906 (16 U.S.C. Section 431-433); Archaeological Resources Public Protection Act of 1979 (16 U.S.C. Sections 470aa - 47011); 43 CFR Part 3</td>
<td>All Proposed Action and alternative project components</td>
</tr>
<tr>
<td>Approval to Dispose of Produced Water</td>
<td>Controls disposal of produced water from Federal leases</td>
<td>Mineral Leasing Act of 1920 (30 U.S.C. 181 et seq.); 43 CFR 3164; Onshore Oil and Gas Order No. 7</td>
<td>Production wells</td>
</tr>
<tr>
<td>U.S. Army Corps of Engineers</td>
<td>Controls placement of dredged or fill material in waters of the United States and adjacent wetlands</td>
<td>Section 404 of the Clean Water Act of 1972 (40 CFR 122 - 123)</td>
<td>Pipeline and road crossings of streams (intermittent and perennial) and wetlands</td>
</tr>
</tbody>
</table>

1-6
<table>
<thead>
<tr>
<th>Issuing Agency/Permit Name</th>
<th>Nature of Permit</th>
<th>Authority</th>
<th>Applicable Project Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wyoming Department of Environmental Quality Notice of Intent - Storm Water Discharge Permit</td>
<td>Controls off-site storm water runoff from construction activities</td>
<td>Section 405 of the Clean Water Act (40 CFR Parts 122, 123 and 124); WDEQ Rules and Regulations, Chapter 18</td>
<td>All construction activities causing disturbance of 5 acres or more in fields of less than 20 wells</td>
</tr>
<tr>
<td>WDEQ Air Quality Division Air Quality Permit-to-Construct</td>
<td>Regulates air emissions from all facilities under the Clean Air Act</td>
<td>Wyoming Environmental Quality Act (W.S. 35-11-201 through 35-11-212)</td>
<td>Gas processing facility</td>
</tr>
<tr>
<td>WDEQ Water Quality Division Administrative approval for discharge of hydrostatic test water</td>
<td>Approval to allow one-time discharge of hydrostatic test water</td>
<td>Wyoming Environmental Quality Act (W.S. 35-11-301 through 35-11-311)</td>
<td>Any hydrostatic testing of pipelines</td>
</tr>
<tr>
<td>Wyoming Department of Transportation Oversize and Overlength Load Permits</td>
<td>Permits for oversize, overlength and overweight loads</td>
<td>Chapters 17 and 20 of the Wyoming Highway Department Rules and Regulations</td>
<td>Transportation of equipment and materials on State and Federal highways</td>
</tr>
<tr>
<td>Wyoming Oil and Gas Conservation Commission Permit to Drill, Deepen or Plug Back (APD process)</td>
<td>Regulates drilling of all wells in the State</td>
<td>Wyoming Oil and Gas Conservation Commission Regulations (Section III, Rule 305)</td>
<td>Wells</td>
</tr>
<tr>
<td>Application for Permit to Use Earthen Pit</td>
<td>Regulates reserve pits on drilling locations</td>
<td>Wyoming Oil and Gas Conservation Commission Regulations (Section III, Rule 326)</td>
<td>Wells</td>
</tr>
<tr>
<td>Authorization for Flaring or Venting of Gas</td>
<td>Regulates flaring and venting of gas</td>
<td>Wyoming Oil and Gas Conservation Commission Regulations (Section III, Rule 346)</td>
<td>Well testing and evaluation</td>
</tr>
<tr>
<td>Plugging and Abandonment of a Well</td>
<td>Establishes procedures for permanently abandoning a well</td>
<td>Wyoming Oil and Gas Conservation Commission Regulations (Section III, Rule 315)</td>
<td>Abandonment of wells</td>
</tr>
<tr>
<td>Wyoming State Land Board Rights-of-way Grants</td>
<td>Rights-of-way across State lands</td>
<td>W.S. 35-20 and 36-20</td>
<td>Roads, pipelines across State lands</td>
</tr>
<tr>
<td>Wyoming State Engineer’s Office Water Well Permit</td>
<td>Grant permit to appropriate groundwater</td>
<td>W.S. 41-121 through 147</td>
<td>Water supply wells</td>
</tr>
<tr>
<td>Issuing Agency/Permit Name</td>
<td>Nature of Permit</td>
<td>Authority</td>
<td>Applicable Project Component</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-------------------------------------------</td>
<td>-------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Sweetwater County</td>
<td>Notification of oil and gas development</td>
<td>County Land Use Code</td>
<td>All project components</td>
</tr>
<tr>
<td>Construction Use Permit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road Crossing/Access Permit</td>
<td>Approval to cross or enter a County road</td>
<td>County Land Use Code</td>
<td>Roads, pipelines</td>
</tr>
</tbody>
</table>

**NOTE:** This list is intended to provide only an overview of key regulatory requirements that would govern project implementation. Additional approvals, permits and authorizing actions could be required.
BLM will require BTA to demonstrate compliance with the Antiquities Act of 1906 (16 U.S.C. Section 431-433) and the Archaeological Resources Protection Act of 1979 (16 U.S.C. Sections 470aa - 47011; 43 CFR Part 3) prior to the start of surface disturbing activities. Avoidance of archaeological and historical sites by project activities is the preferred method of compliance.

Areas potentially affected by surface disturbing activities that contain cultural resources or that provide potential habitat for Federally-listed threatened or endangered species are protected by the National Historic Preservation Act of 1966 and the Endangered Species Act of 1973, respectively.

The U.S. Army Corps of Engineers (COE) regulates the discharge of dredged or fill materials related to construction of roads, pipelines and well pads in waters of the United States, which includes adjacent wetlands. pursuant to Section 404 of the Federal Clean Water Act (33 CFR 323.1). The discharge must also comply with the Environmental Protection Agency's (EPA) Section 404(b)(1) guidelines (40 CFR Part 230). Construction of roads and pipelines would require the crossing of intermittent and permanent drainages in the project area. These crossings would be constructed under a COE nationwide permit. This permit is issued on a nationwide basis for specific categories of activities that are substantially similar and cause minimal environmental impacts. Nationwide permits are designed to allow work to occur with little delay or paperwork.

Special conditions and management practices which apply to nationwide permits include the following: no interference with navigation; stabilization of exposed slopes and banks upon completion; use of appropriate erosion and siltation control measures; minimal disruption to movement of indigenous fish species; placement of heavy equipment on mats when working in wetlands; no jeopardy to threatened or endangered species or destruction of critical habitat; protection of properties eligible for listing on the National Register of Historic Places; and minimization of discharge of material into waters of the U.S., spawning areas and waterfowl breeding areas. The conditions must be followed for the permit to be valid. Failure to comply with the management practices, to the degree practicable, may cause the COE's district engineer to take action to regulate the activity on an individual or regional basis.

Two executive orders (EO) place restrictions on government approval of construction activities in floodplains and wetlands. They are binding on all governmental agencies including the BLM. The EOs require consideration of wetland and floodplain impacts in all documents prepared in compliance with NEPA. The EOs are briefly summarized below:

EO 11978 (42 FR 26951) was designed to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare and to restore and preserve the natural and beneficial values of floodplains. The BLM is required by EO 11988 to restore and preserve the natural and beneficial values of floodplains in all activities conducted by the agencies which affect land use, including regulating and licensing activities. BLM is required to evaluate the potential effects of agency actions (such as approval of APDs or rights-of-way) on floodplains.

EO 11990 (42 FR 26961) was designed, to the extent possible, to avoid the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct and indirect support of new construction in wetlands wherever there is a practicable alternative. To the extent permitted by law, the BLM is prohibited from undertaking or providing assistance for new construction located in wetlands unless the agency finds: 1) that there is no practicable alternative to the construction; and 2) that the action includes all practicable measures to minimize harm to the wetland.

1.8.2 Storm Water and Erosion Control Regulations

Section 405 of the Water Quality Act of 1987 added Section 402(p) to the Clean Water Act which required the EPA to develop a phased approach to regulating storm water discharges under the National Pollutant Discharge Elimination System (NPDES) program. EPA published a final regulation on November 16, 1990 (40 CFR Part 122.26) establishing permit application requirements for storm water discharges.

The State of Wyoming has developed a general storm water permit for construction activities disturbing five acres or greater. No single site would exceed five acres; however field development would disturb more than five acres. Where subject to the Wyoming Department of Environmental Quality (WDEQ) requirements, BTA would prepare a pollution prevention plan and submit a notice of intent. Typically a pollution/erosion prevention plan would include a description of erosion and sediment controls (stabilization and structural measures) that would be installed and storm water management practices that would be implemented. Implementation of a required pollution prevention plan would require weekly inspection reports on pollution control structures.

1.8.3 State of Wyoming Permits

Numerous permits are also required from the State of Wyoming before BTA can proceed with the project. These State permits are listed on Table 1-1. Substantial State permitting requirements are summarized below:

1.8.3.1 Wyoming Oil and Gas Conservation Commission

In addition to the Federal APD review process, BTA must also secure approval to drill the wells from the Wyoming Oil and Gas Conservation Commission (WOGCC) pursuant to W.S. 30-5-101 et seq. This permit requirement applies to all lands within the State including Federal-managed lands (WOGCC Rule No. 305). The permitting process and information requirements are similar to the Federal APD process.

Protecting Public Safety. The WOGCC has adopted minimum safety standards for oil and gas activities (Rules 320-A, 327 and 328). BLM enforces similar safety regulations. The regulations apply to general fire prevention, public protection, well operations, drilling, well servicing, production and associated facilities. WOGCC and BLM inspectors periodically inspect operations to assure compliance.

General Drilling Rules. Similar to BLM’s Onshore Order No. 2, the WOGCC has adopted rules to protect potable fresh water. The WOGCC requires surface casing to a depth below all known or reasonably estimated utilisable domestic fresh water levels (Rule 320(a)). Surface casing must be set in or through an impervious formation and must be cemented with sufficient cement to fill the annulus to the top of the hole. Rule 326 addresses pollution and surface disturbance. The regulations
The development area is covered by the following Federal oil and gas leases:

1.8.3.2 Wyoming Department of Environmental Quality

In addition to administering the general storm water permit discussed above, the WDEQ, Water Quality Division issues permits for and regulates off-site, commercial disposal of fluids (except produced water injection into a disposal well which is regulated by the WOGCC). If drilling fluids are hauled off-site for disposal at a commercial disposal facility, a permit would be required from WDEQ. Any petroleum contaminated soil also must be disposed of at a facility permitted by the WDEQ.

BTA would consult with the WDEQ Air Quality Division regarding the appropriate permit requirements for the gas processing facility and central tank battery. Typically a permit to construct is required for any construction that may increase air emissions. In a prevention of significant deterioration (PSD) area such as the development area, a permit is required for major facilities if potential emissions of criteria pollutants (including volatile organic compounds or VOCs) would exceed 100 tons per year. For all other types of facilities (such as a compressor station), a PSD permit is required if potential emissions exceed 250 tons per year. Under the permit process, WDEQ would consider air emissions from the gas processing facility to assess compliance with applicable air quality regulations under the Clean Air Act and State regulations. BTA would design, construct and operate gas processing and project facilities to ensure compliance with applicable Federal and State air quality regulations.

1.8.4 Local Permits

Pipeline crossings of County-maintained roads must be constructed in accordance with standards set by the County Engineer. Sweetwater County would also require submittal of a Construction Use Permit which is used to update County tax records. Other local permits could be required depending upon the local land use codes in effect at the time a project component is constructed.

1.8.5 Lease Stipulations

The development area is covered by the following Federal oil and gas leases: W-100206, W-119320, W-86953, W-126371 and W-128166. Stipulations applicable to these leases are summarized in Table 1-2. As stated in the leases, where the conditions summarized in Table 1-2 occur "...surface disturbing activities will be prohibited unless or until the permittee or his designated representative and the surface management agency arrive at an acceptable plan for mitigation of anticipated impacts." These mitigation measures would become conditions of approval attached to the APD.

For purposes of clarification, the leases state that:

- "Surface water and/or riparian areas" may include both intermittent and ephemeral water sources or may be limited to perennial surface water

- "Significant sites along historic trails" refer to those trail segments and sites which have been enrolled in or are eligible for enrollment in the National Register of Historic Places.

The leases note that geographical area and time periods of concern associated with these conditions would be delineated at the field level. These are not the only conditions or mitigation measures which could be applied to oil and gas development on these leases. As stated in the leases for the development area:

Under Regulation 43 CFR 3101.1-2 and terms of the lease (BLM Form 3100-11), the authorized officer may require reasonable measures to minimize adverse impacts to other resource values, land uses, and users not addressed in lease stipulations at the time operations are proposed. Such reasonable measures may include, but are not limited to, modification of siting or design of facilities, timing of operations, and specification of interim and final reclamation measures, which may require relocated proposed operations up to 200 meters, but not off the leasehold, and prohibiting surface disturbance activities for up to 60 days.
Table 1-2. Selected Lease Stipulations Attached to Oil and Gas Leases for the Bravo Development Area

<table>
<thead>
<tr>
<th>Stipulation/Condition on Surface Disturbing Activities</th>
<th>Lease (Number) Which Includes the Stipulation or Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>On slopes in excess of 25 percent.</td>
<td>Yes  Yes  Yes  Yes  No</td>
</tr>
<tr>
<td>Within important scenic areas (Class I and II Visual Resource Management Areas).</td>
<td>Yes  Yes  Yes  No  No</td>
</tr>
<tr>
<td>Within 500 feet of surface water and/or riparian areas.</td>
<td>Yes  Yes  Yes  Yes  No</td>
</tr>
<tr>
<td>Within a quarter mile or visual horizon (whichever is closer) from a historic trail.</td>
<td>Yes  Yes  No  No  No</td>
</tr>
<tr>
<td>During periods when the soil material is saturated, frozen, or when watershed damage is likely to occur.</td>
<td>Yes  Yes  Yes  Yes  No</td>
</tr>
<tr>
<td>Within 500 feet of Interstate highways and 200 feet of other existing rights-of-way (i.e., U.S. and State highways roads, railroads, pipelines and powerlines)</td>
<td>No  No  No  Yes  No</td>
</tr>
<tr>
<td>Within 1/4 mile of occupied dwellings</td>
<td>No  No  No  Yes  No</td>
</tr>
</tbody>
</table>
CHAPTER TWO
DESCRIPTION OF PROPOSED ACTION
AND PROJECT ALTERNATIVES

2.1 INTRODUCTION

Under the Proposed Action, BTA would implement resource protection, mitigation and monitoring measures found in Appendix A. Monitoring inspections conducted by BLM and BTA would be based upon these requirements which would be applied to all surface disturbing activities. BLM would conduct monitoring inspections of construction and rehabilitation operations through a compliance officer and/or interdisciplinary team to ensure that these measures are effectively implemented.

The BLM Green River Resource Area Manager would be the Authorized Officer (AO) for the project. Mitigation and monitoring measures could be modified by the AO as necessary to further minimize impacts. Final mitigation and monitoring requirements would be determined by the AO after receiving the results of on-site inspections by BLM and BTA personnel and recommendations from BLM resource specialists. BLM could require additional field studies or documentation of project sites to ensure that reclamation and other resource protection goals have been met.

The purpose of this chapter is to describe BTA’s Proposed Action including project scheduling, design, construction, operation and maintenance, and abandonment and reclamation practices. Project components discussed in this chapter include:

• Drilling, completing and testing up to 10 natural gas wells;
• Construction of tanks, separators, dehydration units, field compressors and other equipment at individual well sites needed to produce these wells for 30 years;
• Drilling one water supply well;
• Development of a natural gas processing facility on a 2.5 acre site within the development area;
• Construction of a central tank battery on a 2 acre site to store produced condensate;
• Construction of an estimated 2.8 miles of condensate pipeline along the existing access road into the development area and 2.2 miles along an unimproved 2-track trail which would connect proposed wells to a central tank battery;
• Construction of approximately 2.4 miles of natural gas gathering pipeline adjacent to an existing road;
• Construction of approximately 5.0 miles of new joint access road and natural gas gathering pipeline;
• Burial of approximately 17.6 miles of permanent natural gas sales pipeline which would join the gas processing facility in the development area with an existing gas sales pipeline.

A summary of disturbance associated with implementation of the Proposed Action is shown in Table 2-1. Figure 2-1 provides an overview of the development area, proposed and alternative pipeline routes. Locations of proposed wells and facilities within the Bravo development area are shown in Figure 2-2. Final road and pipeline alignments would be adjusted as necessary following on-site visits.

Table 2-1. Summary of Surface Disturbance Associated With Implementation of the Proposed Action.

<table>
<thead>
<tr>
<th>Project Component</th>
<th>Number or Miles</th>
<th>Construction-Related Disturbance (Acres)</th>
<th>Production-Related Disturbance (Acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well pads*2</td>
<td>11</td>
<td>27.5</td>
<td>11</td>
</tr>
<tr>
<td>Permanent natural gas sales pipeline*2</td>
<td>17.6</td>
<td>86.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Condensate pipeline*2</td>
<td>5.0</td>
<td>20.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Joint new road-natural gas gathering pipeline*2</td>
<td>5.0</td>
<td>36.4</td>
<td>18.2</td>
</tr>
<tr>
<td>Natural gas gathering pipeline adjacent to existing road*2</td>
<td>2.4</td>
<td>5.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Natural gas processing facility*3</td>
<td>1</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Central tank battery for condensate</td>
<td>1</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>—</td>
<td>180.6</td>
<td>33.7</td>
</tr>
</tbody>
</table>

Notes:
1. One water supply well and an additional 10 natural gas wells would be drilled.
2. Each drilling location would require 2.5 acres of which 1.0 acre would be required for production equipment. Areas not needed for production equipment (1.5 acres) would be reclaimed.
3. Permanent natural gas sales pipeline, where not directly adjacent to an existing or proposed road, would require a 50 foot-wide construction corridor. An estimated 5.6 miles of this corridor would parallel an existing two-track and pipeline corridor and would disturb a new 20 foot-wide corridor.
4. All new disturbance would be reclaimed.
5. Installation of joint new road-natural gas gathering pipeline corridor would disturb a 60 foot-wide corridor of which 30 feet would be reclaimed. All new roads associated with the project would have pipeline installed adjacent to them.
6. Construction of 1 mile of natural gas gathering pipeline, which would carry gas from wells to the processing facility, would be adjacent to existing roads. A 20 foot-wide construction corridor (on average) would be required and would be reclaimed.
7. The gas processing facility would be sized to production actually achieved. This is the maximum expected facility size.
LEGEND

- - Development Area Boundary

- Proposed Gas Wells

- Proposed Roads

- Proposed Gathering Lines

- Proposed Tank Batteries (if On Well Pad)

- Proposed Condensate Line

- - - - Prop. Condensate Line

- - - - Dirt Roads

- Existing Access Road

- Dry Hole - Plugged & Abandoned

- Economical Well or Successful Exploratory Well

--- Figure 2-2

Proposed Activities within the Bravo Development Area
inspections by BLM resource specialists to ensure conformance with standards, procedures and requirements for surface disturbing activities (see Appendix A) which BTA has proposed to adopt. The APD, ROW or permit applications would describe final locations, alignments and construction details of project components.

2.2 SCHEDULING OF PROJECT COMPONENTS

Drilling, construction and reclamation activities would be conducted between 1995 and 2005. Actual construction would depend upon the results of future drilling and actual production levels achieved. A series of unsuccessful wells could result in fewer than the proposed 10 wells being drilled.

Wildlife. Construction activities would be scheduled to avoid or reduce impacts to wildlife. For example, no construction activities would be conducted in crucial big game winter range between November 15 and April 30. Crucial big game parturition areas between May 1 and June 30 unless approved by the Resource Area Manager. No drilling is proposed within crucial big game winter range. No activities are proposed within parturition. In accordance with the draft Green River draft RMP (p. 713), activities within 0.5 miles of an active raptor nest or within 0.25 miles of active sage grouse leks would be scheduled to avoid impacts to birds. A field survey conducted in Spring 1994 found no sage grouse or nesting raptors within the development area and vicinity. In the future, project activities would be scheduled as necessary to avoid impacts to nesting species of concern. Required maintenance activities, however, would be performed throughout the year.

Soils. To minimize rutting and soil compaction, construction would be scheduled to avoid saturated soils or construction with frozen soil materials unless otherwise approved by the BLM Resource Area Manager.

Gas Plant and Central Tank Battery. Scheduling of project activities would depend upon the results of additional, proposed drilling in the development area. For example, if the first proposed wells to be drilled are unsuccessful or produce relatively low quantities of natural gas, the gas processing facility may be downsized or not constructed at all. In this case, equipment such as a dehydration unit, separator and field compressor would be installed and maintained at an individual well location. It is estimated that 5 to 6 producing wells would be needed to produce enough natural gas to make a gas processing facility feasible. The central tank battery is unlikely to be constructed unless most of the proposed wells are successful or production of condensate from successful wells is greater than anticipated. If few successful wells are drilled or condensate production is lower than expected, condensate would be stored in tanks at individual well locations.

2.3 LOCATION, EXTENT AND LAND OWNERSHIP

The development area includes BTA’s Bravo Unit as well as other Federal oil and gas leases held by BTA. Of the 4,632 acres comprising the development area, 4,425 acres are BLM-administered and the remaining 207 acres State land. No private land is found within the development area but a small amount of private land would be affected by construction of the permanent gas sales pipeline. An estimated 181 acres would be disturbed by construction activities. Of this, 97 percent would occur on BLM-administered land and about 3 percent would occur on private land. No State land would be affected by construction activities.

2.4 PROPOSED ACTION

This section provides a description of project components as well as measures incorporated into the Proposed Action in order to reduce or avoid impacts to the environment. Modifications in the Proposed Action and mitigation measures were developed during on-site inspections of BTA’s initial proposal. For example, the route of the proposed permanent gas sales pipeline was adjusted several times following on-site inspections to avoid impacts to steep slopes, wilderness study areas, historic trails, and prairie dog colonies (potential habitat for endangered black-footed ferrets). Many of the environmental protection measures described in this chapter are in addition to standard measures required by BLM.

BTA would hire contractors to implement the Proposed Action. Contractors would be provided with copies of applicable Federal, State and local permits, and other plans and specifications necessary to construct project components in accordance with conditions of approval as specified by BLM and other regulatory agencies. In accordance with BLM Onshore Order No. 2, BTA would be responsible for the compliance of its employees, contractors and subcontractors with the terms and conditions of all permits, agreements, the decision record and mitigation measures described in this EA. Each contractor and subcontractor would be required to maintain up-to-date plans and specifications at construction sites. In accordance with Wyoming statute (WS 39-6-602), BTA would require its contractors and subcontractors to provide proof that applicable State sales or use taxes have been paid on the purchase of equipment, material or supplies used to complete the project.

Permittees of Federal lands would be notified in advance of construction activities. During construction, BTA would require its contractors to regulate access and vehicular traffic as necessary to protect the public and livestock from hazards associated with construction. BTA would conduct all activities in compliance with Appendix A of this EA and all applicable Federal, State and local regulations. BTA has also agreed to implement all mitigation measures developed as part of this environmental assessment.

2.4.1 Well Drilling and Production

The Proposed Action consists of drilling up to 10 natural gas wells. Figure 2-2 shows the approximate locations of proposed wells within the development area. These locations would be adjusted and finalized following on-site inspections with BLM.

A typical drill pad layout is shown in Figure 2-3. Site-specific pad designs would be found in the APD. Construction of a typical pad would disturb up to 2.5 acres including the topsoil stockpile area. Once drilling is completed, a portion of the pad not needed for production equipment (1.5 acre)
Drill Pad Construction. A well location would be surveyed and staked in accordance with on-site inspections with BLM resource specialists. Final location of the pad would be adjusted to avoid playas or areas with a high water table and drainage problems. Proposed runoff and sediment control designs would be reviewed at that time. Topsoil storage areas would be identified and staked. Construction of the typical well pad would take from 2 to 14 days. Shrubs and vegetation would be cleared from the well pad and stockpiled for use during reclamation. Topsoil would then be removed from the pad and stockpiled adjacent to the well site. The location of topsoil stockpiles would be agreed upon during on-site inspections with BLM resource specialists. Areas for topsoil stockpiles would not be bladed or graded. Topsoil stockpiles would be contoured to minimize erosion and, as suggested by the draft RMP (p. 716), would generally be four feet high or less.

A pit would be constructed at each drilling location prior to start of drilling operations. The pit would be used to store fluids returned to the surface from the hole during drilling. All pits would be lined. In line with requirements elsewhere in the Rock Springs District, the pit liner would be at least 16 mil thickness, have a burst strength equal to or exceeding 300 pounds per square inch (psi), a puncture strength of 160 psi or greater and grab tensile strength of 150 psi or greater. The liner would be resistant to deterioration by hydrocarbons. Liners would not be installed directly on rock. Where necessary, pits would first receive a layer of bedding material (e.g., sand) sufficient to prevent contact between the liner and any exposed rock. The pad would be designed so that runoff from adjacent slopes does not flow into the reserve pit.

No trash would be disposed of in the pit. Pits would be fenced on three non-working sides during drilling. After drilling is completed and the rig dismantled, the fourth side of the pit would be fenced until the pit is reclaimed. All four corners would be braced. Fence construction would be on the cut or undisturbed surface and would keep livestock and wildlife from using the pit. BTA proposes to flag or cover reserve pits in netting to discourage their use by migratory waterfowl.

In some cases, the pit would be dewatered upon completion of a drilling operation and the fluids trucked to another location for reuse. This would expedite closure of the pit and implementation of reclamation measures. When no longer needed, drilling fluids would be hauled to a commercial disposal facility permitted with the WDEQ or would be treated on site in accordance with approved WOGCC permit procedures. In other cases fluids would be evaporated from the reserve pit. No permanent production pits would be required.

If a pad is constructed but the well is not drilled, BTA would initiate reclamation of the pad and access road. If this is impractical due to soil, weather or other environmental conditions, erosion control measures would be implemented in the interim.

Well Drilling and Completion. The Lewis Formation and Sinkhole Formation are the targets of the proposed wells. Total depth of wells would be approximately 6,800 feet. Wells would be drilled using fresh water and gel sweeps as required for hole cleaning. All shows of fresh water and
minerals would be reported to BLM. A sample would be taken of any water flow and analytical results furnished to the BLM. Formations crossed by the proposed drilling include the following:

<table>
<thead>
<tr>
<th>Formation</th>
<th>Approximate Depth (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Union</td>
<td>2,300</td>
</tr>
<tr>
<td>Lance</td>
<td>4,700</td>
</tr>
<tr>
<td>Fox Hills</td>
<td>6,300</td>
</tr>
<tr>
<td>Lewis</td>
<td>6,400</td>
</tr>
<tr>
<td>Sinkhole</td>
<td>6,800</td>
</tr>
</tbody>
</table>

Fresh water for drilling would be obtained from water suppliers. There is no surface water and few water wells in the vicinity; therefore BTA proposes to drill a water supply well within the development area to reduce water hauling by truck. Temporary surface lines could be used to pipe water from the water well to a drilling location.

Equipment transported to drilling locations would include pipe racks, pumps and air compressors. Portable dumpsters would be provided at each drilling location and trash hauled off Federal land for disposal. No trash would be burned on-site. Portable chemical toilets or holding tanks would be provided for workers. All sewage would be trucked off Federal land and disposed of in accordance with County and State requirements.

Drilling and completion of a well involves many steps including assembling the equipment and crews, drilling, casing (installing pipe), cementing, perforation, stimulation and installation of the production string. Once well pad construction is complete, the drilling equipment would be brought to the site. A mobile rotary drilling rig would be used for drilling the wells. The rotary drilling rig would be powered by diesel engines. Diesel fuel would be supplied by tanker truck and temporarily stored at each drilling location. Prior to beginning the drilling program, BTA would be required to prepare a Spill Prevention, Control and Containment Plan (SPCC).

A water-based drilling mud would be mixed and stored in portable mud tanks. The density and/or composition of the drilling mud would be altered as hole conditions change. The drilling mud would be mixed on-site with water. The APD, submitted to the BLM for its review and approval prior to the commencement of drilling, would list the drilling mud to be used. The APD would also describe the blowout preventer (BOP) which would be used. A BOP provides the means to shut in the well at the surface. BOPs would be inspected and operated daily to insure good mechanical working order.

BTA’s first step in the drilling process would be to drill a surface casing hole. A 12 1/4 inch diameter hole would be drilled to a depth of about 500 feet. The next step would be to set 8 5/8 inch surface casing in the hole and cement it to the surface. The surface casing would prevent the washout of surface formations during drilling, provide protection of shallow aquifers and provide support for the casinghead and subsequent casing strings.

Once the surface casing is cemented in place, drilling of the 7 7/8 inch production hole would begin. The production hole would be drilled to a depth of approximately 6,800 feet, depending on the location of the well and the actual depth of the target formations. Once the hole has been drilled to the target depth, the hole would be cleaned to remove any rock chips left in the hole and casing would be run. Running the 5.5 inch diameter casing involves inserting a continuous pipe into the hole from the surface to the bottom of the hole. BTA would use standard American Petroleum Institute (API) casing to insure that the casing can safely withstand the forces of tension, collapse and burst. Selection of the proper casing grade and weight involves estimating the forces that would be applied to the casing to insure that the casing will withstand the forces. Casing would be purchased in 30 to 40 foot lengths and brought to the site on trucks. The casing would be stored on pipe racks until each joint is needed. Casing would be placed in the hole, one joint at a time, and threaded together.

Once the entire length of casing is placed in the hole, it would be cemented to the surface or in conformance with requirements under BLM Onshore Order No. 2 as specified by BLM. The service company would use highly specialized equipment to mix dry cement and water into a slurry. The slurry would then be pumped through the casing string and forced up the annular space between the casing and the formation where it would be allowed to harden. This cementing method insures that the annular space between the casing and formation in the productive zones is isolated with cement. The purposes of cementing the casing are to: 1) restore the original isolation between formations that existed prior to the drilling of the well; 2) provide support for the casing by preventing formation pressures from acting directly on the casing; 3) retard corrosion by minimizing contact between the casing and corrosive formation fluids; and 4) protect groundwater from contamination.

Once the casing string has been cemented and the cement allowed to harden, the string would be perforated. Perforating is the process of piercing the casing and the cement sheath behind the casing at the producing zone. The primary purpose of perforating a well is to establish a direct link between the well bore and the producing zone. Piercing the wellbore would be accomplished by an assembly that fires shaped charges. The holes created in the casing and cement sheath would allow natural gas to enter the wellbore and move up the production tubing to the surface.

After the well has been perforated to allow communication between the casing well and the target formation, the well would likely be hydraulically fractured. The reason for fracturing a well is to improve the flow of gas into the wellbore. It involves injecting fluid under high pressure into the producing zone to create and extend the fractures or conductive channels into the formation rock some distance from the wellbore. Hydraulic fracturing would be accomplished by the use of highly specialized equipment and trained crews provided by a local well service company.

Drilling and casing of each well would be accomplished in approximately seven days. After drilling and casing are completed, the drilling rig would be moved to a new location and other equipment brought in for well completion operations. Completion of the well takes approximately 20 days after drilling and cementing of the casing.

Interim Well Pad Reclamation. Production equipment would be laid out to maximize rehabilitation and reduce production-related disturbance. To achieve this, the design of production locations would vary.
The drill rig would be removed from the location within 30 days after completion of drilling. Once drilling and completion are over, all areas not needed for production operations would be reclaimed. Approximately one acre would be required for equipment and production operations. If a well is a dry hole or non-producer, the entire drilling location would be reclaimed. The hole would be plugged in accordance with WOGCC and BLM abandonment procedures.

During interim well pad reclamation, all drilling and completion equipment would be removed. Fluids in pits would either be trucked to another location for reuse or allowed to evaporate from the pit. Pits would be reclaimed under regulations and conditions set forth by the BLM and WOGCC. After fluids have evaporated, the liner would be buried in the pit and the pit backfilled. One month would be allowed for backfill settling before reconnecting and topsoil spreading.

Seeding would be accomplished during the fall or as directed by BLM. Specific seed mixtures using native species would be specified by BLM. Seed mixtures would be certified weed-free and a copy of the certification would be supplied to the BLM prior to planting. Reclamation measures could be delayed by BLM pending more favorable soil and weather conditions. In this case, temporary erosion control measures would be implemented pending completion of reclamation activities.

Well Operation and Maintenance. In the case of a successful well, production equipment such as a separator, heater, dehydrator, field compressor and tank battery would be installed at a well site. Currently, it is estimated that one field compressor could serve 3 to 4 producing wells. Depending upon the number of successful wells, their yield and reservoir characteristics, produced hydrocarbons would be directly piped from the wellhead to the central processing facility for separation. In this case no tank battery would be installed on-site. No produced water pits would be necessary. Produced water would be stored in tanks and trucked off location. Where soil conditions require it, the drill pad would be gravelled to facilitate access on and off of the location and to prevent rutting. Gravel would also minimize off-site sedimentation from the well pad. Gravel would be obtained from local, commercial sources.

Where required due to winter conditions, heaters would be used in the field to maintain flow through pipelines. Some of the natural gas produced would be consumed within the field by gas fired equipment. The field would produce three major types of products:

- natural gas (methane),
- natural gas liquids, and
- condensate (crude oil, heavy liquids).

Natural gas liquids would be collected at the well site or gas processing facility in bullet tanks and eventually would be trucked off-site. Additional discussion of gas processing is found in Section 2.4.5.

Condensate removed from the gas stream would be handled in one of four ways: 1) stored at a well site tank battery and trucked from the site; 2) stored at a central tank battery near gas processing facility and trucked out; 3) piped to the existing Frontier Pipeline in the northwest corner of the development area; or 4) piped to a tank battery near the Bar X Road and then trucked to a sales point. With the exception of Option 3, options for handling produced water would be similar. Options 2-4 would depend upon actual quantities produced in the field and market conditions. Option 1 would be used until actual production levels are known. Figure 2-4 shows a typical production location with storage tanks and the area that would be reclaimed if the tanks were removed and a central tank battery installed. A typical production location with central compression is shown in Figure 2-5. Processed natural gas—i.e., gas with natural gas liquids and condensate removed—would be transported by the proposed permanent gas sales pipeline to an existing NGC pipeline west of the development area.

To minimize visibility and visual impacts, above-ground equipment and facilities would be painted an earth-tone color (i.e., Carlsbad Canyon). No reflective materials would be used. No area lighting, other than at the gas processing facility, would be required. Well pads would not be used for material storage. Abandonment. BTA would follow WOGCC and BLM procedures for plugging and abandoning a well. Upon abandonment, BTA would be required to contact BLM regarding approval of the final reclamation plan. All surface equipment would be removed from the site and the location and access road would be recontoured and reclaimed.

2.4.2 Pipelines

Implementation of the Proposed Action would require the installation of three types of pipelines:

- Buried gathering lines carrying natural gas, natural gas liquids, produced water, condensate or some mixture of these products from individual well sites;
- Buried pipeline carrying condensate to the Frontier Pipeline or a central tank battery, possibly near the Bar X Road; and,
- A buried, permanent natural gas sales pipeline.

Each type of pipeline is described after a general discussion of pipeline construction, operation and maintenance.

Pipeline Design. The design, materials, construction, operation, maintenance and abandonment of pipelines would be in accordance with American National Standards Institute and API-established safe and proven engineering practices. State-of-the-art design, materials and construction techniques would be employed to ensure that the pipelines operate safely with minimal risk to the environment.

General Pipeline Construction. Because the gas produced from the field is very wet, pipelines would be buried. Burial would reduce problems with condensation, freezing and other problems that could occur during the winter months. Where soil conditions allow, pipelines would be buried with a minimum top of pipe cover of three feet. Where pipelines must cross steep terrain or rock outcrops, they could be laid on the surface and painted an earth-tone color (i.e., Carlsbad Canyon) to blend in with the surrounding surface. To limit surface disturbance, BTA has proposed the installation of pipelines adjacent to proposed or existing roads wherever feasible.

BTA and its contractors would attempt to secure the services of local contractors to construct the pipeline system. The workforce would require many different skills including general laborers, equipment operators and welders. BTA would provide the contractors with all permits and detailed...
Figure 2-4
Typical Production Location

Figure 2-5
Typical Production Location with Central Compressor
designs and specifications necessary to construct the pipelines and reclaim the right-of-way. BTA would remain responsible for compliance with the terms and conditions of all permits and the right-of-way grants. Contractors and subcontractors would maintain copies of permits at construction sites.

Pipeline crews would use typical construction techniques. Right-of-way crews would clear and prepare the work area by scalping vegetation, followed by ditching crews who would dig the trench to receive the pipe. Pipe crews would work simultaneously on different portions of the route laying the pipe in the trench. Once the pipe is placed in the ditch, hydrostatic or gas testing could be conducted. After testing, cleanup crews would close the ditch (normally within 3-5 days) and clean up the area. Rehabilitation and reclamation measures would be instituted. These measures would follow conditions of approval incorporated into the BLM's right-of-way grant.

The typical construction right-of-way for pipelines outside of road or pipeline corridors would be 50 feet-wide. Fifteen feet of that is for a travelway with the remainder occupied by heavy equipment, the trench itself, topsoil and spoil storage. However, where an existing road can be used as the travelway, new disturbance could be limited to a 20 foot wide corridor. This would allow construction crews to take advantage of existing two-track trails or roads and limit new disturbance. Pipeline construction would follow measures outlined in Appendix A for compaction, reclamation, clearing and grading and topsoil storage.

Clearing and Grading. Pipeline rights-of-way generally would not be graded due to the level and gently sloping terrain characteristic of affected lands. Where necessary to permit the passage of vehicles or reduce fire danger, vegetation on the right-of-way would be scalped using a mower or brush heater. This technique keeps plant roots intact which, in turn, holds soil in place, decreases erosion and minimizes disturbance to grasses and forbs. This technique also provides an opportunity for existing plants to recover by resprouting thereby enhancing reclamation success and protecting the shrub component. Every effort would be made to assure that topsoil is not damaged during wet conditions or mixed with the scalped vegetation. In isolated cases where a steep slope may be encountered, grading could be required to provide a safe working surface. Any vegetation cleared from the right-of-way would be stored at the edge of the right-of-way and later scattered over disturbed areas during reclamation unless directed otherwise by BLM or the private landowner. Scattered brush would help to protect seedlings.

Topsoil Storage and Replacement. The pipeline trench would be excavated with a backhoe or trenching machine. Topsoil from the excavated trench line would be removed and stockpiled to avoid mixing with trench spoils. Travel would be limited to the existing roads or the staked pipeline construction right-of-way. During prolonged adverse weather conditions when excessive rutting and soil damage could occur, construction would be suspended if so directed by the BLM. Spoil material used to backfill the trench would be free of vegetative or frozen material. The trench would be backfilled with an auger backfilling machine. No berms would be left on the surface. Construction with frozen material would not be permitted.

The right-of-way would be scarified by ripping or chiseling to loosen compacted areas prior to resurfacing topsoil. Scarifying the subsoil would promote water infiltration, improve soil aeration and aid root penetration. On slopes, scarification would also be important to provide a roughened interface between the topsoil and subsoil to reduce the potential for soil slippage. Scarification would leave the soil surface in a gouged and roughened condition. Chiseling/scarifying would be done on the contour where feasible. Where available, rocks and slash would be pulled back onto the right-of-way. Small pockets in the soil of varying size and depth would trap seed and runoff. In this way the roughened surface would reduce erosion and conserve moisture for seed germination. Field inspection of the pipeline route found that slopes in excess of 25 percent are unlikely to be encountered. Thus it will not be necessary to implement the specialized construction and reclamation techniques typically used on such slopes. Deposition and burn site-specific slope and soil conditions, BLM could require mulching or matting. On rock outcrops where burial would be difficult, pipelines could be set on the surface.

Pipeline Testing. Pipelines would be gas or hydrostatically tested to at least 1.25 times the maximum anticipated operating pressure. Testing would comply with applicable ANSI standards. All leaks that are found would be repaired. Test water would be removed and disposed of in accordance with appropriate State and Federal regulations. Test water would be obtained from commercial water haulers or from the water supply well. If BTA surface discharges test water, the company would obtain administrative approval from the Wyoming Department of Environmental Quality for a one-time discharge of hydrostatic test water. Water sources would be permitted with the Wyoming State Engineer’s Office.

Pipeline Maintenance and Operation. Pipelines would be operated and maintained in compliance with applicable Federal, industry and ANSI standards. BTA personnel would monitor and control the system by conducting on-site inspections of project facilities. Inspections generally would be conducted on a daily basis. Implementation of the pollution prevention plan would require weekly inspection reports on pollution control structures.

The primary cause of pipeline failure is third-party damage typically associated with construction machinery hitting buried lines. BTA would sign pipeline routes that cross roads, ditches or other areas where they could be subject to damage. However, given the remoteness of the affected lands, the possibility of third-party damage is unlikely.

Pipeline Abandonment. Upon reaching the end of the useful life of the pipelines, BTA would be required by the ROW grant to contact the BLM and prepare an abandonment plan. Unless otherwise required by BLM, BTA would leave the pipe in place, purge the pipeline of all contents, remove all surface facilities and reclaim disturbed areas. Wastes generated by purging would flow directly into a tank truck and would be hauled to a disposal facility permitted by WDEQ.

2.4.2.1 Gathering Pipelines

A gathering system would be constructed to connect production locations to the gas processing facility or field compressors. Gathering lines would carry natural gas, natural gas liquids, produced water, condensate or some mixture of these products. Gathering pipelines would be approximately 4 inches in diameter. Gathering lines would be installed using standard pipeline construction methods as described above. Where bedrock conditions allow, pipe would be buried with a minimum top-of-pipe depth of three feet. Unless otherwise required by safety standards, all surface pipeline and facilities would be painted an earth-tone color (i.e., Carlsbad Canyon). Wherever possible these lines would be laid adjacent to roads used to access well sites. Where gathering lines follow an existing road a
construction right-of-way up to 30 feet wide would be used. Where gathering lines parallel a
proposed road a 60 foot-wide joint road pipeline corridor would be used. No gathering lines would be
constructed outside of road corridors.

2.4.2.2 Permanent Gas Sales Pipeline

An 8 inch diameter pipeline would be constructed between the gas processing facility and a tie-in
with an existing NGC pipeline approximately 17.6 miles west of the development area. For ease of
access, the tie-in point would be located on the Freighter Gap Road (see Figure 2-1). The pipeline
would carry gas that has been processed to meet the minimum standards set by natural gas
transporters (i.e. natural gas liquids, water and condensate removed). Maximum allowable operating
pressure on the line would be 1,440 psi. Operation of the line would be monitored from the gas
processing facility. A rupture or break in the line would be detected by a sudden drop in line pressure
which would trigger an automatic shutdown of the line.

This permanent, buried line would be approximately 17.6 miles long of which 5.6 miles would be
adjacent to the Frontier oil pipeline and the Baroil CO2 pipeline corridor. A two-track trail or dirt
road follows the Frontier-Baroil corridor; therefore in this case only an additional 20 foot-wide
construction right-of-way would be needed as the existing road can be used for access. Pipe would
be buried using a ditching machine and standard pipeline construction methods described above.
Where soil conditions allow, pipe would be buried with a minimum top-of-pipe depth of three feet.
Unless otherwise required by safety standards, all surface equipment would be painted an earth-tone
color (i.e., Carlsbad Canyon). All disturbed areas would be reclaimed according to BLM
specifications.

The proposed permanent buried pipeline follows a temporary, surface line which was laid to allow
NGC Inc. to transport gas for BTA from its Bravo No. 1 and No. 2 wells. The temporary, surface
line was not intended for long-term operations and BLM has only issued a temporary 2 year right-of-
way for the pipeline. Gas produced from the field is very wet and it is expected that condensation
and freezing would make a surface line infeasible to operate for the life of the field. For those
reasons, a permanent buried pipeline has been proposed to connect existing and proposed wells with
an existing NGC pipeline west of the development area (see Figure 2-1).

A small (approximately one acre) temporary surface facility has been installed within an existing site
at the NCG-Questar pipeline tie-in (Sec. 29, T. 23 N., R. 103 W.) under an amendment to an existing
right-of-way. The facility was needed to accommodate short-term handling of natural gas produced in
the Bravo development area which does not meet standard sales pipeline specifications. This
temporary facility consists of a small compressor, a pig trap and bullet tank. An existing, larger field
compressor was removed from the site to accommodate the new equipment. This new compressor,
which is used to capture hydrocarbon liquids and pressure the storage tank, is much smaller and
quieter than the old compressor which was removed. Equipment at this site would no longer be
needed once the gas processing plant has been installed in the development area.

BTA has entered into a long-term contract with NGC for the transport of sales gas from the
development area. The cultural resources survey completed on the proposed route indicates that the
pipeline would not cross a trail segment of historical value. As proposed, the permanent pipeline
would not enter or cross any wilderness study areas or Area of Critical Environmental Concern.

2.4.2.3 Condensate Handling and the Condensate Pipeline

The purpose of the condensate pipeline is to simplify transportation of condensate to a sales point and
reduce truck trips to well sites. Without the pipeline it is estimated that each well site could require
up to 14 truck trips per week to haul condensate and produced water from a production location. The
line would contain an automatic shutdown device in the event of a line rupture or malfunction. BTA is
proposing four options for transporting condensate from the development area.

1. Pipe the condensate to the existing Frontier crude oil/product pipeline which crosses the
development area (see Figure 2-2).

This option would eliminate the need to truck condensate but would not be feasible in the near term
given that the field would not produce suitable quantities for bulk shipments required by Frontier
pipeline. Currently, pipeline shipments of condensate from the field would require large bulk storage
tanks which are not proposed by BTA. However, changes in pipeline operations could make this
option feasible in the future; therefore disturbance associated with this option has been included as
part of the Proposed Action.

2. Pipe condensate from wells to a central tank battery near the gas processing facility.

This option would result in the removal of tanks from individual well locations. Condensate (and
produced water) would be trucked from the central tank battery. However, if proposed wells are not
successful or produce minimal quantities of condensate, tanks would be kept at individual well
locations.

3. Pipe the condensate out of the development area to a central tank battery near the Bar X Road.

In this case, the tank battery would be located in a depression just west of the Bar X Road on the
access road into the development area (see Figure 2-1). This location would screen the facility from
view by placing it off the skyline. It would reduce potential conflicts with traffic on the Bar X Road.
Similar to the previous option, if proposed wells produce minimal quantities of condensate, this
option would not be implemented and condensate would be stored in tanks at individual wells.

4. Condensate would be stored in tanks at individual well locations and trucked off-site to a sales
point.

Trucks would visit each well location. Up to 14 truck trips per week could be required for a location.
However, future production of condensate is difficult to predict. Similarly, if all 10 proposed wells
were successful it is unlikely that trucks would be used to haul condensate from each location as it
would be more efficient to haul from a central facility.

The condensate pipeline would be installed using standard pipeline construction methods described
above. Unless otherwise required by safety standards, all surface equipment would be painted an
earth-tone color (i.e., Carlshad Canyon). The pipeline to the Bar X Road would parallel a portion of the existing road into the development area (see Figure 2-1). If constructed to join the Frontier Pipeline, or central tank battery the condensate pipeline would follow roads within the development area and would only require about 20 feet of right-of-way outside of road corridors (see Figure 2-2).

### 2.4.3 Central Tank Battery

Assuming the field produces sufficient quantities of condensate, a central tank battery would be constructed on a 2 acre site in the development area or at a site near the Bar X Road on the main access road into the development area. These locations are shown on Figure 2-1. The site for the facility has already been disturbed by past road building activities. The facility could include up to 6 tanks, each capable of holding 1,000 barrels of condensate or produced water. The tanks would be placed within a berm or berms capable of holding 1.5 times the maximum capacity of the tank(s) contained therein. Berms would be built of impermeable material. Loading lines and connections would be located within berms. Tanks would be emptied on a regular basis and would not be allowed to overflow.

To minimize venting of gas from condensate tanks, low pressure vent gas would be recovered via a manifold at individual well sites. In simple terms, condensate would be heated to facilitate removal of the natural gas liquids. The natural gas liquids would then be piped in a poly line to a field compressor or to the gas processing facility where they would be pressurized and stored in bulletin tanks and eventually trucked from the location. If necessary, vapor recovery units also would be installed on each tank battery. BTA would coordinate its plans for vent gas recovery with BLM.

Soil samples would be taken to determine the local water table. Final location of the central tank battery would be adjusted to avoid plays or areas with a high water table and drainage problems. Topsoil storage areas would be staked. The site would be graded. It would be sized to allow off-road parking by trucks while they unload condensate from the battery. Tanks would be painted an earth-tone color (i.e., Carlshad Canyon) and would be similar to those seen in other oil and gas fields from the Bar X Road.

### 2.4.4 Access Roads

Factors which would be considered in final road alignments would include: avoiding plays, avoiding roads parallel and adjacent to drainages, avoiding poor (e.g. wet) soil conditions, avoiding extensive cut and fills taking advantage of local topography, and using existing roads on disturbance where feasible. Final locations of roads would be adjusted to avoid plays or areas that could create road drainage problems.

The Proposed Action has been designed to minimize new road construction and to take advantage of existing areas of disturbance. For example, the existing gravel access road into the development area was an upgrade of a road that has been in existence for decades and was used to access plugged and abandoned wells that had been drilled in the development area and vicinity. However, some new road construction would be necessary to link proposed well sites with existing roads in the development area. All proposed roads would be crowned, ditched and graveled. Roads would be constructed in compliance with BLM standards. Proposed roads would most likely be local or resource roads. Local roads would have a 20 foot-wide surfaced travelway; resource roads would have a 12 foot minimum surfaced travelway. It is estimated that, on average, a 30 foot-wide corridor would be needed for the road surface and maintenance activities. The proposed road network and all access roads would be described in a transportation plan. All roads would be designed to accommodate sustained heavy truck traffic required to haul condensate from tank batteries. Areas outside the travelway and ditches would be reclaimed. All new roads would be surveyed and designed by a certified civil engineer. A certified civil engineer would submit written certification to BLM that roads were built as designed and would recommend construction inspection requirements.

**Construction.** BTA would employ standard cut and fill road construction methods. The centerline of the access road would be staked prior to BLM inspection of a proposed well pad location and its associated access road. Road construction would be conducted in accordance the transportation plan and designs submitted as part of the APD. Areas requiring additional drainage structures and measures to prevent rutting would be identified during on-site inspections and would be described in the transportation plan.

Road construction would begin by clearing, removing and stockpiling vegetation. All protruding materials (i.e., vegetation, rock) within the clearing limits would be removed and stockpiled pending results of well drilling. Stockpiled materials would be pulled back over the right-of-way in the case of an unsuccessful well, or in the case of a successful well, spread over adjacent areas.

Typically, a 40 feet-wide right-of-way would be cleared to allow for construction of a 14 feet-wide travelway and adjacent ditches and drainage structures. Up to a 50-feet wide construction right-of-way would be required for pipelines. In comparison, by combining access road and gathering line, a 60 feet-wide construction right-of-way would be required. By combining road and pipeline into one corridor, construction-related disturbance would be reduced by one-third when compared to constructing pipeline and roads in separate corridors. In other words, one mile of 60 foot wide joint road pipeline corridor would disturb 7.3 acres whereas one mile of separate road and pipeline corridors would disturb 10.9 acres.

Available topsoil (up to 12 inches) would be stripped from areas to be disturbed by road construction. Topsoil would be deposited in a windrow apart from other excavated material. After the desired amount of material has been removed, and the resulting slopes and ditches have been shaped and smoothed, stored topsoil would be evenly spread over exposed subsoil (except on the travelway). Depending upon local soil conditions, roads to successful locations would be graveled. The transportation plan prepared by BTA would specify roads which would be graveled. Where field roads intersect existing roads, two-tracks or jeep trails which are not needed for field development, signs and barriers would be erected to discourage their continued use by vehicles. Any closures would be coordinated with BLM and would be described in the transportation plan.

Follow-up reclamation activities would include filling gullies, smoothing irregularities and repairing other incidental damage. Immediately in advance of the seeding, any crusted surface would be scarified at right angles to the slope plane. All earth cut or fill disturbed in the course of construction, reconstruction or heavy maintenance would be revegetated with a seed mix approved by BLM. This would include road sides, back- and out-slopes.
Once construction is completed, areas outside a 30 foot wide corridor disturbed by routine maintenance activities would be reclaimed. BTA would be responsible for preventive and corrective road maintenance on all roads associated with field operations. This includes crowning, cleaning ditches and drainage structures, culvert installation, snow removal, graveling and dust abatement.

**Abandonment.** Roads abandoned following termination of the project, or in the case of a dry hole or non-producer, would be returned to preconstruction contours. Barriers would be constructed to discourage vehicular use of the abandoned roadbed. The road surface would be scarified in accordance with BLM specifications and seeded with a mixture approved by the BLM. All culverts used for cross drains would be removed. Rock, vegetation and topsoil would be pulled back over the abandoned right-of-way. Revegetation would continue until an acceptable level of success, as determined by the BLM, has been achieved.

### 2.4.5 Natural Gas Processing

Currently, natural gas produced in the Bravo development area does not meet Questar Pipeline Co. specifications—that is, its Btu content is too high due to the presence of natural gas liquids. However, Questar has agreed to accept this gas from NGC on a temporary basis and blend it with other production. Over the long-term, however, natural gas produced from the development area would be considered wet gas and would have to be treated to remove natural gas liquids before the gas could be placed into a pipeline transportation system.

#### 2.4.5.1 Natural Gas Processing Facility

The purpose of this facility would be to provide centralized processing for the removal of impurities and natural gas liquids from the gas stream. A 2.5 acre facility is seen as adequate for all foreseeable production and would accommodate a facility capable of processing and pressurizing up to 30 million cubic feet of gas per day. The facility would avoid the need for processing equipment and bullet storage tanks for natural gas liquids at well sites.

Actual design and construction of the gas processing facility would be completed in stages to match actual production from the development area. Initially only one compressor would be installed at the facility. Figure 2-6 provides a schematic of the processing facility development. The following descriptions are for maximum facility heights.

The proposed refrigeration compressors circulate propane refrigerant to condense natural gas liquids (NGL) in the plant. The compressors, rated at 1,200 horsepower, would burn natural gas and would require a 25 foot high, 1.25 foot diameter stack for emissions. The compressor would be housed in one building approximately 30 feet by 40 feet by 24 feet high. The facility would also include a gas processing unit, natural gas fired generator, a glycol separator and regeneration unit for removing water from the gas stream, heaters, and process coolers. A 50-foot high emergency flare would also be present on site but would only be operated in an emergency situation. The tallest facility would be the product stabilizer which would be approximately 3 feet by 3 feet by 60 feet high. Over time, additional but similar equipment would be added within the facility site if warranted by production from the development area. A 60 feet by 60 feet by 25 feet high building would house an office and
Figure 2-6. Schematic of Natural Gas Processing Facility
A security fence would be constructed around the facility. Although exterior lighting would be installed, no night-time lighting would be required at the facility unless repair or maintenance work is being conducted. Trucks would not haul natural gas liquids from the facility at night. BTA does not propose to install powerlines into the facility site or elsewhere in the development area.

No trash will be burned on-site. No open fires will be permitted. Closed trash containers would be provided at construction sites. Portable chemical toilets or holding tanks would be provided for workers at construction sites. All sewage would be trucked off Federal land and disposed of in accordance with County and State requirements.

Upon reaching the end of its useful life, BTA (or its contractor) would prepare and submit an abandonment plan to the BLM. Upon abandonment, the site would be returned as close as possible to the original contour and stockpiled topsoil spread over it. The site would be reclaimed and vegetated.

2.4.5.2 Gas Processing at Well Locations

It is estimated that construction of the gas processing facility would require the stable, long-term production of 12 to 15 million cubic feet per day of natural gas. This level could be reached with 5-6 production wells. However, lower than expected production from the development area could make construction of the gas processing facility infeasible in which case gas would be treated at individual well locations. Under this scenario, tanks, production-dehydration units, separators and compressors would be installed at individual well locations. The condensate would be heated to facilitate removal of the natural gas liquids which would then be piped in a poly line to a field compressor located at a well site where it would be pressurized and stored in bullet tanks. After processing at the well site, high pressure natural gas would be piped to the permanent gas sales pipeline. Where feasible, the poly line carrying natural gas liquids would be placed in the same trench as the natural gas line from the well site to the permanent gas sales pipeline. Natural gas liquids would eventually be trucked from well sites. If necessary, vapor recovery units also would be installed to capture vent gas on condensate tanks at individual well locations. BTA would coordinate the design and operation of its vent gas recovery system with the BLM. While a slight increase in noise would result from the operation of the field compressor, it is expected that this equipment would help to minimize emissions from condensate tanks. It is expected that one compressor would be sufficient to serve 3-4 wells. For example, one compressor at the Bravo #2 well site would be adequate to serve the #1, #2, #4 and (when drilled) the #5 wells. Water in the gas stream would also be separated and collected in a tank at each well site.

2.4.6 Hazardous Materials

BTA would review substances to be used during construction, drilling and operations in light of the Environmental Protection Agency’s Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 (as amended) to determine whether materials proposed for use qualify as hazardous substances. The lessee would also identify extremely hazardous substances (EHSs) within the list of hazardous substances by referring to the List of Extremely Hazardous Substances and Their Threshold Planning Quantities defined in 40 CFR 355, as amended. Hazardous materials would be used, stored, and disposed of in an environmentally safe
Topsoil salvaging. To improve reclamation success, topsoil would be salvaged wherever possible. Available topsoil (up to 12 inches) would be stockpiled. Stockpiled topsoil would be used to reconstruct disturbed areas. If topsoil is lacking, mulching would be considered as a way to trap runoff, retain soil moisture and improve on-site seed germination.

Clearing and blading. Blading of pipeline rights-of-way would be eliminated. Rights-of-way that are not bladed would develop natural-appearing vegetation more rapidly. Where necessary to reduce fire hazard or allow the passage of vehicles, vegetation would be cut from the remainder of the right-of-way.

Recontouring. Cuts made in steep or rolling terrain during construction of roads, wells or pipelines would be regraded and contoured to blend into the surrounding landscape and to reestablish natural drainage patterns. The goals of recontouring would be to return disturbed areas to original contour, stabilize slopes, control surface drainage and provide a more aesthetic appearance. Any ruts or scars in reclaimed areas discovered during follow-up inspections would be filled.

Mulching. Mulching would be necessary on selected sites—especially shallow or sandy soils or areas where topsoil is lacking. Mulch would improve infiltration rates, add organic matter, conserve moisture and would improve seed germination on all sites. Mulching would also lower the potential for wind erosion. Weed-free hay or straw could be used but would be cropped into the soil.

Fertilizers. BTA does not propose to use fertilizers in the development area. Fertilizer requirements (if any) would be determined on a site-by-site basis in consultation with BLM soils and reclamation specialists. Fertilizer would not be applied near water courses to prevent these materials or dissolved nutrients from entering area waters. Collection and analysis of soil samples could be required by BLM as part of reclamation planning.

Scarification/Ripping. Scarification or ripping (a minimum of 12-18 inches) would be used to loosen compacted soils on well pads, road and proposed pipeline rights-of-way. Severely compacted areas may require cross ripping and ripping to a depth of two feet. Scarifying or chiseling would promote water infiltration, aeration and root penetration. A roughened surface would reduce erosion and conserve moisture for on-site seed germination. Practices such as pitting or imprinting the soil surface would be considered as a way to trap runoff, retain soil moisture and improve on-site seed germination.

As part of its Proposed Action, BTA would implement the following reclamation measures which would be incorporated into its Plan of Operations. The site-specific location and application of each measure would be described in APD, ROW or permit applications which would be submitted to BLM for its review and approval.

Topsoil salvaging. To improve reclamation success, topsoil would be salvaged wherever possible. Available topsoil (up to 12 inches) would be stockpiled. Stockpiled topsoil would provide a superior growth medium when compared to unweathered subsoil materials as the microbiological properties of topsoil are beneficial to the reestablishment of vegetation. Topsoil salvaging would also minimize visual impacts that could occur if subsoils of a different color were left on the surface.

If available and uncontaminated, topsoil used in the construction of berms or at the edge of production locations would be pulled back over disturbed areas. However, on some soil types topsoil may be lacking. Long-term topsoil stockpiles at well pads would be graded and seeded. Long-term soil stockpiles (i.e., longer than 12 months) generally would be kept four feet high or less.

As part of its Proposed Action, BTA would prepare an SPCC Plan. A summary of the SPCC Plan would be made available to BLM, BTA contractors and subcontractors. A copy of the SPCC Plan would be kept in the field. The SPCC Plan would address emergency procedures should a spill occur at the gas processing facility, a pipeline, the central tank battery or a well pad. Spill containment equipment and materials, as listed in the SPCC Plan, would be stockpiled and maintained within the field. Facilities would be posted with a telephone number to call in the case of an emergency or accident. Fuel haulers would be required to have their own spill plan in conformance with U.S. Department of Transportation requirements.

2.4.7 Additional Project Components

A water well may be drilled to provide water for drilling. Upon completion of drilling, BTA would work with BLM regarding the possible conversion of the well to use by livestock and wildlife.

2.4.8 Reclamation

BTA proposed reclamation measures would comply with current BLM standards and guidelines. These measures would consist of returning disturbed areas to preconstruction contour and reseeding. Topsoil, kept separate from spoil material or other materials during construction, would be spread over the surface. Cuts and stockpiled vegetation, along with stockpiled rock, would be spread over disturbed areas. Seeding would be conducted with a seed mixture approved by BLM. Range and agricultural improvements such as fences, gates, cattle guards or ditches damaged during construction would be immediately repaired. Reclamation efforts would be initiated as soon as possible after disturbance occurs.

As part of its Proposed Action, BTA would implement the following reclamation measures which would be incorporated into its Plan of Operations. The site-specific location and application of each measure would be described in APD, ROW or permit applications which would be submitted to BLM for its review and approval.

Topsoil salvaging. To improve reclamation success, topsoil would be salvaged wherever possible. Available topsoil (up to 12 inches) would be stockpiled. Stockpiled topsoil would provide a superior growth medium when compared to unweathered subsoil materials as the microbiological properties of topsoil are beneficial to the reestablishment of vegetation. Topsoil salvaging would also minimize visual impacts that could occur if subsoils of a different color were left on the surface.

2-25
Erosion control. If after scarification, additional erosion control measures are necessary, BTA would install waterbars. Placement of waterbars depends on slope and would be guided by the following guidelines:

- Less than 4 percent slope--300 foot intervals;
- 4 to 8 percent slope--200 foot intervals;
- 8 to 25 percent slope--100 foot intervals; and,
- Greater than 25 percent slope--50 foot intervals.

Waterbars would also be installed at significant grade changes as determined by BTA in site specific conditions. Waterbars would be constructed on a horizontal angle two percent greater than the grade of the slope; would be cut to a minimum of 12 inches in depth below the surface; and, would originate and end in stable, vegetated areas. The specific location and placement of water bars would be described in the APD or ROW application submitted to BLM. The development area is relatively flat and the route of the permanent gas sales pipe was selected to avoid steep slopes (greater than 25 percent); therefore, special erosion control measures designed for steep slopes will not be necessary.

Depending upon site-specific conditions, BLM could require mulching on areas susceptible to high erosion rates. In such cases, straw or hay would be used at the rate of two tons per acre and cramped in where feasible. An asphalt emulsion tackifier or netting may be used on some areas. Asphalt tackifier would not be used near water sources.

Snow fences would be considered as a way to reduce wind erosion and retain snow or to increase soil moisture on reclaimed areas. Sediment traps or filters, such as staked straw bales or silt fences, would be used where sedimentation of drainages is possible until successful reclamation has been achieved. Such measures would be implemented where proposed road and pipeline cross the main drainage through Alkali Basin.

Rip-rap will be required at the inlet and outlet of all culverts. The need for sediment traps or erosion/sediment control fabrics would be identified prior to construction in an APD, ROW application or storm water plan (where required by WDEQ).

Seeding. Upon approval from the BLM, seeding would be accomplished during the growing season. The seed mixture would be certified to be weed-free and a copy of the certification would be supplied to the BLM prior to planting. All seeding rates would be based on pure live seed. Special procedures for drill seeding of shrubs or broadcast seeding of shrub seed after drill seeding has been completed may be necessary. Broadcast seeding would occur on steep terrain and on areas where the surface is covered with stones which would prevent the proper placement of seed. Where broadcast seeding occurs, the seeding rate would be doubled or adjusted for applicable rates based on PLS per square foot.

Monitoring. BTA proposes to conduct inspections of reclamation efforts on an annual basis to evaluate erosion control and revegetation success. The need to reseed, fertilize or spot-treat disturbed areas would be determined after the second growing season. If reseeding is required, reclamation measures would be reviewed and changes needed to improve revegetation success incorporated into future permit applications. Maintenance of all temporary and permanent erosion control structures would occur on an annual basis until revegetation is deemed successful. Additional erosion control structures or procedures would be implemented if erosional problems persisted.

Noxious weed control. Noxious weeds have been noted on disturbed land in the development area. If noxious weeds infest disturbed areas, they would be controlled by mechanical, chemical, biological or other methods which are approved by the BLM. Weed control measures would be developed in consultation with BLM and the County weed control office. Weed control methods would be used in the season or growth stage that they are the most effective. Chemicals would only be applied by certified personnel using specified precautions, application methods and rates in compliance with all applicable Federal, State, and local pesticide regulations. Prior to spraying, further environmental analysis would be required. Use of herbicides would be avoided within 100 yards of water and would not be used in windy conditions. Herbicides would not be applied where populations of Federally-listed threatened, endangered, proposed or candidate plant species are known to occur. Soil sterilants would not be used on topsoil stockpiles.

2.4.9 Project Workforce and Transportation

Construction. Peak workforce for implementing the Proposed Action would be an estimated 75 workers--assuming concurrent well drilling, pipeline construction and construction of the gas processing facility. BTA would attempt to hire qualified workers from the local labor force to the extent allowable by law. Based on its experience with past drilling and construction activities in the area, BTA estimates that up to 80 percent, or 60 workers, would be local hires drawn from towns in southwestern Wyoming. Qualified workers are already present in the local labor pool and these workers would commute to the project area on a daily basis from an established place of residence. In-migrant workers would seek temporary housing in local motels, apartments, trailer parks or private recreation vehicle campgrounds. BTA would inform its contractors and sub-contractors of BLM policies that limit camping on public lands.

Workers, materials and equipment would be transported over Interstate 80 and various County-maintained roads (e.g., Bar X, Nine Mile and Freighter Gap roads). BTA would comply with existing Federal, State and County requirements and restrictions intended to protect road networks, the travelling public, adjacent landowners and their property. County and State load limit restrictions to ensure that the effectiveness of the roughened surface is not reduced. If drill seeding were used, the drill would be equipped with depth bands and seeding would occur on the contour where practical. Typically, seed would be planted between one-quarter and one-half inch deep. Special procedures for drill seeding of shrubs or broadcast seeding of shrub seed after drill seeding has been completed may be necessary. Broadcast seeding would occur on steep terrain and on areas where the surface is covered with stones which would prevent the proper placement of seed. Where broadcast seeding occurs, the seeding rate would be doubled or adjusted for applicable rates based on PLS per square foot.
would be observed at all times to prevent damage to road surfaces. Special arrangements would be made with the Wyoming Transportation Department and Sweetwater County, as required, to transport oversize and overweight loads. All project related traffic would be confined to existing roads, construction sites or within pipeline construction rights-of-way. No cross-country vehicle travel would be permitted. Project-related vehicles would not travel on contributing segments of historic trails. Parking areas would be designated at construction sites.

Passenger vehicles and smaller trucks would be used to transport construction crews and for other miscellaneous purposes. Peak traffic level associated with a peak workforce of 75 would be approximately 50 light vehicle round-trips per day—assuming 1.5 workers per light vehicle and no more than one roundtrip to the project area in a single day. Additional traffic within the project area would be created by the transport of materials to sites. During construction, heavy truck traffic would peak at about 48 roundtrips per day.

**Operations and Maintenance.** After construction is completed, approximately 2 employees would be needed to operate and maintain the field, pipelines and gas processing facility. Approximately 6 roundtrips per day into the development area and vicinity would be associated with operations and maintenance workers. Traffic from trucks hauling condensate, produced water and natural gas liquids could average 2 trips per day per well, or up to 20 trips per day if all proposed wells were successful. An additional 4 trips per day could be associated with haulage from two existing wells. It is anticipated that sporadic snow removal from local roads would be necessary. BTA would cooperate with other oil and gas operators to ensure that the Bar X Road remains open to traffic during the winter. Heavy truck traffic associated with production activities would not occur at night.

BTA would maintain roads and erosion control devices to original designs as described in appropriate permit applications. Roads within the development area or used to access the development area from the Bar X Road, would be surfaced in accordance with specifications set forth in a transportation plan. BTA would be responsible for corrective road maintenance and repair of damage to BLM and the Bar X Road (County Road 21) associated with project-related traffic to standards and specifications set by Sweetwater County or the BLM as applicable. Pipeline crossing of County roads would comply with County permits and standards as applicable.

2.4.10 Plan of Operations (PO)

BTA would prepare a PO which would summarize environmental protection measures and standards to be incorporated into the site-specific design of wells, roads, pipelines and other facilities. The PO would list environmental protection measures described in this chapter, Appendix A and additional measures identified in the Decision Record. This plan would be used to guide the preparation of future permit applications, field inspections and monitoring. It would also serve as a useful guide to environmental requirements for BTA’s contractors and subcontractors.

The PO would be on file in the BLM Resource Area office. A copy of the PO would be kept at project locations and would serve as a field guide to environmental protection standards, guidelines and measures required during implementation of project activities.

2.5 PROJECT ALTERNATIVES

CEQ regulations (particularly Part 1500.2) stress avoidance or minimization of possible adverse effects on the quality of the environment. The Proposed Action incorporates measures intended to minimize disturbance to the environment. Mitigation measures are suggested in this analysis to further reduce the impacts associated with implementation of the Proposed Action. The Proposed Action represents a reasonably foreseeable, maximum development scenario; that is, it is considered the scenario necessary to achieve the maximum recovery of known gas reserves. The Proposed Action already considers the staged development of all project facilities commensurate with maximum production. In addition, project components were relocated to reduce impacts to sensitive resources. For example, following on site inspections with BLM, the proposed site for the gas processing facility and central tack battery were relocated by BTA to reduce the visibility of these facilities. Several dry holes have been drilled in the development area (see Figure 2-2). It is possible that future drilling would indicate that the maximum development scenario proposed here is not economical.

2.5.1 Freighter Gap Pipeline Alternative

Initially, BTA routed its proposed gas sales pipeline to a tie-in point near an existing well site just east of Freighter Gap (see Figure 2-1). This route would be about 3.4 miles shorter than the proposed permanent sales pipeline route. This alternative would reduce construction-related disturbance by 20.6 acres to 160 acres. Production-related surface disturbance would remain the same as the Proposed Action (33.7 acres). In general, implementation of this alternative would require pipeline construction activities similar to those described for the Proposed Action. Surface disturbance from well field development would be the same as the Proposed Action. However, special measures for construction on slopes of 25 percent or greater would have to be implemented. These measures could include increased use of sidehill cuts, extensive erosion control measures, boring portions of the pipeline route and use of diversion dikes at the top of steep slopes.

2.5.2 No Action Alternative

CEQ regulations implementing NEPA require Federal agencies to consider the No Action Alternative in all NEPA documents. Under the No Action Alternative, BLM would deny approval of proposed locations for wells and other proposed facilities. Implementation of the No Action Alternative would require BTA to develop alternative plans and/or locations for its project or, should that prove infeasible, to abandon its plans to develop the area.

These denials would be limited to Federal surface or minerals but would effectively prohibit BTA from proceeding with development. The BLM’s authority to implement the No Action Alternative is limited. Oil and gas leases have been issued to BTA. Because the Secretary of Interior has authority and responsibility to protect the environment within Federal oil and gas leases, restrictions have been imposed on the lease terms by BLM. The restrictions are the basis of the BLM’s standard stipulations and conditions of approval.

The Tenth Circuit Court of Appeals in Sierra Club vs. Peterson (717 F. 2d 1409, 1983) found that "on land leased without a No Surface Occupancy stipulation, the Department cannot deny the permit to drill...once the land is leased the Department no longer has the authority to preclude surface..."
disturbing activity even if the environmental impact of such activity is significant. The Department can only impose mitigation measures upon a lessee who pursues surface disturbing exploration and/or drilling activities." The court goes on to say "notwithstanding the assurance that a later site-specific environmental analysis will be made, in issuing these leases the Department has made an irrevocable commitment to allow some surface disturbing activities, including drilling and road building." Similarly, the Department has made a commitment to allow BTA to transport its production from the development area to a point of sale.

BTA’s leases do not contain No Surface Occupancy stipulations and, therefore, restrictions on oil and gas lease operations must be reasonable. The BLM cannot directly or indirectly prohibit, altogether, the development of the leases.

Under the No Action Alternative, current land and resource uses would continue. Significant quantities of hydrocarbons would be left unrecovered. Economic return on Federal gas reserves and tax and royalty revenues would not be obtained. This situation would be contrary to Federal minerals policy, and the terms and conditions of Federal oil and gas leases, which require the lessee to efficiently develop and extract Federal minerals.

2.5.3 Alternatives Considered But Not Receiving Further Analysis

BTA has entered into a long-term contract with NGC to pipe natural gas from the development area to a sales point. NGC originally proposed to construct the permanent gas sales pipeline adjacent to the Frontier-Baroil pipelines (see Figure 2-1). While this route would have been longer than the Proposed Action or Freighter Gap Pipeline Alternative it would have reduced new disturbance. However, this route passes through private property. NGC was unable to obtain an easement from one private property owner (Union Pacific Resources); consequently the route had to be modified to deviate from the existing Frontier-Baroil corridor. NGC also considered construction of the pipeline adjacent to Nine Mile Road and the road that follows the southern boundary of the South Pinnacles and Alkali Draw WSAs. This route was abandoned to avoid construction activities immediately adjacent to the WSA boundaries. For these reasons, these alternatives were dropped from further consideration and are not analyzed further in this document.

CHAPTER THREE

AFFFECTED ENVIRONMENT

3.1 RESOURCES NOT REQUIRING FURTHER ANALYSIS

This chapter describes resources which would be affected by proposed project components. The scope of the affected environment would vary depending upon the resource discussed. For example, the affected environment for socioeconomic resources is Sweetwater County while the affected environment for soils is limited to those watershed areas disturbed by proposed construction. Affected resources are described as they exist today. The description of the affected environment includes baseline development which has already altered the natural environment and is organized by resource.

The following resources would not be affected either directly or indirectly by proposed activities and thus are not analyzed further in this document:

- Commercial stands of timber;
- Surface or underground coal or mineral mines;
- Prime or unique farmlands;
- Farming or other agricultural land uses other than grazing;
- Designated natural landmarks, national historic sites and landmarks;
- National parks, monuments or recreation sites;
- Designated, proposed or candidate wild, scenic or recreational rivers;
- Designated recreation areas, sites or facilities;
- Tribal lands; or,
- Federal lands administered by Federal agencies other than the BLM.

3.2 SOCIOECONOMIC CONDITIONS

All of the proposed development and pipeline construction activities would take place within Sweetwater County. The population of Sweetwater County is about 43,000. The largest communities in the region are Rock Springs and Green River with smaller communities south and north of the development area: Point of Rocks, Table Rock, Wamsutter, Superior, Eden, and Farson.

Sweetwater County and southwestern Wyoming have been subject to boom-bust cycles associated with changing resource developments. The cyclical economy has resulted in changes in employment and population within short periods of time. For example, between 1980 and 1982 the population of Sweetwater County increased from 41,700 to 45,100 then declined to 40,900 in 1984. In 1986 the population again grew to 44,500 and declined to 38,800 residents according to the 1990 census. Like the rest of the State, the economy of southwest Wyoming fluctuates with the price of minerals, including oil and gas.
3.2.1 Government Revenues and Expenditures

Nationally, Wyoming ranked fifth in natural gas production. State-wide natural gas production has increased steadily, reaching historic highs in the early 1990s. Sweetwater County is a major producer of energy within Wyoming. The County ranks third (out of 23 counties) in oil and gas production. The infrastructure for oil and gas production in the County is well developed and the industry is a major contributor to local government revenues. All production associated with the proposed project would be located within Sweetwater County. Taxes and royalties are described below.

Royalties. The proposed wells would produce Federally-owned minerals. Producers pay a Federal royalty of 12.5 percent on oil and gas sales derived from Federal leases. Fifty percent of revenues from the Federal royalty is returned to the State of Wyoming. The State is permitted to use these funds for road and bridge projects or to fund education programs which benefit local jurisdictions.

State Severance Tax. The State of Wyoming levies a six percent severance tax on natural gas production. The tax is based on the value of production and thus is affected by fluctuations in the price of commodities. One sixth of state severance tax revenue is returned to cities, towns and counties.

Ad Valorem Tax on Production. An ad valorem tax is levied by Sweetwater County on oil and gas production. The tax is based on the value of the previous year’s production after deductions for payment of Federal or State royalties. The State of Wyoming is responsible for assessing the value of this production and reporting its assessment to the County Assessor. In 1993, state-assessed valuations of natural gas properties in Sweetwater County totaled $228.3 million. With an average mill levy of 72.1, natural gas properties produced $16.5 million in ad valorem revenue for Sweetwater County.

County Property Tax. Sweetwater County also assesses a property tax on wellhead equipment, field facilities and other above-ground equipment including those found on Federal surface. The oil and gas industry accounted for nearly 35 percent of all property assessed for taxation in Sweetwater County in fiscal year 1993. Property tax revenues in Sweetwater County on oil and gas drilling and production equipment totaled $1.1 million in 1993.

Sales and Use Taxes. Sales taxes apply to the retail sale of personal property or services. The purchaser of materials, supplies and services from local merchants generates sales tax revenues for State and local governments. Wyoming’s sales tax rate is four percent. A four percent use tax applies to purchases involving the storage or consumption of tangible goods purchased outside of Wyoming. Thus field equipment, drilling or other supplies brought into the development area from out-of-state are subject to the use tax. Wyoming Statute (WS 39-6-602) requires contractors to provide proof that sales or use taxes have been paid on the purchase of equipment, material or supplies used to complete contracts for the repair or improvement of real property.

3.2.2 Housing

Demand for housing in the county is affected by fluctuations in the resource-based economy and population, as discussed above. In the past few years southwest Wyoming has seen increasing mineral development-related construction. The oil, gas and mining industry remains a major employer and contributor to the economy of Sweetwater County. Oil, gas and mining account for 20 to 30 percent of all non-farm, private-sector employees in Sweetwater County (Wyoming Division of Economic Analysis, 1992). Construction accounts for a similar percentage of employees while agriculture accounts for only about 1 percent. The region’s labor pool contains skilled workers experienced in oil and gas development and operations. Nonetheless, given the specialized skills demanded for oil and gas drilling, some in-migration of temporary labor usually occurs as part of any project. These employees typically find temporary accommodations in Evanston, Green River, Rock Springs and other towns which are within a two hour drive from the development area. Commutes of this length are common for workers on energy projects. No shortage or difficulty in obtaining temporary accommodations (e.g. motel rooms) was noted during the spring, summer or fall of 1994. The availability of temporary housing, however, can be quite variable and shortages have occurred in the past during the peak construction season – May to November. Many of the local motels offer rooms and services tailored to construction and energy industry workers.

3.3 TRANSPORTATION NETWORKS

Interstate 80 (I-80) would serve as the major access road to the development area from the nearest population centers – Rock Springs and Green River (see Figure 3-3). Average daily traffic volume on Interstate 80 in the vicinity of the development area is about 8,000 vehicles, 3,800 of which are heavy trucks. From the Interstate, the most direct access is on the Bar X Road also known as County Road 21. Final access from Bar X Road is on an existing gravel road into the development area (see Figure 2-1). Other existing roads within the development area are primitive dirt or two-track roads, many of which have not been used on any regular basis. These roads were constructed for seismic exploration work performed in the 1950s and 1960s or to access wells which are now plugged and abandoned (see Figure 2-2). All roads are open to vehicle use year-round on BLM-administered lands; although if deemed necessary BLM can close a road to protect resource values. Crossings of local roads are subject to County requirements. Pipeline crossings of County roads could be bored or open-cut depending upon the County’s requirements.

3.4 VISUAL RESOURCES

The Visual Resource Management (VRM) System is used by the BLM to inventory and manage visual resources on public lands. The overall goal of the system is to manage public lands in a manner that will protect the quality of the scenic (visual) values of these lands and minimize visual impacts. Classification of land under the VRM System combines evaluations of visual quality (outstanding features), visual sensitivity and viewing distance. Four possible classes are used by BLM to determine the degree of compatibility between proposed developments and existing visual resources. Lands within or adjacent to the development area fall into three of the four Visual Resource Management (VRM) classes:

Class II: The objective of this class is to design proposed alterations so as to blend them into the natural landscape and retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract attention of the casual observer. Any changes must repeat the basic elements of...
form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III: The objective of this class is to design proposed alterations so as to partially retain the existing character of the landscape. Contrasts to the basic elements (form, line, color, and texture) caused by a management activity may be evident and begin to attract attention in the characteristic landscape. However, the changes should remain subordinate to the existing characteristic landscape. Structures located in the foreground distance zone (0-1/2 mile) often create a contrast that exceeds the VRM class, even when designed to harmonize and blend with the characteristic landscape. This may be especially true when a distinctive architectural motif or style is designed. Approval by the District Manager is required on a case-by-case basis to determine whether the structure(s) meet acceptable VRM class standards, and if not, whether they add acceptable visual variety to the landscape.

Class IV: The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. Contrasts may attract attention and be a dominant feature of the landscape in terms of scale; however, the change should repeat the basic elements (form, line, color, and texture) inherent in the characteristic landscape. Structures located in the foreground distance zone (0-1/2 mile) often create a contrast that exceeds the VRM class, even when designed to harmonize and blend with the characteristic landscape. This may be especially true when a distinctive architectural motif or style is designed. Approval by the District Manager is required on a case-by-case basis to determine whether the structure(s) meet acceptable VRM class standards, and if not, whether they add acceptable visual variety to the landscape.

BLM objectives for the management of visual quality apply to all surface disturbing actions. Objectives are achieved by designing and locating disturbances in a manner that most closely meets the minimum degree of contrast acceptable for the VRM class. Project facilities would be designed to meet the objectives of the established visual classifications and appropriate mitigation applied. Facilities, including existing or new wells and linear rights-of-way, would be screened, painted or designed to blend with the surrounding landscape.

The development area and proposed permanent gas sales pipeline route are within areas presently classified VRM Class IV. The East Sand Dunes Wilderness Study Area (lying south and adjacent to the development area) and the South Pinnacles and Alkali Draw WSAs (lying west-northwest of the development area) are classified as VRM Class II. Steamboat Mountain near the terminus of the proposed permanent gas sales pipeline has been classified as VRM Class III.

Public comments received by the BLM on the Green River RMP Draft EIS recommended the preservation of scenic qualities in the area referred to as the Red Desert Watershed Area (see Section 3.5.3). The BLM, in response to this public input, is proposing in the Green River RMP Final EIS to change the VRM classification within the Red Desert Watershed Area from VRM Class IV to VRM Class II in part of the watershed area and VRM Class III in the remaining part. Under this change in management direction, the development area and the proposed permanent gas sales pipeline would be located within VRM Class III and IV areas.

3.5 SPECIAL MANAGEMENT AREAS

3.5.1 Wilderness Study Areas

Four Wilderness Study Areas (WSAs)--Alkali Draw, South Pinnacles, East Sand Dunes and Red Lake--are in the vicinity of the proposed development area (see Figure 3-1). As a result of two environmental impact statements (BLM, 1990; BLM, 1987), none of the WSAs were recommended as suitable for wilderness designation. Until Congress acts on a BLM-Wyoming wilderness bill, lands within WSAs are managed for non-impairment under BLM Interim Management Policy and Guidelines for Lands Under Wilderness Review (H-8550-1). The Interim Management Policy "establishes the guidelines for determining uses and activities that may occur in areas under wilderness review" (Appendix E, p.2). Furthermore, as stated in the policy (p.4):

The BLM's responsibilities under Section 603(c) [of the Wilderness Act] are also affected by section 701 (h) of FLPMA, which states: "All actions by the Secretary concerned under this Act shall be subject to valid existing rights." These mandates in FLPMA establish as a matter of law that, while some development activities are permissible on lands under wilderness review, they are subject to important limitations and must be regulated to prevent impairment of wilderness suitability.

Pending Congressional action, these guidelines require BLM to manage WSAs so their suitability for preservation as wilderness will not be impaired (except for uses and activities that are exempt, or "grandfathered", under the Federal Land Policy and Management Act of 1976 or FLPMA). This non-impairment standard is to ensure that lands meeting the definition of wilderness under the Wilderness Act will not be degraded to the point that they can no longer be considered for preservation as wilderness. If BLM recommendations for non-wilderness status are accepted by Congress, the four WSAs will be managed as multiple use lands with special management area restrictions. A summary of BLM recommendations on these WSAs follows (Table 3-1).

3.5.2 Areas of Critical Environmental Concern (ACEC)

Approximately 43,010 acres in the Steamboat Mountain area have been proposed for designation as an ACEC in the draft Green River Resource Management Area Resource Management Plan. The ACEC includes crucial winter and parturition habitat used by the Steamboat elk and Steamboat mule deer populations. Figure 3-1 shows the ACEC in terms of project components.
<table>
<thead>
<tr>
<th>Wilderness Study Area</th>
<th>Size (Acres)</th>
<th>Recommended for Wilderness (Acres)</th>
<th>Existing Impacts within WSA</th>
<th>Justification for Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkali Draw (pp. 284-290)</td>
<td>16,990</td>
<td>0</td>
<td>Currently there are three producing wells in the WSA and 8.5 miles of two-track road.</td>
<td>&quot;In arriving at a recommendation of nonwilderness, the WSA's value for oil and gas production and its less-than-exemplary wilderness values were primary concerns.&quot; Pre-FLPMA oil and gas leases cover about 15 percent of the WSA. It is projected that 5 new wells and 2-3 miles of road will be developed on these leases. Recoverable reserves are estimated at 38 billion cubic feet of natural gas and 1.5 million barrels of condensate.</td>
</tr>
<tr>
<td>South Pinnacles (pp. 258-264)</td>
<td>10,800</td>
<td>0</td>
<td>There are no pre-FLPMA leases. There are some seismic trails, two-track trails and one abandoned drill site.</td>
<td>&quot;The principal factor in recommending nonwilderness for this WSA was the lack of exemplary wilderness values, particularly primitive and unconfined recreation opportunities for primitive and unconfined recreation are not outstanding...Outstanding opportunities for solitude can only be found in the rimrock area of this WSA. Opportunities for solitude in other portions of the WSA are limited primarily due to the boundary roads that surround the WSA.&quot;</td>
</tr>
</tbody>
</table>
Table 3-1 (Continued)

Summary of Wilderness Study Area Qualities and Recommendations

<table>
<thead>
<tr>
<th>Wilderness Study Area</th>
<th>Size (Acres)</th>
<th>Recommended for Wilderness (Acres)</th>
<th>Existing Impacts within WSA</th>
<th>Justification for Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Sand Dunes (pp. 276-283)</td>
<td>12,800</td>
<td>0</td>
<td>&quot;The WSA is narrow (1-2 miles), long (11 miles), and consists primarily of large sand dunes. While the overall impact to naturalness is slight in the WSA, the three abandoned well sites, the shut-in well, and eight miles of two-track trails reduce naturalness to the point where it is not truly outstanding or unique.&quot;</td>
<td>&quot;In recommending this area for nonwilderness, the conflicts between wilderness and natural gas production were of primary concern...Other principal factors in recommending nonwilderness for this WSA were the lack of exemplary wilderness values...Outstanding opportunities for solitude are only available in the dunes, draws and ridges in the southern portion of the WSA. In the remainder of the WSA, topography and vegetation provide little natural screening; these portions of the WSA would thus provide less than outstanding opportunities for solitude.&quot;</td>
</tr>
<tr>
<td>Red Lake (pp. 293-301)</td>
<td>9,515</td>
<td>0</td>
<td>&quot;The area's naturalness is adversely affected to some extent by adjacent land uses. The sights and sounds associated with oil and gas field development that surrounds the WSA would cause some loss of the perception of naturalness in the WSA.&quot;</td>
<td>Opportunities for primitive recreation are limited in scope. The WSA contains an estimated 54.4 billion cubic feet of natural gas. &quot;The value of these resources and the current [oil and gas] activity nearby are the principle reasons for the non-suitable recommendation.&quot;</td>
</tr>
</tbody>
</table>

3.5.3 Red Desert Watershed Area

The development area is located within the Red Desert Watershed Area as identified in the Green River RMP Draft EIS. The management objective for the watershed area would be to continue to manage the area for multiple use while providing for large areas of unstructured view for enjoyment of scenic qualities. This would be accomplished through facility design and placement, using topography to shield activities, using neutral colors so facilities blend with the landscape, identifying backcountry byways, and providing viewing points for the public. The boundary of the Red Desert Watershed Area includes public lands north of the checkerboard boundary within the Great Divide Basin. The watershed area encompasses portions of six WSAs (Alkali Draw, Alkali Basin-East Sand Dunes, Honeycomb Buttes, Oregon Buttes, Red Lake and South Pinnacles). Wilderness management recommendations and alternatives have been addressed in previous NEPA documents (see BLM, 1990). Management policies and guidelines for these WSAs are defined in the BLM Interim Management Policy and Guidelines for Lands Under Wilderness Review (H-8550-1).

The watershed area would be managed to ensure that developments and activities conform with the concept of open space. The visual resource values of the area would be retained and site-specific visual resource reviews (inventories) would be conducted prior to allowing activities that may affect these values. Surface disturbing activities, mineral exploration and development, and seismic activities would continue subject to the management guidelines provided in the RMP. Preferred route for major rights-of-way would be the east-west Frontier-Barroll pipeline corridor. Other areas would be considered if in conformance with wildlife, watershed, cultural and scenic resources. Overhead powerlines would not be permitted. Off-road vehicle travel would be managed to provide opportunities in conformance with other resource objectives. ORV travel in the watershed area would be limited to designated roads and trails. Recreational activities and uses would be maintained.

3.6 CULTURAL RESOURCES

Archaeological evidence indicates that the region has been occupied by people for at least the past 11,000 years. This earliest phase of occupation is known as the Paleo-Indian period and includes the Folsom Culture and several other cultural complexes that hunted large mammal species. The Paleo-Indian period ended about 7,000 years ago and was followed by cultures that practiced a more generalized hunter-gatherer lifestyle known as the Archaic. During this period people gathered a wide variety of plant foods and hunted available animals. Hunters used spears, known as "atlatls" and vegetal foods were processed on grinding slabs. This generalized Archaic Period lasted for about 5,000 years and was followed by the Late Prehistoric Period. During the Late Prehistoric several technological innovations were introduced into the area including the bow-and-arrow and pottery. With the bow and arrow big game hunting became more of a focus than it had been during the Archaic. During the Late Prehistoric human populations density across North America increased dramatically and apparently several new cultural groups moved into the central Rocky Mountain region.

Most prehistoric sites in the area are short term campsites used by hunter-gatherers. However, there are a number of specialized sites such as drive lines used to manipulate game herds, specialized plant processing sites and ceremonial sites such as vision quest locations. None of these specialized sites are known to occur on potentially affected lands but they may be found during future inventories of the area. More permanent residential sites (e.g., housepits) have been identified in the region in recent years. One housepit site, known as the Buffalo Hump Site, (outside the development area) has been determined to be eligible for inclusion on the National Register of Historic Places (NRHP). Since hunter-gatherers are tightly tied to the environment in which they live, many archaeological sites associated with peoples using this subsistence strategy are associated with special environmental features such as particular plant resources, game wintering areas, shelter and water. A number of the prehistoric campsites in the region have been determined to be eligible for the NRHP. Specialized sites are likely to be potential eligible for the NRHP. Based on past surface inventories for archaeological sites and a few open trench inspections, the density of prehistoric sites seems to be about the same as elsewhere in the Green River Resource Area, that is about four sites per section (640 acres).

Historic sites known to cross the proposed pipeline route include two freighting roads. Several campsites associated with livestock herding are also found in the area. The historic roads are called "expansion era roads" which were used to connect stations on the Union Pacific Railroad (completed in 1869) with livestock and mineral development operations and associated communities throughout the region. The Point of Rocks to South Pass freight road connected the rail head at Point of Rocks with the South Pass gold mining region. The Rock Springs to Lander Stage Road connected the agricultural community of Lander and the Wind River Indian Reservation headquartered at Ft. Washakie with the rapidly developing coal mining community and rail head of Rock Springs, Wyoming during the 1870s and 1880s. Most of the livestock herding campsites are simple historic artifact scatters left behind by shepherders and cowboys. The historic roads are significant historically and eligible for the NRHP. None of the recorded stockherder camps have been determined to be significant although future inventory could locate sites that could be important. The historic trails are managed according to the BLM trails management plan which provides that 1/4 mile on either side of extant trail remnants be protected from industrial development.

BLM (1992, Appendix 6) has outlined the steps that would be taken to protect cultural resources from surface disturbing activities. A Class III cultural inventory has been conducted along the proposed permanent gas sales pipeline route. Several prehistoric camps were found although all had been recorded during cultural inventories conducted prior to construction of the Frontier Pipeline (Darlington, 1994). Class III cultural surveys of the exploratory well sites within the development area were completed and used to ensure that significant sites were avoided. BLM will require similar cultural surveys where surface disturbances would occur within the development area, the results of which would be the basis for evaluating any sites located in terms of their significance, NRHP eligibility and/or need for mitigation of impacts.

3.7 PALEONTOLOGICAL RESOURCES

The development area is underlain by fossil-bearing sedimentary rocks including the Green River Formation from which fossil fish, stromatolites, plants, insects and other invertebrates, frogs, turtles, crocodiles, mammals (including bats), and birds have been described (Grande, 1984); the Wasatch Formation in which fossils of mollusks, crustaceans, fish, turtles, crocodiles and mammals from the Paleocene and Eocene have been identified; and the Lance and Fort Union Formations in which important mammalian fossils have been found. There are no published reports of vertebrate
paleontological localities in the development area or along proposed pipeline routes due to the fact that sedimentary rocks underlying affected lands are mostly unexposed or are too deep.

As discussed in Appendix A of this document, BLM has authority to protect paleontological resources. When avoidance of paleontological resources of scientific value is not possible, data recovery, stabilization, inspections, barriers, signs and other physical protection measures may be required.

3.8 AIR QUALITY

According to the WDEQ, the development area is in attainment for all current ambient air quality standards and is a Class II area for prevention of significant deterioration. The nearest Class I area subject to Prevention of Significant Deterioration (PSD) regulations is the Bridger Wilderness Area, approximately 43 miles north of the development area. Wilderness study areas are not Class I areas; however, under its Interim Management Policy, BLM is to protect these areas from sources of pollutants which could threaten their wilderness character. The Jim Bridger power plant and coal mine 25 miles southwest of the development area is the single largest source of pollutants in the vicinity of the WSAs. Nonetheless, visibility, measured during summer and fall near the Sand Dunes WSA, usually exceeds 70 miles because particulate concentrations are low and generally range between 3 and 15 micrograms per cubic meter (BLM, 1992). Background concentration data for total suspended particulates, ozone, nitrogen oxides (NOx), sulfur dioxide (SO2), carbon monoxide and hydrogen sulfide in the Green River Resource Area are well below Wyoming and National air pollutant standards (BLM, 1992). Within the Green River Resource Area, hydrogen sulfide is of concern due to its significant safety risks. However, no wells in the vicinity of the development area are known to have produced hydrogen sulfide.

3.9 NOISE

Background noise measurements have not been conducted in the development area. The EPA considers 55 dBA to be the health and welfare standard. Background noise levels in the development area may be similar to the EPA category—“Farm in Valley.” Background noise levels for such an area are daytime, 29 dBA; evening, 39 dBA; and night, 32 dBA. Local conditions, such as topography and the frequent high winds characteristic of the region, can alter background noise conditions. It is more likely that background levels range from 30 to 40 dBA (BLM, 1984). Noise-sensitive areas (NSA) identified in the vicinity of the development area would include raptor nest sites, sage grouse leks (when occupied) and wilderness study areas. Noise sensitive areas, such as residences, are not found within or near the development area.

3.10 GROUNDWATER

The development area lies within the Great Divide Basin, a relatively shallow, topographically closed depression (encompassing 3,959 square miles) where the Continental Divide forms the hydrographic boundary and separates it from the Green River Basin. Groundwater in the uppermost strata of the basin—the Laney Shale, Wasatch and Battle Springs Formations—flows to the center of the basin and recharges a series of lakes (Lost Creek Lake, Circle Bar Lake, Chain Lakes) in Battle Springs Flats, approximately 20 miles east of the development area (Lowham et al, 1985). Groundwater in the highlands rimming the Great Divide Basin appears to flow in local systems, recharging on ridges and discharging to the closest drainage. The flow pattern of deep groundwater is less clear, but evidence from monitoring wells drilled in the eastern Great Divide Basin suggests that it is saline and practically stagnant.

Water wells completed in the Wasatch Formation (the principal aquifer in the area) yield pumped discharges ranging from 0.5 to 688 gallons per minute (gal/min); flowing yields from 0.2 to 550 gal/min (Lowham et al, 1985). Pumped wells in the Fort Union Formation yield up to 300 gal/min and flowing wells from the Green River Formation yield up to 900 gal/min (Lowham et al, 1985). Groundwater from wells near the development area yield only fair quality water with dissolved solids concentrations ranging from 500 to 3000 milligrams per liter (mg/L). EPA (1979; National Secondary Drinking Water Regulation) recommends no more than 500 mg/L dissolved-solids in drinking water. Typically the sodium proportion of groundwater found in the area is too high for irrigation. Water wells completed in the Fort Union Formation in the past yielded little water that was of poor quality and either marginal or unfit for stock water. Selected groundwater data from four wells in the vicinity of the development area that were drilled in the 1970s is provided in Table 3-2.

3.11 SURFACE WATER

Streams originating within the Great Divide Basin are ephemeral or intermittent and have extended periods of no flow. Streamflow largely depends upon runoff which mainly occurs during the spring and early summer. Much of the moisture in the form of snow is lost to sublimation and summertime precipitation often evaporates before reaching the ground. Average annual runoff within the Great Divide Basin is estimated to be less than one-inch per year (Lowham et al, 1985). No perennial streams and only one intermittent stream confined to the Great Divide Basin would be affected. The Basin is isolated from the Green River or Platte River systems. The development area and vicinity is characterized by playas which are shown on topographic maps (see Figure 2-1 for example). No surface water was observed in any of the playas or drainages within the development area in Spring or Fall, 1994; however, playas and drainages can fill following winters of substantial (10-20 inch) snow falls.

3.12 SOILS

Affected soils have developed from alluvium, residuum and eolian parent materials composed of sedimentary deposits. Soil development in the proposed development area was influenced by alluvial processes, the amount of moisture received from snow accumulation or soil deposition and loss by wind. Regionally strong, persistent winds have dramatically influenced soil development by accumulating more snow on north and east facing slopes or on the leeward side of ridges and rock outcrops. Wind blown soil deposits typically collect in these same areas and, over time, soils in these areas become deeper, are higher in organic matter and are more developed (e.g., horizon differentiation). In comparison, wind swept ridges in the development area and vicinity tend to have shallow soils and exposed rock outcrops.
Table 3.2. Selected Water Quality Data from Four Wells Drilled in the Vicinity of the Development Area (Townships 21N-23N, Ranges 99W-100W).

<table>
<thead>
<tr>
<th>Parameter (units)</th>
<th>Mean Value</th>
<th>Value Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Conductivity (μS/cm)</td>
<td>2978</td>
<td>1440 - 4700</td>
</tr>
<tr>
<td>pH</td>
<td>8.4</td>
<td>7.9 - 8.9</td>
</tr>
<tr>
<td>Total Alkalinity (CaCO₃, mg/L)</td>
<td>581</td>
<td>514 - 647</td>
</tr>
<tr>
<td>Total Phosphorus (mg/L)</td>
<td>0.06</td>
<td>0.04 - 0.08</td>
</tr>
<tr>
<td>Hardness (mg/L CaCO₃)</td>
<td>13.6</td>
<td>4.0 - 24.0</td>
</tr>
<tr>
<td>Dissolved Calcium (mg/L)</td>
<td>3.1</td>
<td>0.6 - 6.7</td>
</tr>
<tr>
<td>Dissolved Magnesium (mg/L)</td>
<td>1.4</td>
<td>0.5 - 2.0</td>
</tr>
<tr>
<td>Dissolved Sodium (mg/L)</td>
<td>692</td>
<td>340 - 1167</td>
</tr>
<tr>
<td>Dissolved Potassium (mg/L)</td>
<td>3.2</td>
<td>1.6 - 7.0</td>
</tr>
<tr>
<td>Dissolved Chlorine (mg/L)</td>
<td>303</td>
<td>64 - 928</td>
</tr>
<tr>
<td>Dissolved Sulfate (mg/L)</td>
<td>357</td>
<td>0.5 - 1099</td>
</tr>
<tr>
<td>Dissolved Fluorine (mg/L)</td>
<td>4.8</td>
<td>2.6 - 8.5</td>
</tr>
<tr>
<td>Total Dissolved Solids (mg/L)</td>
<td>1874</td>
<td>864 - 2900</td>
</tr>
</tbody>
</table>


In general, affected soils are weakly developed, neutral to strongly alkaline, calcareous and low in organic matter. The development area lies within the Torringtons-Cambordiths-Haplargids Association that is common within the Great Divide Basin (Young and Singleton, 1977). These soils occur on nearly level to steep slopes, developing in residuum on bedrock (uplands) and in alluvium (playas). Soils of this association are characterized by the following: noncalcareous loam and silt loam with less than 20 percent clay content; sandy clay loam and sandy clay with moderate wind erosion potential; moderate infiltration rates with a moderate rate of water transmission; and moderate soil erodibility.

The eastern portion of the development area coincides with moderately deep to very shallow, well drained soils on rolling upland plains (Teagulf, Hugugston, Haterton, Wint, Tassaleem, Seesikadee, Leckman, Kandalay soils). The western portion of the development area and most of the proposed permanent gas sales pipeline and alternative routes are on deep, poorly drained soils formed on nearly level bottomlands and alluvial fans (Dines, Qualman, Chrisman soils). These soils tend to be strongly saline and/or alkaline (BLM, 1992).

The western two miles of the proposed permanent gas sales pipeline route would pass through a third soil complex found on sloping upland plains at higher elevations and in higher precipitation zone (10-14 inches) than the other two soils complexes. These soils (Blackhall, Rentac, Carmody, Grieves, Rencot, Thermopolis, Elk Mountain, Blazon, Delphill, Redwash, Redrock, Shinhara soils) are shallow to moderately deep and well drained. Shallow soils in this group (less than 20 inches to bedrock) tend to be erosive, have low water-holding capacity, and have high runoff potential on slopes as low as 3 percent.

The northern 2 miles of the Freighter Gap Pipeline Alternative is within this same soil complex. Unlike the proposed pipeline route, approximately 1000 feet of the Freighter Gap Pipeline Alternative would be on steep (50-60 percent) slopes.

A fourth soil type is found south and adjacent to the development area and on the eastern third of the proposed permanent gas sales pipeline. This soil type (Cotopaxi) is identified as deep and excessively drained shifting sand dunes formed on undulating eolian sand deposits.

3.13 GEOLOGY AND MINERALS

The Wyoming State Geological Survey has noted the possibility of overlapping mineral occurrences in the development area. No inactive, active or proposed coal or mineral mines exist in the development area or would be affected by project activities. However, coalbed methane exploration has revealed methane in subbituminous coals of the Wasatch Formation in Sweetwater County (Jones and DeBruin, 1990) and directly west of the development area (BLM, 1992).

An estimated 28 dry holes and no active wells are found within an eight mile radius of the existing Bravo #1 and #2 wells. Five dry holes have been drilled within approximately 1.5 miles of the proposed wells (see Figure 2-2). None of the area shown on Figure 2-1 has seen the level of oil and gas development found in the Desert Springs Field (T. 20-21 N., R. 97-98 W.) south of the development area, or the Hay Reservoir Field (T. 24 N., R. 97 W.), approximately 37 wells. Table 3-3 describes oil and gas fields within the area shown in Figure 2-1. Oil and gas development in this area has tapped geographically small, isolated fields and has not resulted in more than one producing well per field. Based on the results of BTA's drilling and local geology it appears that the oil and gas reservoir to be tapped by the Proposed Action is isolated and is very unlikely to spawn development beyond the 10 proposed wells analyzed in this EA. In its assessment of the mineral potential for the East Sand Dunes Wilderness Study Area directly south of the development area (see Figure 2-1), the BLM found that "the success rate for wells drilled is expected to be a low 15 percent. This indicates that development may occur, but intense development is not likely" (BLM, 1991).
Table 3-3
Oil and Gas Fields in the Vicinity of Proposed Wells and Pipelines

<table>
<thead>
<tr>
<th>Field/Unit Name</th>
<th>Discovered</th>
<th>Location</th>
<th>Number of Producing wells</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freighter Gap</td>
<td>1981</td>
<td>T. 24 N. R. 102 W.</td>
<td>0</td>
<td>Abandoned</td>
</tr>
<tr>
<td>Horn Canyon</td>
<td>1976</td>
<td>T. 24 N. R. 100 W.</td>
<td>1</td>
<td>Producing</td>
</tr>
<tr>
<td>Mud Lake</td>
<td>1959</td>
<td>T. 23 N. R. 98 W.</td>
<td>0</td>
<td>Abandoned</td>
</tr>
<tr>
<td>Saddle Bag</td>
<td>1981</td>
<td>T. 24 N. R. 100 W.</td>
<td>0</td>
<td>Abandoned</td>
</tr>
<tr>
<td>Steamboat Mountain</td>
<td>1978</td>
<td>T. 23 N. R. 102 W.</td>
<td>1</td>
<td>Producing</td>
</tr>
<tr>
<td>Treasure</td>
<td>1980</td>
<td>T. 24 N. R. 101 W.</td>
<td>1</td>
<td>Producing</td>
</tr>
</tbody>
</table>


3.14 VEGETATION:

Vegetation types which would be affected by project components were determined through ground surveys, interpreting aerial photography and the vegetation data developed by the BLM for the draft RMP (BLM, 1992). Five main vegetation communities would be affected by the project: low density sagebrush-grass; high density sagebrush; grasslands with little or no sagebrush; saltbush; and greasewood.

Low Density Sagebrush. This vegetation type is most frequently encountered within the development area and along proposed and alternate pipeline routes (Table 3-4). Predominant plant species are Wyoming big sagebrush, basin big sagebrush, birdfoot sagewort, rabbitbrushes and spiny hopnail. Major grass species in the understory include Indian ricegrass, thickspike wheatgrass, needle-and-thread, bottlebrush squirelltail and sandberg bluegrass. Soils which support this vegetation type vary widely in depth and texture. Within the 7 to 9 inch precipitation zone, vegetation productivity of low density sagebrush communities range from 200 to 700 pounds per acre with an average livestock stocking rate of 0.07 AUM per acre (BLM, 1992). Canopy or ground cover is typically less than 35 percent.

High Density Sagebrush. This type has greater canopy or ground cover (greater than 35 percent) of the various component shrub species compared to the low density sagebrush type. There are few locations where project components coincide with this type and it is not extensive in the development area (Table 3-4) since it generally occurs in areas above 7,000 feet that receive 10 or more inches of precipitation annually. Within the 10 to 14 inch precipitation zone, vegetation productivity of high density sagebrush communities range from 700 to 1,500 pounds per acre with an average livestock stocking rate of 0.25 AUM per acre. In the 7 to 9 inch precipitation zone however, the average livestock stocking rate is 0.14 AUM per acre in high density sagebrush (BLM, 1992).

Table 3-4. Vegetation Types Potentially Affected by Project Components

<table>
<thead>
<tr>
<th>Vegetation Type</th>
<th>Land Affected by Proposed Activities within Development Area</th>
<th>Land Affected by the Proposed Condensate Pipeline</th>
<th>Land Affected by the Proposed Permanent Gas Sales Pipeline</th>
<th>Land Affected by the Freighter Gap Pipeline Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Density Sagebrush</td>
<td>79</td>
<td>86</td>
<td>52</td>
<td>72</td>
</tr>
<tr>
<td>High Density Sagebrush</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Grassland</td>
<td>4</td>
<td>0</td>
<td>21</td>
<td>?</td>
</tr>
<tr>
<td>Saltbush</td>
<td>17</td>
<td>14</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td>Greasewood</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Grassland. Grasslands with little or no shrub component were found along the proposed sales pipeline route but not within the development area. This community occurs on hills and ridgelines with shallow soils near Steamboat Mountain. Grassland vegetation communities are a subgroup of the low density sagebrush vegetation type mapped from Landsat imagery by BLM (1992). Dominant grasses include thickspike wheatgrass, needle-and-thread, Indian ricegrass and sandberg bluegrass. Grasslands are encountered in a 10 to 14 inch precipitation zone. Vegetation productivity of grasslands in this precipitation zone range from 600 to 1,400 pounds per acre with an average livestock stocking rate of 0.12 AUM per acre (BLM, 1992).

Saltbush. Gardner's saltbush is the dominant shrub in this vegetation type. Grasses include Indian ricegrass and bottlebrush squirelltail. Winterfat and birdfoot sagewort are also components in this type which has very sparse plant cover. Typical canopy cover is estimated to be less than 35 percent. Soils supporting this vegetation type have a high salt content. BLM (1992) estimates vegetation productivity of saltbush between 150-600 pounds per acre with an average livestock stocking rate of 0.13 AUM per acre.
Greasewood. Black greasewood is the dominant species but other shrubs such as sagebrush, rabbitbrush and spiny hopsage and shrubs including gardner saltbush and winterfat are common within this vegetation type. More lush growths of greasewood are found along intermittent stream channels and on stabilized sand dunes; basin wild rye is often present at these sites. This vegetation type occurs on lowland areas with deep, medium to heavy textured saline soils that typically have a high sodium content. Greasewood vegetation occurs along all the major drainages and washes in the development area and at similar sites along proposed pipeline routes. Within the 7 to 9 inch precipitation zone, vegetative productivity of greasewood communities range from 300 to 900 pounds per acre with an average stocking rate of 0.15 AUM per acre (BLM, 1992). Typical canopy cover is estimated to be less than 35 percent.

3.15 RANGE RESOURCES

Portions of four grazing allotments would be affected by the project. Table 3-5 lists the affected allotments and total Federal acreage within each. The development area is entirely within the Red Desert Allotment which is composed mostly of public land with a portion of one section of State land. The proposed permanent gas sales pipeline route passes through all four allotments listed in Table 3-5.

The Red Desert and Rock Springs allotments are classified as maintenance allotments. That is, present management and range conditions are viewed as satisfactory with high resource production and without serious conflicts. The Steamboat Mountain and Fourth of July allotments are categorized as allotments in which present management and range conditions are to be improved to balance grazing, recreation and/or big game seasonal use. In the Red Desert allotment, overlapping habitat use by feral horses and cattle is most pronounced during fall when both utilize sagebrush-grasslands, and in severe winters when they congregate near sheltering ridgelines (Miller, 1983). Dietary overlap between horses and cattle is also greatest during fall (Olsen and Hansen, 1977). There is also substantial dietary overlap of elk in the Red Desert allotment with feral horses, cattle and domestic sheep especially during fall and winter (Olsen and Hansen, 1977). Pronghorn diets show little overlap with livestock (cattle and sheep), feral horses, and elk (Olsen and Hansen, 1977) although severe competition for water may result from dominance of horses at water wells during dry periods (Miller, 1983).

3.16 WETLANDS, FLOODPLAINS AND RIPARIAN AREAS

3.16.1 Wetlands and Riparian Areas

Executive Order 11990 calls on Federal agencies "to avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands". The EPA and COE regulate activities in wetlands and waters of the U.S. through the Clean Water Act's Section 404 permit program for dredge and fill activities. Data on affected wetland and riparian resources in the proposed development area was collected from National Wetlands Inventory (NWI) maps, BLM aerial photography and on-site examinations.
Table 3-5. Grazing Allotments Potentially Affected by the Bravo Field Development.

<table>
<thead>
<tr>
<th>Allotment Name</th>
<th>Allotment Categorization</th>
<th>Proposed Allotment Projects</th>
<th>Federal Acres</th>
<th>Grazing System</th>
<th>5-Year AUMs</th>
<th>Kind of Livestock</th>
<th>Season of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th Of July (03016)</td>
<td>Improvement</td>
<td>None</td>
<td>9,791</td>
<td>Deferred Rotation</td>
<td>840</td>
<td>Cattle</td>
<td>Spring, Summer, Fall, Winter</td>
</tr>
<tr>
<td>Red Desert (13012)</td>
<td>Maintenance</td>
<td>None</td>
<td>243.676</td>
<td>6 pasture Deferred Rotation</td>
<td>1,716</td>
<td>Cattle/Sheep</td>
<td>Spring, Summer, Fall, Winter</td>
</tr>
<tr>
<td>Steamboat Mountain (13014)</td>
<td>Improvement</td>
<td>None</td>
<td>24.498</td>
<td>2 pasture Deferred Rotation</td>
<td>851</td>
<td>Cattle</td>
<td>Spring, Summer, Fall, Winter</td>
</tr>
<tr>
<td>Rock Springs (13018)</td>
<td>Maintenance</td>
<td>Construct 15 reservoirs to improve wild horse distribution</td>
<td>956.682</td>
<td>No System</td>
<td>52,000</td>
<td>Cattle/Sheep Horses</td>
<td>Yearlong</td>
</tr>
</tbody>
</table>

Notes:
1. Virtually all (97%) affected lands in these allotments are BLM-administered.
2. As defined by the draft Green River RMP, Appendix 9-6.
Wetlands potentially affected by proposed activities are typically small (less than one acre), temporarily flooded areas associated with intermittent drainages or range improvement improvements. No perennial streams would be affected. One intermittent stream which would be affected by proposed pipeline construction is classified as R45BA wetland (riverine-intermittent-streambed-temporarily flooded) in the National Wetland Inventory. Small depressions may collect water from surrounding slopes and intermittent streams during run-off periods. These areas are classified as PUSA and PUSC wetlands (palustrine-unconsolidated shore-temporarily flooded or seasonally flooded), or playas that support various forbs and grasses once standing water evaporates or drains. Typically there is no distinctive riparian vegetation zone associated with any of these wetlands since the presence of water is usually for short durations annually.

3.16.2 Floodplains

Executive Order 11988 (42 Federal Register 26951) was adopted to "avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative". The Federal Emergency Management Agency (FEMA) has developed a series of maps which depict areas potentially inundated by a 100-year flood but these maps were unavailable for the affected lands because lands were either classified as Zone “D” which includes “areas of undetermined but possible flood hazards” or project components would be “located in an undeveloped area”. Any potential flood hazards would be due to flash floods in intermittent drainages. The magnitude of flow depends on the depth and water content of the snowpack and the occurrence of springtime rains. Generally, peak flow occurs during May-June in area streams. Summer thunderstorms may also cause temporary flow.

3.17 THREATENED AND ENDANGERED SPECIES AND SPECIES OF CONCERN

3.17.1 Wildlife Species

Three federally-listed endangered wildlife species could potentially occur in the vicinity of proposed activities (USFWS, 1994): the black-footed ferret, peregrine falcon, and bald eagle. USFWS has noted that another species, the mountain plover now classified as a Category C1 candidate species, could be proposed for listing as threatened or endangered in the foreseeable future. USFWS also identified another four Federal candidate species that could occur in the development area: ferruginous hawk, loggerhead shrike, long-billed curlew, and mountain plover. Burrowing owls are also considered in this analysis because they have been documented in the vicinity of the development area and are a BLM and State-priority species. Information on reported sightings of these species in the vicinity of proposed project activities is provided below.

Black-footed Ferret. According to information compiled by the Wyoming Game and Fish Department (Kinter and Martin, 1992), USFWS (1991) and Wyoming Natural Diversity Database (WNDDB, 1994), there has been one documented and numerous unverified reports of black-footed ferrets in the vicinity of the proposed development area (Table 3-6). There is only one recent record that documents physical evidence for black-footed ferrets—a ferret skull found in 1981 approximately 37 miles east of the development area. White-tailed prairie dog colonies have been mapped in the development area and along the proposed permanent gas sales pipeline route and surveyed for black-footed ferrets in September, 1994. No ferrets or their sign were found during these surveys.

Table 3-6. Reports of Black-footed Ferrets Within an Approximate 37-mile Radius of Principal Project Components.

<table>
<thead>
<tr>
<th>Reported Observation Date</th>
<th>Location</th>
<th>Approximate Distance From Project Component</th>
<th>Observation Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1930</td>
<td>22N 106W 12</td>
<td>20 miles</td>
<td>Trapped /1</td>
</tr>
<tr>
<td>October 1972</td>
<td>23N 98W 26</td>
<td>11 miles</td>
<td>Confirmed /2</td>
</tr>
<tr>
<td>1981</td>
<td>22N 93W 33</td>
<td>37 miles</td>
<td>Skull-Confirmed /1</td>
</tr>
<tr>
<td>May 1983</td>
<td>23N 98W -</td>
<td>4.0 miles</td>
<td>Probable /1</td>
</tr>
<tr>
<td>July 1984</td>
<td>22N 104W -</td>
<td>25 miles</td>
<td>Probable /2</td>
</tr>
<tr>
<td>September 1984</td>
<td>26N 99W 13</td>
<td>17 miles</td>
<td>Probable /2</td>
</tr>
<tr>
<td>July 1988</td>
<td>23N 101W 31</td>
<td>2.5 miles</td>
<td>Possible /1</td>
</tr>
</tbody>
</table>

Notes: 1. Ratings of Possible or Probable provided by Kinter and Martin 1992.
2. Ratings of Confirmed or Probable provided by USFWS 1981 and updates.

Peregrine Falcon. Although peregrine falcons may pass near the development area and vicinity during migrations, there are no records that they have done so. Cliffs on Steamboat Mountain could be suitable nesting habitat if other habitat components were also present but other suitable nesting habitat components do not appear to be present; therefore, peregrines are not expected to nest in the vicinity of the development area.

Bald Eagle. During winter, bald eagles commonly utilize communal roosts. No communal roosts have been reported or are likely in the vicinity of the proposed development area. All evidence indicates that communal roosts used by wintering bald eagles at night are in trees that provide relatively optimum shelter from wind and low ambient temperatures (Steenhof et al., 1980; Anthony et al., 1982; Anderson and Patterson, 1988). In Wyoming, bald eagles are listed as endangered but there are no records in the WGFD Wildlife Observation System (WOS) to indicate that eagles have been observed in the development area during winter or at any other time of year.

Candidate Wildlife Species. Species that are candidates for listing were also noted by USFWS. Category 1 (C1) candidate species are likely to be proposed for listing as threatened or endangered by USFWS; Category 2 (C2) species are those for which there is some information to suggest that proposal for listing as threatened or endangered may be appropriate but data are insufficient to conclusively document biological vulnerability; Category 3 (C3) species were once being considered for listing as threatened or endangered but are no longer under consideration due to their current abundance or lack or immediate threat. Candidate species that were identified by the USFWS as potentially occurring in the development area are described below.
The mountain plover (C1 candidate species) and long-billed curlew (C3 candidate species) inhabit short grass prairies and areas of low vegetation maintained by grazing (Dinsmore, 1983; Parrish, 1988). There are no records of long-billed curlews from any database in the vicinity of the proposed development area but they might occur at any of the alkaline lakes in the region. There is one record (WOS) of mountain plovers in sagebrush-grasslands habitat east of the development area and three mountain plovers (two were juveniles) were seen in saltbush vegetation during a 1994 survey for prairie dog colonies along the proposed pipeline route. Habitat suitable for nesting is probably available in the vicinity of proposed activities. Mountain plovers have been associated with prairie dog towns where vegetation has been reduced (Knowles et al., 1982; Olson-Edge and Edge, 1987).

The ferruginous hawk (C2 species by the USFWS) have been seen in the vicinity of the development area on several occasions and several nests are within 1 mile of the proposed permanent gas sales pipeline route. Ferruginous hawk populations are known to fluctuate considerably over a period of years due to changes in prey populations (Smith et al., 1981). While prey availability is an obvious limiting factor to raptor nesting success, nest site availability may also be a limiting factor in some areas (Fitzner and Newell, 1989). Because ferruginous hawks nest on the ground or often on accessible substrates, nests suffer considerable depredation from ground predators.

The loggerhead shrike (C2 species) is associated with open habitats including sagebrush rangeland and desert scrub (Johnsgard, 1986). Nests have been noted in shrubs such as four-wing saltbush (Porter et al., 1975) and suitable nesting habitat occurs in greasewood vegetation and in taller shrubs associated with sand dunes south of the development area.

Pygmy rabbits (C2 candidate species) were found in the vicinity of proposed activities during 1994 surveys for black-footed ferrets. Although they are most common in the Great Basin (Zeveloff, 1988), they were recently documented east of the Green River in Sweetwater County (WNDDB, 1994). In Wyoming and elsewhere, pygmy rabbits are associated with dense stands of big sagebrush, usually in drainages and hollows (Campbell et al., 1982).

Other Special Status Wildlife Species. WGFD (1987) has designated Priority 1 species as those needing intensive management to insure that extirpation or significant population declines do not occur. Priority II species are those needing additional study to determine whether intensive management is needed (WGFD, 1987). Only one Priority II species, the burrowing owl, occurs in the vicinity of proposed activities. A family of five burrowing owls was seen during the 1994 survey for prairie dog colonies along the proposed permanent gas sales pipeline route. They nest in prairie dog burrows or other mammal burrows where bare ground and lower shrub densities occur. Other records (WOS and WNDDB) indicate they have been infrequently observed in the vicinity of the development area.

3.17.2 Fish Species

There are no federally listed or candidate fish species that would be affected by this project.

3.17.3 Plant Species

A search of the Wyoming Natural Diversity Database (WNDDB, 1994) found that no federally listed threatened or endangered plant species have been identified in the development area or on potentially affected lands. Three C2 species, however, were noted by the WNDDB as potentially occurring in the development area and proposed pipeline corridors: Wyoming (contracted) ricegrass (Oryzopsis contracta), mystery wormwood (Ariemia biennis var. diffusa), and large-fruited bladderpod (Lesquerella macrocarpa). The bladderpod has been found on barren clay flats and hills, sometimes in soils where bentonite and/or gypsum is a component (Dorr and Dorr, 1980). WNDDB indicates several populations near potentially affected lands in the vicinity of Freighter Gap. It is associated with Gardner saltbush (BLM, 1992). Off-road vehicles and trampling by feral horses have been principal threats to this species (Dorr, 1980).

Wyoming contracted ricegrass is found in basin areas on dry, shallow or sandy soils (Hallsten et al., 1987) and has been found south and east of the proposed development area in sagebrush on disturbed roadside rights-of-ways (WNDDB, 1994)—conditions which could occur in affected lands. This species has been recommended for down-listing from C2 since it is more common than previously believed (WNDDB, personal communication with PIC Technologies, Inc., June 10, 1994).

WNDDB lists one occurrence of mystery wormwood approximately 12 miles south of the proposed development area. It appears to occur on clay flats (WNDDB, 1994) and plays in Sweetwater County (Dorr, 1992). These conditions could be found on affected lands.

3.18 WILDLIFE AND AQUATIC RESOURCES

3.18.1 Big Game

Mountain lions have been occasionally seen on Steamboat Mountain. No sightings of black bears have been recorded on the WOS near the proposed development area and no lions or bears have been harvested recently in the vicinity (Rothwell, 1994a). Thus their occurrence seems unlikely.

Three big game species known to inhabit the vicinity throughout the year are pronghorn, mule deer, and elk. The proposed development area would coincide with one population (herd unit) each of elk and mule deer and two pronghorn herd units. Boundaries of crucial winter range for this species are shown in Figure 3-2.

Pronghorn. The development area is within the Red Desert herd unit while land affected by the proposed permanent gas sales pipeline and Freighter Gap Pipeline Alternative west of Nine Mile Road are within the Sublette herd unit (see Table 3-7). Animals in the Sublette herd unit migrate farther between seasonal ranges than any in North America and, because of the large area covered, three WGFD administrative districts manage this herd unit. The population has fluctuated due to drought and/or severe winters but recently it has been slightly increasing and was estimated at 27,672 animals in 1993 (Christian, 1994c; see Table 3-7). The Red Desert pronghorn population has been slightly increasing. WGFD believes that fences within this herd unit are potentially significant sources of mortality where they inhibit animals from migrating to suitable habitats, especially in winter or during fawning (Hiatt, 1994). No antelope crucial winter range or parturition areas would be affected.
Figure 3-2
Big Game Crucial Ranges and Sage Grouse Leks

- Elk Crucial Winter Range
- Tie-In to Existing Pipeline
- Freighter Gap Pipeline Alternative
- Proposed Sale Pipeline
- Proposed BRV/O Development Area
- Proposed Coastal Tank Battery
- Elk Crucial Winter Range
- LEK 72
- LEK 110
- LEK 109
- LEK 108

67
Table 3-7. Big Game Populations, Hunt Area Harvest and Occupied Seasonal Ranges Coinciding with Project Components.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pronghorn</td>
<td>Red Desert Sublette</td>
<td>15,000</td>
<td>13.288</td>
<td>Slightly Increasing</td>
<td>60</td>
<td>253</td>
<td>Non-critical Spring-Summer-Fall</td>
<td>Hiatt 1994</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40,000</td>
<td>27.672</td>
<td>Slightly Increasing</td>
<td>92</td>
<td>737</td>
<td>Non-critical Winter-Yearlong</td>
<td>Christiansen 1994a</td>
</tr>
<tr>
<td>Mule Deer</td>
<td>Steamboat</td>
<td>4,000</td>
<td>2.048</td>
<td>Slightly Increasing</td>
<td>99</td>
<td>26</td>
<td>Unoccupied Range Non-critical Winter-Yearlong</td>
<td>Christiansen 1994b</td>
</tr>
<tr>
<td>Elk</td>
<td>Steamboat</td>
<td>500</td>
<td>510</td>
<td>Constant</td>
<td>100</td>
<td>93</td>
<td>Unoccupied Range Non-critical Winter Year-long</td>
<td>Christiansen 1994c</td>
</tr>
</tbody>
</table>

Notes:
1. Any ranges designated as crucial by WGFD are those areas which determine whether a population maintains and reproduces itself at or above the WGFD population objective over the long term. Winter-yearlong are occupied throughout the year but during winter they are utilized by additional animals that migrate from other seasonal ranges.
Several studies conducted in the vicinity of the affected lands have revealed the influence of water on pronghorn distribution during the winter (Irwin et al., 1984) and summer (Sandstrom, 1969; Alldredge and Deblinger, 1988). These and other studies also emphasized the importance of shrubs, especially sagebrush, in pronghorn diets throughout the year (Severson et al., 1968; Alldredge and Deblinger, 1988).

**Mule Deer.** Proposed project components coincide with the Steamboat mule deer herd unit (Table 3-7). As currently mapped by WGFD, the boundary for crucial winter-yearlong mule deer range essentially follows the Freighter Gap road where the proposed permanent gas sales pipeline terminates. No project components would be located within crucial seasonal mule deer ranges. The development area overlaps two mule deer hunt areas in which the 1993 harvest totalled 205 deer. The 1993 population estimate is below the WGFD population objective (Table 3-7), in part due to low fawn recruitment in recent years and the severe winter of 1992-93 (Christiansen, 1994b).

Wintering areas for mule deer are often located at lower elevations where big sagebrush-rabbitbrush, bitterbrush-sagebrush steppe, and riparian habitat types occur (BLM, 1987). In western Wyoming, wintering mule deer are almost always seen in sagebrush-grasslands (Oedekoven and Lindzey, 1987). Deer tend to select drainages and ridges over other topographic features and non-berm and southeastern aspects over other exposures.

**Elk.** The development area is within the Steamboat elk herd unit (Table 3-7). These elk are in one of two populations that inhabit desert sagebrush ecosystems in Wyoming. The population has remained at about the WGFD population objective (Table 3-7). Harvest success rates are high in this population probably due to the open terrain; most hunters are able to harvest mature bulls (Christiansen, 1994c). A portion of the proposed gas sales pipeline route lies within crucial elk winter-yearlong range, i.e. from Fourth of July Wash to the tie-in point adjacent to Freighter Gap Road (see Figure 3-2). No other project components are located within crucial elk range. Elk in the arid, shrub-dominated Red Desert were mostly found in basin big sagebrush vegetation and avoided black greasewood during the summer months (Ryder et al., 1986). During the calving period and summer, cow elk also selected riparian areas although bulls did not; riparian areas provided cows with succulent vegetation and water needed during lactation (McCorquodale et al., 1986). In the Red Desert, cooler summer temperatures and succulent vegetation probably attracted elk to north-facing slopes (Ryder et al., 1986). Elk diets, predominantly wheatgrass and needlegrass, overlap considerably with those of feral horses and cattle during fall and winter in the Red Desert (Olsen and Hansen, 1977).

**3.18.2 Waterfowl, Upland Game Birds, Furbearers, Small Game**

**Waterfowl.** There is no permanent habitat for waterfowl in the vicinity of the proposed development area. If water is present during spring migration, a few birds might utilize small reservoirs such as that on Fourth of July Wash, south of the proposed permanent gas sales pipeline route.

**Upland Game Birds.** Sage grouse are the most common and important game bird in this part of Wyoming. Mourning doves may also occur near some project components. As indicated in Table 3-8, the development area is within two WGFD Upland Game Bird Management Areas. Blue grouse are not likely to occur in the development area.

Three important habitat components for sage grouse include strutting/nesting grounds, brood rearing areas and wintering areas. Leks in the vicinity of the development area and sales pipeline are shown on Figure 3-2 and described in Table 3-9. Most sage grouse nests are found within 0.5 to 3 miles from leks where suitable nesting habitat is present (Pyrah, 1971; Wallestad and Pyrah, 1974; Martin, 1976; Braun et al., 1977). Sage grouse typically nest on the ground beneath sagebrush canopy cover for nest concealment (Pyrah, 1971). During the summer, sage grouse tend to stay within 1.5 miles of water where meadow-riparian areas along intermittent and perennial streams provide important brood-rearing habitats. Since open water and meadow-riparian areas are limited or non-existent, important brood-rearing habitat is also very limited in the vicinity of the development area.

**Small Game.** Desert cottontails are probably the only small game species likely to occur in the vicinity of proposed activities. Cottontails inhabit all affected vegetation types but the highest populations are expected in greasewood and sagebrush drainages. During recent surveys for prairie dog colonies in August, 1994, very few desert cottontails were observed.

**Furbearers.** On-site observations indicate the presence (animals, tracks and feces observed) of badgers, coyotes, and red fox. These, as well as bobcat, striped skunk, ermine and long-tailed weasels, are locally occurring furbearing species that may be present. These species would be expected to occur throughout most wildlife habitat types in the vicinity of affected lands.

**3.18.3 Raptors**

Available WOS and BLM records indicate that at least 12 species of raptors have been observed in the vicinity of proposed project activities. Some species, including the golden eagle, ferruginous hawk, red-tailed hawk, prairie falcon, American kestrel, great horned owl, and burrowing owl, very likely nest in the area. Nesting by northern harriers in suitable habitats is assumed although no nest sites have been identified.

Rock outcrops provide suitable nest substrates for golden eagles, ferruginous hawks, red-tailed hawks, prairie falcons, kestrels and great horned owls and past observations indicate that most of these species have nested on cliffs or trees on Steamboat Mountain. Harriers, burrowing owls, and ferruginous hawks nest on the ground. Other raptors, such as the northern goshawk, Swainson’s hawk, and short-eared owl are infrequently observed during spring and autumn migrations. Rough-legged hawks are common winter residents.
Table 3-9. Sage Grouse Leks and Most Recent Documented Activity Status in the Vicinity of Project Components.

<table>
<thead>
<tr>
<th>Lek Identification</th>
<th>Location</th>
<th>Approximate Distance From the Proposed Development Area</th>
<th>Recent Activity Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>24N 98W 16</td>
<td>4.2 miles</td>
<td>1993, Active</td>
</tr>
<tr>
<td>108</td>
<td>22N 99W 02</td>
<td>4.0 miles</td>
<td>1993, Active</td>
</tr>
<tr>
<td>109</td>
<td>23N 99W 02</td>
<td>0.4 mile</td>
<td>1992, Active</td>
</tr>
<tr>
<td>71</td>
<td>23N 102W 31</td>
<td>4.0 miles</td>
<td>unknown</td>
</tr>
<tr>
<td>72</td>
<td>24N 99W 29</td>
<td>2.0 miles</td>
<td>1988, Active</td>
</tr>
<tr>
<td>110</td>
<td>24N 99W 35</td>
<td>0.5 mile</td>
<td>unknown</td>
</tr>
<tr>
<td>84</td>
<td>22N 101W 25</td>
<td>8.0 miles</td>
<td>unknown</td>
</tr>
<tr>
<td>85</td>
<td>21N 100W 06</td>
<td>10.0 miles</td>
<td>unknown</td>
</tr>
</tbody>
</table>

Source: 1. T. Christiansen, WGFD Biologist, Green River. Unpublished data.  
2. WGFD Wildlife Observation System database.

3.18.4 Nongame Wildlife Species

A variety of nongame mammals, birds and herpetofauna probably inhabit the development area and vicinity. Nongame mammals known or expected to occur include bats (long-eared myotis, big brown bat, and hoary bat), white-tailed jackrabbit, least chipmunk, yellow-bellied marmot, Wyoming and thirteen-lined ground squirrels, white-tailed prairie dog, northern pocket gopher, olive-backed pocket mouse, kangaroo rat, bushy-tailed wood rat, deer mouse, northern grasshopper mouse, and sagebrush voles.

The upland sagebrush-grassland, greasewood, and saltbush habitats present within the development area and vicinity support several nongame bird species which are typical of the Red Desert region. The predominant passerine in this area is the horned lark, a yearlong resident. Common summer visitors in local shrub-dominated habitats include lark bunting, western meadowlark, Brewer’s sparrow, vesper sparrow, sage sparrow, green-tailed towhee, and sage thrasher. Rock wrens, cliff swallows, bank swallows and Say’s phoebes are expected in rocky draws or along rock outcrops. Tiger salamanders, northern leopard frogs, and Great Basin spadefoot toads could occur in temporary ponds and small reservoirs. Sagebrush-grasslands, greasewood, saltbush and rock outcrops are suitable habitats for the northern sagebrush lizard and eastern short-horned lizard (Baxter and Stone, 1980).

3.18.5 Aquatic Resources

No perennial streams or other water bodies capable of supporting fisheries would be affected.

3.19 RECREATION RESOURCES

Affected lands are used for dispersed recreation, mainly hunting. Within the Green River Resource Management Area hunting accounts for approximately 71 percent of all recreation days and 86 percent of total annual visitor expenditures (BLM, 1992). Existing roads provide access routes for hunters. Affected lands are not considered trophy hunting areas. All WSAs are closed to ORV use. ORV use is limited to existing roads and trails. No designated recreation sites, trails, facilities or recreation management areas would be affected by proposed activities.

3.20 WILD HORSES

The development area and most of the proposed pipeline routes are within the Great Divide Basin Wild Horse Management Area. The management area is about 73 percent public land, 25 percent private land and 2 percent state land. BLM has established a target population level of 415-600 horses for this management area. The estimated 1992 population was 475 animals (BLM, 1992). Since part of this management area is checkerboard with private land owned by the Rock Springs Grazing Association (RSGA), legal agreements between BLM and RSGA require BLM to remove all wild horses from checkerboard grazing lands in excess of the number agreed to by RSGA. The current population reflects this agreement.

Studies have noted a potential for competition for range resources between wild horses, cattle and elk in the Red Desert (Olson and Hansen, 1977) and between sheep and antelope. Because there is little dietary overlap, less potential competition exists between pronghorn and either wild horses or cattle (Denniston et al, 1982). Competition for water between horses, cattle and pronghorns during dry

Table 3-8. Game Species Harvest in Affected Waterfowl Management Areas (WFMA) and Upland and Small Game Management Areas (USGMA).

<table>
<thead>
<tr>
<th>Game Species Category</th>
<th>Management Area</th>
<th>Game Species</th>
<th>1993 Harvest of Species in Management Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upland Game Birds</td>
<td>USGMA 9 - Red Desert</td>
<td>Sage Grouse</td>
<td>1.956</td>
</tr>
<tr>
<td></td>
<td>USGMA 7 - Eden</td>
<td>Mourning Dove</td>
<td>51</td>
</tr>
<tr>
<td>Small Game</td>
<td>USGMA 9 - Red Desert</td>
<td>Sage Grouse</td>
<td>5.824</td>
</tr>
<tr>
<td></td>
<td>USGMA 7 - Eden</td>
<td>Mourning Dove</td>
<td>376</td>
</tr>
</tbody>
</table>

Source: J. T. Christiansen, WGFD Biologist, Green River. Unpublished data.
periods can be especially serious since large numbers of horses have been observed utilizing all water from some flowing wells in the Red Desert (Miller, 1983).

3.21 EXISTING OIL AND GAS DEVELOPMENT

Human activity, including oil and gas development, has had a noticeable effect on the environment of the development area and the vicinity. Within the area north of Interstate 80 shown in Figure 3-3, there are an estimated 146 producing gas wells, 205 producing oil wells and 261 plugged and abandoned wells for a total of approximately 600 wells. However, this activity has not been evenly distributed. As is evident from Figure 3-3, most of the active wells are found in the 20 mile-wide checkerboard strip of private and Federal land along the north side of Interstate 80 or in the Hay Reservoir area. Only isolated centers of oil and gas production—typically with 1-2 wells—occur outside of these areas. There are no active wells within an eight mile radius of the existing Bravo #1, #2, #3 and #4 wells in the development area. An estimated 28 plugged and abandoned wells are found within this same radius including the Bravo #3 well drilled by BTA. For these reasons, as well as reasons discussed in Section 3.13, the Bravo development area should not be viewed as an extension of existing oil and gas fields or as an offshoot of past or current oil and gas production activities. The oil and gas reservoir under the development area appears to be an isolated find discovered during the drilling of a wildcat well.

Over time, the size of well pads has changed as operators and regulatory agencies have become more aware of resource conflicts and as the cost of well pad construction has increased. The actual size of a well pad used by each operator is dependent on many factors such as well depth, the need for produced water and condensate storage tanks and environmental factors. BLM is working with operators to reduce the size of each well pad to the minimum necessary to safely drill the well. Existing well pad sizes are quite variable and until recently, operators were not required to provide well pad dimensions in State or Federal APD applications. For example, wells drilled before the 1970s were often on pads of three acres or more but pad size has decreased to 2.5 acres or less. Because the size of the drill pad is not available for older wells, this analysis assumed that the average size of well pads is 2.5 acres and the average size of production locations is 1.5 acres. Based on these assumptions, it is possible to estimate disturbance associated with the 612 well pads drilled in the 1,200 square mile area north of Interstate 80 (see Figure 3-3). It is estimated that construction of the 612 well pads disturbed an estimated 1,530 acres. But 261 of these locations have been abandoned and reclaimed, and today there are an estimated 526 acres of production-related disturbance remaining due to 351 producing oil and gas well sites in this 1,200 square mile area.

Disturbance in this area has also occurred as a result of road construction. As shown in Figures 2-1, 2-2 and 3-3 numerous County roads, dirt roads, jeep trails and two-track roads cross the development area and vicinity. These roads have been developed to serve oil and gas, grazing, recreation users and private landowners. An extensive network of Sweetwater County roads crosses the area. Given the low density of active oil and gas wells in some areas, it is difficult to identify roads which were created to serve oil and gas drilling, private landowners or other resource users. Within the development area, however, it is apparent that many existing roads were constructed to access the now plugged and abandoned well sites shown on Figure 2-2. In some cases these existing roads were graded and graveled.
FIGURE 3-3

Oil and Gas Wells in the Vicinity of the Proposed Action
CHAPTER FOUR
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter describes the environmental impacts of implementing BTA's Proposed Action and project alternatives. Discussion focuses on the affected resources discussed in Chapter Three. Analysis of the Proposed Action and project alternatives assumes the implementation of all measures, techniques and practices discussed in Chapter Two as well as compliance with all applicable Federal, State and local regulations; therefore, the mitigation measures suggested in this chapter are intended to reduce residual impacts, to minimize increases in cumulative impacts, and to minimize unavoidable adverse impacts.

The Proposed Action, as described in Chapter Two, was designed to comply with applicable Federal, State and local environmental statutes and regulations and incorporates measures intended to avoid or minimize environmental impacts. BLM standard stipulations and conditions of approval have been incorporated into the Proposed Action. This analysis also assumes implementation of standard operating procedures for surface-disturbing activities in the Green River Resource Area as discussed in the draft RMP and summarized as Appendix A of this EA. These procedures and conditions are not repeated in this chapter. Rather, the impact analysis assumes that these standards, conditions, and procedures would be effectively implemented. Monitoring of their implementation is discussed at the end of Chapter Four. Measures are recommended where necessary to ensure implementation. Additional mitigation measures are recommended which would minimize residual impacts and avoid unnecessary or undue impacts on resources associated with implementation of the Proposed Action and project alternatives. Nonetheless, some impacts would be unavoidable. Where they would occur, unavoidable impacts are discussed for the affected resource.

4.1.1 Impact Significance Criteria and Impact Analysis

Each impact discussion begins with the criteria used to judge the significance of impacts. These criteria have been used in other NEPA documents prepared on oil and gas development in the Green River Resource Area. The criteria are followed by a discussion of impacts that can be reasonably expected from implementation of the Proposed Action, the Freighter Gap Pipeline Alternative, and the No Action Alternative.

4.1.2 Cumulative Impacts

Current regulations of the Council of Environmental Quality (40 CFR 1508.7) define a cumulative impact as

...the impact on the environment which results from the incremental impact of the 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

In conformance with this regulation, this analysis of cumulative impacts addresses the following issues.

1. What is the incremental impact of the action?

New impacts introduced by the implementation of the Proposed Action and project alternatives are discussed for each affected resource in this chapter. Impacts are evaluated in terms of significance criteria. The Proposed Action would incorporate measures—such as reclamation, environmental surveys, project scheduling and relocation of project sites—intended to avoid or reduce incremental impacts. Mitigation measures suggested in this chapter would further reduce or avoid incremental increases in impacts. Depending upon the specific resource, the analysis found that incremental impacts—that is, new impacts created by implementation of the Proposed Action—would be minor or negligible.

2. What activities would occur within the same geographical area, are related in terms of the type of environmental impacts and problems created, and could be expected to produce cumulative impacts?

This analysis considers oil and gas drilling and production—including well pad construction and road-pipeline construction—that has occurred within the Bravo development area and in the vicinity of the Bravo development area. In terms of the technology used and the potential environmental impacts or problems created, the proposed activity would be similar to other conventional oil and gas activities found in the vicinity of the development area.

3. What past and present activities are evident and what impacts have resulted from these activities?

This analysis discusses past and present oil and gas drilling and production activities at a variety of geographic scales, including: activities within the development area, activities within an 8 mile radius of the development area, and activities within a 1,200 square mile area surrounding the development area and the proposed permanent gas sales pipeline. Evidence of past and present activities is shown in Figures 2-1 and 2-2. Figure 3-3 shows past well drilling activities and current production wells in a 1,200 square mile area that includes the development area.

4. What activities are reasonably foreseeable and what would be the impact of these activities?

No other proposals for oil and gas drilling within the development area are pending. BLM has received no proposals for field developments within eight miles of the Bravo development area. On-going infill drilling and production operations would continue in other, existing oil and gas fields found within the 1,200 square mile area surrounding the development area and the proposed permanent gas sales pipeline.
Activities considered "reasonably foreseeable" include: proposals, notifications or plans that have been provided to BLM or other government agencies for consideration, review or approval: to-be-completed projects previously approved by BLM or other government agencies; or activities that can be projected from current activities (e.g., the need to extend a sales pipeline into a new oil and gas field). For purposes of this analysis, reasonably foreseeable activities do not include actions merely contemplated by a party or speculative scenarios about oil and gas drilling. The Proposed Action incorporates all reasonably foreseeable activities and facilities needed to fully develop and produce the natural gas reservoir which has been defined by exploration and confirmation wells drilled by BTA within the Bravo development area. The Proposed Action considers all actions connected with proposed well drilling including the need for new processing, a gathering system, condensate storage and a permanent gas sales pipeline.

It is difficult to project future oil and gas activity in the vicinity of the development area. Future oil and gas activity will hinge upon fluctuations in energy prices, changing demand, availability of pipeline and transportation systems, local geology, reservoir characteristics and depletion rates, discoveries of new reserves and technological changes. Companies are currently reassessing their 1995-1996 drilling plans in light of the recent fall in natural gas prices. Projections must also consider that until BTA's recent success, drilling of 28 (now plugged and abandoned) wells within eight miles of the Bravo development area had not resulted in a commercial, field development. One of the three exploration and confirmation wells drilled by BTA in the development area was a dry hole. A 1994 wildcard well drilled by BTA on State land in the Buffalo Hump area was also a dry hole. BLM has also noted that the success rate of drilling in the vicinity of the development area is expected to be a low 15 percent (BLM, 1991). Based on these conditions, it is reasonably foreseeable that few new wells that those proposed by BTA would be drilled within the development area. It is also reasonably foreseeable that the project would not spawn development of an oil and gas field larger than that analyzed in this EA.

5. What change in cumulative impacts would be introduced by the Proposed Action or project alternatives when combined with past, present and reasonably foreseeable activities? The change in cumulative impacts associated with implementation of the Proposed Action would be negligible for the following reasons.

a. BTA has agreed to implement environmental protection measures discussed as part of its Proposed Action, standard BLM requirements, measures summarized in Appendix A of this EIA, and mitigation measures discussed in this chapter. With implementation of these measures incremental impacts introduced by the Proposed Action would be avoided or minimized.

b. Impacts introduced by the proposed project would be minor, would be geographically isolated and would not be qualitatively different from those already occurring as a result of past and present oil and gas activities.

Field development would involve drilling 10 additional wells over a ten year period. Even if all the proposed wells were producers, they would represent a small increase (less than 3 percent) over the estimated number (351) of existing oil and gas production wells found in a 1,200 square mile area north of Interstate 80 (see Figure 3-3). Proposed ancillary facilities (e.g., gas processing facility, tank batteries) would serve the Bravo development and would not provide regional gathering, compression or processing capacity.

The proposed activity would take place in an area that has seen oil and gas activity in the past. At least five plugged and abandoned wells, including a well in the East Sand Dunes WSA, have been drilled within 1.5 miles of proposed wells (see Figure 2-2). All 28 wells found within an eight mile radius of the development area have been plugged and abandoned. There is an existing road network within, and in the vicinity of, the development area which was in existence prior to the identification of nearby WSAs. The main access road into the development area utilizes a road corridor which has been in existence for decades and which was used to access past well drilling in the development area and on adjacent lands. To offset new road construction, where roads needed for field development intersect existing roads, two-tracks or jeep trails which are not needed for field development, barriers and/or signs would be erected to close these existing roads/trails and to discourage their use by vehicles. To the extent allowable by private landowners, the proposed permanent gas sales pipeline would follow an existing pipeline right-of-way. Future-expected gas processing pipelines which are in existence for years or, where feasible, parallels existing road corridors. Proposed condensate and gathering lines would be constructed adjacent to existing or proposed roads. The proposed location of the gas processing facility has been selected to ensure that it is not on a skyline and that its visibility has been minimized. Given the relatively flat topography of affected lands, existing industrial facilities, such as the Bridger Power Plant, pipeline corridors, roads, and oil and gas drilling in the Hay Reservoir Field and Desert Springs fields are visible from area WSAs and by visitors traveling area roads. Where feasible, construction within crucial elk winter range would occur approximately 0.25 miles or less from an existing road (see Figure 3-2)--areas less likely to be used by elk. Construction would be scheduled to avoid the crucial winter range period. For these reasons, and others discussed in this document, the Proposed Action is not expected to have a discernable effect on the level of cumulative impact.

It is reasonable to expect that infill drilling within Hay Reservoir--about 12 miles east of the development area--would continue. However, the specific level of future drilling would depend upon gas prices, reservoir depletion and other factors discussed above. Activity in the first few years of this decade averaged about 5-6 new wells per year. The Hay Reservoir Field has access, pipeline, gas processing and compression facilities independent of the Bravo development area. Additional development in Hay Reservoir Field would not be dependent, connected or related to proposed activities within the Bravo development area.

Infill drilling is also likely to continue in the Desert Springs Field and other fields along Interstate 80. Desert Springs is an old field about 12 miles southeast of the development area. This field is in a checkerboard of private and Federal land. In recent years infill drilling in this field has averaged about 2-3 wells per year. Drilling and production activities on private land for private minerals is outside the jurisdiction of BLM. Future infill drilling would depend upon private landowner/mineral owner preferences, natural gas prices, reservoir depletion and other factors that cannot be reliably predicted. Given the age of this field (it was first drilled in 1959) an increase in plugged and abandoned wells--and subsequent reclamation of sites--is reasonably foreseeable. The ratio of future well abandonments to future infill drilling cannot be predicted at this time. Additional development in the Desert Springs Field or other fields along Interstate 80 would not be dependent, connected or related to proposed activities within the Bravo development area.
BLM is considering the impacts of past and future drilling activity in these and other nearby fields in the draft Green River RMP (see Appendix 7-5, BLM, 1992). BLM is also initiating an evaluation of the cumulative effects of mineral development in southwestern Wyoming to provide a regional perspective of environmental change and to determine whether the change is in conformance with its Rock Springs and Rawlins District RMPs or is within acceptable parameters of ecosystem management.

4.2 SOCIOECONOMIC CONDITIONS

4.2.1 Impact Significance Criteria

An increase in demand for temporary housing in excess of availability is considered a significant impact. Short- or long-term increases in demand for local government facilities or services in excess of capacity are also considered a significant impact.

4.2.2 Proposed Action

BTA has estimated that proposed construction and operation activities would employ a maximum of about 75 workers at any one time -- assuming concurrent drilling and the construction of roads, pipelines and the gas processing facility. For most workers, project-related employment would be short-term. Project-related employment would decrease once the gas processing facility has been completed. Workers would be employed for construction of the gas processing facility for about one field season. Past exploratory drilling in the development area and construction of a temporary pipeline suggest that 80 percent of the workforce would be local hires. Once constructed, operation of the gas processing facility would employ an estimated 2 full time workers who would reside in local communities. A small increase in retail sales, employment income and local tax revenues would be associated with local hires. Overall, however, the operation phase of the project would have a very small, long-term effect on regional employment, income, government revenues and demand for government services.

Government Revenues and Expenditures. Revenue estimates must be based on projected natural gas production and future energy prices. Estimated production, energy prices, and thus revenues, could vary significantly over time. Production would be affected by the characteristics of the reservoir. Thus, these revenue estimates should not be used for planning purposes. Revenue estimates assume an average wellhead price of $1.80/MCF.

Federal Royalty. When fully developed, it is estimated that the field could produce up to 30 million cubic feet of natural gas per day, or up to an estimated $19.7 million in natural gas sales each year. BTA would pay a 12.5 percent Federal royalty on natural gas sales or an estimated $2.5 million in royalties. Fifty percent of these revenues would be returned to the State of Wyoming for road and bridge projects or education programs.

State Severance Tax. The State of Wyoming's six percent severance tax, based on the value of production, would also fluctuate with energy prices. Assuming production of 30 million cubic feet per day, revenues could range up to $1.2 million a year.

County Tax Revenues. Sweetwater County's property tax would be levied on the value of wellhead equipment, the central tank battery, gathering lines, and the gas processing facility. The initial value of this property would be based on final construction costs. The project would return several thousand dollars in property tax revenue to Sweetwater County. For purposes of comparison: the ad valorem tax levied by the County on oil and gas production would return over $140,000 per year assuming production of 30 million cubic feet of natural gas per day and a price of $1.80/MCF.

Sales and Use Taxes. Sales and use tax revenues would be generated by the purchase of materials (e.g., gravel) from local suppliers and by workers' purchases at local stores, restaurants and motels: however, what percentage of this would represent sales tax revenue cannot be estimated. For example, as one project in the region or, that "lost" revenue would be offset by revenues generated by the start of the Proposed Action. In this case there would be little or no change in sales tax revenues. Field equipment, drilling or other supplies brought into the project area from out-of-state would be subject to the use tax.

Housing and Employment. No workers camp is proposed. Workers would live in local communities. The field being tapped by BTA is relatively small and isolated (see Figure 3-3). BTA would only have one or two drill rigs working in the development area at any one time. No more than 10 natural gas wells are proposed. In the past BTA has utilized a rig that had been employed elsewhere in the Green River Resource Area. It is likely that the proposed drilling would utilize workers employed on other local, recently-completed drilling projects, resulting in no net effect on employment or the demand for housing. Similarly, many of the pipeline and construction workers are likely to have been previously employed on projects elsewhere in the region and therefore would not generate new demand for housing. It is possible that some spot shortages of motel accommodations could occur in Green River and Rock Springs during peak tourist season but accommodations are available in other towns within 2 hours of the project site. Some illegal camping on public lands could occur.

Due to the use of local workers (estimated at 80 percent) and the small number (2) of permanent employees involved, the Proposed Action would produce negligible, insignificant changes in socioeconomic conditions related to housing, employment and government services. It would, however, produce substantial government revenues.

4.2.3 Freighter Gap Pipeline Alternative

Same as the Proposed Action.

4.2.4 No Action Alternative

A small increase in permanent employment would be lost if this alternative were implemented. Substantial Federal royalty revenue (up to $2.5 million) and other tax revenues would be foregone if this alternative were implemented.

4.2.5 Mitigation

No additional mitigation measures are proposed.
4.2.6 Cumulative, Long-Term Impacts

Given that 10 additional natural gas wells are proposed over a ten year period, only 1-2 rigs would work in the development area. Only two permanent employees would be hired and local hires would constitute an estimated 80 percent of the project workforce. Field development would be unlikely to contribute to cumulative long-term impacts on socioeconomic conditions. Regional socioeconomic conditions associated with mineral development are considered in the draft Green River RMP.

4.2.7 Unavoidable Adverse Impacts

Some illegal camping on public lands could occur during construction.

4.3 TRANSPORTATION NETWORKS

4.3.1 Impact Significance Criteria

A decline in the current level of service provided by the Bar X Road (Sweetwater County Road 21) or other County roads affected by project construction would be a significant impact. A decline in the level of service would occur if the road surface deteriorates to the point that average vehicle speed must be reduced and traffic flow is interrupted.

4.3.2 Proposed Action

Peak construction-related heavy truck traffic (48 vehicle round trips per day) or passenger vehicles (maximum of 50 light vehicles per day) would have a negligible effect on Interstate 80 traffic volume given that this portion of the Interstate averages 3,800 trucks per day. Similarly no change in accident frequency is expected. Heavy truck hauling of condensate and natural gas liquids would not occur at night. Rutting and deterioration of County and local roads could occur from heavy truck and other traffic, especially when road surfaces are wet. This potential impact would persist from construction into the production phase if trucks were used to haul condensate. Up to 20 heavy truck trips per day would be required to haul condensate and natural gas liquids from proposed wells assuming that all of them were successful. While the access road into the development area and the Bar X Road have been designed to accommodate heavy truck traffic, accelerated deterioration of the road surface would occur due to this increased traffic. More frequent road maintenance would be necessary. Implementation of the transportation plan (see Section 2.4.4) would protect road quality and reduce vehicle use of two-tracks and roads not needed for field development. Adherence to BLM and County requirements for road maintenance and repairs would protect road surfaces and public safety and ensure minimum interference with local traffic. For these reasons, the Proposed Action is not expected to result in significant impacts to the transportation network.

4.3.3 Freighter Gap Pipeline Alternative

Same as the Proposed Action.
4.3.4 No Action Alternative

A slight increase in traffic volume, road deterioration and the need for maintenance would be avoided if this alternative were implemented.

4.3.5 Mitigation

To reduce heavy truck traffic into the development area, condensate should be piped from the development area to a sales point if and when this becomes feasible and if warranted by future production from proposed wells.

BTA should work with the County and oil and gas operators south of the development area to implement a cooperative road maintenance agreement for the Bar X Road.

4.3.6 Cumulative, Long-Term Impacts

Currently, heavy truck traffic on the Bar X Road north of the existing Desert Springs Field is infrequent. While actual traffic count data is lacking, it appears that relatively light heavy truck traffic is associated with operation of gas wells in the Desert Springs Field. The road is not a major access route into the Hay Reservoir Field. Nonetheless, based on its current condition and BLM road design standards, the Bar X Road appears to be capable of handling over 100 vehicles per day. Given the relatively high quality of the Bar X and other local roads, and implementation of protection measures discussed in this EA, additional traffic from this project is not expected to contribute to cumulative, long-term impacts.

4.3.7 Unavoidable Adverse Impacts

Some temporary deterioration of road surfaces could occur pending the completion of road repairs and maintenance.

4.4 VISUAL RESOURCES

4.4.1 Impact Significance Criteria

Long-term degradation in any VRM Class II area which cannot be mitigated (e.g., by screening, reclamation, use of low profile tanks and buildings, painting of facilities, etc.) and which is visible from important viewpoints would be considered a significant impact.

4.4.2 Proposed Action

No activities would occur within existing Class I, Class II or Class III areas. All proposed disturbance would occur in a Class IV area. However, if BLM’s Final Green River RMP is approved, the proposed development area and portions of the permanent gas sales pipeline would be located within a VRM Class III area. Nevertheless, the Proposed Action would be compatible with either a Class III or IV designation which allow for modifications in the existing character of the landscape. Construction of joint new road-pipeline corridors, use of existing roads, and construction of pipelines adjacent to existing road and pipeline corridors wherever possible would reduce surface disturbance, new corridors and associated visual impacts. Because no activities would occur within a Class I or II area and because all proposed activities would be compatible with the Class III or IV designation applicable to affected lands, impacts would not exceed the significance criteria.

As called for in the Proposed Action, painting of all surface facilities (e.g., tanks) an earth-tone color (Carlsbad Canyon) would reduce the visual impact of facilities and meet VRM objectives. Additional, site-specific opportunities to reduce the visibility of facilities (e.g., using local topography for screening) would be identified during on-site inspections of proposed project sites with the BLM. Because the gas processing facility would generate its own electricity, no power poles would be needed and this source of potential visual impact would be avoided. The proposed gas processing facility would be located in a low-lying area to reduce its visibility against the skyline. Operation of the emergency flare at the facility would only be visible if an emergency shut down of the gas processing facility or pipeline system were required. Gas processing at individual well locations, as discussed in Section 2.4.5, would introduce minimal additional visual intrusion as the height and size of processing equipment would be smaller than tank batteries at proposed sites.

As discussed in Chapter Two, night lighting would not be necessary at the gas processing facility. Lights on the drill rig would be visible but this would be a temporary impact—lasting the 30 days it takes to drill and complete a well. Visual impacts as they relate to WSAs are described in that section of Chapter Four. Reclamation and use of existing corridors would decrease visual impacts from the permanent gas sales pipeline.

4.4.3 Freighter Gap Pipeline Alternative

The Freighter Gap Pipeline Alternative would be highly visible as it would cross steep slopes to reach the mesa top. However, like the Proposed Action, the alternative would be constructed within a VRM Class IV area and would be compatible with that designation.

4.4.4 No Action Alternative

Implementation of this alternative would avoid the introduction of visual impacts but would have no impact, positive or negative, on conformance with VRM classifications.

4.4.5 Mitigation

To ensure that visual impacts are minimized, the BLM permit application for the proposed gas processing facility should detail technical alternatives which were examined to reduce the height of buildings, the product stabilizer and other facilities and provide technical justification for dimensions and heights of final facility designs.

Consideration should be given to painting the lower portions of the emergency flare and product stabilizer an earth-tone color and any skylined portion of these facilities a light blue or similar blending color.

All lighting on drill rigs should be directed downward. Unshielded lights should not be used.
4.4.6 Cumulative, Long-Term Impacts

Past oil and gas drilling, road construction and current developments have altered the visual qualities of lands surrounding the area. Visual impacts associated with the Desert Springs Field (first drilled in 1959) and the Hay Reservoir Field (first drilled in 1977) persist to this day. Pads for the estimated 351 producing oil and gas wells in the 1,200 square mile area described in Section 3.21 have resulted in 526 acres of production-related disturbance. In comparison, pads for the additional 10 proposed natural gas wells would add approximately 10 acres of long-term, production-related disturbance—assuming all wells were successful. Changes in the visual qualities of the landscape surrounding the development area have also occurred as a result of County roads and road building, off-road vehicle use, gravel pits, grazing and mineral exploration. However, this level of disturbance is within the parameters of a Class III or IV area.

Given the implementation of proposed environmental protection and mitigation measures combined with existing visual impacts, no cumulative impacts which would substantially alter existing visual qualities, or which would be incompatible with a Class III and IV VRM designation, are expected to result from the Proposed Action or project alternatives.

4.4.7 Unavoidable Adverse Impacts

Some visibility of most any type of human activity in the development area is unavoidable given the terrain, openness and lack of screening vegetation. Elements of the Proposed Action would be visible from the Bar X Road, the Freighter Gap Road and adjacent wilderness study areas (for further discussion of WSAs see Section 4.5). The proposed flare stack (up to 50 feet tall) and the product stabilizer (up to 60 feet tall) at the gas processing facility would be the structures most likely to be visible. Visibility of drill rigs (typically over 100 feet tall) would be temporary. Until reclaimed, the corridor of the permanent gas sales pipeline would be visible from the Freighter Gap Road and from the east slopes of Steamboat Mountain. However, this pipeline would tie into an existing pipeline adjacent to the Freighter Gap Road. The introduction of temporary visual impacts pending revegetation of disturbed areas along pipeline rights-of-way would be unavoidable.

4.5 SPECIAL MANAGEMENT AREAS

4.5.1 Impact Significance Criteria

Any project component that would degrade wilderness values within a Wilderness Study Area (WSA) to the point of affecting its consideration by Congress for preservation as wilderness, as defined under the Wilderness Act, would be a significant impact. In addition, significant impacts would occur if project components adversely affected the functional values of any proposed or currently designated Area of Critical Environmental Concern (ACEC).

4.5.2 Proposed Action

No component of the Proposed Action would be constructed within a WSA or ACEC. All access into project locations would be across lands outside of WSAs (see Figure 2-1).

Management standards described in BLM’s Interim Management Policy and Guidelines for Lands Under Wilderness Review do not apply to lands outside of a WSA. Impacts on wilderness qualities—such as opportunities for solitude—are discussed below for each WSA. (See Section 4.9 for a discussion of the assumptions used in the analysis of potential noise impacts.)

East Sand Dunes WSA. (12,800 acres; 0 acres recommended for wilderness). Three abandoned well sites, a shut-in well and eight miles of two-track trails are found within the WSA. Due to its shape (1-2 miles wide and 11 miles long), shallow relief and sparse vegetation, this WSA provides very limited opportunities for solitude (BLM, 1991). Traffic on area roads and the Bar X Road, the Bridger Power Plant and oil and gas drilling to the south of the WSA are visible from the WSA. Noting the WSA’s lack of exemplary wilderness values, BLM observed that outstanding opportunities for solitude are available in the dunes, draws and ridges in the southern portion of the WSA—the side furthest from the development area. The presence of depressions, lower elevations and taller dunes extending east-west across the WSA would combine to screen project activities from the view of visitors in portions of the WSA. Visitors in the southern portion of the WSA would be least likely to view project activities. Because the Bar X Road forms the eastern project-related traffic on the road would be visible and audible from portions of the WSA. The existing access road into the development area comes within about 0.4 mile of the WSA boundary. However, this road was in existence prior to BTA’s exploratory activities and was originally constructed to access well sites (now plugged and abandoned) within the WSA and on adjacent lands. The nearest proposed surface facility (a gas well) would be about 0.6 miles from the WSA boundary and about two miles from that portion of the WSA which offers some opportunity for solitude. The proposed gas processing facility would be about 1.5 miles from the WSA boundary and more than 2.5 miles from the southern portion of the WSA which offers some opportunities for solitude. BTA’s original site for the facility was revised to reduce potential impacts on visitors to the WSA. The proposed site for the gas processing facility sits in a wide shallow basin. Visibility of the facility would be reduced because it would not be silhouetted against the skyline. Painted an earth tone color, it would be set against a similarly colored landscape. The gas processing facility, field compressors or other equipment at individual well sites are unlikely to be audible within the WSA as noise generated by such equipment is expected to reed to background level (30-40 dBA) within about 0.7 mile.

Red Lake WSA. (9,515 acres; 0 acres recommended for wilderness). The sights and sounds associated with oil and gas field development therefore surrounding the WSA are evident. Drilling in the Hay Reservoir Field is evident from the WSA. Bar X Road forms the western boundary of the WSA and existing and proposed traffic on the road would be visible from the WSA due, in part, to the higher elevation of the road. BLM has already noted that opportunities for primitive recreation in this WSA are limited in scope. Increased truck traffic on the Bar X Road associated with the project would not alter potential opportunities for primitive recreation. No disturbance would occur within the WSA. The closest proposed facility—the central tank battery site near the junction of the Bar X Road and the access road into the Bravo development area—would be over two miles from the western boundary of the WSA. It is unlikely that any noise associated with that facility would be audible in the WSA.

South Pinnacles WSA. (10,800 acres; 0 acres recommended for wilderness). Seismic trails, two-track trails and one abandoned drill site are evident within the WSA. County roads form the western, eastern and southern boundaries of the WSA. Existing traffic on these roads would be visible and
audible from lands within the WSA. The BLM has noted the lack of exemplary wilderness values, particularly primitive and unconfined recreation, in this WSA and the fact that outstanding opportunities for solitude are limited by the presence of roads that surround the WSA. Proposed pipeline construction would occur within about 0.25 miles of one of these boundary roads and would be visible from within the WSA. Due to the relatively flat topography between the edge of the WSA and the development area (see Figure 4-1), project-related activities, particularly in the northwest portion of the development area, would be visible in the background. These activities would be an estimated 1.5 miles or more from the closest boundary of the WSA and are unlikely to be audible within the WSA. The proposed gas processing facility would be an estimated three miles from the closest boundary of the WSA. It is unlikely to be audible from within the WSA. Placement of the gas processing facility in a depression would reduce its visibility from this WSA.

**Alkali Draw WSA.** (16,990 acres, 0 acres recommended for wilderness). There are three wells in the WSA, 8.5 miles of two-track road and existing pre-FLPMA oil and gas leases. County roads form the western, southern and eastern boundaries of the WSA. A road separates the Alkali Draw WSA from the South Pinnacles WSA. Existing and proposed traffic on these roads would be visible and audible from the WSA. Pipeline construction would be visible from southern portions of the WSA adjacent to the Freighter Gap Road. This disturbance would be temporary, lasting a few months. No surface disturbance would occur within the WSA or within an estimated 1.25 miles of its boundary. Proposed activities are unlikely to be audible from within the WSA. Visual impacts associated with pipeline construction would be similar to those already found within and adjacent to the WSA. For example, steam plumes from the Bridger Power Plant are visible from portions of the WSA.

The Proposed Action is not expected to degrade any WSA or ACEC to the point where its potential for designation would be affected. The Proposed Action would not impair the suitability of WSAs for designation as wilderness due to the following factors:

- None of the proposed activities would occur within a WSA.
- The Proposed Action would be consistent with BLM's *Interim Management Policy and Guidelines for Lands Under Wilderness Review*.
- Existing human activities—such as traffic, a power plant and oil and gas development—are audible and visible from within these WSAs.
- The Proposed Action would not introduce new impacts substantially different from those already audible and/or visible from within WSAs.
- These WSAs have less than exemplary or unique wilderness-related qualities as noted in past analysis conducted by BLM (BLM, 1991).
- As described by BLM in past analyses (BLM, 1991), these WSAs lack important qualities which would make them suitable for wilderness—such as outstanding opportunities for solitude.
Steamboat Mountain ACEC. The Proposed Action would not be constructed within the Steamboat Mountain ACEC. Surface disturbance associated with burial of the permanent gas sales pipeline in the vicinity of the ACEC would be temporary and would occur adjacent to a County Road.

Red Desert Watershed Area. The Proposed Action would be compatible with the management objective for the watershed area which calls for continuation of multiple use, mineral exploration and development—subject to RMP guidelines—while providing for large areas of unobstructed view for the enjoyment of scenic values. Site-specific reviews of visual resource values would occur during on-site inspections of proposed facility locations. Where available, topography would be used to screen project facilities from view. Proposed locations for the gas processing facility and central tank battery were selected to utilize local topography to screen these facilities, to the extent possible, from visitors. Surface facilities would be painted neutral colors to blend with the landscape. Surface facilities would not be located directly adjacent to existing county roads. To preserve open space, developments and activities would utilize existing roads, corridors and areas of existing disturbance to the extent feasible. The right-of-way for the proposed permanent gas sales pipeline would utilize the east-west Frontier-Baroil pipeline corridor to the extent allowable by private landowners. No overhead powerlines are proposed. Vehicle travel in the watershed area would be limited to designated roads, trails and construction sites or rights-of-way.

4.5.3 Freighter Gap Pipeline Alternative

The northern portion of the Freighter Gap Pipeline Alternative is adjacent to the Alkali Draw WSA. Impacts from construction of the permanent gas sales pipeline would be greater than those occurring under the Proposed Action. However, this impact would be temporary. Otherwise impacts would be similar to the Proposed Action.

4.5.4 No Action Alternative

Implementation of this alternative would avoid impacts, however slight, to proposed WSAs and ACECs in the project area.

4.5.5 Mitigation

BTA should inform its employees, contractors and subcontractors of the importance, purpose and need to protect WSAs and the Steamboat Mountain ACEC from off-road vehicle activity and other impacts.

4.5.6 Cumulative, Long Term Impacts

No proposed or reasonably foreseeable activities would occur within WSAs. No other proposed or reasonably foreseeable activities would occur adjacent to these WSAs. The Proposed Action would introduce activities visible from the WSAs; however, as discussed above, these activities in combination with existing impacts would not impair the suitability of these WSAs. Because the project would not affect resources within the Steamboat Mountain ACEC, it would not contribute to cumulative, long-term impacts on this resource.

4.5.7 Unavoidable Adverse Impacts

Some temporary surface disturbance (less than 0.1 acres) adjacent to the proposed boundary of Steamboat Mountain ACEC would be unavoidable. Visibility of some project activities from viewpoints within WSAs would be unavoidable.

4.6 CULTURAL RESOURCES

4.6.1 Impact Significance Criteria

Loss of cultural resources eligible for the National Register of Historic Places (NRHP) is considered a significant impact. Failure to comply with BLM procedures implementing Federal cultural resource management practices is considered a significant impact. Surface disturbing activities within 0.25 mile of contributing segments of the historic trails is a significant impact, unless such disturbance is not visible from the historic trail or occurs in an area of existing visual intrusion within the buffer.

4.6.2 Proposed Action

A Class III cultural resources inventory of the route to be followed by the proposed permanent gas sales pipeline located three prehistoric sites (48SW5053, 48SW5055, 48SW6238) determined to be eligible for the National Register of Historic Places. Two historic roads—the Rock Springs to Lander Stage Road and the Point of Rocks to South Pass Road—were also recorded in the vicinity of the proposed pipeline route. The BLM consulted with the State Historic Preservation Officer and the Advisory Council on Historic Preservation concerning potential effects to these cultural resources. The consultation resulted in a "no adverse effect" determination for the pipeline with the provision that the pipeline trench be inspected by an archaeologist and that appropriate studies be done on any archaeological materials encountered during construction. Segments of the trails with historical value would be avoided and the proposed permanent gas sales pipeline would have no adverse effect upon them.

As discussed in Chapter Two, BTA would complete Class III cultural resource inventories on all other lands to be disturbed by project activities. The objectives of these inventories would be to identify cultural properties, evaluate their significance and determine the effects of any proposed activity upon them. If any cultural resources are found to be within the area of potential effect, efforts would be made to relocate the activity. If a cultural resource cannot be avoided, appropriate measures to mitigate effects on the resource would be determined by the BLM in consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation. Mitigation may include data recovery prior to construction, monitoring of construction and/or open trench inspection followed by data recovery or other appropriate measures.

If sites were discovered during the Class III inventory or during project construction, they would be evaluated for inclusion on the National Register of Historic Places. BLM would develop recommendations for reducing or eliminating impacts to sites potentially eligible for the National Register. Sites would be avoided whenever feasible or in situ preservation would be implemented. Data recovery is appropriate if avoidance or in situ preservation are not feasible. If local conditions warrant, BLM could require monitoring of construction. If cultural properties on, or eligible for, the
National Register are within an area of potential disturbance and the site could not be avoided. The BLM would begin the consultation process with the State Historic Preservation Officer in accordance with procedures outlined in 36 CFR 800. In this way impacts to potentially significant cultural resources would be avoided.

4.6.3 Freighter Gap Pipeline Alternative

No known historic trails would occur within 0.25 mile of this alternative; however, a Class III cultural inventory would be conducted along this alternative route. Impacts are expected to be similar to the Proposed Action.

4.6.4 No Action Alternative

The possible accidental disturbance and/or loss of cultural resources during earth-moving activities would be avoided.

4.6.5 Mitigation

To avoid any confusion regarding Federal regulations governing the protection of cultural resources, BTA should inform its employees, contractors and subcontractors that collecting arrowheads or other cultural artifacts on Federal land is a violation of Federal law.

4.6.6 Cumulative, Long-Term Impacts

Implementation of BLM procedures and measures, discussed as part of the Proposed Action, would be adequate to avoid increased cumulative, long-term impacts.

4.6.7 Unavoidable Adverse Impacts

The potential for inadvertent damage to subsurface sites not detected during earth-moving activities would be unavoidable.

4.7 PALEONTOLOGICAL RESOURCES

4.7.1 Impact Significance Criteria

The loss of any fossils considered important for scientific purposes is considered a significant impact.

4.7.2 Proposed Action

The probability of construction activities (permanent gas sales pipeline, well pads and roads, central tank battery, and gas processing facility) disturbing paleontological resources of significant scientific value is low because these activities would not occur in areas of known fossil-bearing strata. Proposed pipelines would generally follow existing corridors (road and/or pipeline) which have already been disturbed. Where new land is disturbed, BTA would be required to comply with BLM standard stipulations and conditions of approval to avoid or mitigate impacts to paleontological resources. Those stipulations require that any paleontological resource discovered during construction must be immediately reported to the BLM and all operations in the immediate vicinity of the discovery halted until written authorization to restart work is issued by the BLM. Measures that would be implemented to protect these resources are avoid potential impacts are discussed in Appendix A. For these reasons, no significant impact on paleontological resources is expected to occur.

4.7.3 Freighter Gap Pipeline Alternative

Same as the Proposed Action.

4.7.4 No Action Alternative

Implementation of this alternative would avoid a small potential for damage to, or loss of, paleontological resources of scientific importance due to earth-moving activities.

4.7.5 Mitigation

No additional mitigation measures are proposed.

4.7.6 Cumulative, Long-Term Impacts

It appears that little or no disturbance to paleontological resources has occurred on lands affected by proposed activities. There appears to be no increased potential for the cumulative loss or destruction of paleontological resources if BLM resource protection measures and mitigation measures described in this EA are implemented.

4.7.7 Unavoidable Adverse Impacts

There is a slight possibility that some unrecognized paleontological resources, particularly those underground, could be inadvertently disturbed or lost as a result of project activities.

4.8 AIR QUALITY

4.8.1 Impact Significance Criteria

Exceeding ambient air quality standards (Federal or State) as a result of project activities is considered a significant impact.

4.8.2 Proposed Action

Field compressors or engines at the proposed gas processing facility would burn natural gas. Field compressors or the proposed gas processing facility would emit several air pollutants regulated by WDEQ. Emissions from a 1,200 horsepower compressor engine would be an estimated 25 tons/year of nitrogen oxides (NOX), 25 tons/year of carbon monoxide (CO) and 2 tons/year of volatile organic compounds (VOC). Emissions from all other processing equipment at the site is expected to total
25 tons/year of nitrogen oxides (NO\textsubscript{x}), 25 tons/year of carbon monoxide (CO) and 3 tons/year of volatile organic compounds (VOC). The gas processing facility would not be considered a "major emitting facility" regulated by WDEQ since it would not emit more than 250 tons of carbon monoxide in a year.

Emissions from condensate tanks would be reduced by treatment of condensate at the well site to remove natural gas liquids—a source of vent gas. Emissions from field compressors would be unavoidable as compressors would be needed to pressurize and store natural gas liquids. It is estimated that one field compressor would be needed for every 3-4 producing wells in the development area if a gas processing facility is not constructed. If necessary, vapor recovery units would also be installed on tank batteries to further reduce emissions.

Air emissions from the project are not expected to affect any Class I area—the closest area is more than 45 miles away—and would not affect any area where an applicable air quality standard is known to be violated. Plans for the gas processing facility would be reviewed by WDEQ to ensure compliance with applicable Federal and State air quality standards and regulations. Facility design or operations would be adjusted as necessary to ensure compliance. Because proposed activities would be in compliance with Federal and State air quality regulations and standards, no significant impacts are expected to occur.

Construction and drilling equipment would produce minor amounts of exhaust. Air born dust from construction and vehicles would be created. Particulate emissions would vary substantially from day to day, depending on the level of activity, the specific operation and weather. Increases in vehicle exhaust and particulate matter would be short-term and would end with the completion of construction activities. Implementation of dust suppression measures, as called for in the Proposed Action and as required by BLM, would reduce fugitive dust and impacts to visibility. For this reason, traffic associated with field operations would not result in noticeable increases over existing levels of particulates.

4.8.3 Freightier Gap Pipeline Alternative

Same as the Proposed Action.

4.8.4 No Action Alternative

A minor increase in air emissions within the region would be avoided but overall, air quality and compliance with air quality standards and regulations would not be affected by implementation of this alternative.

4.8.5 Mitigation

No additional mitigation measures are proposed.

4.8.6 Cumulative, Long-Term Impacts

Air quality in the vicinity of the Proposed Action is affected by the presence of the Bridger Power Plant and mine, Interstate 80 and existing oil and gas development in the Hay Reservoir and Desert Spring fields. Even with these developments air quality is in compliance with Federal and State standards and visibility regularly exceeds 70 miles. Proposed construction and operation activities are expected to make a minor contribution to existing cumulative impacts on air quality but are not expected to affect visibility or compliance with Federal-State air quality standards.

4.8.7 Unavoidable Adverse Impacts

The introduction of some additional air pollutants and fugitive dust into the airshed would be unavoidable.

4.9 NOISE

4.9.1 Impact Significance Criteria

Exceeding Federal standards for noise (55 dBA) at existing residences or other noise-sensitive areas (NSA) would be considered a significant impact.

4.9.2 Proposed Action

The analysis of noise impacts considered that frequent high winds characteristic of the area alter background noise commonly reported by EPA for rural areas and could mask noise created by project activities. Noise engineers predict that background levels in situations similar to the development area are likely to range between 30 and 40 dB A due to wind conditions (Air Sciences, 1994). Noise models and measurements reported here also do not account for topography. The noise attenuation distances reported here should be viewed as a worst case situation.

Noise sensitive residences or human occupied structures are not found within at least 30 miles of the gas processing facility. EPA noise standards are unlikely to be exceeded at sage grouse leks and raptor nests since none have been found 0.7 miles or less from proposed noise-producing activities. Routine noise from construction, drilling and production activities is unlikely to be heard in WSAs.

By some estimates, earth-moving equipment generates up to 115 dBA. At this level noise would decline to 55 dBA—the EPA health and welfare standard—approximately 3,500 feet (0.7 miles) from the source (Montana Board of Oil and Gas Conservation, 1989). However, newer standards provided by heavy equipment manufacturers suggest that such equipment generates no more than about 90 dBA, suggesting that noise levels would decline below 55 dBA in less than 0.7 miles. In any case, this noise would be temporary and would cease once construction activities had been completed.

Noise produced by field compressors or equipment at the gas processing facility is expected to decline to 55 dBA within 0.1 mile and to 35 dBA within 0.75 mile. Noise from drilling is expected to recede to background level (30-40 dBA) in about 0.75 mile (Montana Oil and Gas Conservation, 1989). Noise from the emergency flare would be temporary and would only during an emergency shut down of the gas processing facility or pipeline system. For these reasons, noise at noise sensitive areas is unlikely to exceed 55 dBA and no significant impacts are expected to result.
4.9.3 Freightier Gap Pipeline Alternative
Noise from construction activities along this route is similar to that associated with construction of the permanent gas sales pipeline.

4.9.4 No Action Alternative
Implementation of the No Action Alternative would avoid the introduction of noise from operation of the gas processing facility. It would also avoid the introduction of temporary noise but which would have little if any impact on noise sensitive areas.

4.9.5 Mitigation
BTA should ensure that insulation, mufflers and noise barriers are installed as needed to ensure that noise from the gas processing facility is reduced to background level (30-40 dBA) within approximately 0.75 mile from the facility.

BTA should require that standard mufflers be installed on all project-related drill rig engines, vehicles, construction equipment and other engines.

4.9.6 Cumulative, Long-Term Impacts
No other projects are planned which, in combination with proposed activities, are likely to result in long-term increases in background noise levels near residences or other noise sensitive areas.

4.9.7 Unavoidable Adverse Impacts
Temporary noise increases in the vicinity of drilling and construction sites would be unavoidable. A long-term increase in noise in the vicinity of field compressors or the gas processing facility would be unavoidable.

4.10 GROUNDWATER
4.10.1 Impact Significance Criteria
Any activity resulting in a violation of Federal-State water quality standards is considered a significant impact. Drawdown of groundwater levels at wells used for human or livestock by more than five feet is considered a significant impact.

4.10.2 Proposed Action
Proposed activities are unlikely to significantly affect groundwater for the following reasons. Water in aquifers potentially tapped by the proposed water well is of low quality and generally unsuitable for human use. No other water wells are found in the development area; drawdown of wells miles from the proposed water well is unlikely given that affected strata have a very low permeability. As discussed in Chapter Two, BTA would line all pits. Measures for containing and mitigating spills of hydrocarbons would be addressed in the SPCC Plan. Because all wells would be cased and cemented in accordance with BLM and WOGCC requirements, groundwater would be protected. As discussed in Chapter Two, surface casing would be installed and cemented to protect shallow aquifers during drilling. Water-based mud would be used, further reducing potential impacts on groundwater. For these reasons no significant impacts on groundwater are expected to occur.

4.10.3 Freightier Gap Pipeline Alternative
Same as the Proposed Action.

4.10.4 No Action Alternative
Implementation of this alternative would have little effect on protection of groundwater supplies or the usefulness of groundwater potentially affected by the Proposed Action.

4.10.5 Mitigation
No additional mitigation measures are proposed.

4.10.6 Cumulative, Long-Term Impacts
Affected strata have a low permeability and aquifers in the area tend to be isolated. These conditions, in combination with proposed drilling and other practices intended to protect groundwater, suggest that the project would make a negligible contribution to cumulative, long-term impacts on groundwater quality and quantity.

4.10.7 Unavoidable Adverse Impacts
A slight, localized decrease in the quantity of groundwater could occur due to withdrawals from the proposed water well.

4.11 SURFACE WATER
4.11.1 Impact Significance Criteria
Any activity resulting in a violation of ambient water quality standards is considered a significant impact.

4.11.2 Proposed Action
Water courses affected by the Proposed Action are ephemeral or intermittent and none are considered Class I, II or III streams by WDEQ. BTA has not proposed any water withdrawals from the Colorado River basin, the Platte River basin or any other surface water source in the region. Under the Proposed Action, playas would also be avoided. No perennial streams would be affected as none are found in the development area or along proposed pipeline routes. An SPCC plan would be implemented. Because no activity is expected to result in a violation of water quality standards, no
significant impacts are expected to occur.

Water quality could be affected by surface runoff from areas where vegetation has been removed and from erosion of spoil material during occasional intense thunderstorms. However, the potential for increased sediment yield would be controlled by implementation of reclamation and erosion control measures, such as scarification and water bars, described in Chapter Two. Effective implementation of sediment control measures, and an SPCC plan, as discussed in Chapter One, would reduce potential impacts to surface waters.

Within the development area, one intermittent/ephemeral drainage would be crossed by the proposed permanent gas sales and a gathering pipeline. The gas processing facility and central tank battery would be an estimated 500 feet or more from this drainage. All surface water flowing in this drainage would be retained within Alkali Basin. Construction of all pipeline crossings of intermittent/ephemeral drainages would be in accordance with measures discussed in Chapter Two as well as COE requirements. Implementation under these conditions would reduce potential impacts from sediment and erosion.

Under the Proposed Action, no water from hydrostatic testing would be placed directly into any drainage, wetland or surface water. Discharge of the hydrostatic test water in accordance with State regulations and measures outlined in Chapter Two (e.g., use of energy dissipators, silt fence) would help to minimize the potential for erosion and sedimentation. Pipeline rights-of-way would not be graded. This would help to protect vegetation adjacent to the drainage and the stability of stream banks which would ultimately reduce potential soil erosion and sedimentation.

4.11.3 Freighter Gap Pipeline Alternative

Same as the Proposed Action.

4.11.4 No Action Alternative

Implementation of the No Action Alternative would have little effect on water quality but would eliminate the possibility of impacts—however slight—to intermittent drainages caused by erosion, sedimentation or a possible fuel spill.

4.11.5 Mitigation

BTA should stake proposed surface facilities to ensure that final locations of well sites, the gas processing facility, roads, and the central tank battery are outside of intermittent or ephemeral drainages, stream channels, wetlands (as defined by NWI maps), impoundments or playas (as shown on topographic maps), and to ensure that surface locations are in conformance with standards and requirements discussed in Appendix A.

4.11.6 Cumulative, Long-Term Impacts

Given the lack of surface water resources affected by project components and implementation of measures discussed in Chapter Two, the project would result in no increase in long-term cumulative impacts to surface water.

4.11.7 Unavoidable Adverse Impacts

Crossing of intermittent or ephemeral drainages are unavoidable due to the local topography and the location of the project activities in relation to existing road and pipeline corridors and drainages.

4.12 SOILS

4.12.1 Impact Significance Criteria

Construction on slopes greater than 25 percent or when soils are frozen or during periods of high soil moisture content could result in significant impacts.

4.12.2 Proposed Action

Production-related disturbance would be associated with areas that remain unreclaimed for the life of the project, such as portions of well pads used for production equipment, road surfaces, the gas processing facility and central tank battery. Areas of construction-related disturbance that would not be needed for production activities would be reclaimed. These areas would include a portion of each well pad, pipeline corridors and cut and fill slopes. Site-specific factors, such as slope, salinity and reclamation potential, ultimately would determine reclamation success on these areas.

The Proposed Action, as discussed in Chapter Two, would minimize soil disturbance by the following measures: installing proposed pipelines adjacent to proposed roads; utilizing existing pipeline corridors for the permanent gas sales pipeline where feasible (subject to the expressed prohibition of private landowners); limiting well pad size to the minimum necessary to safely conduct drilling and production operations; installing production facilities (gas processing facility, central tank battery) adjacent to an existing road; reclaiming dry holes in a timely manner; and eliminating blading of pipeline rights-of-way. Under the Proposed Action, project activities would be scheduled to avoid saturated soils or construction with frozen materials. No disturbance to landslide deposits or steep slopes (greater than 25 percent) would occur. No disturbance to areas of sand dunes, such as those found south of the development area, would occur. Depending upon the specific project site, affected soils could possess characteristics which could make reclamation difficult, however, with reclamation monitoring and follow-up reclamation where necessary, avoidance of steep slopes and saturated soils, and avoidance of construction with frozen material no significant impacts are expected to occur.

Low rainfall. All soil disturbance, except for the last two miles at the west end of the proposed permanent gas sales pipeline, would occur in an area that receives less than 10 inches per year of precipitation. Seed germination could be highly variable depending upon recent precipitation patterns. Therefore, as discussed in Chapter Two, fall seeding is generally recommended to take advantage of fall-winter-spring moisture to improve seed germination. Repeated seeding may be necessary to accomplish successful revegetation.

Shallow soils. Soil depth in the development area and vicinity is highly variable, ranging from deep to shallow (less than 20 inches). Areas with shallow soils would tend to have low productivity and
would be difficult to revegetate because of low available water storage capacity, limited effective rooting depth, low nutrient reserve and high erosion potential. Additionally, available topsoil is likely to be a limiting factor in this situation.

Exposed or shallow bedrock. In some cases pipelines could pass through soils with a shallow depth to bedrock which would make revegetation difficult. However, this occurrence is expected to be uncommon. The proposed permanent gas sales pipeline was routed to avoid rock outcrops that would complicate construction and reclamation. Gathering lines in the development area and the condensate pipeline would be constructed in areas with deep soils and little, if any, exposed bedrock.

Poorly drained soils. The western two-thirds of the development area and an estimated 10.6 miles of the proposed permanent gas sales pipeline would affect deep, poorly drained soils characteristic of local bottomlands and alluvial fans. These soils tend to be saline and/or alkaline. Saline soils have low reclamation potential. Sediment from these materials could have an adverse effect on water quality but no perennial streams are found in the area. The one intermittent stream that would be affected flows into a closed basin and would not affect salinity in the Colorado River or Platte River drainages. Eliminating grading during pipeline construction and the return of subsoil to pipeline trenches would reduce long-term exposure of saline soil material.

4.12.3 Freighter Gap Pipeline Alternative

The northern 2 miles of the Freighter Gap Pipeline Alternative are within a soil complex of shallow to moderately deep and well drained soils that have low water-holding capacity and are expected to be erosive. This alternative would reduce construction-related surface disturbance by 20.4 acres but, unlike the Proposed Action, approximately 1000 feet of this route would be on very steep (50-60 percent) slopes. Additional construction would occur on slopes of 25 to 50 percent. Construction of pipelines or other facilities on slopes greater than 25 percent generally require extensive cuts and fills which can result in:

- A large scar with greater erosion potential;
- Greater potential to lose, mix or bury critical topsoil during construction and reclamation which could lower soil productivity;
- Greater difficulty in stabilizing cut slopes through revegetation; and,
- Greater difficulty in returning disturbed slopes to their pre-construction contour during final reclamation.

Because a greater quantity of material is undercut during construction on slopes greater than 25 percent, instability and the potential for slope failure increases. According to Levinski (1982) and SCS (1982), where cut and fill slopes are steeper than 1.5:1 or 2:1 revegetation is rarely satisfactory. Disturbance from extensive cuts and fill on steep slopes affected by this alternative would be difficult to revegetate. Significant impacts to soils could result from implementation of this alternative.

4.12.4 No Action Alternative

This alternative would preclude disturbance to soils resulting from the Proposed Action or alternatives.

4.12.5 Mitigation

The following mitigation measure are recommended to reduce residual impacts to soils that would occur following the implementation of all measures discussed in Chapter Two.

In addition to measures discussed in Chapter Two, site-specific reclamation plans should be attached to appropriate right-of-way or permit applications. These plans should address the following: a) seed mixtures that incorporate species adapted to low rainfall and to saline-alkaline soil conditions; b) isolation of topsoil and subsoil to avoid mixing; c) use of mulch or soil amendments if necessary to improve seed germination and revegetation; d) a seeding schedule which should take advantage of fall-winter moisture; and, e) a program for monitoring revegetation and reclamation success.

4.12.6 Cumulative, Long-Term Impacts

Potential contributions to cumulative impacts associated with soil disturbance—such as soil erosion, fugitive dust, soil loss, loss of soil productivity, stream salinization and sedimentation—would be minimal given that BTA has agreed to implement soil protection measures discussed in Chapter Two and Appendix A of this EA, and all other environmental protection and mitigation measures discussed in this EA.

4.12.7 Unavoidable Adverse Impacts

An estimated 34 acres of production-related disturbance would be unavoidable and necessary if oil and gas leases in the development area are to be fully and efficiently developed.

4.13 GEOLOGY

4.13.1 Impact Significance Criteria

Any activity that would create geologic hazards (such as landslides or slumps) is considered a significant impact.

4.13.2 Proposed Action

No geologic hazards or existing mines, oil and gas wells, leases or operations, coal operations or other minerals would be affected by implementation of the Proposed Action; therefore no significant impacts are expected to result.

4.13.3 Freighter Gap Pipeline Alternative

Unlike other pipeline routes, approximately 1,000 feet of this route would be on a steep (50-60 percent) slopes. Construction of pipelines on slopes greater than 25 percent generally require extensive cuts and fills which could result in greater difficulty in stabilizing cut slopes. Because a greater quantity of material is undercut during construction on slopes greater than 25 percent, instability and the potential for slope failure would increase. Special engineering practices would have to be implemented.
4.13.4 No Action Alternative

This alternative would preclude any risk of geologic hazards.

4.13.5 Mitigation

Special engineering practices for steep slopes should be described in the right-of-way application if the Freighter Gap Pipeline Alternative is chosen.

4.13.6 Cumulative, Long-Term Impacts

Under the Proposed Action, geologic hazards would not increase and geologic resources would not be affected. Given the lack of existing impacts to these resources, no increased cumulative impacts are expected to occur.

4.13.7 Unavoidable Adverse Impacts

There would be an increased potential for slope failure if the Freighter Gap Pipeline Alternative were implemented.

4.14 VEGETATION

4.14.1 Impact Significance Criteria

Significant impacts to vegetation would occur through the loss of forage at levels that would significantly affect sensitive species, range resources or wildlife populations.

4.14.2 Proposed Action

Impacts to vegetation from the Proposed Action would vary by project component. Vegetation would be removed during construction of roads, well pads, the gas processing facility, central tank battery and pipeline trenches. Disturbance from these project components is summarized by vegetation type in Table 4-1. The severity of vegetation crushing would depend on vegetation species, type or character (e.g., shrub or herbaceous); physiology of the plant (i.e., dormancy); and impacts to plant roots and soils immediately adjacent to the plant.

Herbaceous vegetation within affected vegetation types is expected to return to predisturbance conditions within 5 years. Cutting of shrubs, rather than blading pipeline rights-of-way, would keep roots intact, allow some shrubs to resprout and would help to restore shrub densities. Where cutting occurs, shrubs are expected to take approximately 10 years to return to pre-construction densities.
Table 4-1. Estimated Disturbance by Vegetation Type (Acres$^1$)

<table>
<thead>
<tr>
<th>Project Component</th>
<th>Source of Impact</th>
<th>Low Density Sagebrush</th>
<th>High Density Sagebrush</th>
<th>Grassland</th>
<th>Saltbush</th>
<th>Greasewood</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural gas processing facility</td>
<td>Construction</td>
<td>2.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Production</td>
<td>2.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Joint new roads and natural gas gathering pipeline</td>
<td>Construction</td>
<td>24.9</td>
<td>0.0</td>
<td>0.0</td>
<td>3.1</td>
<td>8.4</td>
<td>36.4</td>
</tr>
<tr>
<td></td>
<td>Production</td>
<td>12.5</td>
<td>0.0</td>
<td>0.0</td>
<td>1.5</td>
<td>4.2</td>
<td>18.2</td>
</tr>
<tr>
<td>Natural gas gathering pipeline adjacent to existing road</td>
<td>Construction</td>
<td>5.8</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td>Production</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Wells pads</td>
<td>Construction</td>
<td>24.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>3.2</td>
<td>27.5</td>
</tr>
<tr>
<td></td>
<td>Production</td>
<td>10.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Central tank battery</td>
<td>Construction</td>
<td>2.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>Production</td>
<td>2.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Condensate pipeline</td>
<td>Construction</td>
<td>17.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>2.9</td>
<td>20.1</td>
</tr>
<tr>
<td></td>
<td>Production</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Permanent, buried natural gas sales pipeline</td>
<td>Construction</td>
<td>44.7</td>
<td>2.6</td>
<td>6.5</td>
<td>17.8</td>
<td>14.7</td>
<td>86.3</td>
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<tr>
<td></td>
<td>Production</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Proposed Action</td>
<td>Construction</td>
<td>121.4</td>
<td>2.6</td>
<td>6.5</td>
<td>20.9</td>
<td>29.2</td>
<td>180.6</td>
</tr>
<tr>
<td></td>
<td>Production</td>
<td>27.0</td>
<td>0.0</td>
<td>1.5</td>
<td>5.2</td>
<td>33.7</td>
<td>100.6</td>
</tr>
<tr>
<td>Freighter Gap Pipeline Alternative$^2$</td>
<td>Construction</td>
<td>114.9</td>
<td>0.9</td>
<td>0.4</td>
<td>11.3</td>
<td>32.5</td>
<td>160.0</td>
</tr>
<tr>
<td></td>
<td>Production</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Notes:
1. See Table 2-1 for assumptions regarding disturbance and reclamation by project component.
2. Production-related disturbance is less than construction-related disturbance due to the implementation of reclamation measures on surface not needed for on-going production activities, such as pipeline corridors and a portion of each well pad not needed for production equipment. Construction-related and production-related disturbance are not additive.
3. Under this alternative, production-related facilities would remain the same, but the route and length of the permanent natural gas sales pipeline would change.
This impact is considered insignificant since shrub roots would remain intact and herbaceous species would stabilize disturbed areas and provide wildlife and livestock forage. The semi-arid climate and soil characteristics would make revegetation difficult. Seeding in the fall would take advantage of winter moisture. Using seed mixes adapted to local conditions (giving primary consideration to species native to the area), stock piling topsoil and other reclamation measures discussed in Chapter Two would encourage reclamation success. Production-related impacts to vegetation from well pads, roads, central tank battery and the gas processing facility would remain in place longer than 5 years.

Existing pipeline corridors have been reclaimed and/or revegetated. However, in some cases this construction was completed years ago under less stringent environmental controls than now apply to construction activities. Vegetation density and species composition on these previously reclaimed corridors may not match that of adjacent lands. In such cases, proposed re-disturbance and reclamation would offer the opportunity to "re-reclaim" these corridors in accordance with more up-to-date standards and practices. Proposed use of existing corridors would also reduce disturbance to shrubs which are used as winter forage by big game.

Herbaceous vegetation on areas subject to clearing and grading (e.g., portions of well pads not needed for production activities) would recover in three to five years. This would reduce erosion and stabilize disturbed soils. Reclamation of disturbed areas with grasses and forbs would benefit cattle but may be unsuitable for wintering big game or species which require shrub habitats. As called for in the Proposed Action, scalping rather than grading, and incorporating cut shrubs into topsoil spread over reclaimed areas would encourage the regeneration and reestablishment of shrubs. For these reasons, no significant impacts to vegetation are expected to occur.

Reclamation inspection, monitoring and implementation of corrective measures, as discussed later in Chapter Four, would also help to ensure that adequate reclamation success is achieved. However, actual reclamation success would depend, in part, upon environmental and management conditions beyond the control of BTA. Drought conditions, livestock grazing, grazing by wild horses and ORV use could affect revegetation success.

4.14.3 Freight Gap Pipeline Alternative

The proportion of impact by vegetation type would generally be the same as the Proposed Action (see Table 4-1). Production-related disturbance would be identical to the Proposed Action.

4.14.4 No Action Alternative

This alternative would preclude disturbance to vegetation from project activities.

4.14.5 Mitigation

Mitigation measures necessary to minimize residual impacts to vegetation include measures discussed in the Soils section (Section 4.12).

4.14.6 Cumulative, Long-Term Impacts

Production-related disturbance would not occur in unique or unusual vegetation types. Upon completion of reclamation activities, an estimated 34 acres would be required for production-related activities. As discussed in appropriate sections of this EA, impacts to vegetation (forage loss) would result in little, if any, cumulative impact on populations of wildlife or livestock as seed mixes would incorporate forage species native to the local area.

4.14.7 Unavoidable Adverse Impacts

The long-term loss of 38 acres of vegetation would be unavoidable if existing oil and gas leases in the development area are to be fully and efficiently developed. Unavoidable adverse impacts to vegetation would also include crushing of vegetation and loss of vegetation cover.

4.15 RANGE RESOURCES

4.15.1 Impact Significance Criteria

A ten percent or greater reduction in the AUMs in any single grazing allotment is considered a significant impact.

4.15.2 Proposed Action

Removal of vegetation during construction would result in the loss of forage to livestock. Surface disturbing activities could spread noxious weeds to relatively weed-free areas. However, BTA has agreed to control noxious weed infestations (see Chapter Two). Livestock could be displaced from normal grazing areas. Livestock loss could occur due to collisions with project vehicles. Petroleum intoxication is often fatal to cattle and other domestic livestock (Edwards et al., 1979) and could occur if they ingest toxic compounds in reserve pits. However, pits would be fenced to preclude entry by livestock. Backfilling trenches as soon as feasible after pipeline installation would reduce the risk of cattle, wildlife or wild horses accidentally falling into trenches.

Construction activities would result in the temporary loss of about 16 AUMs or the forage consumed by one cow and calf in 16 months. This estimated loss is divided between four allotments: about one AUM in the 4th of July Allotment; 12 AUMs in the Red Desert Allotment; one AUM in the Rock Springs Allotment; and two AUMs in the Steamboat Mountain Allotment. Stocking rates provided in Appendix 11-2 of the draft Green River RMP and DEIS (BLM, 1992) were used to estimate project effects on available livestock AUMs. This loss would decline to about four AUMs in the Red Desert Allotment upon completion of proposed reclamation. The production-related loss of four AUMs per year would continue over the life of the project. Construction- or production-related losses of grazing AUMs would not exceed ten percent of total AUMs in any grazing allotment (see Table 3-5); therefore no significant impacts would occur.

Because disturbance from construction of the proposed permanent gas sales pipeline would occur within or adjacent to existing pipeline corridors, re-disturbance of those areas would provide opportunities to revegetate these areas in accordance with more contemporary reclamation standards.
4.15.3 Freighter Gap Pipeline Alternative

Compared to the Proposed Action, implementation of this alternative would result in slightly less construction-related forage loss (about 1-2 AUMs) but production-related loss would be the same as the Proposed Action.

4.15.4 No Action Alternative

Implementation of this alternative would eliminate potential forage losses.

4.15.5 Mitigation

BTA should not construct pipelines through any water impoundment or stock watering ponds. BTA should route the permanent gas sales pipeline to avoid an existing stock reservoir in the Fourth of July wash.

4.15.6 Cumulative, Long-Term Impacts

The proposed project would contribute a minor (4 AUMs) impact to cumulative, long-term impacts on forage.

4.15.7 Unavoidable Adverse Impacts

The short-term loss of an estimated 16 AUMs and the long-term loss of about 4 AUMs would constitute an adverse impact that would be unavoidable if oil and gas leases in the development area are to be developed. The impact of this loss on the State and local communities would be offset by estimated annual Federal oil and gas royalties of $2.5 million (half of which are returned to the State of Wyoming), up to $1.2 million per year in State tax revenues, as well as over $100,000 per year in County ad valorem and property tax revenues. Actual loss of forage would depend upon reclamation success.

4.16 WETLANDS, RIPARIAN AREAS AND FLOODPLAINS

4.16.1 Impact Significance Criteria

Because of its value to wildlife and scarcity in the project area, loss of wetland or riparian habitat at any individual location in excess of 1 acre or the combined loss of more than 10 acres of wetland or riparian habitat is considered a significant impact. Any violation of EO 11990 (Protection of Wetlands) is also considered a significant impact. Likewise, any violation of EO 11988 (Protection of Floodplains) is considered a significant impact.

4.16.2 Proposed Action

Wetlands and Riparian Areas. Under the Proposed Action, the permanent gas sales pipeline and a gathering line would cross one drainage in the Alkali Basin which has been classified as a riverine-intermittent-streambed temporarily flooded (R4SBA) wetland and mapped by NWI (see Figure 2-2). A narrow zone of vegetation along this intermittent stream is predominantly greasewood with some sagebrush and basin wildrye. Pipeline construction would temporarily disturb less than 0.1 acre of this vegetation. No other project components within the development area or proposed pipeline routes would be located within wetlands. No other wetlands are located within 200 feet of the permanent gas sales pipeline.

A potential also exists for a fuel spill to occur into playas elsewhere in the development area or vicinity. However, this impact would be avoided because the Proposed Action incorporates a prohibition on vehicle travel outside of staked pipeline rights-of-way, construction or production sites or roads. Implementation of an SPCC plan and the accessibility of spill control and containment equipment at construction sites and the gas processing facility/field office would also limit the impacts of an accidental fuel (diesel, gasoline) spill.

Floodplains. Consultation of available floodplain maps indicates that no project facilities would be located within the 100-year floodplain.

4.16.3 Freighter Gap Pipeline Alternative

No wetlands would be crossed by the proposed Freighter Gap Pipeline Alternative. No portion of this alternative pipeline route is within a known floodplain.

4.16.4 No Action Alternative

Implementation of the No Action Alternative would eliminate all potential impacts to wetlands.

4.16.5 Mitigation

Sites for surface facilities should be staked to ensure that they are 500 feet from jurisdictional wetlands.

4.16.6 Cumulative, Long-Term Impacts

Because they would be avoided, no change in cumulative impacts to floodplains, wetland or riparian habitat would occur.

4.16.7 Unavoidable Adverse Impacts

Less than 0.1 acre of greasewood-dominated riparian habitat on an intermittent stream would be temporarily disturbed as a result of pipeline construction.
4.17 THREATENED AND ENDANGERED SPECIES AND SPECIES OF CONCERN

4.17.1 Impact Significance Criteria

Any direct threat that is likely to adversely affect an individual Federal or State endangered, threatened, or proposed species is considered a significant impact. Loss of any critical habitat currently utilized by a Federal or State endangered, threatened or proposed species is considered a significant impact. Any project related action that would change the status of a candidate species under the Endangered Species Act would be considered a significant impact.

The Endangered Species Act (Section 7(a)) obligates BLM to ensure that actions which they authorize or permit are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat for such species. The Proposed Action or project alternatives would avoid adverse impacts to any federally listed species. No critical habitat for any federally listed species would be affected. As discussed below, implementation of the Proposed Action or project alternatives is not expected to reduce the reproduction, number or distribution of a federally listed species to such an extent that would appreciably reduce the likelihood of the survival and recovery of that species in the wild (50 CFR 420.02).

Candidate species do not receive protection under Endangered Species Act unless they are the subject of a published proposed rule determining endangered or threatened status. However, USFWS monitors the status of all candidates, especially those for which available information indicates an imminent threat and USFWS encourages consideration of these during long-range environmental planning (Federal Register, November 21, 1991, 56(22);58804). BLM policy does not allow actions that would change the status of C1 or C2 candidate species under the Endangered Species Act. The status of no candidate species would be adversely affected by the Proposed Action.

The biological assessment incorporated into this EA is used to review actions and programs authorized, funded, or carried out by the BLM to determine potential effects on threatened and endangered species and species proposed for listing by USFWS. BLM policy requires that all adverse impacts on threatened and endangered species and their habitats be avoided except when: 1) it is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by USFWS; 2) an exemption has been granted under the Endangered Species Act; or 3) the USFWS biological opinion recognizes an incidental taking. Adverse impacts on species proposed for listing are to be avoided while their Federal status is being determined. The Proposed Action and project alternative would comply with this policy. Mitigation measures are suggested to further reduce the potential for impacts.

4.17.2 Proposed Action

Implementation of the Proposed Action and suggested mitigation measures discussed below would not be likely to jeopardize the continued existence of any endangered, threatened or proposed species or result in the destruction or adverse modification of critical habitat for such species. Implementation of the Proposed Action is not expected to reduce the reproduction, number or distribution of Federally-listed or proposed species to such an extent that it would appreciably reduce the likelihood of the survival and recovery of such species in the wild (50 CFR 420.02). No habitats

utilized by threatened or endangered species would be irrevocably removed from future use by the Proposed Action. Implementation of the Proposed Action is not expected to adversely affect candidate species to the extent that its status under the Endangered Species Act would be changed.

Black-footed Ferret. USFWS (1994) determined that surveys for black-footed ferrets were necessary on approximately 300 acres of prairie dog colonies that would be affected by the permanent gas sales pipeline. During September, 1994, seven prairie dog colonies affected by the permanent gas sales pipeline were surveyed for black-footed ferrets. No black-footed ferrets or their sign were observed during the surveys and no impacts are anticipated due to pipeline construction.

Only portions of the development area have been searched for prairie dog colonies but past observations indicate that the presence of colonies which meet USFWS criteria for potential habitats is unlikely.

There is a remote possibility that vehicles could kill a ferret. However, except for one skull found in 1981 approximately 37 miles from any proposed project components, none of the reports of black-footed ferrets in or near affected lands have been verified and it is unlikely that ferrets currently inhabit prairie dog colonies in the area.

Peregrine Falcon. No impacts to peregrine falcons are anticipated since there is no suitable nesting habitat affected by any component of the Proposed Action. Peregrines could migrate through the area but their occurrence near any project component would indicate their tolerance for the activity.

Bald Eagle. No powerlines are proposed. There are no suitable nest or winter roost sites for bald eagles present in or near the development area although they may infrequently occur or during winter if they seek carrion on ungulate winter ranges. Therefore no impacts are expected to occur.

Candidate Wildlife Species--Raptors. Human disturbances during the nesting period could adversely affect productivity if activities occurred near occupied raptor nest sites. During recent field surveys several ferruginous hawk nests were found within 1 mile of the proposed route for the permanent gas sales pipeline. BLM has adopted a 1 mile buffer zone around nesting ferruginous hawks to avoid disturbing birds with human activities. As part of the Proposed Action, BTA has agreed to schedule project activities to avoid impacts to nesting raptors.

The buffer zone concept is generally supported by the results of research conducted by White and Thurow (1985) who studied reproductive success of ferruginous hawks that were exposed to various levels of disturbance while nesting. The experimental design indicated that, although individual nesting pairs varied in their response to disturbance, adult birds would not flush from nests 90 percent of the time if the disturbance was more than 820 feet away. The investigators recommended that a no disturbance buffer zone be at least 820 feet around nests of birds in good physiological condition but, when prey are scarce, larger buffer zones should be employed to protect nesting birds when they are less tolerant of disturbance (White and Thurow, 1985). Nonetheless, expert opinions about buffer zones vary widely. For example, the point at which off-road vehicles caused a 20 percent rate of nest abandonment by incubating ferruginous hawks (Suter and Jones, 1981) ranged from 300 feet to two miles. But, where intensively studied, only 4 percent of all nest failures of 629
ferruginous hawk nests could be attributed to human disturbances (Gilmer and Stuart, 1983).

**Other Candidate Species.** USFWS has advised that mountain plovers may be proposed for listing as threatened or endangered in the foreseeable future. Presently they are classified as a category C1 candidate species. Mountain plovers have been observed in the project vicinity. Since they nest on the ground, adult birds, young and eggs are susceptible to mortality by vehicles. Confining vehicles to staked construction sites, rights-of-way and existing roads would reduce potential impacts to this species. Furthermore, only an estimated 6.5 acres of grassland vegetation would be affected out of 180.6 acres of construction-related disturbance (see Table 4-1).

Long-billed curlews and loggerhead shrikes could be impacted if nests, eggs, or birds are destroyed by vehicles or foot traffic. As called for in the Proposed Action, limiting project-related traffic to existing roads or construction sites and rights-of-way would reduce potential impacts. Pygmy rabbits could suffer direct mortality with construction equipment operating in high density sagebrush. However, only 2.6 acres of this habitat (out of 180.6 acres) would be temporarily disturbed by pipeline construction and thus mortality and habitat loss are not anticipated. Other candidate wildlife species would not be potentially affected to the same extent although construction activities in greasewood vegetation could adversely impact nests and nesting activities of loggerhead shrikes.

**Other Special Status Wildlife Species.** The only WGFD Priority II species that could be affected is the burrowing owl. However, by avoiding prairie dog burrows, impacts to burrowing owls could be avoided. Construction activities within prairie dog colonies could disturb burrowing owls that are nesting from late March through August.

**Plant Species.** No Federally listed threatened or endangered plant species would be affected by project activities. Three C2 plant species potentially occur on affected lands including Wyoming ricegrass (*Oryzopsis contracta*), large-fruited bladderpod (*Lesquerella macrocarpa*), and mystery wormwood (*Artemisia biennis var diffusa*). Suitable habitat for each species may be present within the development area but is most likely to be encountered along the proposed permanent gas sales pipeline route: mystery wormwood could be associated with playas found in the development area and vicinity; Wyoming contracted ricegrass is often found on disturbed roadsides and on dry, shallow or sandy soils in basin areas; large-fruited bladderpod occurs in soils with bentonite and/or gypsum present, often on barren clay flats and hills.

Avoidance of construction in playas would minimize potential impacts on mystery wormwood. Botanists with the Nature Conservancy's Wyoming Natural Diversity Database have recommended that Wyoming contracted ricegrass be down-listed from C2 to 3C since it is more common than previously believed (WNDDB, personal communication with PIC Technologies, Inc., June 10, 1994). Impacts to these species are unlikely, therefore, to result in a change in status under the Endangered Species Act. Potential impacts to the bladderpod, found near Freighter Gap, would be reduced by using existing road and pipeline corridors. The status and knowledge of these plant species could change during the course of project implementation; therefore, coordination with the BLM and botanical experts would be necessary to determine whether surveys for these species are warranted prior to surface disturbing activities and what, if any, mitigation measures are appropriate.
4.17.3 Freight Gap Pipeline Alternative

This alternative route has not been surveyed for prairie dog colonies. Such a survey would be undertaken prior to implementing this alternative route. For other threatened, endangered and species of concern the analysis and conclusions discussed above for the Proposed Action apply to this alternative.

4.17.4 No Action Alternative

Implementation of the No Action Alternative would eliminate any potential adverse impacts to candidate and WGFD priority species and their habitats but would have no affect (positive or negative) on populations of these species or their status under the Endangered Species Act. Indirect impacts due to increased public access or potential effects of disturbance to species during nesting periods, however remote, would be reduced under this alternative.

4.17.5 Mitigation

Black-footed Ferrets. Proposed construction sites in the development area not examined in past surveys for prairie dogs should be examined prior to surface disturbing activities to confirm the presence or lack of prairie dog colonies. If prairie dog colonies are found, BTA should locate all project components to avoid direct impacts to prairie dog burrows. If this is not possible, surveys of prairie dog colonies (and ferrets where required by BLM and the USFWS), should be conducted in accordance with USFWS guidelines and requirements.

Candidate Wildlife Species--Raptors. Where surface disturbing activities are planned for the nesting season in suitable habitat, BTA should conduct raptor surveys. BLM should prohibit human activity within 1 mile of an active ferruginous hawk nest during the nesting season (March 15 through July 31). BLM should prohibit modification of nest substrate or nesting structures.

Other Candidate Species--Mountain Plover, Loggerhead Shrikes. Where surface disturbing activities are planned for the nesting season and would be located in suitable habitat, BTA should conduct mountain plover and loggerhead shrike surveys. If necessary, BTA should minimize impacts by scheduling surface activities in potential nesting habitats to avoid the following reproductive periods: in grasslands from late March through July for mountain plovers; in greasewood or other tall shrub vegetation mid-April through July for loggerhead shrikes. BTA should install barriers and/or signs indicating reclaimed areas that are closed to ORV use and thus avoid potential impacts to mountain plovers and other ground-nesting birds.

Other Special Status Wildlife Species. BTA should avoid impacts to burrowing owls during the reproductive period (late March through August) by avoiding impacts to prairie dog burrows during this time period. Impacts to other special status species are not anticipated and no mitigation measures are proposed.

Candidate Plant Species. Given the potential for changes in candidate plant status in future years, BTA should coordinate and consult with BLM and expert botanists to determine whether surveys for candidate plant species are warranted prior to surface disturbing activities and what type of mitigation measures, if any, should be implemented. Avoidance of candidate species should be adopted as the preferred mitigation measure wherever feasible.

4.17.6 Cumulative, Long-Term Impacts

Because no impacts on Federally-listed or proposed species or their critical habitat would occur, the proposed project would not contribute to cumulative impacts on these species. Project scheduling and avoidance would eliminate impacts to candidate species and thus avoid increased cumulative impacts.

Increased access and ORV use by the public, particularly during hunting seasons, could eventually lead to indirect impacts on nesting ferruginous hawks, long-billed curlews, pygmy rabbits, mountain plovers and loggerhead shrikes, during the nesting period. However, the development area is not a prime hunting area and receives little recreation visitation. Traffic associated with construction and production activities would be confined to proposed and existing road right-of-ways to avoid indirect impacts due to increased access or ORV use.

4.17.7 Unavoidable Adverse Impacts

No unavoidable adverse impacts to Federally-listed threatened, endangered or proposed species would occur.

4.18 WILDLIFE AND AQUATIC RESOURCES

4.18.1 Impact Significance Criteria

Any project-related activity that would result in habitat degradation such that a decrease in big game herd unit population size below levels specified in the Green River RMP, as coordinated with Wyoming Game and Fish Department, would be a significant impact. Project-related activities that would disturb big game on crucial ranges under severe winter conditions or during birthing periods would be significant impacts. Disturbances to sage grouse and raptors within specified buffer zones during reproductive periods would be significant impacts.

4.18.2 Proposed Action

Construction and operation of project activities could impact wildlife by causing direct mortality during construction and operations, displacement of animals due to human presence that would induce stress and/or cause them to utilize less suitable habitats, or by destruction of habitat. It is possible that some animals would be struck by vehicles or killed during construction and production activities. Clearing, grading, or excavating habitats could lead to mortality of small mammals, reptiles, amphibians, invertebrates, and nesting birds with eggs or young (BLM, 1979). Burrowing vertebrates are especially vulnerable; for example, pocket gopher burrows are usually less than 2 feet deep (Chase et al., 1986). Burrows provide shelter for other vertebrates including toads, lizard and snake species, cottontails, ground squirrels, mice, weasels, and skunks, and birds, particularly burrowing owls (Chase et al., 1982; Clark et al., 1982). The proposed use of existing areas of disturbance -- for example, by placing pipelines along existing roads -- would help to reduce these impacts. Similarly, combining road and pipeline corridors would reduce surface disturbance when compared to separate corridors.

Since burrowing species' occurrence and densities at sites of proposed facilities are unknown, the magnitude of impact to species inhabiting burrows cannot be predicted. Although some mortality would occur during construction, this is not expected to significantly affect overall populations of
species that inhabit burrows.

Mortalities due to wildlife-vehicle collisions are more likely on paved highways but could occur on graded roads such as the Bar X Road and access roads. Wildlife that are particularly vulnerable to collisions with vehicles include skunks, cottontails and jackrabbits, deer, coyotes, badgers, snakes and birds such as mourning doves and meadowlarks that are likely to inhabit shrublands or grasslands adjacent to roads (Leedy, 1975; Case, 1978; Wilkins and Schmily, 1980). Increased traffic volume on local roads would probably lead to directly collisions with deer or antelope (Arnold, 1978). The number of wildlife-vehicle collisions appears to be directly related to local wildlife population levels but, as indicated for mule deer, vehicle-related mortality does not appear to contribute substantially to the overall mortality rate of a population (Reeve, 1990). Similar impacts on the overall mortality rate are expected for elk or antelope.

Petroleum intoxication is often fatal to cattle, other domestic livestock, and presumably to wild ruminants (Edwards et al., 1979). In addition, wildlife mortalities can occur if animals become trapped in reserve pits (Esmoil, 1991). Water produced during drilling may have high concentrations of salts or other compounds that, if ingested, could be toxic to wildlife or encrust feathers of waterfowl utilizing reserve pits. Measures incorporated into proposed well pad designs and drilling would reduce the probability of these impacts. Implementation of the SPCC plan would reduce the probability of wildlife ingesting petroleum products. Dewatering, flagging or netting of reserve pits would discourage migratory birds from entering reserve pits. No production pits would be installed which would eliminate this potential source of exposure of wildlife to petroleum products. Fencing of reserve pits would discourage their use by livestock or big game. Use of water-based, rather than oil-based, drilling mud would also reduce the potential for ingestion of materials toxic to wildlife.

In addition to direct impacts, the proposed project would result in indirect effects in the form of alteration and/or loss of habitat through construction effects on vegetation and ground substrates. Production activities would result in the long-term removal of 34 acres of vegetation for roads, well pads and ancillary facility sites (central tank, battery, gas processing facility). Most non-woody vegetation at production sites would be destroyed but woody vegetation would be stockpiled for use in reclamation. Alteration and loss of habitat would adversely affect some wildlife, particularly species restricted to small habitats and those with very small home ranges (i.e. some small mammals, reptiles, and amphibians). For these species, production-related disturbance may reduce the carrying capacity within the immediate area.

By eliminating grading on the permanent gas sales and condensate pipeline, which account for an estimated 106 out of 181 acres of proposed construction-related disturbance, impacts to shrubs would be reduced. Conversion of a portion of the yield from a proposed water well could enhance wildlife habitat given that water is a limiting factor in the area. However, before it could be used water quality would have to be tested as groundwater in the area tends to be saline.

Under the Proposed Action, a total 34 acres of vegetation would be removed from use by livestock and wildlife for the life of the project. An estimated 181 acres would be disturbed by construction activities. Less than 4 percent of construction-related disturbance would occur in grassland, less than 2 percent would occur in high density sagebrush. The remainder would occur in saltbush, greasewood or low density sagebrush. No wetland or riparian wildlife habitats would be lost. Production-related loss of habitat would occur in greasewood, saltbush, or low density sagebrush.

Restoration and recovery of vegetation on reclaimed sites would depend on the type of vegetation, soil, precipitation and grazing pressure. Restoration of sagebrush to pre-construction density could take decades if subjected to drought and grazing. Although the structural component of shrub-dominated habitats would recover slowly, successful restoration of seeded herbageous vegetation may improve forage for wildlife within a relatively short time.

Big Game. Because pipeline construction would not occur within crucial winter ranges during the winter (unless authorized by BLM) no displacement of big game is likely during periods when the effects of such disturbance on animals are most severe. None of the proposed production-related disturbance would occur in big game crucial winter range.

Big game would generally disperse away from construction activities, roads, well drilling activities, the proposed gas processing facility and any location where vehicles and/or humans on foot are present. Pronghorn and mule deer, though, habituate to such activities if vehicles travel predictable routes and do not stop (Easterly et al., 1991; Aldredge and Dehlinger, 1988; Reeve, 1984). Elk probably would move at least 0.5 mile from well drilling activities or until they are out of sight (Ward, 1986; Reede, 1988) although vehicles closer than 0.6 mile (Ryder et al., 1986). As elk escape from disturbances, they seek visual barriers such as ridges (Ward, 1986; Gillin, 1989) and drainages (Olson, 1981). Mule deer would probably exhibit less response to well drilling and vehicles once roads were constructed although they would generally avoid roads if no screening (e.g., by topography) were present (Black et al., 1976; Rest and Bailey, 1979). Pronghorns near drilling activities could temporarily decrease but would recover once construction and drilling activities are completed (Easterly et al., 1991).

Construction of spur roads into individual well pads in the development area would not provide public access to winter ranges. Outside of wintering periods, game violations (e.g., poaching) are most likely to occur during the hunting season. Increased illegal kills or crippling losses have been related to increased workforce associated with large industrial developments (Kuck and Ackerman, 1984).

An estimated 33 acres of elk crucial winter/yearlong range would be temporarily disturbed by construction of the permanent gas sales pipeline. This is roughly equivalent to the acreage that would be required to support one elk for a 4-6 month period, depending upon specific vegetation and habitat conditions. Actual utilization of this portion of crucial range is difficult to predict, especially since disturbance would occur in the vicinity of existing County roads and higher quality habitat exists to the north and west of affected lands. The proposed construction would not occur during the crucial winter range period and the proposed activity would occur in the vicinity of a major access road to Freightier Gap and Steamboat Mountain (see Figure 3-2) which could be affecting elk utilization of this area. Grasses and forbs would be restored to disturbed areas in crucial elk winter range within 3 to 5 years. This is preferred forage for elk.

Raptors. Impacts from project activities on nesting golden eagles, prairie falcons, red-tailed hawks, northern harriers and American kestrels are unlikely since there is little or no suitable nesting habitat in the vicinity. Project activities are not expected to displace wintering golden eagles and rough-legged hawks from hunting grounds.

Other Wildlife Species. Given the lack of affected habitat, waterfowl would not be affected. Likewise, impacts to aquatic fur bearers (mink, muskrat) are not expected to occur.
Since they nest on the ground, sage grouse would be impacted if project-related vehicles drove over nests. Construction activities during the mating period could disrupt lek attendance since sound produced by displaying males is a key stimulus promoting bird attendance (Eng et al., 1979a). But most grouse depart from leks by 9:00 AM (Jenni and Hartzler, 1978) and disturbances could easily be avoided. The closest known leks are about 0.5 mile from the development area boundary (see Figure 3-2) and about one mile from any proposed activity. A field survey conducted in Spring, 1994 found no evidence of sage grouse in the vicinity of the development area or these leks. BLM requires that no surface facilities be constructed within 0.25 mile of an active sage grouse lek and that no construction activities occur within 0.25 mile of an active lek February 1 through May 15 from 6 pm to 8 am daily (see Appendix A).

Impacts to terrestrial furbears are not anticipated. Cursorial species such as coyote, bobcat and fox would escape from the disturbances although slow moving and inconspicuous species (skunk, weasels) could be killed by project-related vehicles. Since these species are widely dispersed in low densities, there is little likelihood that an individual would be in the area of any specific event. Desert cottontail, could also be killed by vehicles but they would most likely escape from any surface disturbing activity.

Noise associated with proposed activities would probably cause birds and other wildlife to avoid disturbance areas. The extent of areas disturbed by noise would vary with the presence of physical barriers, vegetation, wind, and temperature (Harrison, 1978). Reports indicate that mammals and birds would escape from noises between 75 and 85 dBA (Golden et al., 1980). According to the manufacturers ratings, noise from heavy machinery such as scrapers and dozers is about 80 dBA at 50 feet from this source. Because these noise measurements do not take topography, weather or wind conditions into account, actual impacts of noise on wildlife would vary with local conditions.

Noise impacts from drilling and construction equipment would be temporary while noise from the processing plant would persist 24 hours a day for the life of the project. Noise from the plant is expected to decline to background levels (30-40 dBA) approximately 0.75 miles from the site. Given these noise levels, noise from the gas processing plant is not expected to affect any known leks (see Figure 3-2) as none are closer than 2.5 miles of the proposed plant site. Displacement at the 80 dBA level would occur in areas within 0.4 mile or less from the plant site if no mufflers were used on engines. The displacement radius would be reduced to less than 0.1 mile with installation of mufflers and placement of the compressor and generator in a building as called for in the Proposed Action.

Construction and operations would displace passerine birds, nongame mammals, and upland game birds. These impacts would be minor since none of the affected habitats are unique or limited in area and initial, increased human activity would already displace affected wildlife into alternative, undisturbed habitats.

Disturbance to big game on crucial winter ranges would be avoided by project scheduling. No activities are proposed in birthing areas. Disturbance to vegetation with in elk crucial winter range would be temporary and would occur in the vicinity of existing roads and lower quality habitat. Disturbance to raptors and sage grouse during the reproductive period would be avoided by project scheduling or by avoiding buffer areas around leks and nests. For these reasons, implementation of the Proposed Action would not result in impacts which would be considered significant under the criteria specified in Section 4.18.1

Aquatic Resources. No impacts to aquatic resources by any components of the Proposed Action or alternative are anticipated.

4.18.3 Freighter Gap Pipeline Alternative

Same as the Proposed Action. Approximately 12 acres of crucial elk winter-yearlong range would be temporarily disturbed compared to 33 acres for the Proposed Action. None of the route would affect crucial ranges used by other wildlife species. This alternative would cross steep rocky slopes on which nesting raptors were observed in Spring, 1994. Some loss of nesting habitat could occur, otherwise impacts would be the same as the Proposed Action.

4.18.4 No Action Alternative

Implementation of the No Action Alternative would have no adverse or beneficial impact on wildlife species or their habitats.

4.18.5 Mitigation

(See Appendix A for environment standards, procedures and requirements which would be implemented).

BTA should provide all project-related personnel, contractors and subcontractors with information about State and Federal wildlife regulations, including raptors and threatened and endangered species.

BTA should require its contractors and subcontractors to adopt a policy of a) prohibiting firearms and dogs at work sites; and b) subjecting workers convicted of wildlife violations to disciplinary actions.

Field evaluations of sage grouse leks should be conducted by BTA prior to the start of activities in potential sage grouse habitat between February 1 and July 31.

A copy of all information gathered during field investigations should be forwarded to the BLM wildlife biologist.

BTA should work with BLM on a design for utilizing excess water from the proposed water well (if water quality is acceptable) for wildlife and/or wild horse purposes. Piping of water to an off-site location (e.g. into a nearby playa, water tank, etc.) should be considered.

4.18.6 Cumulative, Long-Term Impacts

Because impacts to active sage grouse leks and raptor nests and associated buffer zones would be avoided, the project would not contribute to cumulative, long-term impacts on those sites and species.

None of the proposed production-related disturbance would occur in crucial big game winter range or birthing areas. Reclamation of the proposed pipeline right-of-way would restore grasses and forbs which is preferred forage for elk. Therefore the Proposed Action would make no contribution to
cumulative, long term impacts on big game or crucial winter range.

Production-related disturbance would result in the long-term loss of 34 acres of wildlife habitat due to the removal of vegetation and conversation of land to oil and gas production. However, this disturbance is not expected to result in long-term effects to populations of big game, burrowing animals, small mammals, reptiles, amphibians or birds. Therefore no long-term cumulative effects are expected to occur. Some loss of wildlife due to collisions with vehicles would occur; however research cited earlier indicates that this would not contribute substantially to the overall mortality rate of a population and therefore would not contribute to long-term, cumulative impact on wildlife populations. Because no wetlands perennial streams or other aquatic resources would be affected, the Proposed Action would make no contribution to cumulative, long-term impacts on waterfowl or other species that rely on these habitats. Because no ACEC, unique or unusual wildlife habitats would be affected, the Proposed Action would make no contribution to cumulative long-term impacts on these habitats. Conversion of a portion of the yield from the proposed water well, if feasible, to wildlife purposes would help to improve wildlife habitat especially in an area where water sources are rare and lack of water is a limiting factor. 4.18.7 Unavoidable Adverse Impacts

Construction-related disturbance of 181 acres of sagebrush, grassland, greasewood and saltbush vegetation (see Section 4.14) and the production-related disturbance of 3.8 acres of low density sagebrush, greasewood, and saltbush vegetation would constitute an unavoidable adverse impact. Vehicle-wildlife collisions would also be unavoidable. The temporary disturbance of elk crucial winter-yearlong range would be unavoidable regardless of whether the Proposed Action or Freighter Gap Pipeline Alternative were implemented; however, reclamation would restore grasses and forbs which is preferred forage for elk. Short-term disturbances along existing road or pipeline corridors, although unavoidable, would be largely confined to an area where vegetation has already been altered. Noise would increase the likelihood of temporary displacement of wildlife from the vicinity of project locations. 4.19 RECREATION RESOURCES 4.19.1 Impact Significance Criteria

Any activity that would prohibit or result in interference with existing developed recreation sites or facilities for more than one season of recreational use is considered a significant impact. Long-term displacement of existing dispersed recreation use is considered a significant impact. 4.19.2 Proposed Action

No developed sites or facilities would be affected. Construction and operation of wells and the gas processing facility within the development area could affect hunting quality within approximately 0.75 mile of the plant due to noise impacts and displacement of wildlife. Otherwise the Proposed Action would have little or no effect on locally or regionally important hunting or other recreation opportunities and no significant impacts are expected to occur. 4.19.3 Freighter Gap Pipeline Alternative

Same as the Proposed Action. 4.19.4 No Action Alternative

Selection of this alternative would have little effect on hunting quality or success. Implementation would have no effect (positive or negative) on recreation sites or facilities. 4.19.5 Mitigation

No additional mitigation measures are proposed. 4.19.6 Cumulative, Long-Term Impacts

Because impacts to recreation sites and facilities would be avoided, and impacts on local or regional recreation opportunities would be negligible, the Proposed Action would make no contribution to cumulative, long-term impacts on recreation. 4.19.7 Unavoidable Adverse Impacts

A minor decline in hunting quality would occur in the vicinity of the gas processing facility. 4.20 WILD HORSES 4.20.1 Impact Significance Criteria

Project-related impacts that would inhibit BLM from maintaining wild horse population objectives would be a significant impact. 4.20.2 Proposed Action

No portion of the Proposed Action is expected to adversely affect wild horses or inhibit BLM from maintaining population objectives; therefore no significant impacts are expected to occur. BLM has proposed to develop 15 water wells in the Rock Springs Allotment to improve distribution of wild horses. A temporary loss of approximately one AUM—or about the amount of forage consumed by one wild horse in one month—would occur in this allotment. All other portions of the Proposed Action are within allotments for which there are no similar projects have been proposed by BLM to improve wild horse habitat. Fencing of pits would minimize the risk of wild horses becoming trapped. Collisions with project-related vehicles could occur. The Proposed Action is not expected to significantly decrease forage available for wild horses or increase competition for forage and livestock or native big game species (see discussion in vegetation and range resources sections). Grazing by wild horses could adversely affect reclamation success and require repeated treatments.
of disturbed lands especially near the flowing well Fourth of July Wash.

4.20.3 Freighter Gap Pipeline Alternative

The entire Freighter Gap Pipeline Alternative is within the Red Desert Allotment where no projects have been proposed by BLM to improve wild horse habitat. Implementation of this alternative is not expected to significantly decrease forage available for wild horses or increase competition between them and livestock or native big game species (see vegetation and range resources sections).

4.20.4 No Action Alternative

Implementation of this alternative would avoid any loss of potential forage available for wild horses.

4.20.5 Mitigation

If grazing by wild horses prevents successful reclamation on the right-of-way of the permanent gas sales pipeline near the Fourth of July Wash, a plan for fencing reclaimed areas should be developed in cooperation with BLM. Mitigation measures which would minimize residual impacts to vegetation include measures discussed in the Vegetation (Section 4.14.4), Range (Section 4.15.4) and Wildlife sections (Section 4.18.4). These measures would reduce potential impacts on forage available to wild horses.

4.20.6 Cumulative, Long-term Impacts

No increase in cumulative, long-term impacts to the population of wild horses is anticipated.

4.20.7 Unavoidable Adverse Impacts

An increased risk of vehicle-wild horse collisions would be unavoidable. The construction-related loss of 16 AUMs would be unavoidable. However this would be reduced following reclamation and production-related activities would result in the loss of four AUMs. Actual loss of forage for wild horses would depend on reclamation success and grazing by wildlife and livestock.

4.21 PUBLIC HEALTH AND SAFETY

4.21.1 Proposed Action

Potential health and safety hazards associated with the Proposed Action and project alternative would include:

- Release of oil, diesel, gasoline, hydraulic fluid or lubricants during drilling;
- Release of oil, diesel, gasoline, hydraulic fluid or lubricants from storage tanks or containers;
- Work-related injuries and accidents;
- Fire at a drill site or processing facility;
- Mishandling or improper disposal of hazardous chemicals; or,
- Blowouts.

These health and safety concerns would increase with proximity to residences or population centers but no residences are located in the vicinity of proposed activities. Apart from land management agency personnel, project workers or ranchers, I few people visit or travel through the development area. Hydrogen sulfide has not been encountered in the development area or vicinity.

Safety practices associated with drilling and servicing of oil and gas wells are specified and regulated by the State Occupational Health and Safety Commission. These regulations encompass the use of drilling equipment, operations, personal protective equipment and safety training. Additional regulations related to the protection of health and safety during drilling and production operations have been developed by the BLM and the Federal Occupational Safety and Health Administration.

According to EPA regulations, drilling fluids, produced waters and other wastes associated with exploration and development of crude oil and natural gas are exempt from regulation as hazardous wastes under the Resource Conservation and Recovery Act (RCRA). Exempt wastes are those limited to, or uniquely associated with, primary field operations, downhole operations or those operations necessary to locate and recover oil and gas from the ground and remove impurities at or near the wellhead. According to the EPA: "...the off-site transport of exempt waste from a primary field site for treatment, reclamation or disposal does not negate the exemption." However, some service company wastes--such as spent solvents, waste acids--are not covered by the oil and gas exploration and production exemption and would be handled, transported and disposed of as hazardous waste (Federal Register, March 22, 1993, pp. 15284-15287). BTA and its contractors would be required to dispose of those materials in accordance with applicable Federal and State regulations.

No extremely hazardous substances (as defined by 40 CFR 355) would be used, stored, or transported on Federal land. In accordance with BLM Instruction Memorandum No. WY-04-94-24, as part of the applicable APD or permit process, BTA would provide BLM with a list of any chemical found on the Environmental Protection Agency's Consolidated List of Chemicals Subject to Reporting Under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 which would be used, stored or transported across Federal land. Typically such materials would include barium (a drilling additive), ethylene glycol (antifreeze) and methanol. Storage of hazardous materials in the development area would be subject to applicable SARA Title III reporting requirements.

BLM On-Share Order No. 2 (Federal Register, November 18, 1988) requires that a blowout preventer (BOP) be installed, used and maintained and tested to ensure well control. An APD for each proposed well would address expected pressures and specify the type of BOP which would be installed. APDs would be reviewed and approved by BLM before drilling is allowed to commence.

Accidental puncture of pipelines by heavy construction equipment (e.g., backhoes) is the most common cause of pipeline leaks. Corrosion and material defects are the second most common cause of pipeline leaks--the former being more common in older pipelines without the more resistant coatings now being employed. Impacts from tank leakage or failure would be controlled by the installation of berms around tanks. Oil contaminated soils would be disposed of in accordance with applicable State and Federal regulations. Any waste management facility at which petroleum-contaminated soils are accepted for treatment and/or disposal must possess a valid solid waste management permit from the Wyoming Department of Environmental Quality.

Under Federal regulations (e.g., 40 CFR 112), a Spill Prevention Control and Countermeasure (SPCC)
plan would be required for field facilities similar to those being proposed by BTA. The plan would address preventive systems as well as contingency measures that would be in place to control a spill. Preparation and implementation of an SPCC plan and on-site storage of spill containment and control equipment would help to minimize the environmental impacts of any spill of a fuel or hazardous material.

4.21.2 Freighter Gap Pipeline Alternative

Generally, same as Proposed Action. However, construction on steep slopes could present additional safety concerns.

4.21.3 No Action Alternative

Selection of this alternative would avoid a slight increase in the potential for environmental impacts due to an accidental release of fuels, lubricants or produced hydrocarbons.

4.21.4 Mitigation

U.S. Department of Transportation regulations (Federal Register, February 2, 1993) also require that persons transporting oil by truck in a "package" (i.e., a tank) with a capacity over 450 liters (about 118 gallons) are required to have a written SPCC plan in place. This plan should address accidents that could occur from hauling of diesel fuel for drilling and construction activities.

BTA should provide workers with a card describing spill response procedures.

BTA should provide all workers with medical emergency telephone numbers for ambulance service to Rock Springs.

If feasible, cellular phone service should be provided at project locations which can be used to report accidents, spills, and other unexpected events (e.g., discovery of subsurface cultural sites). BTA should ensure that appropriate spill control supplies are readily available at construction sites.

4.21.5 Cumulative, Long-Term Impacts

Because all activities would be conducted in an isolated area and in accordance with Federal and State regulations intended to protect public health and safety, no increase in cumulative, long-term risks to public health and safety are expected to occur.

4.21.6 Unavoidable Adverse Impacts

Some increased potential for a spill and accidents and injuries involving construction and production workers would be unavoidable.

4.22 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irretrievable and/or irreversible impacts would include: some loss of topsoil due to wind erosion and mixing with subsoil; loss of forage for livestock, wildlife and wild horses until project locations are reclaimed or abandoned and reclaimed; extraction and consumption of natural gas from production formations; and some displacement of wildlife from the vicinity of construction activities and production facilities.

4.23 MITIGATION AND MONITORING

4.23.1 Implementation

To effectively implement resource protection and mitigation measures described in this EA, BTA would be required to conduct monitoring of project sites in cooperation with the BLM. Monitoring is a requirement defined in the Code of Federal Regulations (40 CFR 1505.2(c) and 1503.3). The regulation states: "A monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation."

4.23.2 Authorization to Proceed

USFWS concurrence on the endangered species biological assessment would be received before the start of project activities. Authorization to proceed with the implementation of BTA's project on public lands would be contingent upon BLM receiving or inspecting the following from BTA:

- A summary of the SPCC plan applicable to production and gas plant operations:
- Cultural clearance reports:
- Results of biological surveys specified (where applicable):
- A detailed APD, ROW or permit application which identifies site-specific construction.
- A transportation plan which summarizes: existing roads which will be used to access the development area and project locations; roads which will be closed to project-related traffic; roads within the development area which will be reclaimed; a description of the BLM road standards which will apply to proposed roads or road upgrades; and soil conditions and type of surfacing (e.g., depth of gravel) to be applied to new and existing roads.
- A plan of operations (PO) which summarizes: resource protection, mitigation and monitoring measures discussed in this EA: BLM conditions of approval; and standard BLM procedures governing oil and gas drilling, surface disturbing activities, and protection of cultural resources.

The plan of operations will guide preparation of APDs, right-of-way and other permit applications as well as field development, operations and maintenance. The PO would be reviewed and approved by BLM prior to the start of surface disturbing activities.

Prior to constructing a project component, BTA would prepare an APD, ROW or appropriate permit application which would define and map specific locations where site-specific mitigation and environmental protection measures called for in this EA would be implemented. Final locations for these measures would be confirmed by BLM and BTA following on-site inspections of project locations. The APD, ROW or permit application would include maps and diagrams showing the following information, as applicable:
Pipeline alignments relative to existing and proposed roads;
- Well pad locations relative to existing pads and roads;
- Well pad designs;
- Roads that will be used to access the project area;
- Proposed road designs;
- Any temporary use areas or road pullouts;
- Areas with special terrain conditions (e.g., steep slopes);
- Other areas with special conditions such as proximity to drainages or cultural resources;
- Specific locations where mitigation measures would be implemented—e.g., mulching, waterbars;
- Crossings of intermittent streams or drainages;
- Areas of grading and stripped vegetation;
- Topsoil stockpiles;
- Sediment control measures; and,
- Location of crucial winter ranges, leks and other resources which could result in seasonal constraints on proposed activities.

BTA would inform its contractors that they will be required to comply with all resource protection measures found in the Plan of Operations and conditions of approval attached to APDs, right-of-way grants or other permits.

### 4.23.3 Monitoring Requirements

**Reclamation.** All reclamation associated with the project will be monitored to ensure the following:

- Immediate site stabilization to limit wind and water erosion;
- Establishment of vigorous stands of desirable plant species;
- Implementation of noxious weed control in cooperation with County Weed and Pest Control Agency;
- Establishment of vegetation consistent with wildlife and livestock needs;
- Protection of existing aesthetic values commensurate with a Class IV area;
- Compliance with site-specific revegetation requirements; and,
- Establishment of regenerating and self-supporting vegetation communities.

Monitoring of a reclaimed area would be a joint effort of the BLM and BTA. BLM will inspect the site immediately after seeding. BTA would be responsible for notifying BLM as soon as the site has met reclamation objectives. BLM would conduct an inspection of the site to assess whether final reclamation has been achieved and whether BTA is released from any further reclamation responsibilities. If the BLM finds that reclamation objectives have not been met, further treatment will be prescribed.

Reclamation monitoring may require collection of data adequate to characterize ground cover, vegetation canopy cover and species occurrence. This data would be compared to the following acceptance criteria:

- Reclamation vegetative cover is 50 percent of pre-disturbance cover at two years; and,
- Reclamation vegetative cover is 80 percent of pre-disturbance cover at five years.

**Erosion condition ratings for reclaimed sites would also be evaluated at the same time vegetation is monitored (see BLM Erosion Condition Class Rating System). Other acceptance criteria may be adopted as a result of a reclamation technical review.**

**Roads.** During project activities roads would be monitored by BTA and BLM to ensure compliance with the transportation plan and to identify the following:

- Condition of the road surface and whether maintenance activities are needed;
- Erosional problems and what repairs and/or erosion control measures are needed;
- Fugitive dust levels and whether application of a dust suppressant is necessary;
- Safety conditions and whether project activities have created safety hazards that would require warning signs, posted speed limits or other measures;
- Traffic flow conditions and whether project activities have interrupted traffic flows through the project area such that management measures (e.g., warning signs, reduced speed limits, etc.) are needed;
- Violation of prohibitions on project-related, off-road vehicle travel and whether barriers to such travel are needed;
- Containment of project-related vehicles to existing roads, staked pipeline or road rights-of-way and project locations;
- Use of designated parking areas; and,
- Water used for dust abatement is obtained from approved sources.

In some cases, pull-outs adjacent to existing roads may be required. Pullouts would conform to applicable BLM road design standards which would be described in the PO and transportation plan.

It would be the responsibility of BTA to conduct preventative and corrective road maintenance on project related roads throughout the life of their operations. BTA would be responsible for necessary preventative and corrective road maintenance on resource roads used to access well locations and facilities within the development area. Maintenance responsibilities may include, but are not limited to: blading, road grading, cleaning ditches, repairing drainage facilities, graveling, dust abatement, noxious weed control and other requirements as directed by the AO.

BTA is encouraged to initiate a joint road use agreement for the Bar X Road which will define the respective maintenance responsibilities of oil and gas operators using the road, and, which will protect the road surface and not impose additional maintenance costs Sweetwater County. The road use agreement should identify responsibilities for necessary preventative and corrective road maintenance throughout the duration of the project. Coordination with Sweetwater County is paramount to the development of the joint road use agreement and an overall transportation network.

**Permits.** APDs, ROW and other appropriate permit applications as described in Chapter One of this EA would be obtained. Necessary permits to drill and draw water from water supply wells would be obtained from the Wyoming State Engineers Office. BTA would monitor its contractors and subcontractors to ensure compliance with permit requirements.
4.23.4 Resource Protection and Mitigation Measures

Measures designed to reduce or eliminate impacts associated with implementation of the Proposed Action or project alternatives are:

- Required as standard practice by BLM;
- Incorporated into the Proposed Action (Chapter Two of this EA and Appendix A); or,
- Recommended in Chapter Four of the EA as ways to reduce residual impacts associated with implementation of the Proposed Action or project alternatives.

BTA has agreed to implement all of these resource protection and mitigation measures. Application of some of these measures would depend upon site-specific conditions as determined by BLM during inspections and review of APDs, ROW or permit applications.

4.23.5 Administrative Requirements

BTA and its contractors and subcontractors would conduct operations in full compliance with applicable Federal, State and local laws and regulations, and within the guidelines/stipulations specified in the Decision Record, right-of-way grants and permits issued by BLM.

BTA would prepare a PO which would describe BLM-required environmental protection and mitigation measures applicable to the project. The PO would include a description of practices necessary for reclamation of areas not required for operations. Individual APDs, ROW or permit applications would discuss configuration of the reshaped topography, drainage systems, segregation of spoil materials, surface manipulations, waste disposal and soil treatments. An estimated time for commencement and completion of reclamation operations would also be included.

Because this impact analysis assumes their implementation, standard operating procedures for surface-disturbing activities must be adhered to during all proposed activities unless an AO-approved written exception has been granted. Exceptions would only be granted in cases where adherence to standard procedures is not possible or necessary, and the project is acceptable with proper mitigation.

BTA would schedule and attend a preconstruction conference with the AO and his or her representative prior to commencing any construction activities requiring BLM permits.

Preconstruction Planning and Design. Site-specific recommendations and locations of applicable mitigation measures would be finalized by the BLM and BTA following on-site inspections and review of applicable APDs, ROW and permit applications. Follow-up inspections of project sites would be conducted by BLM.

Hazard Mitigation. Notice of any spill or leakage of oil or other pollutant in violation of 43 CFR 110.5 would be immediately given by BTA to the AO and such other Federal and State officials as are required by law. Any oral notice would be confirmed in writing within 72 hours of any occurrence.

Proper precautions would be taken at all times to prevent wildfires. BTA would be held responsible for suppression costs for any fires on public lands caused through negligence of employees, contractors or subcontractors.

A summary of BTA’s SPCC plan would be prepared and made available to BLM. A complete copy of the plan would be kept at BTA’s field office and at the gas plant. An orientation would be conducted with BTA contractors and subcontractors to ensure that they are aware of the steps that should be taken in the event of a spill.

Reclamation Plans. Prior to construction, BTA would submit an applicable APD, ROW or permit application which would identify the site-specific location and design of reclamation measures described in the PO. These measures would be shown on detailed maps (7.5 minute scale or better) and, where applicable, would address the following:

- Erosion control measures;
- Scarification;
- Seed mixes using native species and adapted to site-specific conditions—as described in Chapter Four of this EA:
- Seeding method;
- Fertilization;
- Mulching;
- Maintenance;
- Off-road vehicle barriers;
- Sediment control structures;
- Monitoring; and,
- Noxious weed control.

The applicable application would describe the specific seed mixture to be used and the location of sediment control and reclamation measures described in this EA or identified during on-site inspections by BTA and BLM.

Information contained in reclamation sections of an application would be of sufficient detail to demonstrate that sensitive resources would be adequately protected, that impacts would be adequately mitigated and that the proposed designs and construction would implement environmental protection measures described in the PO. Specific erosion control and reclamation measures, and locations for use, would be determined during on-site investigations by the inter-disciplinary team.
CHAPTER FIVE
CONSULTATION AND COORDINATION

5.1 TEAM ORGANIZATION


Cooperating Agency. None.

5.2 LIST OF PREPARERS

The interdisciplinary staff involved in the preparation and review of this EA is listed on Table 5-1.

5.3 SCOPING AND ISSUES IDENTIFICATION

A public scoping process for this EA consisted of the following actions:

- Mailing of a scoping notice on August 16, 1994 to local landowners, permittees, environmental groups, oil and gas operators and other parties who have expressed an interest in past oil and gas activities within the Green River Resource Area;
- Mailing of the August 16, 1994 scoping notice to Federal, State and County government offices and officials, newspapers, radio stations, public land users and user groups; and,
- A review of issues raised during scoping for similar oil and gas projects in the region.

A total of 12 responses were received. All comments were considered in preparation of the EA. The following issues were identified during scoping:

- Potential impacts to aesthetic, air quality and recreation values in the East Sand Dunes and South Pinnacles Wilderness Study Area;
- Potential effects to a proposed National Conservation Area;
- Potential impacts to big game crucial winter range;
- Cumulative impacts to wildlife and wildlife habitats;
- Potential impacts to migratory birds and nesting raptors;
- Potential impacts of electrical power lines on raptors;
- Potential impacts to threatened or endangered species;
- Potential degradation of water quality and wildlife habitat quality;
- Risks of wildlife exposure to hazardous materials;
- Analytical problems due to incomplete information;
- Potential impacts to wetlands and waters of the U.S.;
- Potential impacts to alkali soils and steep slopes;

Table 5-1. List of Preparers and Reviewers

<table>
<thead>
<tr>
<th>Name</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaron Clark</td>
<td>President, PIC Technologies, Inc.</td>
</tr>
<tr>
<td>Gerald Jacob</td>
<td>Project Management, Document Preparation, NEPA Compliance, Proposed Action, Special Management Areas, Visual, Recreation, Cumulative</td>
</tr>
<tr>
<td>Archie Reeve</td>
<td>Wildlife, T&amp;E, Vegetation, Wild Horses</td>
</tr>
<tr>
<td>Kathy Adenlof</td>
<td>Surface Water, Groundwater, Wetlands, Floodplains</td>
</tr>
<tr>
<td>David Kane</td>
<td>Range, Vegetation</td>
</tr>
<tr>
<td>Dan Duce</td>
<td>Soils</td>
</tr>
<tr>
<td>Archaeological Services, Western Wyoming College</td>
<td>Author of Class III Cultural Resources Report (Permanent Gas Sales Pipeline Corridor)</td>
</tr>
<tr>
<td>Joe Thomas, Phyllis Lucas</td>
<td>Maps, Graphics</td>
</tr>
<tr>
<td>William LeBarron</td>
<td>Green River Resource Area Manager</td>
</tr>
<tr>
<td>Russ Tanner</td>
<td>Cultural Resources</td>
</tr>
<tr>
<td>Jim Perkins</td>
<td>Range, Vegetation</td>
</tr>
<tr>
<td>Don Judice</td>
<td>Petroleum Engineer</td>
</tr>
<tr>
<td>Jon Dolak</td>
<td>Surface Compliance, Reclamation</td>
</tr>
<tr>
<td>Rick Amidon</td>
<td>Wildlife, Fisheries, T&amp;E Animals</td>
</tr>
<tr>
<td>Wayne Sutherland</td>
<td>Geology, Water Quality, Paleontology</td>
</tr>
<tr>
<td>Barbara Amidon</td>
<td>T&amp;E Plants</td>
</tr>
<tr>
<td>John McDonald</td>
<td>Soils</td>
</tr>
<tr>
<td>Dennis Doncaster</td>
<td>Hydrology</td>
</tr>
<tr>
<td>John Henderson</td>
<td>Wetlands and Riparian Resources</td>
</tr>
<tr>
<td>Bill McMahan</td>
<td>Document Review, NEPA Compliance</td>
</tr>
</tbody>
</table>
• Possible effects of future mineral explorations for uranium, evaporite deposits, micaceous and volcanic rocks (diamond bearing);
• Hazards due to wind blown sands;
• Protection of unique natural features, Wilderness Study Areas and historic trails;
• Potential impacts to cultural resources;
• Potential economic benefits to local communities;
• Demands on existing community infrastructures;
• Land use changes from agricultural to mineral-oriented;
• Contingency plan for H,S release;
• Housing of the work force and worker camps;
• Potential for damage to existing underground pipelines;
• Compatibility with existing management plans and objectives;
• Cumulative impacts;
• Potential economic and tax benefits to be derived;
• Implementation of effective mitigation.

Information was requested from the respondent (Sierra Club) about the boundaries, goals and nature of the National Conservation Area discussed in their response to scoping.

5.4 AGENCY AND PUBLIC REVIEW

Respondents in the scoping process are listed below.

Federal Agencies:

U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service

Agencies of the State of Wyoming:

State of Wyoming, Office of the Governor
Wyoming Public Service Commission
Geological Survey of Wyoming
Wyoming Game and Fish Department
Wyoming Department of Commerce

Sweetwater County Agencies

Department of Staff Resources & Technical Services

Citizen Groups and Regional Groups

National Wildlife Federation
Sierra Club
Wind River Multiple Use Advocates

5.5 DOCUMENT AVAILABILITY

Affected landowners and affected permittees were provided with copies of this document along with landowners, environmental groups, oil and gas operators, Federal, State and local government agencies, and other parties who have expressed an interest in past oil and gas activities in the vicinity of the proposed project.
LIST OF REFERENCES


APPENDIX A

Environmental Standards, Procedures and Requirements for BTA Bravo Development

The standards, procedures and requirements described below are quoted, in part, from the draft Green River Resource Area Management Plan and Draft Environmental Impact Statement (BLM, 1992) and BLM State and District standards. Permit applications refer to APDs, ROW applications and other required BLM applications. Some of the following measures may not apply to project activities but have been included for completeness.

Pending issuance of the final RMP-EIS, BTA has agreed to incorporate these standards, procedures and requirements into its proposed field development. In this way implementation of the Proposed Action or project alternative will not foreclose implementation of management alternatives discussed in the draft RMP.

A-1. General Standard Operating Procedures for Surface-Disturbing Activities Related to Oil and Gas Development

A-1.1 General Surface Disturbance

Surface disturbance will be prohibited on slopes in excess of 25 percent. Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the Authorized Officer.

Surface disturbance will be prohibited within important scenic areas (Class I and II Visual Resource Management Areas). Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the Authorized Officer.

Surface disturbance will be prohibited within 500 feet of surface water and/or riparian areas. Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the Authorized Officer.

Surface disturbance will be prohibited within one-quarter mile of the visual horizon (whichever is closer) of historic trails. Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the Authorized Officer.

Construction will be prohibited with frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur. Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the Authorized Officer.

A-1.2 Handling of Topsoil and Spoil

Before a surface disturbing activity is authorized, topsoil depth will be determined. The amount of topsoil to be removed, along with topsoil placement areas, will be specified in the authorization.

The uniform distribution of topsoil over the area to be reclaimed will be required unless conditions warrant a varying depth.

On large surface-disturbing projects (e.g., gas processing plants) topsoil will be stockpiled and seeded to reduce erosion.

Where feasible, topsoil stockpiles will be required to be designed to maximize surface area to reduce impacts to soil microorganisms. It is recommended that stockpiles be no more than 3-4 feet high.

Where possible, topsoil would be piled in a linear fashion, mulched as necessary, and seeded to reduce wind and water erosion and soil micro-organism depletion. Stockpiles remaining less than two years are best for soil micro-organism survival and native seed viability.

Areas used for spoil storage will be required to be stripped of topsoil before spoil placement. The replacement of topsoil after spoil removal will be required.

Temporary disturbances which do not require major excavation (e.g., small pipelines) may be stripped of vegetation to ground level using mechanical treatment, leaving topsoil intact and root mass relatively undisturbed.

Closures due to saturated soil conditions when soil resource damage would occur due to wheel rutting or compactions on wet soils may be applied (dependent on the type and duration of the action and the effect on site-specific soil characteristics).

Disturbances will be limited on slopes greater than 25 percent.

Linear facilities such as pipelines are projects requiring soil interpretations. Evaluation and interpretation involves identification of soil properties which would influence their use and recommendations for development while minimizing soil loss.

A-1.3 Construction, Maintenance and Reclamation of Roads

Recognized roads, as shown on the Rock Springs District Office Transportation Plan, will be used when the alignment is acceptable for the proposed use.

Generally, roads will be required to follow natural contours; be constructed in accordance with standards as described in BLM Road Standards and BLM Manual section 9113; and be reclaimed to BLM standards.

A-2
To control or reduce sediment from roads, guidance involving proper road placement and buffer strips to stream channels, graveling, proper drainage, seasonal closure, and in some cases redesign or closure of old roads will be developed when necessary.

Road construction may be prohibited during periods when soil material is saturated, frozen, or when watershed damage is likely to occur.

On newly constructed roads and permanent roads, the placement of topsoil, seeding, and stabilization will be required on all cut and fill slopes unless conditions prohibit this (e.g., rock).

No unnecessary side-casting of material (e.g., maintenance) on steep slopes will be allowed.

Snow removal plans may be required so that snow removal does not adversely affect reclamation efforts or resources adjacent to the road.

Reclamation of abandoned roads will include requirements for reshaping, recontouring, resurfacing with topsoil, installation of water bars, and seeding on the contour. The removal of structures such as bridges, culverts, cattle guards and signs usually will be required.

Stripped vegetation will be spread over the disturbance for nutrient recycling, where practical. Fertilization or fencing these disturbances will not normally be required. Additional erosion control measures (e.g., fiber matting) and road barriers to discourage travel may be required.

Road closures may be implemented during crucial periods (e.g., wildlife winter periods, spring runoff, and calving and fawning periods).

In rough terrain, the type of road construction is side-casting (using the material taken from the cut portion of the road to construct the fill portion; slightly less than one-half of the road bed is on a cut area and the rest is on a fill area).

Roads are usually constructed with a 14-foot (single lane) or 24-foot (double lane) running surface (in relatively level terrain).

Soil texture, steepness of the topography, and moisture conditions may dictate surfacing the access road in some places but generally not for the entire length.

A-I-4 Construction of Well Pads and Facilities

On well pads and larger locations, the surface use plan will include objectives for successful reclamation including: soil stabilization, plant community composition, and desired vegetation density and diversity.

No surface disturbance is recommended on slopes in excess of 25 percent unless erosion controls can be ensured and adequate revegetation is expected. Engineering proposals and revegetation and restoration plans will be required in these areas.

Before disturbance, the BLM should determine topsoil depth on proposed projects. This depth along with topsoil placement is to be specified in stipulations.

On producing locations, operators will be required to reduce slopes to original contours (not to exceed 3:1 slopes). Erosion control measures will be required after slope reduction.

Facilities will be required to approach zero runoff from the location to avoid contamination and water quality degradation downstream.

All unused portions of facilities or producing well locations will be resurfaced with topsoil and seeded with soil stabilizing species. Mulching, erosion control measures, and fertilization may be required to achieve acceptable stabilization.

Terraces or elongated water breaks would be constructed after slope reduction.

Snow fences, placed to increase snowfall accumulation over a reclaimed area, and reshaping to create shallow depressions (to catch surface runoff) may be required in areas receiving 10 inches or less of annual precipitation.

No sour gas lines would be located closer than one mile to a populated area or sensitive receptor. The applicants must use the best available engineering design (e.g., alignment, block valve type and spacing, pipe grade), and best construction techniques (e.g., surveillance, warning signs) as approved by the Authorized Officer to minimize both the probability of rupture and radius of exposure in the event of an accidental pipeline release of sour gas.

A variance from the one-mile distance may be granted by the Authorized Officer based on detailed site-specific analysis that would consider meteorology, topography, and special pipeline design and/or construction measures. This analysis would ensure that populated areas and sensitive receptors would not be exposed to an increased level of risk.

It is recommended that all reserve pits be lined unless soil permeability is less than 0.06 inches per hour.

A-I-5 Construction and Reclamation of Pipelines

Existing crowned and ditched roads will be used for access where possible to minimize surface disturbances.

Where possible, clearing of pipeline and communication line rights-of-way will be accomplished with the least degree of disturbance to topsoil.

Where topsoil removal is necessary, it will be stockpiled (wind-rowed) and respread over the disturbance after construction and backfilling are completed.

Vegetation removed from the right-of-way will also be required to be respread to provide protection, nutrient cycling, and a natural seed source. Bladed surface materials would be respread upon the
cleared route once construction is completed.

To promote soil stability, the compaction of backfill over the trench will be required (not to extent above the original ground level after the fill has settled).

Water bars, mulching, and terracing will be required, as needed, to minimize erosion. Guides for construction and water bar placement are found in "Surface Operating Standards for Oil and Gas Exploration and Development" (USDI, 1978).

Instream protection structures (e.g., drop structures) may be required in drainages crossed by a pipeline to prevent erosion.

Disturbed areas and linear disturbances that have been reclaimed may need to be fenced when the route is near livestock watering areas.

On ditches exceeding 36 inches, 6-10 inches of surface soil should be salvaged where possible on the entire right-of-way.

When pipelines and communication lines are buried, there should be at least 30 inches of backfill on top of the pipe.

A-1.6 Reclamation

Abandoned sites must be satisfactorily rehabilitated by the lessee in accordance with a plan approved by BLM.

Soil samples may be processed to determine reclamation potential, appropriate reseeding species, and nutrient deficits. Tests may include: pH, mechanical analysis, salt content, ESP, and nitrogen, phosphorous, and potassium.

Areas not used for production purposes should be backfilled and blended into the surrounding terrain, reseeded and erosion control measures installed.

All excavations and pits should be closed by backfilling and contouring to conform to surrounding terrain.

All reclamation is expected to be accomplished as soon as possible (3 to 5 years) after the disturbance occurs with efforts continuing until a satisfactory revegetation cover is established and the site is stabilized.

On all areas to be reclaimed, seed mixtures will be required to be site-specific and will be required to include species promoting soil stability.

Livestock palatability and wildlife habitat needs will be given consideration in seed mix formulation.

Interseeding, secondary seeding, or staggered seeding may be required to accomplish revegetation objectives.

During rehabilitation of areas in important wildlife habitat, provision will be made for the establishment of native browse and forb species, if determined to be beneficial for the habitat affected.

Follow-up seeding or corrective erosion control measures may be required on areas of surface disturbance which experience failure.

Trees, shrubs, and ground cover (not to be cleared from rights-of-way) will require protection from construction damage.

Backfilling to preconstruction condition (in a similar sequence and density) will be required. The restoration of normal surface drainage will also be required.

Any mulch used will be free from mold, fungi, or noxious weed seeds. Mulch may include native hay, small grain straw, wood fiber, live mulch, cotton, jute, synthetic netting, and rock. Straw should contain fibers long enough to facilitate crimping and provide the greatest cover.

The grantee or lessee will be responsible for the control of all noxious weed infestations of surface disturbances. Control measures will adhere to those allowed in the Rock Springs District Noxious Weed Control EA (USDI, 1982) or the Regional Northwest Area Noxious Weed Control Program EIS (USDI, 1987).

A-2. Resource-Specific Protection Measures and Procedures

A-2.1 Air Quality Protection Measures

As projects are planned that include possible major sources of air pollutant emissions, special air quality protection related stipulations are added to BLM permits and rights-of-way grants.

The BLM coordinates with the Wyoming Department of Environmental Quality/Air Quality Division during the process of analysis. This coordination often results in the technical review of applications for permits and/or identification of additional stipulations to be applied to these permits.

The release of hazardous air contaminants, particularly the emissions from sour gas sweetening plants (a process used to remove H₂S from natural gas resulting in the emission of sulfur dioxide) is a public concern.

BLM requires industry to prepare analyses of risks involved with the development of sour gas pipelines and treatment facilities. These analyses are designed to project impacts both to the public and to resource values.

BLM will consult with the State of Wyoming, the U.S. Forest Service, industry, and the public to ensure that the most technically sound, environmentally balanced, and economically feasible decisions
are made.

The emission of fugitive dust shall be limited by all persons handling, transporting, or storing any material to prevent unnecessary amounts of particulate matter from becoming airborne to the extent that ambient air standards described in Wyoming Air Quality Standards and Regulations, 1989, Section 14 are exceeded.

Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings, or structures, construction operations, the grading of roads or the clearing of land are appropriate control measures (Wyoming Air Quality Standards and Regulations, 1989, Section 14).

Application of asphalt, oil, water, or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which can give rise to airborne dusts are appropriate control measures (Wyoming Air Quality Standards and Regulations, 1989, Section 14).

Installation and use of hood, fans, and fabric filters to enclose and vent the handling or dusty materials are appropriate control measures; adequate containment methods shall be employed during sandblasting or other similar operations (Wyoming Air Quality Standards and Regulations, 1989, Section 14).

Covering, at all times when in motion, open bodied trucks, transporting materials likely to give rise to airborne dust are appropriate control measures (Wyoming Air Quality Standards and Regulations, 1989, Section 14).

A-2.2 Watershed Best Management Practices

Dumping of produced water on roads will not be allowed unless they contain less than 400 mg/l TDS and do not contain hazardous wastes.

Main artery roads, regardless of primary user, will be crowned, ditched, drained, and surfaced with gravel to reduce sediment, salt, and phosphate loading to the Green River.

Reserve pits will not be located in areas where groundwater is less than 50 feet from the surface and soil permeability is less than 0.06 inch per hour.

In areas where soil permeability is less than 0.06 inch per hour and where shallow ground water exists (50 feet or less), produced waste water from oil and gas operations will be disposed of in an approved aboveground storage tank or other acceptable means to comply with Onshore Order #7.

Any produced water pit or drilling fluids pit that shows indications of containing hazardous wastes will be tested for the Toxicity Characteristic Leaching Procedure (TCLP) constituents. If analysis proves positive, the fluids will be disposed of in an approved manner. The cost of the testing and disposal will be borne by the potentially responsible party.

A-2.3 Wildlife Mitigation Guidelines

To protect important big game (elk, moose, deer, antelope, and bighorn sheep) winter habitat, activities or surface use will not be allowed from November 15 to April 30 within certain areas (crucial winter range) encompassed by the authorization.

The same criteria apply to defined big game (elk and bighorn sheep) birthing areas from May 1 to June 30.

To protect important raptor (eagles, accipiters, falcons, buteos, osprey, burrowing owl) and/or sage and sharp-tailed grouse nesting habitat, activities or surface use will not be allowed from February 1 to July 31 within certain areas encompassed by the authorization.

The same criteria apply to defined raptor and raptor game bird winter concentration areas from November 15 to April 30.

No activities or surface use will be allowed on that portion of the authorization area identified within (a specified locale) for the protecting habitat (e.g., sage/sharp-tailed grouse breeding grounds, and/or other species/activities).

The "no surface occupancy" stipulation of February 1 to July 30 within ½ mile of raptor nest can be shortened, depending on nesting chronology of individual species, nest site location, and topography. Inactive nests can be excepted, as may certain types of short-term, minor disruption land use activities which are not anticipated to affect nesting success.

A "no surface occupancy" stipulation will be applied to a ½ mile radius of active sage grouse strutting grounds to include no aboveground facilities (power lines, storage tanks, fences, etc.). Linear disturbances such as low-traffic roads, pipelines, seismic activity, etc., could be granted exceptions.

A "no surface disturbance" stipulation will be applied from February 1 through May 15 within ½ mile radius of active strutting grounds from 6 pm to 8 am daily. The actual timing of this stipulation can be modified by weather conditions such as fog and cloudy conditions, or clear, bright moonlit nights.

On portions of the authorized use area (with legally described location) known or suspected to be essential habitat for a threatened or endangered species, the lessee/permittee will be required to conduct inventories or studies in accordance with BLM and U.S. Fish and Wildlife Service guidelines to verify the presence or absence of the species prior to conducting any on-site activities.

In the event that a threatened or endangered species occurs, the lessee/permittee will be required to modify operational plans to include the protection requirements of the species and its habitat (e.g., seasonal use restrictions, occupancy limitations, facility design modifications).

A-2.4 Cultural and Paleontological Resource Mitigation Guidelines

The cultural resource management process described in Appendix 6 of the Green River Resource Area Resource Management Plan and Draft EIS (1992) will be followed for compliance with Section

When a proposed discretionary land use has potential for affecting the characteristics which qualify a cultural property for the National Register of Historic Places, mitigation will be considered.

In accordance with Section 106 of the Historic Preservation Act, procedures specified in 36 CFR 800 will be used in consultation with the Wyoming State Historic Preservation Officer and the Advisory Council on Historic Preservation in arriving at determinations regarding the need and type of mitigation to be required.

The preferred strategy for treating potential adverse effects on cultural properties is "avoidance". If avoidance involves project relocation, the new project area may also require cultural resource inventory.

If avoidance is imprudent or unfeasible, appropriate mitigation may include excavation (data recovery), stabilization, monitoring, protection barriers and signs, or other physical and administrative measures.

Mitigation of paleontological and natural history sites will be treated on a case-by-case basis. Factors such as site significance, economics, safety, and project urgency must be taken into account when making a decision to mitigate.

Authority to protect (through mitigation) such values is provided for in FLPMA, Section 102(a)(8). When avoidance is not possible, appropriate mitigation may include excavation (data recovery), stabilization, monitoring, protection barriers and signs, or other physical protection measures.

APPENDIX B
Dear Mr. Kane:

Thank you for your request of July 21 regarding candidate, threatened, or endangered species that may occur in the vicinity of Alkali Flats, Sweetwater County, Wyoming. In accordance with section 7(c) of the Endangered Species Act of 1973, as amended (ESA), my staff has determined that the following threatened or endangered (T/E) species may be present in the project area.

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Expected Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black-footed ferret&lt;br&gt;(Mustela nigripes)</td>
<td>Endangered</td>
<td>Potential resident in prairie dog (Cynomys sp.) colonies.</td>
</tr>
<tr>
<td>Bald eagle&lt;br&gt;(Haliaeetus leucocephalus)</td>
<td>Endangered</td>
<td>Migrant.</td>
</tr>
<tr>
<td>Peregrine falcon&lt;br&gt;(Falco peregrinus)</td>
<td>Endangered</td>
<td>Migrant.</td>
</tr>
</tbody>
</table>

Candidate species that may occur within the project area are identified below. Many Federal agencies have policies to protect candidate species from further population declines. I would appreciate receiving any information available on the status of these species in or near the project area.

<table>
<thead>
<tr>
<th>Species</th>
<th>Category</th>
<th>Expected Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferruginous hawk&lt;br&gt;(Buteo regalis)</td>
<td>2</td>
<td>Grasslands statewide</td>
</tr>
<tr>
<td>Mountain plover&lt;br&gt;(Charadrius montanus)</td>
<td>1</td>
<td>Grasslands statewide</td>
</tr>
<tr>
<td>Long-billed curlew&lt;br&gt;(Numenius americanus)</td>
<td>3C</td>
<td>Grasslands/wetlands</td>
</tr>
<tr>
<td>Loggerhead shrike&lt;br&gt;(Lanius ludovicianus)</td>
<td>2</td>
<td>Woodlands/shrublands statewide</td>
</tr>
</tbody>
</table>

If you have any questions please contact Mike Jennings of my staff at the letterhead address or phone (307) 772-2374.

Sincerely,

Charles P. Davis
Field Supervisor
Wyoming State Office

cc: Director, WGFD, Cheyenne, WY
Nongame Coordinator, WGFD, Lander, WY

Mr. David P. Kane

Plants
Large-fruited bladderpod<br>(Lesquerella macrocarpa)

2 Barren clay hill and flats

*1 = Federal T/E listing appears appropriate and is anticipated. 2 = Current data insufficient to support listing. 3C = More widespread or abundant than previously believed, or no immediate threats identified.