Final Environmental Impact Statement

Bull Mountain Natural Gas Pipeline

United States Department of Interior

Bureau of Land Management

United States Department of Agriculture

Forest Service

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USDI Bureau of Land Management, Glenwood Springs Field Office
USDA Forest Service, White River National Forest
USDA Forest Service, Grand Mesa-Uncompahgre-Gunnison National Forests

Gunnison, Delta, Mesa, and Garfield Counties, Colorado

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Bull Mountain Natural Gas Pipeline
Final Environmental Impact Statement
Gunnison, Delta, Mesa, and Garfield Counties, Colorado

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Abstract: The Bureau of Land Management (BLM), with USDA Forest Service (FS) consultation, proposes to issue a permanent right-of-way (ROW) grant and temporary use area (TUA) permits that would authorize SG Interests (SG) to construct, operate and maintain the Bull Mountain Natural Gas Pipeline (BMNGP). The BMNGP project would involve installing approximately 25.5 miles of 20-inch diameter buried steel natural gas pipeline and related aboveground appurtenances within a 50-foot permanent ROW, and the reconstruction or upgrading of FS and BLM roads to a standard sufficient for the construction of the ROW, pipeline and associated traffic. The BLM and FS also propose to authorize SG to install a produced water pipeline of 8-inch diameter steel pipeline within the same ROW trench as the gas pipeline. Surface disturbance during road reconstruction/upgrading and ROW/pipeline construction is estimated to be 390 acres considering a proposed construction ROW (part of TUA) of approximately 100 feet (50 feet additional to permanent ROW). The 50-foot permanent ROW would encompass 154 acres out of the 410 acres mentioned above. The remaining surface disturbance (upto 101 acres) would occur as a result of needed road upgrades/reconstruction prior to pipeline construction. The proposed pipelines and related facilities would be located on BLM public lands administered by the Glenwood Springs Field Office and on National Forest System (NFS) lands administered by the White River (WRNF) and Grand Mesa-Uncompahgre-Gunnison (GMUG) National Forests. Other ancillary facilities would be located on private lands approximately 45 miles northeast of Paonia, CO and 10 miles south of Silt, CO (See Figure 1).

TABLE OF CONTENTS

List of Figures

SUMMARY OF THE FINAL ENVIRONMENTAL IMPACT STATEMENT (FEIS)

PROPOSED ACTION

The Bureau of Land Management (BLM), with USDA Forest Service (FS) consultation, proposes to issue a right-of-way (ROW) grant and temporary use area (TUA) permits that would authorize SG Interests (SG) to construct, operate and maintain the Bull Mountain Natural Gas Pipeline (BMNGP). The BMNGP project would involve installing approximately 25.5 miles of 20-inch diameter buried steel natural gas pipeline and related aboveground appurtenances within a 50-foot permanent ROW, and the reconstruction or upgrading of FS and BLM roads to a standard sufficient for the construction of the ROW, pipeline and associated traffic. The BLM and FS also propose to authorize SG to install a produced water pipeline of 8-inch diameter steel pipeline within the same ROW trench as the gas pipeline. Surface disturbance during road reconstruction/upgrading and ROW/pipeline construction is estimated to be 390 acres considering a proposed construction ROW of approximately 100 feet (50 feet additional to permanent ROW). The 50-foot permanent ROW would encompass 154 acres out of the 390 acres mentioned above. The remaining surface disturbance (81 acres) would occur as a result of needed road upgrades/reconstruction prior to pipeline construction. The proposed pipelines and related facilities would be located on BLM public lands administered by the Glenwood Springs Field Office and on National Forest System (NFS) lands administered by the White River (WRNF) and Grand Mesa-Uncompahgre-Gunnison (GMUG) National Forests. Other ancillary facilities would be located on private lands approximately 45 miles northeast of Paonia, CO and 10 miles south of Silt, CO (See Figure 1).

SIGNIFICANT ISSUES

Internal and external scoping identified the following significant issues and these issues were used to develop the action alternatives and project design criteria. The significant issues include the following:

Table S-1. List of Significant Issues

Issue Topic	Cause and Effect
1. Effects on Inventoried Roadless Areas (IRAs)	The 25.5 miles of proposed Pipeline construction and ROW grant could alter roadless character in approximately 8.33 miles of three Inventoried Roadless Areas: Clear Creek IRA (GMUG) – 5.75 miles; East Willow IRA (WRNF) – 1.72 miles; and Baldy Mountain IRA (WRNF) – 0.86 miles. Inventoried Roadless Areas character could be affected by initial land disturbance and long-term appearance of a linear pipeline ROW.
2. Effects on Visual Resources	Pipeline ROW construction and installation of associated facilities will reduce the visual appearance of the landscape due to initial land disturbance and long-term appearance of a linear pipeline ROW, but may or may not maintain compliance with designated visual objectives. This depends on how well the VRPP is followed.
3. Effects on Soils	Pipeline ROW construction could adversely affect soil structure and stability in the project area thus potentially causing mass wasting and other soil erosion issues.
4. Effects on Air Quality	Pipeline ROW construction, compressor use, and project-related traffic could cause reductions in air quality standards, regulations and requirements resulting from fugitive dust, pollutants and NO^x and CO emissions.

Issue Topic	Cause and Effect
5. Effects on Vegetation	Clearing vegetation for pipeline ROW construction would reduce the existing vegetation and the benefits that vegetation provides.
6. Noise Impacts	Pipeline ROW and facility construction activities, and traffic noise, could have negative effects on private property owners and wildlife due to increased and unfamiliar noise.
7. Effects on Big Game Wildlife Habitat	Pipeline ROW construction activities could adversely affect wildlife use of summer range and calving and fawning habitat due to displacement and/or loss of habitat.

ALTERNATIVES CONSIDERED IN DETAIL

The BLM and FS developed five alternatives: the No Action, the Proposed Action (Preferred Alternative), and three other action alternatives generated in response to issues raised by the public and the project Interdisciplinary Team (IDT). The five alternatives considered in detail for this analysis are listed in Table S-2 below. Complete details of the alternatives, including project design criteria, are found in Chapter 2 of this document.

Table S-2. List of Alternatives Considered in Detail

No Action Alternative	The No Action is the baseline for comparing the other alternatives. The natural gas and water pipelines and associated facilities would not be authorized or built on Federal Lands and road upgrades necessary to accommodate construction would not occur for this project.
Proposed Action (Preferred Alternative)-Parallel Ragged Mountain Pipeline	The Proposed Action is the proposed pipeline route as submitted by the project proponent (SG). The Proposed Action is also the agencies' Preferred Alternative. Total pipeline length is approximately 25.5 miles.
Alternative 1-Maximize Following Existing Roads	Alternative 1 is the alternative developed in response to public and IDT input for a route that would maximize following existing roads. In the northern end of the project area, the route would follow County Road 79/344 and National Forest System Road (#800) along West Divide Creek, and follow National Forest System Roads #265 and #844 on the southern end of the project area. The middle portion of this route would be the same as the Proposed Action. No BLM lands are involved in Alternative 1. Total pipeline length is approximately 25.9 miles.
Alternative 2-Avoid Inventoried Roadless Areas	Alternative 2 responds to public input for a route that would avoid all Forest Service Inventoried Roadless Areas (IRA). The route would follow County Road 265 and National Forest System Roads to the west of the proposed action in a longer loop that would include National Forest System Roads #265, #270, #342 and #344. Total pipeline length is approximately 39.1 miles; the longest of all alternatives.
Alternative 3-Avoid IRA & Follow Powerline	Alternative 3 responds to public input for a route that would avoid all Forest Service Inventoried Roadless Areas. Alternative 3 is a variation of Alternative 2 in that it would follow the same roads as Alternative 2 at the northern and southern ends but in the middle would follow the existing Curecanti-Rifle 230-kilovolt transmission line. This alternative is shorter in length than Alternative 2, but longer than the proposed action and Alternative 1. Total pipeline length is approximately 32.4 miles.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The environmental consequences of implementing this project, by alternative, are described in detail in Chapter 3 of this document. However, at the end of Chapter 2 are a series of alternative comparison tables that provide a concise summary of the effects by the purpose and need, the significant issues, and the resource areas affected (e.g. Wildlife, Recreation). These tables are not repeated in this section, but can be found in Chapter 2, Section 2.4 - Comparison of Alternatives.

CHAPTER 1: PURPOSE AND NEED FOR ACTION

1.1 DOCUMENT STRUCTURE

The US Department of the Interior (USDOI) – Bureau of Land Management (BLM), and the US Department of Agriculture (USDA) – Forest Service (FS) have prepared this Final Environmental Impact Statement (FEIS) in compliance with the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), agency regulations, and all applicable federal and state laws. This FEIS provides a basis for coordinated federal agency decision-making in a single document, avoiding duplication between federal processes. In addition, other federal, state, and local agencies will use the FEIS in approving or issuing permits or approvals for all or part of the proposed project. Federal, state, and local permits, approvals, and consultations necessary for the BMNGP project are discussed in Section 1.5.4. For the BMNGP project, the BLM is the agency with authority to issue the ROW Grant for the gas pipeline under the Mineral Leasing Act since the gas pipeline traverses lands administered by two or more federal agencies (30 U.S.C. 185 Sec. 28(a). The BLM must consult with the FS in order to grant a ROW for the gas pipeline. A Delegation of Authority will be provided by the Forests to the BLM, which extends the authorization for the "Service First Program" and allows BLM to issue a second ROW for the waterline (P.L. 106-291, as amended, and P.L.09-54, Title IV, Section 428). This FEIS discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into the following sections:

Chapter 1. Purpose and Need for Action: This chapter includes background information on the project proposal, the purpose and need for the project, and the proposal for achieving that purpose and need. This section also describes how the BLM/FS informed the public of the proposal and identifies the key issues that drive the analysis.

Chapter 2. Alternatives, including the Proposed Action: This chapter provides a more detailed description of the proposed action as well as alternative methods for achieving the stated purpose and need. These alternatives were developed based on significant issues raised by the public, the interdisciplinary team (IDT), and other agencies. This section also provides a number of summary tables comparing the alternative actions and the environmental consequences associated with each alternative.

Chapter 3. Affected Environment and Environmental Consequences: This chapter describes the physical, biological, and human environments potentially affected by the proposed action and alternatives, and describes the potential effects of the proposed action and alternatives, including the no-action alternative.

Chapter 4. Consultation and Coordination: This chapter provides a list of preparers and agencies consulted during the development of the environmental impact statement, and a list of those who the document was distributed to.

Other Sections: The document also includes a glossary, a list of references, appendices and an index.

Additional documentation, including more detailed analyses of project area resources may be found in the project planning record files. Permanent project planning record files will be located at the Bureau of Land Management - Glenwood Springs Field Office, 50629 Highways 6 & 24, Glenwood Springs, Colorado 81601. For information regarding planning record files content please contact Niccole Mortenson, Project Manager at (970) 874-6616 or nmortenson@fs.fed.us.

1.2 INTRODUCTION

On June 10, 2004, the project proponent SG Interests I, LTD (SG) and their authorized agent, Trigon EPC, filed an Application for Transportation and Utility Systems and Facilities on Federal Lands (Standard Form 299, project file) to construct, operate, and maintain a natural gas pipeline and related facilities on public lands administered by the BLM Glenwood Springs Field Office, and National Forest System (NFS) lands administered by the Grand Mesa-Uncompahgre and Gunnison National Forests (GMUG) and the White River National Forest (WRNF). SG also applied for temporary use area (TUA) authorizations (includes construction ROW) with the natural gas pipeline, including authorization for a water pipeline to transport water co-produced with natural gas to an appropriate disposal site. The proposed natural gas pipeline and related facilities would extend approximately 25.5 miles between its southern origin point on private land in T11S, R90W, Section 10, and its northern terminus also on private land at the existing Divide Creek Compressor Station in T8S, R92W, Section 1.

The proposed natural gas pipeline corridor would traverse through portions of Gunnison, Delta, Mesa, and Garfield Counties, Colorado (See Figure 1 for a vicinity map). Of the approximately 25.5 miles of proposed pipeline, 3.8 miles are on BLM public lands in Garfield County, 8.4 miles are on GMUG NFS lands within Delta and Gunnison Counties, 8.2 miles are on WRNF NFS lands within Mesa and Garfield Counties, and the remaining 5.0 miles are located on private lands.

The Bull Mountain Natural Gas Pipeline Project (BMNGP) proposal calls for a 20-inch diameter natural gas pipeline and an 8-inch diameter water pipeline to be co-located within a 50-foot permanent right-of-way (ROW) grant. The proposed natural gas pipeline would interconnect on the north end with an existing 14-inch pipeline (“Questar Line”) at the Divide Creek Compressor Station in Garfield County, Colorado. The 14-inch (“Questar Line”) pipeline is linked to the Meeker/Greasewood Hub Compressor Station west of Meeker, Colorado for gas delivery to the national energy transmission network.

SG is the unit operator of the Bull Mountain Unit Area (an approximately 20,000-acre area of federal (BLM), state and private “unitized” lands available for mineral discovery, development and production) located in Gunnison County at T11S, R89W, R90W and T12S, R89W and R90W (See FEIS Appendix A-Figure 18). SG proposed this pipeline and related facilities to transport natural gas from the Bull Mountain Unit to the national energy market. The Bull Mountain Unit is currently at 320-acre spacing which would potentially accommodate 55-60 wells over the 20,000-acre unit. There are currently 3 wells drilled in the Bull Mountain Unit.

Existing pipelines will continue to be used as they are and serve the local energy market and further not a part of the analysis. They are both in the listed in cumulative effects.

Based on current test well pressure data, approximately 8 million standard cubic feet per day (MMSCFD) could be produced from the Bull Mountain Unit at the present time. The gas pipeline would be designed for a maximum operating pressure (MAOP) of 1440 psig. Probable natural gas system operating pressure is approximately 900 psig with a resulting design flow rate in excess of 80 MMSCFD, which is the anticipated production volume from the Bull Mountain Unit based on test well pressure data if Unit build-out over the next 10 to 12 years occurs. Under this project proposal, the BLM would issue a ROW grant for a term of 30 years with right to renew. The estimated life of the pipeline is approximately 50 years based on industry standard.

The proposed Bull Mountain Pipeline ROW would be immediately adjacent to and paralleling existing natural gas pipeline ROWs (Ragged Mountain Pipeline and Rocky Mountain Natural Gas Pipeline) for approximately 10 miles of the total proposed 25.5 mile route. Of the 10 miles paralleling the existing pipeline ROWs, 7.7 miles would be on NFS lands and 2.3 miles on private lands. The Ragged Mountain Pipeline (RMP) has a permitted 20-foot ROW which would result in an approximate 10-foot overlap with the proposed 50-foot permanent ROW for the BMNGP due to offset requirements.

The 6-inch RMP, built in 1983, is located near the Bull Mountain Unit and extends across the WRNF and GMUG for approximately 22.6 miles (See FEIS Appendix A-Figure 1 and Figure 18). The estimated capacity of the RMP is 7 MMSCFD (after the recent compression upgrade) and is currently operating at approximately 1.8-6 MMSCFD. The RMP is not estimated to have sufficient additional capacity to transport the anticipated production volumes from the Bull Mountain Unit and furthermore, does not provide a connection to the national energy market as its northern terminus is the RMNGP which supplies gas to the local market.

Other options to transport natural gas from the Bull Mountain Unit to the national energy market are discussed in Chapter 2 Alternatives.

1.3 PURPOSE AND NEED

The purpose of the Bureau of Land Management's action is to approve Right-of-Way Grants (ROW grants) and temporary use area (TUA) permits with Forest Service (GMUG and WRNF) concurrence as established by the Federal Land Management and Policy Act of 1976 (FLPMA). The ROW grant responds to SG Interests' (SG's) "Application for Transportation and Utility Systems and Facilities on Federal Lands." Issuance of a ROW would authorize SG to construct, operate and maintain a 20-inch natural gas pipeline together with an 8" produced waterline and associated facilities within a 50-foot permanent right-of-way (ROW) subject to terms and conditions of the ROW grants and stipulations for use of federal lands as identified by the respective land management agencies. The pipeline would accommodate anticipated natural gas production from the Bull Mountain Unit in addition to future "common carrier" (30USC185(r)) capacity needs that could arise from other existing leased production areas. The waterline would transport water co-produced with the gas out of the Bull Mountain Unit production area to an appropriate commercially-available disposal facility at the north end of the project area as a disposal well is currently not available in the Bull Mountain Unit area.

This project conforms to the Federal Government's policy to foster and encourage mineral development, as expressed in the Mining and Minerals Policy Act of 1970 and recognized in FLPMA. This project also conforms to the goals of the Mineral Leasing Act of 1920, as amended, and the 2005 Energy Policy Act, which promotes the development of oil and gas resources by facilitating natural gas production from existing federal oil and gas leases and privately-held mineral interests by allowing transportation of that gas across federal lands to processing and distribution facilities. This project would contribute to meeting the need for domestic energy resources by making gas available to the national energy market via the interstate pipeline network servicing markets in the West, the Midwest, or the central United States.

Further, by providing for mineral development, the Agencies' Land Management Plans (LMPs) acknowledged that these areas could support facilities necessary for production and transportation of natural gas from existing leased production areas. The project responds to goals and objectives for mineral development outlined in the BLM Glenwood Springs Field Office Resource Management Plan (BLM RMP, 1988), the GMUG Land and Resource Management Plan as amended (GMUG Forest Plan, 1993) and the WRNF Land and Resource Management Plan as amended (WRNF Forest Plan, 2002) (collectively referred to as the Land Management Plans). See Section 1.6 for specific goals and objectives of the Land Management Plans by Agency.

1.4 PROPOSED ACTION IN BRIEF

A brief description of the proposed action is provided in this section. The proposed action and other alternatives are described in greater detail in Chapter 2.

The proposed Bull Mountain Natural Gas Pipeline (BMNGP) and related facilities would be located on public lands administered by the Glenwood Springs Field Office of the BLM, on NFS land administered by the White River and Grand Mesa-Uncompahgre-Gunnison National Forests, and on private lands approximately 45 miles northeast of Paonia, CO and 10 miles south of Silt, CO (See Figure 1).

The BLM, in consultation with the FS, proposes to issue a 30-year permanent ROW grant and temporary use (TUA) permits that would authorize SG to construct, operate, and maintain the BMNGP and associated facilities. The BMNGP project would involve installing approximately 25.5 miles of 20-inch diameter buried steel natural gas pipeline and related aboveground appurtenances within the same 50-foot permanent ROW. The BLM, with FS consultation, also proposes to issue a 30-year ROW grant that would authorize SG to install a produced water pipeline of 8-inch diameter steel pipeline laid in the same ROW trench as the gas pipeline. Surface disturbance during construction is estimated to be approximately 390 acres considering a temporary construction right-of-way of 100 feet (includes 50 permanent ROW) and needed road improvements/upgrades to allow project-related traffic. The 50-foot permanent ROW would encompass approximately 154 acres out of the 390 acres mentioned above. Needed road upgrades would account for approximately 81 acres of the 390 acres disturbance.

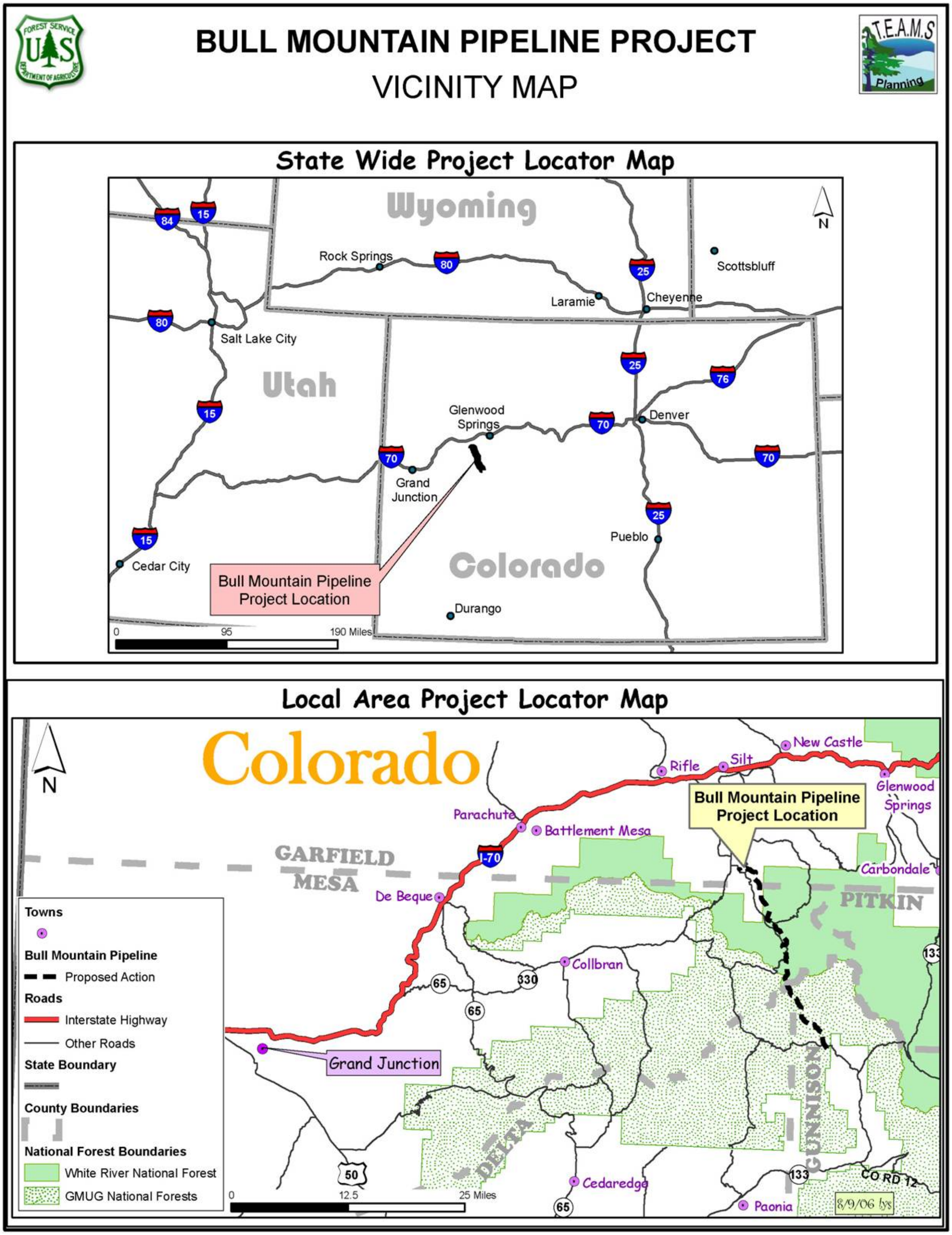
The BMNGP project would also involve the connected actions of (1) construction and operation of a four-acre compressor station and natural gas processing facility on private land at the southern end of the pipeline; and (2) construction of facilities required for pipeline operation at the northern end of the pipeline, also on private land at the existing Divide Creek Compressor Station. Although the BLM and FS have no authority or jurisdiction over such facilities on private land, the agencies must analyze this action in the same impact statement (40 CFR 1508.25).

1. The compressor station on the south end would have 4 compressor units with estimated total 15,760 horsepower (HP) for anticipated build out of the BMNGP at 80 million standard cubic feet per day (MMSCFD). Other ancillary facilities proposed at the 4-acre site, mentioned in more detail in Chapter 2, include a metering station and associated metal building, 480 HP water pump, construction yard, 20-inch pig launcher (piping arrangement that allows cleaning/inspection devices, a.k.a. "pigs," to be placed into a pipeline without stopping flow), and security fencing around the entire site.

2. Facilities proposed at the Divide Creek Compressor Station (private land), mentioned in more detail in Chapter 2, include a metering station and associated metal building, 20-inch pig receiver (piping arrangement that allows "pigs" to be removed from a pipeline without stopping flow) and produced water tank.

In conjunction with the pipeline proposals, the FS proposes to authorize road use permits for construction, reconstruction, use, upgrade, and/or maintenance of existing and/or temporary roads needed for access to the pipeline construction ROW. No new permanent roads are proposed anywhere in the project area.

Figure 1. Project Location Map



1.5 AUTHORIZING ACTIONS AND AGENCY JURISDICTIONS

1.5.1 FEDERAL POLICY, ACTS AND INTERAGENCY GUIDES

MINERAL LEASING ACT OF 1920, AS AMENDED (30 U.S.C. 185)

Application for the BMNGP project was made under Section 28 of the Mineral Leasing Act of 1920 (MLA, as amended, 30 U.S.C 185). The MLA (Sec. 28 (a)) authorizes federal agencies to grant ROWs for pipeline purposes for the transportation of oil, natural gas, synthetic liquid or gaseous fuels, or any refined product produced. The MLA (Sec. 28 (e)) further gives federal agencies authority to allow temporary uses of federal lands for construction, operation and maintenance of pipelines. The BLM and FS implementing regulations for this portion of the MLA are found at 43 CFR 2800, 2880 and 36 CFR 251.

MLA directs the agencies to require the applicant to submit a plan of construction, operation, and rehabilitation for ROWs. SG's submission of a Plan of Development (POD) satisfies this requirement (See FEIS Chapter 2).

In addition, MLA (Sec. 28 (h) (2)) gives the federal agencies the authority to impose stipulations on pipeline projects for the following:

> (A) Requirements for restoration, revegetation, and curtailment of erosion of the surface of the land;
>
> (B) Requirements to insure that activities in connection with the right-of-way or permit would not violate applicable air and water quality standards or related facility siting standards established by or pursuant to law;
>
> (C) Requirements designed to control or prevent:
>
> > (i) Damage to the environment (including damage to fish and wildlife habitat),
> >
> > (ii) Damage to public or private property, and
> >
> > (iii) Hazards to public health and safety; and
>
> (D) Requirements to protect the interests of individuals living in the general area of the right-of-way or permit who rely on the fish, wildlife, and biotic resources of the area for subsistence purposes. Such regulations shall be applicable to every right-of-way granted.

The BMNGP project traverses several federal land management jurisdictional boundaries, and therefore falls under provisions listed in Sec. 28 (c) (2) of MLA that "where the surface of the Federal lands involved is administered by two or more Federal agencies, the Secretary (of Interior) is authorized, after consultation with the agencies involved, to grant or renew rights-of-way or permits through the Federal lands involved." Thus, although the BMNGP project would cross a combination of NFS and BLM public lands, there would be one ROW grant issued for the gas pipeline by the BLM.

PUBLIC LAW 106-291, AS AMENDED, AND PUBLIC LAW 109-54, TITLE IV, SECTION 428

Under the authority of P.L. 106-291, as amended, and Public Law 109-54, Title IV, Section 428, which extends the authorization for the “Service First Program” through Fiscal Year 2008, the BLM, FS, National Park Service, and the U.S. Fish and Wildlife Service may pilot programs to conduct projects, planning, permitting, leasing, contracting, and other activities, either jointly or on behalf of one another. Reciprocal delegations of authorities, duties, and responsibilities may be made to promote customer service and efficiency.

SURFACE OPERATING STANDARDS AND GUIDELINES FOR OIL AND GAS EXPLORATION AND DEVELOPMENTS (“GOLD BOOK”). USDI-BLM & USDA-FOREST SERVICE, 4TH EDITION, 2006

This is the primary BLM-FS guide for Best Management Practices for oil and gas development. The “Gold Book” includes detailed practices, standards and guidelines for the construction of roads and pipelines related to energy exploration and development. Measures described in the “Gold Book” would be included, as appropriate, in any ROW permit issued by the BLM for the Bull Mountain Natural Gas Pipeline project. Exception to or modification of these guidelines is at the surface management agency’s discretion based on the physical conditions at the site.

ENVIRONMENTAL MANAGEMENT SYSTEM (EXECUTIVE ORDER 13148)

The purpose of the Environmental Management System (EMS) is to establish, document, implement, maintain, and continually improve the environmental performance associated with the activities, products and services. EMS conforms to the International Standards Organization (ISO) 140001 standards. Some agencies may not have implemented their EMS program to date; others who have implemented EMS may require the monitoring of significant environmental aspects. These requirements will be reviewed with companies or individuals at a pre-work meeting by an Agency Representative, if they apply.

1.5.2 USDA-FOREST SERVICE DIRECTION

FOREST SERVICE MANUAL 2700, SPECIAL USES MANAGEMENT, CHAPTER 2720, OIL AND GAS DEVELOPMENT (2726.31)

The authority for grants to non-Federal entities for oil and gas pipeline rights-of-way on National Forest System lands for the purpose oil or gas pipeline rights-of-way is Section 28 of the Mineral Leasing Act of 1920, as amended (30 U.S.C. 185). The designation includes only pipelines and directly related facilities for the transportation of oil, natural gas, synthetic liquid or gaseous fuel, and any refined product produced there from.

Section 2726.31a states "Holders of valid BLM oil and gas leases and designated operators of BLM unitized lease areas do not require a special use authorization for pipelines or directly related facilities associated with the lease and located within the boundaries of the lease or unit area, as long as the pipelines or facilities are used solely for the production or gathering of oil and gas. If the pipelines and related facilities are used for the transportation of oil and gas, whether on-lease or off-lease, the pipeline right-of-way must be issued under the authority of the Mineral Leasing Act."

Section 2726.31.2.a states if the non-Federal pipeline crosses Federal lands under the jurisdiction of at least one other agency in addition to Forest Service-administered lands, the Secretary of the Interior, Bureau of Land Management, grants the necessary authorization after concurrence of the Forest Service. "The Forest Service may require that the grant include those terms, conditions, or stipulations necessary to ensure that the grant would not be inconsistent with National Forest System purposes. It also may recommend inclusion of other appropriate terms, conditions, or stipulations. Pursuant to 43 CFR 2882.3(i), the Forest Service also may refuse to grant authorizations or to give the Secretary of the Interior its concurrence if the grant would be inconsistent with National Forest System purposes."

Section 2726.31c states "pipeline rights-of-way shall be only wide enough for efficient operation and maintenance of the pipeline after construction. They shall not exceed 50 feet plus the ground occupied by the pipeline or its related facilities, unless the issuing officer records the reasons why a wider right-of-way is necessary for operation and maintenance after construction, or to protect the environment or public safety. Approve temporary additional widths as necessary during the construction phase of the pipeline."

Section 2726.31.32.a includes "related facilities may include valves, pumping stations, supporting structures, bridges, monitoring and communication devices, surge and storage tanks, terminals, roads, airstrips, and campsites. Related facilities need not connect with or be adjacent to the pipeline and may be the subject of separate authorizations."

FOREST SERVICE MANUAL 2700, SPECIAL USES MANAGEMENT, CHAPTER 2720, 2729.01, AUTHORITY

Forests are directed to "Issue authorizations for the impoundment, storage, transmission, or distribution of water under the appropriate provisions of the Federal Land Policy and Management Act of October 21, 1976 (43 U.S.C. 1761), The Act of October 27, 1986, or if in wilderness, under the Wilderness Act of September 3, 1964."

ROADLESS AREA CONSERVATION RULE (RACR) OF 2001 (36 CFR 294)

RACR of 2001 prohibits road construction in Inventoried Roadless Areas unless it meets the exceptions stated. No road construction is proposed in the Inventoried Roadless Areas. There is no prohibition from installing a pipeline in Inventoried Roadless Areas.

FOREST SERVICE MANUAL 7700, TRANSPORTATION SYSTEM, CHAPTER 7730, 7731.16 – PERMITS

Road Use Permits (RUP) are required to authorize the use of existing National Forest System roads for all commercial purposes (36 CFR 261.54(c)). Permits may fulfill the requirements of an order or authorize a use that an order or regulation restricts. Permits include conditions for road use and for the protection and management of National Forests. Procedures for issuing permits are found in Forest Service Handbook (FSH) 7709.59, section 24.

Commercial Use In order to ensure investment sharing and performance of road maintenance, forest officers may implement systems for authorizing commercial use of National Forest System roads. Issue a road order pursuant to 36 CFR 261.54 requiring that commercial use not otherwise authorized by a contract, agreement, easement, license, or special-use permit be authorized by permit only. Include appropriate investment sharing and maintenance requirements and rules of use as terms of the permit. Under this direction, the GMUG has implemented Forest Supervisor’s Order FS-01-01 that requires all commercial users of forest roads to have a Road Use Permit.

Oversize Vehicles In order to protect the safety of road users and public investment in roads and bridges, use permits to authorize the movement of oversized vehicles when vehicle use is not otherwise authorized by agreement or easement.

Order # R2-2007-01 Pursuant to Title 16 U.S.C. 551, and Title 36 CFR 261.50(a) and (b), the following summarized acts are prohibited on all National Forest System lands administered as National Forests or National Grasslands within the Rocky Mountain Region (Region 2):

PROHIBITIONS:

1. Operating any motor vehicle on National Forest System roads in violation of applicable state, county or local government law, regulation and/or ordinance relating to the use and possession of motor vehicles (36 CFR 261.54(d))

2. Operating a vehicle carelessly, recklessly or without regard for the rights or safety of other persons or in a manner or at a speed that would endanger or be likely to endanger any person or property on National Forest System roads (36 CFR 261.54(f))

3. Parking or leaving a vehicle in violation of posted instructions (36 CFR 261.58(g))

4. Using a National Forest System Road for commercial hauling without a permit or written authorization from the Forest Service (36 CFR 261.54(c))

5. Possessing or consuming a beverage which is defined as an alcoholic beverage by applicable state law (36 CFR 261.58(bb))

6. Possessing, storing or transporting Cannabis plant/s or part thereof or any controlled substance derived from the manufacture of Cannabis plant/s as defined or classified under 21 USC 802(16) as Marijuana (36 CFR 261.58(t))

7. Possessing, discharging or using any kind of firework or pyrotechnic device. 36CFR 261.52(f))

8. Operating or using any internal or external combustion engine without a spark arresting device properly installed, maintained, and in effective working order, meeting either: (1) Department of Agriculture, Forest Service Standard 5100-1a (as amended); or (2) Appropriate Society of Automotive Engineers (SAE) recommended practice J335(b) and J350(a) (36 CFR 261.52(j))

EXEMPTIONS:

Pursuant to 36 CFR 261.50(e), the following persons are exempt from this order:

1. Persons with a Forest Service permit specifically authorizing the otherwise prohibited act or omission.

2. Persons utilizing motorized vehicles to provide incidental services and supplies for holders of National Forest System in-holdings, for holders of Forest Service recreational special use authorizations, and/or for authorized public services are exempt from Prohibition 4. “Incidental” is defined for the purposes of this Regional Order as the

occasional delivery of fuel, food and other necessary supplies, or provision of services to the above described holders and/or authorized users.

3. Persons who have attained the age of 21 years are exempt from Prohibition 5 to the extent not otherwise restricted by applicable federal, state or local law.

4. Any Federal, State, or local officer, or member of an organized rescue or fire fighting force in the performance of an official duty.

1.5.3 USDI-BUREAU OF LAND MANAGEMENT DIRECTION

43 USC 1761-1771, 16 USC SECTION 185, 43 CFR 2800 ET AL., AND 43 CFR PART 2880 ET AL. RIGHTS OF WAY UNDER THE FEDERAL LAND POLICY AND MANAGEMENT ACT AND THE MINERAL LEASING ACT

ROWs granted by BLM are authorized by the Federal Land Policy and Management Act (Title V of the Federal Land Policy and Management Act of October 21, 1976, as amended 43 U.S.C. 1761-1771) and the Mineral Leasing Act (Section 28 of the Mineral Leasing Act of 1920, as amended 16 U.S.C. 185). ROWs are processed according to regulations promulgated under the authority of these laws and found at 43 CFR 2800 and 43 CFR 2880 respectively. As authorized by the Mineral Leasing Act (MLA) BLM will issue rights-of-way grants for oil and natural gas gathering, and distribution pipelines and related facilities (not authorized by appropriate leases) and oil and natural gas transmission pipeline and related facilities. As authorized by the Federal Land Policy and Management Act (FLPMA), BLM will issue ROW grants for pipelines (other than oil and gas pipelines) and other facilities or systems which are in the public interest. Manuals and handbooks (2800 and 2880) developed subsequent to the regulations, and the requirements contained within the manuals and handbooks, also apply.

1.5.4 PERMITS THAT MAY BE REQUIRED AND CONSULTATION REQUIREMENTS

For the BMNGP project, the BLM is the agency with jurisdiction to issue the gas pipeline ROW grant under the MLA since the pipeline traverses lands administered by two or more federal agencies. Table 1 lists permits that may be required to construct the project.

Table 1. Required Permits

Agency	Permit or Consultation	Applicability
Federal		
US Department of Interior-Bureau of Land Management—Glenwood Springs Field Office		
	Right-of-Way Grants & Notices to Proceed	Pipeline Right-of-Way Grant and Water Pipeline Right-of-Way Grant
	Temporary Use Permits	Temporary work areas needed for pipeline construction
	EIS review – Joint Lead Agency	NEPA compliance and decision-making authority
US Department of Agriculture Grand Mesa, Uncompahgre, & Gunnison National Forest & White River National Forest		
	Right-of-Way Grants & Notices to Proceed consultation for gas and water pipeline	Use of NFS lands
	EIS review – Joint Lead Agency	NEPA compliance
	Road Use Permit	Use of National Forest System Roads (NFSRs)
	Timber Sale Contract (if applicable)	Tree removal
US Department of Interior -US Fish & Wildlife Service—Grand Junction, Colorado		

Agency	Permit or Consultation	Applicability
	Section 7 consultation (Endangered Species) (if required)	Threatened and Endangered (T/E) species protection on federal lands
	"Take" permit for Federal T/E species (if required)	T/E species protection on federal lands
Department of Defense-Sacramento District Corps of Engineers—Grand Junction, Colorado		
	Nationwide Permit (NWP) 12 notice & verification & 404 permit	Work in navigable waters of United States (U.S.); or discharge dredge, or fill material in waters of U.S., including wetlands
	401 Permit	Temporary construction, access, and dewatering
Department of Transportation		
Office of Pipeline Safety	49 CFR Part 192	Conformance with applicable design, operation, and maintenance regulations
Bureau of Alcohol, Tobacco, and Firearms	Explosive user's permit	Permit to purchase, store, and use explosives for site preparation during pipeline construction, as necessary
Independent Federal Agency		
Advisory Council on Historic Preservation (ACHP)	Section 106, National Historic Preservation Act (NHPA)	Provide comments on the proposed action, as necessary
State of Colorado		
Department of Public Health and Environment		
Air Quality Control Division – Air Pollutant Emission Notice (APEN)		
	Land Disturbance APEN	Construction disturbance >25 acres
Water Quality Control Division		
	NPDES Stormwater Permit	Discharge of stormwater run-off from construction site
	NPDES Temporary Discharge Permit	Dewatering of groundwater from construction site
	Minimal Industry Discharge Permit (MINDI)	Discharge of hydrostatic test water
	Section 401, CWA, Water Quality Certification	Permit for stream and wetland crossings
Local		
Gunnison County, Mesa County, Delta County, Garfield County	Any permits applicable to operations on private land or county road segments	

1.6 LAND MANAGEMENT PLAN CONSISTENCY

This section briefly summarizes the management direction sources that are applicable to the BMNGP Project.

1.6.1 USDA FOREST SERVICE-WHITE RIVER NATIONAL FOREST

WRNF LAND AND RESOURCE MANAGEMENT PLAN 2002 (AS AMENDED)

The WRNF Land and Resource Management Plan (LRMP) (2002 as amended) gives direction that is applicable to the proposed action in the following sections:

Forest-wide Goals and Objectives

> **Goal 2: Multiple Benefits to People.** Provide a variety of uses, products, and services for present and future generations by managing within the capability of sustainable ecosystems (LRMP, p 1-10).
> **Objective 2c:** Improve the capability of national forests and rangelands to sustain desired uses, values, products, and services (LRMP, p 1-11)

- o Strategies 2c.4 – Over the life of the plan, take advantage of opportunities to develop model projects that demonstrate new environmental protection technology and landscape-compatible design of oil and gas production facilities.
- o Strategy 2c.5 – Over the life of the plan, respond to requests for leasing, exploration, and development of mineral and energy resources in accordance with regulations and forest plan availability and specific lands decisions.
- o Strategies 2c.11 – Over the life of the plan, approve special-use proposals that are consistent with desired conditions, standards, and guidelines.

Forest-wide Standards and Guidelines (see Ch. 3 for specific forest resources' standards and guidelines)

- A standard is defined as a course of action that must be followed, or a level of attainment that must be reached, to achieve forest goals.
- A guideline is a preferred or advisable course of action or level of attainment. Guidelines are designed to achieve desired conditions (goals).

Special Uses (LRMP, p. 2-40)

Standard: Do not approve new uses and phase out current uses when existing permits expire where the primary use is storage or disposal of hazardous materials, including landfills.

Management Area (MA) Direction

Management areas define where different management activities may be carried out and where different kinds of public uses occur. The management area prescription guides the activities taking place within each management area. Management area prescription includes a management area theme, description, desired conditions and management area-specific standards and guidelines beyond that provided by the forest-wide standards and guidelines.

The proposed BMNGP project is within the following WRNF Management Areas (MAs) (**See Appendix A – Figure 8**):

Table 2. WRNF Management Areas

Management Area Name
MA 5.41 (Deer and Elk Winter Range)
MA 5.43 (Elk Habitat)

Management Area 5.41 Deer and Elk Winter Range (LRMP, p. 3-57)

Theme: Deer and elk winter ranges are managed to provide adequate amounts of quality forage, cover and solitude for deer, elk and other species.

MA description (brief): These are areas where multiple-use principles are applied to emphasize habitat management for deer and elk. They include lands classified as winter ranges and areas used during average winters.

Desired Condition (brief): Human activities are managed so that deer and elk can effectively use the area. Activities that may be managed or restricted include burning, rangeland management, timber harvest, habitat manipulation, recreation, minerals exploration and development, and road management. Scenery is managed to provide a range of scenic integrity objectives from low to moderate.

MA 5.41 Standards and guidelines:

BIODIVERSITY

Standard: 1. Vegetation composition and structure are managed to meet the needs of deer, elk, and other species on their winter ranges within the constraints of the conservation of biological diversity and the maintenance and enhancement of sensitive habitats.

INFRASTRUCTURE

Standards: 1. Over-the-snow vehicle use is restricted to designated routes and play areas unless authorized by special use permit or for emergency use.
2. All new roads passing through this area will avoid important forage, cover, and birthing areas.

Guideline: 1. Roads and trails needed to implement management in the area should be low-standard, single-purpose roads.
2. Avoid crossing these areas with new arterial and collector roads.

DOMESTIC LIVESTOCK GRAZING

Standard: 1. Establish stocking levels for livestock to ensure adequate forage is available for deer and elk.

Guideline: 1. Develop livestock grazing systems in cooperation with federal agencies and private landowners to ensure that all lands are considered when determining vegetation management objectives for the area.

RECREATION

Guideline: 1. Restrict recreation activities that would disturb deer and elk during winter and spring periods.

SPECIAL USES

Guideline: 1. Discourage special uses that require access during winter and spring periods.

VEGETATION MANAGEMENT

Standard: 1. These areas are not part of the suitable timber land base.
2. Vegetation management will be designed to maintain or improve deer and elk habitat objectives.

WILDLIFE

Guidelines: 1. Where trees and shrubs are sparse, and terrain is the primary factor providing cover, minimize human activity during periods when elk and deer are concentrated in the area.
2. Habitat management goals are developed in coordination with the Colorado Division of Wildlife and the owners of intermingled and adjacent private land to minimize resource conflicts on and off National Forest System lands.

INVENTORIED ROADLESS GUIDELINE (from Forest Plan Amendment 02)

Guideline: Management activities in inventoried roadless areas should emphasize long-term maintenance of roadless characteristics and habitat improvement for threatened, endangered, proposed, or sensitive species; or maintenance and restoration of ecosystem composition and structure such as reducing the risk of uncharacteristic wildfire effects or threat of insect or disease epidemics.

Management Area 5.43 Elk Habitat (LRMP, p. 3-61)

Theme: These areas are managed for elk. Low road densities and optimum forage and cover ratios characterize this management area prescription.

MA description (brief): These areas contain important elk habitat, including incidental winter range. They also provide opportunities for non-motorized recreation, while allowing timber harvesting and livestock grazing.

Desired Condition (brief): Vegetation is managed to provide healthy plant communities with a variety of species present for food and cover. Forested areas may appear managed without much evidence of damage by insects and disease. Scenery is managed to provide a range of scenic integrity objectives from low to moderate.

MA 5.43 Standards and guidelines:

INFRASTRUCTURE

Guideline: 1. Travelways open to motorized travel will not exceed an average travelway density of one-half mile per square mile during seasonal periods when the area is designated for calving, migration, winter, or summer habitat (see Wildlife Guideline 2, below).

DOMESTIC LIVESTOCK GRAZING

Guideline: 1. Design livestock management strategies, including distribution and stocking rates, to be compatible with elk habitat objectives.

VEGETATION MANAGEMENT

Standards: 1. These areas are part of the suitable timber land base and they contribute to the allowable sale quantity.
2. Vegetation management practices will be used to maintain or improve elk habitat.

WILDLIFE

Guidelines: 1. Provide adequate forage to sustain elk populations.
2. The following dates may be used for restrictions of activities, depending upon the objectives for which the area was established:

- ***Calving*** May 15 to June 20
- ***Migration*** *Fall*—October 15 to November 30, *Spring*—April 15 to June 20
- ***Winter*** December 1 to April 14
- ***Summer*** June 16 to October 14

INVENTORIED ROADLESS GUIDELINE (from Forest Plan Amendment 02)

Guideline: Minimize road construction in inventoried roadless areas, emphasizing temporary roads over permanent roads. Roads would only be constructed when necessary to meet management area objectives and only after other options have been examined for feasibility.

WRNF OIL AND GAS LEASING EIS AND ROD 1993

The WRNF Oil and Gas (O&G) Leasing Record of Decision (ROD) made approximately 1,521,258 acres available and authorized for leasing. The Bull Mountain Natural Gas Pipeline project is within the area noted as "available and authorized" for leasing (WRNF O&G Appendix Map G), and is also in an area with existing leases (WRNF O&G Appendix Map D). As this is a ROW proposal and no leasing or lease development scenarios are proposed in this document, leasing is not pertinent to this project.

1.6.2 USDA-FOREST SERVICE-GRAND MESA, UNCOMPAHGRE, & GUNNISON NATIONAL FORESTS

GMUG LAND AND RESOURCE MANAGEMENT PLAN 1991 (AS AMENDED)

The Grand Mesa, Uncompahgre, and Gunnison National Forests Land and Resource Management Plan (LRMP) (1991 as amended) gives direction that is applicable to the proposed action in the following sections:

Forest-wide Standards and Guidelines (see Ch. 3 for specific resources' standards and guidelines)

Special Use Management: LRMP, pp. III-71. Act on special use applications in a prioritized order in which acting on land use activity requests that contribute to increased economic activity associated with national forest resources (e.g. oil and gas), is second of three priorities.

Management Area (MA) Direction

The project area is within the following GMUG Management Areas (**See Appendix A – Figure 8**):

Table 3. GMUG NF Management Areas

Management Area Name
MA 6B Livestock Grazing
MA 7A Timber Management
MA 9A Riparian Area Management

MA 6B: Livestock Grazing (LRMP, pp III-148)

Management emphasis is for forage production and livestock production. The area is managed for livestock grazing where the range condition is at or above satisfactory level. Range condition is maintained through use of forage improvement practices, livestock management, and regulation of other resource activities. Investments in compatible resource activities can occur. Management activities are evident but harmonize and blend with the natural setting.

VISUAL RESOURCE MANAGEMENT

General direction for visual resource management within the 6B areas calls for designing and implementing the management activities to blend with the natural landscape, to manage for the adopted visual quality objective (VQO), and implement visual resource management as outlines in management requirements.

No other resource specific direction or standards and guidelines relevant to this type of project are identified in the Forest Plan.

MA-7A: Timber Management on slopes < 40% (LRMP, pp III-191)

Management emphasis is for wood-fiber production and utilization. These areas are managed for utilization of large roundwood of a size and quality suitable for sawtimber. Management activities remain visually subordinate along forest arterial and collector roads and primary trails, or may dominate the foreground and middleground, but harmonize and blend with the natural setting.

VISUAL RESOURCE MANAGEMENT

General direction for visual resource management within the 7A areas calls for meeting stated VQOs, managing for adopted VQOs and implement visual resource management as outlines in management requirements.

No other resource specific direction or standards and guidelines relevant to this type of project are identified in the Forest Plan

MA-9A: Riparian Area Management (LRMP, pp III-238)

Management emphasis is for Riparian/Aquatic Ecosystems. Emphasis is on the management of all the components of aquatic/riparian ecosystems to provide healthy, self-perpetuating plant communities, acceptable water quality standards, habitats for viable populations of fish and wildlife, and stable stream channels and still water body shorelines. Vehicular travel is limited on roads and trails at times when the ecosystems would be unacceptably damaged. The area over which this prescription applies is forest-wide.

TRANSPORTATION SYSTEM

General direction includes locating roads outside riparian areas unless other routes have been determined as more environmentally damaging, use sediment traps with barriers where the natural vegetation is inadequate to protect the waterway, and minimize detrimental disturbance to the riparian area by construction activities, initiate timely and effective rehabilitation, and restore riparian areas so that vegetative ground cover or suitable substitute protects soil from erosion and prevents increased sediment yield.

Standards and guidelines: Do not parallel streams when road location must occur in riparian areas except where absolutely necessary. Cross streams at right angles, and locate stream crossings at points of low bank slope and firm surfaces.

No other specific direction or standards and guidelines relevant to this type of project are identified in the Forest Plan.

GMUG OIL AND GAS LEASING EIS AND ROD 1993

The GMUG O&G Leasing Record of Decision (ROD) made approximately 813,180 acres of NFS lands available and authorized for leasing. The Bull Mountain Natural Gas Pipeline project is within the area noted as available and authorized for leasing. As this is a ROW proposal and no leasing or lease development scenarios are proposed in this document, the leasing is not pertinent to this project.

1.6.3 USDI-BUREAU OF LAND MANAGEMENT-GLENWOOD SPRINGS FIELD OFFICE (GSFO)

RESOURCE MANAGEMENT PLAN, 1988

The BLM-GSFO Resource Management Plan (BLM-RMP) includes resource management themes for BLM lands. Approximately 50 acres of the proposed action for BMNGP would affect BLM lands. The applicable resource management direction for the BMNGP project includes the following:

Water Quality Management (RMP, p.9)

Emphasis is to maintain or improve existing water quality where possible.

Livestock Grazing Management (RMP, p.20)

Emphasis is to provide for livestock forage to accommodate livestock allotment use.

Forest Management – Woodland Pinyon-Juniper (RMP, p.31)

Emphasis is to manage to meet fuel wood demand for pinyon-juniper.

Visual Resource Management (RMP, p.38)

Emphasis is to maintain Class IV or V visual qualities.

The BLM may require a BLM-RMP amendment for a change in current visual resource direction if Alternative 2 or 3 is selected. Alternatives 2 and 3 are proposed within a Visual Resource Management (VRM) Class II area and a BLM-RMP amendment may be required if the project cannot meet VRM Class II objectives. A potential BLM-RMP amendment would be needed for plan consistency (See 3.12 – Visual Resources).

1.7 PUBLIC INVOLVEMENT

The following sections summarize the actions taken to inform and request scoping comments from the general public, other agencies and governments, permittees, organizations, groups, and individuals. In addition, scoping comments received are summarized. A detailed list of scoping comments is contained in the project files.

1.7.1 FEDERAL REGISTER NOTICES

- A Notice of Intent (NOI) to conduct scoping and prepare an Environmental Impact Statement (EIS) was published in the *Federal Register* (Vol. 70, No. 167) on August 30, 2005.
- A corrected NOI was published in the *Federal Register* (Vol. 70, No. 175) on September 12, 2005. The original NOI had typographical errors made that were corrected.
- Draft EIS Notice of Availability was published in the *Federal Register* (Volume 71, Number 179) on September 15, 2006.

1.7.2 PUBLIC NOTIFICATIONS

Table 4 summarizes the initial scoping actions, press releases and letters sent to date. The formal scoping period was initiated with the publication of the NOI in the *Federal Register* on August 30, 2005.

Table 4. General Public Involvement Actions (including mailings, press releases, and newspaper articles)

Date	Notification Item	Who/Where	Notes
January 1, 2005	Project noted in WRNF and GMUG Schedule of Proposed Actions (SOPA) on Forest Websites	WRNF-GMUG websites	Project listed for first time in the Jan 05 SOPA. Also in subsequent SOPA quarterly for both Forests.
August 30, 2005	Mailing of Proposed Action Scoping Package to project mailing list (164 addresses)	Project IDT leader	Scoping package sent out to 164 addresses provided by WRNF, GMUG NF and BLM-Glenwood Springs Field Office.
August 30, 2005	NOI published in *Federal Register*	*Federal Register*	Published NOI had several typographical errors made by the Office of Federal Register. Corrected NOI was submitted to *Federal Register*.
August 30, 2005	Project Information posted on the WRNF and GMUG NF websites	WRNF-GMUG NF websites	The GMUG NF website is just a link back to the WRNF website, which is lead website for the project.
September 12, 2005	Corrected NOI published in *Federal Register*	*Federal Register*	Corrected the typographical errors made in the original NOI published on August 30, 2005.
October 21, 2005	Press Releases for BMNGP Project.	Press Release posted on WRNF website and sent by WRNF via email to numerous local and regional news and radio media outlets. See list below: *The Daily Sentinel*, Grand Junction CO *Rifle Citizen Telegram*, Rifle CO *Glenwood Post Independent*, Glenwood Springs, CO *Delta County Independent*, Delta CO *Montrose Daily Press*, Montrose, CO *The Eagle*, Montrose, CO *Palisade Tribune*, Palisade CO *Ouray News*, Ouray CO	

Date	Notification Item	Who/Where	Notes
		Gunnison County Times, Gunnison CO KFCR-Colorado Public Radio, Centennial, CO KVNF Radio, Paonia CO KMTS Radio, Glenwood Springs, CO KDNK Radio, Carbondale, CO KAJX Radio, Aspen, CO KUBC Radio, Montrose CO KKIX Radio, Montrose CO KWGL Radio, Montrose	
October 21, 2005	News article about BMNGP Project in the *Grand Junction Daily Sentinel*	*The Daily Sentinel* newspaper, Grand Junction, CO.	News article noted brief details with comments by WRNF and Wilderness Workshop.
October 26, 2005	News article about BMNGP Project in *Delta County Independent*	*Delta County Independent*, Delta, CO	News article that was a summary of the USFS press release.
October 27, 2005	News article about BMNGP Project in *Montrose Daily Press*	*Montrose Daily Press* newspaper, Montrose CO	News article noting brief details and links to Forest websites for info. Comments by GMUG and WRNF, Comments by High Country Citizens Alliance and Wilderness Watch.
October 11, 2005	Additional Scoping Letter sent to public	Project IDT Leader	Sent a scoping letter to 10 addresses of local land owners added since initial scoping letter sent out on Aug 30, 2005.
September 13, 2006	DEIS letters		Mailed to 137 agencies, tribal government, groups, and individuals
September 15, 2006	Press Release on DEIS Seeking Comments released	Public Affairs Officers	Local newspapers and radio media outlets

Additional contacts were made with special use and range permittees, and requests for additional information were filled during and after the scoping period. Documentation of these contacts is in the project file.

1.7.3 SCOPING LETTERS AND COMMENTS

The BLM and FS received comments on the project from approximately 30 parties during scoping (the procedure by which a Federal Agency identifies important issues and determines the extent of analysis necessary for an informed decision on a proposed action). Original letters, phone records and scoping comments are contained in the project files. In addition, a content analysis of the scoping comments was completed to identify issues, concerns and potential alternatives; that analysis is documented in the project files.

1.7.4 DEIS COMMENTS AND RESPONSE TO COMMENTS

Fifty-five comments were received in response to the DEIS. Comments submitted and Response to Comments can be found in Appendix Q of this Document. Where appropriate, contents of this FEIS have been changed to reflect comments.

1.8 ISSUES

Scoping is used to identify issues that relate to the effects of the proposed action. An issue is an unresolved conflict or public concern over a potential effect on a physical, biological, social, or economic resource as a result of the proposed action and alternatives to it. An issue is not an activity; instead, the projected effects of the proposed activity create the issue.

The BLM and FS separated the issues into two groups: significant issues and non-significant issues. The Council for Environmental Quality (CEQ) NEPA regulations require this delineation in 40 CFR Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)".

> Significant issues are defined as those directly or indirectly caused by implementing the proposed action.
>
> Non-significant issues are identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. Reasons regarding categorization as non-significant may be found in the project record.

The IDT identified and carried through the analysis several non-significant issues in order to fully develop and allow further comparison of the proposed action and alternatives. Non-significant issues carried through the analysis in Chapter 3 include: **effects on watershed, range and noxious weeds, fisheries, heritage resources, recreation and transportation.**

Table 5 below lists the significant issues considered for this analysis generated from public comments and/or the project interdisciplinary team (IDT). A complete content analysis summary and an issue identification summary are in the project record files.

Table 5. List of Significant Issues

Issue Topic	Cause and Effect
1. Effects on Inventoried Roadless Areas (IRAs)	The 25.5 miles of proposed Pipeline construction and ROW grant could alter roadless character in approximately 8.33 miles of three Inventoried Roadless Areas: Clear Creek IRA (GMUG) – 5.75 miles; East Willow IRA (WRNF) – 1.72 miles; and Baldy Mountain IRA (WRNF) – 0.86 miles. Inventoried Roadless Areas character could be affected by initial land disturbance and long-term appearance of a linear pipeline ROW.
2. Effects on Visual Resources	Pipeline ROW construction and installation of associated facilities will reduce the visual appearance of the landscape due to initial land disturbance and long-term appearance of a linear pipeline ROW, but may or may not maintain compliance with designated visual objectives. This depends on how well the VRPP is followed.
3. Effects on Soils	Pipeline ROW construction could adversely affect soil structure and stability in the project area thus potentially causing mass wasting and other soil erosion issues.

Issue Topic	Cause and Effect
4. Effects on Air Quality	Pipeline ROW construction, compressor use, and project-related traffic could cause reductions in air quality standards, regulations and requirements resulting from fugitive dust, pollutants and NO^x and CO emissions.
5. Effects on Vegetation	Clearing vegetation for pipeline ROW construction would reduce the existing vegetation and the benefits that vegetation provides.
6. Noise Impacts	Pipeline ROW and facility construction activities, and traffic noise, could have negative effects on private property owners and wildlife due to increased and unfamiliar noise.
7. Effects on Big Game Wildlife Habitat	Pipeline ROW construction activities could adversely affect wildlife use of summer range and calving and fawning habitat due to displacement and/or loss of habitat.

1.9 DECISION FRAMEWORK

This FEIS is not a decision document. Its main purpose is to disclose the potential consequences of implementing a proposed action and alternatives to that action. Comments on the DEIS were used to prepare a final EIS. After reviewing the final EIS and public comments, and the project record, the responsible official will issue a Record of Decision (ROD) documenting which alternative has been selected and why.

The BLM Glenwood Springs Field Office Manager is the responsible official for this decision, as granting ROW authorizations for natural gas transmission lines (i.e. pipelines) that cross federal lands managed by two or more other Federal agencies is BLM's responsibility under the Mineral Leasing Act.[1]

The BLM Glenwood Springs Field Office Manager is responsible for making the following decisions:

- Shall a ROW grant be issued for the 20" Bull Mountain natural gas pipeline that will support pipeline construction and operation on federal lands?
- Shall a ROW grant be issued for the 8" produced water pipeline that would be located in the same right-of-way trench as the gas pipeline?[2]
- Shall Temporary Use Permits be granted for temporary use areas needed for project construction on federal lands?
- What, if any, Resource Management Plan Amendments would be needed to change the Visual Management Standards and Guidelines along the selected pipeline ROW?

The Forest Supervisors of the GMUG and WRNF are responsible for making the following decisions:

- Should the FS provide concurrence to the BLM Glenwood Springs Field Office Manager for the issuance of a gas and water pipeline ROW and should concurrence include any specific terms, conditions, or stipulations necessary to ensure that the grant is consistent with FS direction?

[1] Alternative 1 does not include BLM lands. If Alternative 1 was selected, the WRNF and GMUG Forest Supervisors would be responsible for authorization of the ROW grant for the gas and water pipelines.
[2] The authorization of the 20" gas pipeline ROW grant is not contingent on authorization of the 8" water pipeline ROW grant.

- Should the FS authorize road use permits for construction, reconstruction, use, upgrade, and/or maintenance of existing and/or temporary roads needed for access to the pipeline construction ROW?

CHAPTER 2: ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 INTRODUCTION

This chapter describes and compares the alternatives considered for the Bull Mountain Natural Gas Pipeline project. It includes a description and map of each alternative considered along with a list of criteria for locating potential routes. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a basis for alternative selection. Some of the information used to compare the alternatives is based upon the design of the alternatives and some of the information is based upon the environmental, social and economic effects of implementing each alternative.

2.1.1 ROUTE SELECTION CRITERIA

Route selection was based on critical review of issues that affect overall project success in achieving the purpose and need. The following criteria (using Gas Pipeline Industry Standards) were applied during the pipeline route assessment processes, and are listed in order of importance:

1. Public/construction safety hazards during & after construction –To the maximum extent feasible, reduce the probability of worker/public harm or third party damage to the facility by avoiding:
   - Routes through neighborhoods
   - Routes close to existing houses
   - Routes through residentially or commercially developing areas
   - Routing along active roads
   - Difficult terrain (rocky, steep slopes, side slopes, sloughing/erosive soils, saturated soils)
   - Minimize crossings (roads, rivers, canyons, utilities, railroads)
   - Crossing heavily forested areas (large diameter trees)
   - Crossing active agricultural fields, or
   - Routing at close offset from existing facilities, etc.
2. Constructability/Engineering/Operating feasibility – Evaluate the engineering requirements. Determine if the route can be reasonably constructed, accounting for practical design, construction, and operation procedures including workplace safety and minimizing impacts to the environment. Considerations include:
   - Department of Transportation (DOT) regulatory requirements
   - Pipeline diameter, wall thickness, operating pressure design for anticipated volumes
   - Compression/pump horsepower requirements and siting
   - Pipeline origin and terminus
3. Permitting feasibility – Identify permitting requirements and constraints. Reduce regulatory compliance issues, as practical.

- Maximize use of existing corridors (i.e. parallel existing pipelines)
- Route to avoid “point” resource impacts (i.e. wetlands, streams, archaeological sites, side slopes) to the maximum extent feasible
- Construction time frame with consideration of any seasonal restrictions
- Optimize route length and construction use areas to reduce overall physical impacts (minimize land disturbance)

4. ROW Acquisition feasibility – Develop reasonable and practical route to minimize impacts to affected landowners (federal, state, and private).
   - Land ownership/tract density
   - Societal benefit from facility (i.e. bringing additional supply of utility gas, transport of mineral interest, exercising valid lease rights, etc.)
   - Land use types
   - Land owner concerns regarding the siting of the facility across their lands
   - Legally defensible route
5. Access & Transportation Availability
   - Maximize use of existing roads for both construction and post-construction access (i.e. minimize use of temporary access roads).
6. Economics
   - Consider capital costs related to construction, authorization and operation of facilities on a particular route

2.1.2 PROJECT DESIGN CRITERIA AND MONITORING ACTIVITIES

The BLM and FS also developed project design criteria to be used as part of all of the action alternatives as appropriate for each alternative. This list of items is intended to document in writing the recommendations for specific measures that may not have been clearly identified in the Plan of Development (POD) at the time of the analysis. The final POD is the document that is intended to function as the complete list of project implementation methods, design criteria and other protective measures. FEIS Chapter 2 Table 6 contains these additional project design criteria developed to reduce or eliminate impacts on specific resources and are incorporated as an integrated part of the Proposed Action, the POD and alternatives as applicable.

FEIS Table 6 also has the complete list of the monitoring actions that would take place during and after project activities.

PROJECT DESIGN CRITERIA AND MONITORING FOR ALL ACTION ALTERNATIVES

All action alternatives will adhere to the following design criteria (as applicable to specific alternative) and those proposed by the company in their Plan of Development (POD).

Project design criteria, mitigation, and monitoring are all provided in detail in the Bull Mountain Pipeline Plan of Development (POD). The POD contains measures that are consistent with Forest and Resource Management Plan direction, Forest Service/BLM Regional direction, federal and state law, and Executive Orders. The intent is that the final POD would also contain all of these measures noted in Table 6 below contains project design criteria developed to reduce or eliminate impacts on resource areas and are incorporated as an integrated part of the proposed action, alternatives and the POD as applicable.

Project Design Criteria
Project design criteria are based upon standard practices and operating procedures that have been employed and proven effective in similar circumstances and conditions. Project design criteria can fall into four general areas: 1) General Project Design – standard practices dictate avoidance and minimization as an integral part of project design; 2) Forest/BLM Plan Requirements - standards, guidelines and management direction provide a starting point for initial development planning and the generation of project design criteria; 3) Best Management Practices (BMPs) - an integral part of any design criteria; and 4) Statutory and Regulatory Constraints – all applicable federal, state, and local laws and regulations, as well as terms and conditions of required permits that must be complied with.

Project design criteria prescribe measures that would reduce or eliminate potential effects of the action alternatives. Project design criteria are non-discretionary once approved in a decision. Project design and planning can effectively eliminate the requirement of mitigation measures for the action alternatives.

Table 6. Project Design Criteria by Resource Area

Design Criteria	Description of Project Design Criteria
Air Quality	
AQ-1	Dust abatement techniques shall be used as directed by the Forest Service and/or BLM to minimize dust in a way such that visibility and air quality are not affected and a hazardous condition is not created. Dust will not reach a height of 12 feet. The proponent will comply with federal, state and local air quality emission standards and regulations.”
AQ-2	Where electrical power is available, electric motors shall be used to reduce emissions from field engines.
Botany/TES Plants	
BO-1	Additional rare plant surveys would be conducted for action alternatives if selected. Only the proposed action has been surveyed.
Fisheries	
FISH-1	ROW grant holder shall not conduct instream construction work during spring spawning season (April – August 31st) in any fish-bearing streams or on any crossings of fish-bearing streams that contain cutthroat trout. For the Proposed Action, these streams include: Henderson Creek, North Fork Henderson Creek, Little Henderson Creek, and West Divide Creek.
FISH-2	ROW grant holder will conduct instream work in cutthroat trout bearing streams only during low-flow periods. These streams include: Henderson Creek, North Fork Henderson Creek, Little Henderson Creek, and West Divide Creek.
General Misc.	
GEN-1	Project design criteria, mitigation, and monitoring are all provided in detail in the Bull Mountain Pipeline Plan of Development (POD). The POD contains measures that are consistent with Forest/BLM Plan direction, Forest Service/BLM Regional direction, and other Federal and State Laws and Executive Orders.
GEN-2	An Environmental Protection Plan (part of the POD) has been prepared and submitted to the FS and BLM for approval. This plan contains, among other

Design Criteria	Description of Project Design Criteria
	items, measures for stormwater management, spill prevention and pollution control, working near wetlands and stream crossing techniques
GEN-3	Upon selection of an action alternative and prior to construction activities, ROW grant holder would be required to submit a detailed plan of operations subject to BLM/FS review.
GEN-4	ROW grant holder would be responsible for documenting compliance with all terms and conditions of the Record of Decision and ROW grant including any bonding requirements.
GEN-5	Pipeline construction activities would occur between May 1 and mid-October of any year in order to restrict construction activities during big-game hunting seasons and reduce resource impacts during winter conditions. Note: timing restriction does not apply to hydrotesting the pipeline, hydromulching and reseeding activities, and other maintenance/reclamation activities that may be required in the fall before winter sets in.
GEN-6	A USFS and/or BLM field compliance inspector would be assigned to the Bull Mt. Pipeline project during the construction and reclamation period to ensure compliance with the terms and conditions agreed to in the Record of Decision and ROW grant. The ROW grant holder would be responsible for funding any agency work associated with the Bull Mountain Pipeline project.
GEN-7	Right-of-way access following construction would be accomplished by foot, horseback or other non-motorized method. Use of motorized vehicles for ROW access for noxious weed control, corrosion survey and other monitoring is prohibited. Motorized vehicles would only be authorized to drive along the right-of-way for emergency repairs on a case-by-case basis and would be subject to BLM/FS notification and approval.
GEN-8	ROW grant holder would provide and service sanitary facilities (i.e., porta-potties and trash receptacles) needed during construction.
GEN-9	If during the normal operation of the pipeline after construction is completed, and the actual pipeline is or becomes exposed, that section would be reburied to the construction specifications.
GEN-10	The ROW grant holder shall appropriately designate on the ground all known survey monuments, section corners, and other corners associated with pipeline construction operations. ROW grant holder shall protect all known monuments, witness corners, reference monuments and bearing trees against avoidable destruction, obliteration or damage during pipeline construction operations.
GEN-11	The ROW grant holder shall provide Construction Managers and Quality Control Inspectors for all construction spreads that have the authority to issue instructions or direct operations to administer the ROW grant(s) and associated permits in accordance with the Plan of Development (POD) and its Appendices. The Construction Managers and Inspectors shall have the authority to enforce engineering standards and specifications. The inspectors shall be authorized to inspect all work including preparation, fabrication, or manufacture of material for the project. A Geotechnical Engineer shall be available to evaluate sensitive geological hazard areas not previously addressed, and to ensure that construction processes previously identified in sensitive areas are adequate based on subsurface inspection.
GEN-12	The ROW grant holder shall provide and maintain work environments and procedures which will safeguard the public and Government personnel and property, exposed to the ROW grant holder's operations and activities.
GEN-13	The ROW grant holder will confine operations to within the clearing limits or other

Design Criteria	Description of Project Design Criteria
	areas designated in the POD and prevent the depositing of rocks, excavated material, stumps or other debris outside these clearing limits.
Heritage Paleontological Resources	
HR-1	Conduct a cultural resource inventory of all areas which lie outside of the surveyed 200 ft corridor for the Proposed Action Alternative. This would include any truck turn-a-rounds or other TUA areas that were outside the 200' wide corridor of initial surveys for cultural resources.
HR-2	Conduct a cultural resource inventory of all access roads on BLM and White River and GMUG National Forests that have not been previously inventoried.
HR-3	One historic property (5ME14577) eligible to the National Register was identified and will be impacted by the project as currently planned. It is recommended that the pipeline be rerouted to avoid this site. The re-route will need to be flagged and a cultural resource inventory will need to be done if it falls outside the 200 ft wide corridor of initial surveys for cultural resources. If a reroute is not possible, then data recovery will have to be undertaken to mitigate the adverse effects to this site. If data recovery is necessary it will have to be undertaken prior to any pipeline construction in the area of the site.
HR-4	Alternatives 1, 2, and 3 have not been completely inventoried for cultural resources. Prior to the construction process, a Class III cultural resources survey would be completed by a qualified permitted archaeologist on all areas proposed for ground disturbance within the selected Bull Mountain Pipeline route. This cultural resource inventory report will be produced in accordance with OAHP, FS, and BLM guidelines, documenting all cultural resources located, and made recommendations to avoid impacts or mitigation of these resources. ROW grant holder will be responsible for coordination with the Forest Service and BLM to comply with the mitigation measures.
HR-5	An archaeological monitor of ground disturbing activities associated with the selected alternative for the Bull Mountain pipeline is required in areas where heavy vegetation limited surface visibility during the inventory; in areas of deep soils; and in stream valleys where human occupation is likely and where significant subsurface cultural resources may be present and undiscovered. Areas requiring archeological monitoring will be identified on maps by agency archeologists
HR-6	The ROW grant holder shall hold preconstruction meetings with its field workers to inform them of the importance of not disturbing any historic, archaeological, or scientific resources, including collecting artifacts, and that anyone found deliberately disturbing those resources will be subject to prosecution.
HR-7	Pursuant to 43CFR10.4 (g), the authorized officer must be notified, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43CFR10.4 (c) and (d), activities must stop in the vicinity of the discovery and the discovery must be protected for 30 days or until notified to proceed by the authorized officer. (For a complete citing of NAGPRA, refer to Title 43 – Public Lands: Interior, Subtitle A – Office of the Secretary of the Interior, Part 10 – Native American Graves Protection and Repatriation Regulations available from the U. S Government Printing Office)
HR-8	If in connection with operations under this contract the project proponent, his contractors, subcontractors, or the employees of any of them, discovers, encounters or becomes aware of any objects or sites of cultural or paleontological

Design Criteria	Description of Project Design Criteria
	value or scientific interest such as historic or prehistoric ruins, graves or grave markers, fossils, or artifacts, the proponent shall immediately suspend all operations in the vicinity of the cultural or paleontological resource and shall notify the BLM authorized officer of the findings (16 U.S.C. 470h-3, 36CFR800.112). Operations may resume at the discovery site upon receipt of written instructions and authorization by the authorized officer. Approval to proceed will be based upon evaluation of the resource. Evaluation shall be by a qualified professional selected by the authorized officer from a federal agency insofar as practicable. When not practicable, the holder shall bear the cost of the services of a non-federal professional.
HR-9	Within five working days the authorized officer will inform the holder as to: • whether the materials appear eligible for the National Register of Historic Places; • the mitigation measures the holder will likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and, • a time frame for the authorized officer to complete an expedited review under 36CFR800.11, or any agreements in lieu thereof, to confirm through the State Historic Preservation Officer that the findings of the authorized officer are correct and the mitigation is appropriate.
HR-10	The proponent may relocate activities to avoid the expense of mitigation and/or the delays associated with this process, as long as the new area has been appropriately cleared of resources and the exposed materials are recorded and stabilized. Otherwise, the proponent will be responsible for mitigation costs. The authorized officer will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the authorized officer that the required mitigation has been completed, the proponent will then be allowed to resume construction.
HR-11	Antiquities, historic ruins, prehistoric ruins, paleontological or objects of scientific interest, identified or unidentified, that are outside of the authorization and not associated with the resource within the authorization will also be protected. Impacts that occur to such resources that are related to the authorizations activities will be mitigated at the proponent's cost including the cost of consultation with Native American groups.
HR-12	The Native American Graves Protection and Repatriation Act (NAGPRA), requires that if inadvertent discovery of Native American Remains or Objects occurs, activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice made to the BLM Authorized Officer, as well as the appropriate Native American group(s) (IV.C.2). Notice may be followed by a 30-day delay (NAGPRA Section 3(d)).
HR-13	If a fossil or fossils are found, the ground-disturbing proponent will suspend operations until approval to proceed has been procured from the Authorized Officer (this can be verbal and/or written). A qualified (permitted) professional paleontologist will be notified within 48 hours to assess the find and advise the Authorized Officer of the necessary mitigation.
HR-14	It is preferred that the qualified (permitted) professional paleontologist is from the appropriate agency if available. Otherwise, the proponent will need to contract a qualified paleontologist with a valid appropriate paleontological permit (USFS or BLM) to do the mitigation work.
HR-15	The proponent will hold pre-field meetings with all field workers and require them to not disturb any sensitive heritage or paleontological resources they may encounter.

Design Criteria	Description of Project Design Criteria
Noxious Weeds	
NX-1	The ROW grant holder shall prepare and submit a Noxious Weed Management and Control Plan to the Forest Service and BLM for approval at least 30 days prior to starting construction. Following approval by the agencies, the plan shall become part of the authorization document. At a minimum, this plan shall include methods to be used for prevention and control of noxious weed and exotic plant infestations, use of weed free seed, weed free materials (straw bales, straw waddles, etc.), washing of vehicles and equipment prior to moving them onto NFS and public lands, and measures to be employed following construction of the pipeline.
NX-2	The ROW permit holder shall also be responsible for prevention and control of noxious weed and exotic plant infestations which are not within the authorized area, but which are determined by the BLM/Forest Service to have originated within the authorized area.
NX-3	All seed purchased will be certified to be free of the noxious weed seeds from weeds listed on the current "All States Noxious Weeds List." Test results from a certified seed analyst, seed analysis labels attached to the bags and seed analysis reports from each container shall be provided to the BLM/Forest Service prior to application of the seed.
NX-4	New infestations of noxious weeds of concern to BLM/Forest Service and identified by either the ROW grant holder or BLM/Forest Service, shall be promptly reported to the other party. ROW grant holder and BLM/Forest Service shall agree on treatment methods to reduce or stop the spread of noxious weeds when new infestations are found.
Inventoried Roadless Areas	
IRA-1	ROW grant holder must follow direction provided in the Visual Resource Protection Plan (VRPP) which is located in Appendix P of the EIS. The VRPP contains measures to prevent, reduce, or rehabilitate adverse visual impacts.
IRA-2	Naturalize all the areas disturbed by project construction outside the 50ft ROW. Naturalization includes restoration of grades, revegetation, naturalized boulder and rock placement, and vertical mulching techniques to blend the ROW in with the surrounding landscape patterns and characteristics which allows for non-motorized and aerial survey of the corridor within the 50ft ROW.
IRA-3	An Environmental Protection Plan (part of the POD) has been prepared and submitted to the FS and BLM for approval. A component of the Environmental Protection Plan includes restoration/reclamation activities to be reviewed and approved by BLM/FS staff as a condition of project approval under any action alternative which involves construction and occupation within IRAs (IRA). The Environmental Protection Plan must provide rehabilitation and restoration activities commensurate to achieve and/or maintain IRA characteristics to the extent feasible. Additional review and approvals for any amendments necessary to the Environmental Protection Plan prior to abandonment may also be required.
Recreation	
RE-1	BLM/USFS roads shall remain open to the public during construction or reconstruction to the extent practical; however, delays/closures of up to 1-2 hours could occur, if approved by the authorized officer. If an emergency situation arises, the ROW grant holder would provide immediate passage for emergency vehicles. A forest or area closure order may be issued for areas under construction to ensure safety of forest visitors. All recreation activities, including

Design Criteria	Description of Project Design Criteria
	hiking, camping, hunting, ATV riding, horseback riding, etc, will be prohibited within the construction right-of-way. The ROW grant holder will post and sign the boundaries of the areas under construction in accordance with FS and BLM specifications.
RE-2	CONTROLLING OFF-ROAD VEHICLE USES OF THE RIGHT OF WAY (ROW) Measures would be implemented to control the use of the right-of-way and prevent unauthorized travel along the right-of-way by off-road vehicles. These measures would be determined in the field and may include the following: • Installing gates or other man-made physical barriers • Creating natural barriers by planting trees at points of intersection between the ROW and access roads • Creating natural barriers made of large debris and/or rocks • Stockpiling trees cut for ROW clearing and laying them in the ROW • Placing boulders of a sufficient size and buried according to agency direction The ROW grant holder would coordinate with the BLM/USFS and landowners to determine measures to be implemented to control off-road vehicle use of the ROW. Efforts to control unauthorized off-road vehicle use would continue, in cooperation with the surface owner, throughout the life of permitted ROW.
RE-3	ROW grant holder would be responsible to replace, repair, and reinforce any motorized access barriers if they are breached throughout the life of the permitted ROW.
RE-4	OUTFITTER/GUIDES The ROW grant holder would work with the Forest Service, BLM and affected outfitter/guides to develop temporary operating plans to minimize the impacts of construction activities on their business operations. Any new ground disturbance at the outfitter/guide base camp located at the end of Forest Road 268 will be rehabilitated and reclaimed immediately after construction activities are completed from that location (Proposed Action and Alternative 1).
RE-5	DISPERSED CAMPING Pipeline construction workers would not be permitted to camp in the project area or surrounding federal lands during pipeline construction. Traditional dispersed campsites that would be affected by construction will be rehabilitated and access to them restored after pipeline construction activities have been completed.
RE-7	PUBLIC INFORMATION, SIGNING, MEDIA Information concerning construction activities, construction status, road closures and forest closures would be posted at agency offices and on agency websites. News releases would be distributed to local media outlets. Local landowners would be contacted in advance by the ROW grant holder. Informational road signs and any road or area closure orders would be placed along Forest Roads 800, 265 and 268 warning recreationists of large vehicle traffic, closures, delays, etc.
Safety	
SF-1	Safety measures would be provided to protect workers and the public from electrical shock. Hazards associated with work activities in the vicinity of high-voltage electric power transmission lines would be identified, mitigated and/or

Design Criteria	Description of Project Design Criteria
	avoided.
Soils	
SO-1	In general, soils will be bladed, scraped, piled, excavated, displaced, backfilled and compacted. Erosion and sediment control measures will be in place at all times to prevent and control soil erosion as determined by FS/BLM.
SO-2	To avoid leaving native soil unprotected from erosion after reconstruction or ground disturbance, hydro-seeding/mulching methods shall be applied no later than November 1. Intermediate seeding shall be done as soon as possible after disturbance.
SO-3	Follow FSH2509.25-*Watershed Conservation Practices Handbook* from Region 2 Specifically these sections: • 11 - HYDROLOGIC FUNCTION • 11.1 - Management Measure (1) • 11.2 - Management Measure (2) • 12 - RIPARIAN AREAS AND WETLANDS • 12.1 - Management Measure (3) • 12.2 - Management Measure (4) • 12.3 - Management Measure (5) • 12.4 - Management Measure (6) • 12.5 - Management Measure (7) • 12.6 - Management Measure (8) • 13 - SEDIMENT CONTROL • 13.1 - Management Measure (9) • 13.2 - Management Measure (10) • 13.3 - Management Measure (11) • 13.4 - Management Measure (12) • 14 - SOIL QUALITY • 14.1 - Management Measure (13) • 14.2 - Management Measure (14) • 15 - WATER PURITY • 15.1 - Management Measure (15) • 15.2 - Management Measure (16) • 15.3 - Management Measure (17)
SO-4	Specifically SG/TriGon will: • In developing the storm water erosion control plan required by the State, and erosion control in general, the practice of using native materials and Bioengineering principles will be used. Practices and methods described by various Forest Service Documents may be used for design, along with information gathered from the NRCS relating to Bioengineering for erosion, runoff, and sediment control. Forest Service documents are: • Protect and replace topsoil; control and minimize soil erosion and resulting sedimentation; protect water resources, be responsible for revegetation, restoration, and stabilization of disturbed soils on the project; limit introduction and spread of noxious weeds, and return the disturbed area to pre-existing conditions. They will be expected to maintain the integrity of hydrologic function, riparian and wetland function, soil productivity, and water purity during this proposed action. • Redistribute large, woody material and rock salvaged during clearing

Design Criteria	Description of Project Design Criteria
	operations on BLM/FS administered lands. Disperse materials over the portion of the right-of-way from which the trees and brush were originally removed to act as water and erosion control, mulch, provide wildlife habitat, seedling protection, and a deterrent to vehicular traffic. • Measures identified in this plan apply to work within the project area defined as the right-of-way (ROW), access roads, temporary use areas, and other areas used and disturbed during construction of the project.
SO-5	Erosion control measures and devices will be implemented and maintained during and after the construction phase. Erosion control measures used will implemented during construction will use Bio-engineering principles, and native materials to prevent trampling and dismantling by cattle and wildlife. Some measures may include the use of waterbars, sediment detention ponds, trenchbreakers, sand bags, shredded or chipped native materials, downed logs and other similar materials, silt fence sediment barriers, and straw bale sediment barriers. Permanent erosioncontrol measures implemented during restoration will include seedbed preparation, seeding, control of use by cattle, waterbars, trench breakers, permanent mulching, erosion control matting, and also the use of native materials (downed logs, shredded plant materials and other effective measures and materials) and monitoring. • Viable, healthy topsoil is absolutely essential for the successful reclamation of the disturbances this project will cause. Topsoil will be salvaged and protected along the pipeline route to facilitate revegetation of the right-of-way after construction is complete. Topsoil from the trench line and working side (trench and working side method) will be stripped to a depth of 6-8 inches and segregated from the subsoil. Topsoil will be stockpiled in a location where it will not be mixed with the subsoil material. It should also be protected from construction disturbance and erosion. Topsoil piles should be less than 2 ft tall, keeping as much exposed to the air as possible. The topsoil should be stripped when moist, or dry, but not wet or frozen, or snow covered. If it must be stored longer than 90 days, it should be seeded with a protective sterile vegetative cover crop. (regreen/triticale) • Install erosion and sediment control measures/devices immediately after initial soil disturbances. It may be necessary to use multiple layers of measures/devices to assure effectiveness, depending on the local conditions and effectiveness of each measure/device. These will be monitored and maintained throughout construction and restoration, until replaced by permanent erosion control measures. • All disturbances will be stabilized, with effective runoff and erosion control measure in place before seasonal shut downs. • Disturb only to the minimum area necessary to efficiently complete construction activities. • Mud blading of roads or construction right of way will not occur on Forest Service/BLM roads or lands. • If it becomes apparent that water control and run-off measures are not working as designed during saturated conditions. Cease all activities on BLM/FS roads and construction rights of way and concentrate on runoff

Design Criteria	Description of Project Design Criteria
	and water control. Begin activities only when water and runoff can be controlled. • Streambank crossing areas and slopes above dry drainages, water bodies and wetlands require will require additional stabilization beyond the replacement of original contours and other normal erosion control requirements. Stabilization of theses areas is a very important step in keeping sediment out of the drainage network. The use of Silt Fencing and straw bales will be de-emphasized Such measures that are often considered Bio-Engineering techniques will be the main way of controlling sediment , runoff and erosion in these sensitive areas. These may include but not be limited to : the use of on-site materials (e.g. placing felled trees, shrubs and brush on these areas), the use of soil tackifiers to hold soil and mulch in place, the use of jute netting, the use of rock and coarse gravel to hold slopes and soil in place, etc. This may take multiple measures and techniques to be effective. The exact measures for specific sites will be identified in the Storm Water Prevention Plan. • Temporary and permanent erosion/sediment/runoff control measures will be installed to control erosion/ runoff and transport of sediment. Erosion / sediment controls will be used and maintained during all phases of construction. Selection of appropriate erosion controls will be based on soil properties, steepness of the slope, proximity to wetlands, live or intermittent channels, stability of surrounding slopes, and anticipated surface flow or runoff. Erosion control measures will include sediment barriers, possible sediment detention ponds(any mix of appropriate materials will be possible, however the use of silt fencing and straw bales will be de-emphasized) waterbars, soil tackifiers, weed free straw or coconut core or locally prepared waddles, terracing, vegetative layering, erosion control fabric, and vegetative and rock mulch. Other runoff/erosion and sediment control measures may include but not be limited to: Sand Bags, Gravel bag berms, hydromulch, stabilization of any out let situations, check dams, temporary vegetative covers, diversion ditches, check dams, etc. • All perennial crossings (live water) will be designed to handle expected use, and either low water crossings, culverts, bridges or temporary bridges. • All perennial /intermittent crossings will also be hardened to the point that daily use by heavy construction equipment will not allow loose material into the drainage network. • Any dewatering of trench will avoid directing water into live streams, wetlands or unstable slopes.
SO-6	In general, soils will be bladed, scraped, piled, excavated, displaced, backfilled and compacted. Erosion and sediment control measures will be in place at all times to prevent and control soil erosion as determined by FS/BLM.
SO-7	To avoid leaving native soil unprotected from erosion after reconstruction or ground disturbance, hydro-seeding/mulching methods shall be applied on slopes greater than 30% as soon as possible but no later than November 1. Intermediate seeding shall be done as soon as possible after disturbance.
SO-8	Avoid Highly unstable areas This is the first step in preventing excessive resource impacts and protecting pipelines and facilities as directed by FSM, NFMA, FSH, Watershed Conservation Practices Handbook 13.1e, & BLM's Gold Book, 2006
SO-9	If avoidance is not possible Include the following list to reduce excessive damage

Design Criteria	Description of Project Design Criteria
	to pipeline and Resources (this can also be considered a safety issue….could prevent pipeline breakage relating to potential slope movement). : • Have appropriate Geo-Tech evaluation on slopes that have Moderately High-High Geologic Hazard ratings. • Provide specific engineering designs to withstand slope movement pressures where Geo-Tech evaluations indicate necessary. • Design should also include movement monitoring devices, both immediate slope situations and pipeline alignment.
SO-10	This is material from the POD. To reduce overall impact to the soil resource and potential for erosion and sedimentation, minimize as much as possible the amount of scraping, blading, excavating and other surface disturbance to only what is absolutely necessary. This is especially important on steeper slopes.
SO-11	Based on experience from past pipeline construction projects, catch mistakes early to prevent excessive resource damage. Insure timely installation and proper use of BMPs. Provide Forest Service environmental inspectors for day to day construction activities.
SO-12	To prevent impacts to the soil resource outside of construction ROW and will aid in restoration., all spoil material will be contained within the construction ROW, this includes, sliver fill material, stockpiled topsoil, excess rocks/boulders, etc.
SO-13	To add to a more complete restoration process, preventing large amounts of fill settlement, snow and frozen soil material is not to be used in construction of fill areas and dikes or berms. BLM's Gold Book, 2006
SO-14	It Is important for successful revegetation/reclamation that a proper seed bed be prepared prior to final seeding, to provide adequate conditions for seedling growth and establishment (decompacted, good tilth, and appropriate amounts of organic matter) (WCP Handbook 13.4a).
SO-15	T prevent dust stabilization chemicals from getting into streams, water bodies or wetlands, monitor dust abatement, if chemicals are used extra filtering may be needed at crossings and in close proximity to live water and wetlands to prevent movement into these areas (WCP Handbook 13.3i)
Transportation- Exiting NFSRs and Road Upgrades	
TR-1	Prior to any construction commencing, a Road Maintenance and Improvement Plan for all roads will be submitted for USFS/BLM approval. The plan will detail the amount and type of maintenance to be performed on existing routes, the amount and type of improvements/reconstruction to be performed on existing routes and detail construction plans for temporary routes. The Road and Improvements Plan will incorporate specifications of the following: a. For maintenance on existing National Forest System Roads (NFSRs), the Forest Service T-800 specifications and USFS Standard Road Maintenance Specification,, as applicable. b. For improvements and/or reconstruction on existing NFSRs or BLM roads, the AASHTO Standards for Low Volume Roads and the FHWA Standard

Design Criteria	Description of Project Design Criteria
	Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-03 US Customary Units as applicable for materials quality. c. The ROW grant holder will need to establish traffic controls and/or access restrictions during pipeline construction on some roads for public safety if mixed traffic use is an issue. The proponent will submit a traffic control plan for approval 30 days prior to commencing construction. d. All bridge construction work on new or existing bridges shall be done according to standard agency Road Use Permits/Authorizations and FS policy (R2 Supplement 7104 Exhibit #3). The bridge construction work must be done using plans and specifications stamped by a Professional Engineer (PE) and must meet maximum equipment load requirements. e. All signage and sign plans will comply with the current Manual on Uniform Traffic Control Devices (MUTCD). Proponent will submit signs plans for approval in writing and signs in place prior to work commencing. Proponent will be responsible for traffic control measures (See MUTCD), installation and maintenance of all signage associated with project. f. The proponent will immediately repair any project-related damage to any road to avoid adverse impacts on other authorized users. Repairs will be made in compliance with the Forest Service T-800 specifications and USFS Standard Road Maintenance Specification and FHWA South Dakota Maintenance practices (to prevent future sags and potholes within the roadway) and terms in the Road Use Permit/Authorization. Road improvements/reconstruction and any other work that is critical "for approval" will be signed and stamped by a Colorado Registered Professional Engineer (PE).
TR-2	Texas Creek 841.1 will not be used for ROW equipment, but will be used for stringing trucks to deliver pipe to the construction site.
TR-3	Earthwork and road reconstruction during periods of wet subgrade conditions shall not be allowed when the subgrade is saturated and has lost structural strength. The California Bearing Ratio (CBR) test or similar test, as approved by a FS Engineer, shall be performed on all roads to evaluate the strength of road subgrades. These figures shall be used as a means of designing the structural section of the road. If CBR testing indicates the subgrade is weak (CBR reading less than 8) ROW grant holder must construct/reconstruct a structural section to carry expected equivalent single axle loads (ESALs) over the design life of the road. Normal design life span is 20 years for surfaced roads. CBRs will be determined for worst–case scenario (high moisture content) for design purposes.
TR-4	Roads shall be maintained to minimum standards or improved as determined by BLM/USFS permit requirements. All maintenance and improvements/reconstruction shall be in compliance with project requirements, USFS Standard Road Maintenance Specifications, and FHWA Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-03 US Customary Units.
TR-5	On native surface roads, all ruts, holes and washboards shall be removed by scarifying or cutting to the bottom of such defects and repair back to original grade. No depressed sections will be allowed. Fines accumulated in blading roads or from drainage ditches shall not be wasted over fill shoulders
TR-6	Following construction the ROW grant holder would return roadways to as good or better condition than they were prior to construction or as prescribed by the respective authorizing agencies.
TR-7	Commercial users will be required to hold an agency Road Use

Design Criteria	Description of Project Design Criteria
	Permit/Authorization as applicable.
TR-8	Road construction on excessively steep grades (in excess of 15%) will be avoided.
TR-9	In order to minimize the impacts and stabilize the road structural section on steep grades (>8%), those sections shall be stabilized with sub-base, base and surface aggregates. Various stabilization materials such as oils, lime, cements, fly ash, resins, lignin sulfinate, magnesium or calcium chlorides, enzymes, and chemical may be used to improve the material properties of the in-situ soil. Prior to using any soil stabilizer on site, agency approval will be required.
TR-10	Road maintenance, improvements and reconstruction will include adequate surface drainage and rolling dips (reinforced with geotextile and aggregate, if needed) so that the water is dispersed off the road frequently and water concentration is minimized. This may be achieved by in-sloping or crowning the road, placing crushed aggregate surfacing material at an approved compacted depth. (See Forest Service typical drawings #1 and 2 at the end of Appendix B)
TR-11	In some areas, it may be practicable to install a system of ditches and culverts to accommodate the concentration of water.
TR-12	For roadway section with 6 inches OR LESS of new structural surfacing section or existing surfacing sections with any aggregate segregation or contamination by intruding fine materials, no rutting, pumping or plastic deformation of the roadway surface will be allowed. Rutting, plastic deformation, or pumping of the surface will result in the proponent’s operations, on that road, ceasing immediately and remaining shutdown until repairs and improvements are made to prevent additional damage to the structural section. For surfacing sections with GREATER THAN 6 inches of new structural surfacing section any rutting, pumping or plastic deformation in excess of structural section thickness divided by 3 (T/3) will not be allowed and will result in proponent’s operations, on that road, ceasing immediately and remaining shutdown until repairs and improvements are made to prevent additional rutting. This T/3 limitation applies to any forest road utilized by the proponent, even if it is not part of the project area or transportation plan. Surface maintenance will be immediately required (blading, reworking and recompacting, etc) in these rutted sections before construction traffic will be allowed back on any section of the road. Culverts shall be armored with riprap on the outlet side so as not to discharge water onto erodible, unprotected soils. There is a potential need for other reinforcing structures such as retaining walls (Mechanically Stabilized Embankments (MSE)) or reinforced fills and entrapment of sediment with silt fences or other BMP’s approved by the FS.
TR-13	Culverts shall be armored with riprap on the outlet side so as not to discharge water onto erodible, unprotected soils. (See Forest Service typical drawing #3 at the end of Appendix B)
TR-14	In certain circumstances, there may be a need for other reinforcing structures such as retaining walls or reinforced fills and entrapment of sediment with silt fences or other Best Management Practices approved by the FS/BLM. (See Forest Service typical drawings #4, 5, and 6 at the end of Appendix B)
TR-15	After a road has been reconstructed, each lift (subbase, base, and surface) shall be compacted to 95% of Proctor value (AASHTO T99) and the driving surface maintained to prevent loss of fine graded materials.
TR-16	Surface material will be replaced as needed and directed by the USFS/BLM.
TR-17	The ROW grant holder will not construct any new permanent access roads on

Design Criteria	Description of Project Design Criteria
	BLM/USFS lands.
TR-18	The ROW grant holder will conduct a field survey of all access roads in the spring prior to construction in order to determine necessary road maintenance, improvements and/or reconstruction. These improvements will be flagged for field review by the jurisdictional land management agency (BLM/USFS) and based on Road Design Decision Worksheets and Design Criteria for Temporary Access Road Construction and Road Reconstruction provided by the USFS. BML/USFS representatives, in conjunction with ROW grant holder, shall review these improvements and incorporate said improvements into the road use permits.
TR-19	Road reconstruction or maintenance across streams or wetlands will follow the same special procedures outlined in the POD. (See Forest Service typical drawing #7 at the end of Appendix B)
TR-20	"Windrowing" or road berm of soil, gravel or material on the outboard side of the road, blocking surface drainage is not an acceptable road maintenance practice anywhere on the GMUG and White River National Forests.
TR-21	No damage to cattleguards, including their substructure, will be permitted. Those cattleguards that are not up to State legal load limits will not be crossed with heavy equipment and will be replaced prior to use by ROW grant holder. (See Forest Service typical drawing #8, 9, 10, 11 and 12 at the end of Appendix B)
TR-22	ROW grant holder's employees, agents, contractors, etc., shall be encouraged to carpool in order to reduce the probability of traffic accidents, conflicts with school bus traffic and farm vehicles, conflicts with stock and wildlife on the roads, road noise and fugitive dust, damage to roads and adjacent vegetation and speeding.
Vegetative Rehabilitation	
VEG-1	ROW grant holder shall prepare and submit for approval by FS and BLM a restoration/reclamation plan (part of the POD) that will include soil treatment on areas to be revegetated seeding methods, preparation of seedbed, timing of reseeding, etc.
VEG-2	Ground disturbance in areas with any oakbrush will not be seeded with shrub seed as the FS/BLM prefers to leave openings in this community type for wildlife.
VEG-3	ROW grant holder shall seed areas where mineral soil is exposed or as designated by the FS/BLM.
VEG-4	Seeding shall be completed in a timely manner following the last disturbance activity by ROW grant holder in the disturbed area.
VEG-5	Unless otherwise agreed to in writing, seeding shall be done in the early spring or fall during weather and moisture conditions favorable for quick germination and growth of the plants. In general, seeding should be done between March - May 15th or Sept. 15th - November in areas below 8500' in elevation and between May - June 15th or September - November in areas above 8500' in elevation.
VEG-6	When an adequate seed bed does note exist, ROW grant holder shall scarify to get a 2 inch loose soil seedbed, prior to seeding.
VEG-7	In areas of grassland parks, local Thurber fescue seed would be collected in the fall and spread in areas where it is found along the pipeline as it is not available commercially. The ROW grant holder would be responsible for seed collection and seed dispersion.
Visuals	
VQ-1	ROW grant holder must follow direction provided in the Visual Resource

Design Criteria	Description of Project Design Criteria
	Protection Plan (VRPP) which is located in Appendix P of the EIS. The VRPP contains measures to prevent, reduce, or rehabilitate adverse visual impacts.
VQ-2	Pipeline and associated infrastructure will be screened from view, where possible.
VQ-3	Wherever possible and practicable, pipeline will be installed adjacent to roads/trails to minimize surface disturbance and provide for easy access to pipeline for maintenance or spill response.
VQ-4	All above ground structures and equipment except for those that are necessary to operate and maintain the pipeline and which are authorized by the right-of-way grant will be removed following construction.
VQ-5	Where possible and practicable, the edges of the cleared pipeline area will be feathered to blend into surrounding landscape.
VQ-6	Cut and fill will be minimized where possible and practicable.
VQ-7	Naturalize all the areas disturbed by project construction, including outside the 50ft ROW. Naturalization includes restoration of grades, revegetation, naturalized boulder and rock placement, and vertical mulching techniques to blend the ROW in with the surrounding landscape patterns and characteristics, which allows for non-motorized and aerial survey of the corridor within the 50ft ROW.
VQ-8	Confine activities including personal and company vehicles/equipment to areas designated in appropriate permits from the FS/BLM. Designated areas of equipment/material storage should be placed in areas of previous disturbance wherever possible.
VQ-9	Minimize access routes into project area. Follow land contours to minimize clearings, cuts and fills.
VQ-10	During clearing operations, removal of vegetation will be minimized to reduce visible disturbance wherever possible. Minimize clearing vegetation to the extent practical and protect trees, shrubs and groundcover wherever possible.
VQ-11	During clearing operations, no skidding of vegetation on trails. Crossing trails will be minimized or avoided.
VQ-12	Accomplish decking of trees in areas authorized for use by FS/BLM. Fully rehabilitate deck areas and remove slash debris as soon as possible. Slash can be chipped and scattered in areas authorized by FS/BLM.
VQ-13	Within project area, for cleared trees, cut all stumps to 6” or less height
VQ-14	ROW grant holder will work in conjunction with and provide a professional landscape architect to develop, design and implement project layout, project monitoring, and site rehabilitation/reclamation at project completion (as identified through the Visual Resource Protection Plan (VRPP) process).
VQ-15	Incorporating all three dimensional planes, plan, design and locate vegetative manipulation and/or structures in the landscape in a scale and shape which retains the form, line, color, texture of the characteristic landscape, borrowing from natural features.
VQ-16	Maximize and retain any existing vegetative screening potential in visually sensitive areas if possible. Design for “Leave Islands” where possible.
VQ-17	Manipulate ROW clearing to conform to natural vegetative pattern. Blend soil disturbance into natural topography to achieve a natural appearance, reduce erosion and rehabilitate ground cover. Gently grade ground surface to achieve a naturally undulating surface, matching surrounding landform except where measures are needed to control off-road vehicle use of the right of way.
VQ-18	Avoid fastening ropes, cables or fences to trees.

Design Criteria	Description of Project Design Criteria
VQ-19	Promptly remove survey stakes, flagging, trash or other debris/waste from project area as soon as possible. Remove all debris resulting from operations that is not being used for reclamation activities.
VQ-20	Provide bear-proof trash receptacles for trash generated daily by crews or provide for daily removal of trash off BLM/Forest Service land (if required).
VQ-21	If outdoor lighting is required, design outdoor lighting to direct light where it is needed, and where possible, use low pressure sodium light sources. Keep lighting to the minimum required for safe operations. Shield or design lights to prevent offsite glare, and use nighttime lighting only where necessary.
VQ-22	Restore topographic contours to reasonably conform to the contours that existed prior to initiation of operations. ROW grant holder would work with and provide a landscape architect to accomplish this task (as identified through VRPP process). Tasks would include design review and implementation review on site as directed by the Responsible Official.
VQ-23	In areas where tufting grasses occur in meadow blade in place wherever possible. In areas where larger vegetation (shrubs etc) can be bladed in place do so wherever possible.
VQ-24	Mitigate ground disturbances to maintain scenic integrity objectives.
VQ-25	ROW grant holder will gain authorized officer approval of color selections for constructed elements (pipes, gates etc).
Watershed	
WS-1	Temporary bridges will be installed across water bodies on all water body crossings, before construction, to allow construction equipment to cross. Bridges may include clean rock fill over culverts, timber mats supported by flumes, railcar flatbeds, flexi-float apparatus, or other types of spans. Typical drawings for equipment bridges are included in the POD. Construction equipment will be required to use the bridges, except the clearing crew who will be allowed one pass through the water bodies before the bridges are installed. Equipment bridges will be one of the following types: • portable bridges that span the channel • clean rock riprap and flumes • timber equipment mats Each bridge will be designed to allow for the maximum predicted flows for the time frames that it will be in place, including all anticipated precipitation events. The ROW grant holder will also maintain bridges so that soil from equipment or the bridge abutment is prevented from entering any water body. All equipment bridges will be removed as soon as possible after permanent seeding.
WS-2	On streams where the ROW construction will cross perennial flow, a flume will be used to maintain streamflow through the construction site within the stream channel. The following project design features will be required on all water body crossings with streamflow: • Pipe segments for the crossing will be fabricated in adjacent additional temporary use areas. • Pipe will be coated with concrete or equipped with set-on weights to provide negative buoyancy, where required. • Topsoil will be stripped from the streambanks along the trenchline and stockpiled at least 10 feet from waters edge. • Spoil will be stored at least 10 feet from the waters edge and will be

Design Criteria	Description of Project Design Criteria
	located behind sediment barriers or other containment structures. • In-stream work will be limited to the construction equipment necessary to dig the trench, lower-in the pipe, and backfill the trench. • Every effort will be made to complete all in-stream work within 24 hours. • When trench dewatering is necessary, dewatering structures will be located in upland areas so that no heavily silt-laden water reaches a water body. Dewatering requirements are discussed in the Environmental Protection Plan of the POD. • Streambanks will be restored and reseeded as soon as possible after installation of pipe.
WS-3	On flowing streams the flume crossing method will involve trenching through the water body while water is directed to flow through a flume pipe over the trenchline. Prior to trenching, a flume pipe sized to adequately carry the streamflow will be placed in the channel to carry the streamflow over the ditchline. Sandbags will be used to direct stream flow into the upstream end of the flume and at the downstream end to seal off the active trench area. Scour protection will be placed at the downstream end of the flume, if necessary. Track hoes will excavate a trench under the flume pipe from one or both of the water body banks. Equipment operating within the water body will be limited to that needed to construct the crossing. The contractor will place spoil excavated from the trench a minimum of 10 feet from the edge of the water body for temporary storage. Sediment barriers will be installed where necessary to prevent sediment and excavated spoil from entering the water. Once the trench is excavated, the prefabricated segment of pipe will be installed under the flume in the trench at least 4 feet under the streambed. The trench will then be backfilled with native streambed spoil and the streambanks restored to pre-construction contours.
WS-4	On dry stream drainages, crossings will be constructed using the same upland, mainline construction methods that will be used along the rest of the right-of-way, except that spoil will be placed outside the channel. During cleanup and reclamation, the pre-construction profiles and contours (including meanders of the drainage bed) of dry drainages will be re-established. Mulch and erosion control matting will be installed in accordance with requirements for water bodies and wetlands as discussed in the POD Appendix 12
WS-5	The dry channel crossing method will involve trenching through the water body while water is not flowing over the trenchline. Subsurface water may be encountered during construction activities Therefore, water and sediment control measures are also included for dry channel crossings. Track hoes will excavate a trench in the flowing water body from one or both of the water body banks. Equipment operating within the water body will be limited to that needed to construct the crossing. The contractor will place spoil excavated from the trench a minimum of 10 feet from the edge of the water body for temporary storage. Sediment barriers will be installed where necessary to prevent sediment and excavated spoil from entering the water. Earthen trench plugs will be left in place on both banks of the water body until immediately before pipe installation in order to separate the water body trench from the upland trench to prevent any encountered water from being diverted into the upland portions of the pipeline trench and to keep muddy water that accumulates in the upland trench from flowing into the water body. Once the trench is excavated, the prefabricated segment of pipe will be installed in the trench at least 4 feet under the streambed. The trench will then be backfilled with native streambed spoil and the streambanks restored to pre-construction contours.

Design Criteria	Description of Project Design Criteria
WS-6	Construction equipment working in wetlands will be limited to that essential for right-of-way clearing, trench excavation, pipe fabrication and installation, backfilling, and right-of-way restoration. In areas where there is no reasonable access to the right-of-way except through wetlands, non-essential equipment will be allowed to travel through wetlands only if the ground is firm enough or has been stabilized to avoid rutting. Foreign material (upland soil, rock, tree stumps, etc.) will not be imported into the wetland to stabilize the working area. If standing water or saturated soils are present, equipment will work from, and access across, timber equipment mats. If the wetland is dry, equipment can use the right-of-way for access on an as-needed basis with as much traffic as possible routed around the wetland.
WS-7	Clearing of vegetation in wetlands will be limited to trees and shrubs which will be cut flush with the surface of the ground and removed from the wetland. To avoid excessive disruption of wetland soils and the native seed and rootstock within the wetland soils, stump removal, grading, topsoil segregation, and excavation will be limited to the area immediately over the trenchline. A limited amount of stump removal and grading may be conducted in other areas if dictated by safety-related concerns. During clearing, sediment barriers, such as silt fence and staked straw bales, will be installed and maintained adjacent to wetlands and within additional temporary use areas as necessary to minimize the potential for sediment runoff in accordance with the Environmental Protection Plan of the POD. Sediment barriers will be installed across the full width of the construction right-of-way at the base of slopes adjacent to wetland boundaries. Silt fence and/or straw bales installed across the working side of the right-of-way will be removed during the day when vehicle traffic is present and will be replaced each night. Alternatively, drivable berms may be installed and maintained across the right-of-way in lieu of silt fence or straw bales. Sediment barriers will also be installed within wetlands along the edge of the right-of-way, where necessary, to minimize the potential for sediment to run off the construction right-of-way and into wetland areas outside the work area.
WS-8	On wetland sites that are not saturated nor do not have standing water, the contractor will strip up to 12 inches in depth of topsoil above the trenchline prior to trenching. If the wetland is located on a sidehill, topsoil will be stripped from the entire area being graded. Topsoil will be stockpiled in a location where it will not be mixed with any upland soils or wetland subsoil. Care will be taken to ensure that the area stripped over the trenchline is wide enough to include topsoil over trench sidewalls that may slough off due to high groundwater. Sediment barriers will be installed between the spoil piles and the edge of the right-of-way where there is a potential for material to leave the right-of-way.
WS-9	On saturated wetland soil crossings, areas that have standing water, every attempt will be made to remove and stockpile all topsoil up to 12 inches in depth as directed in the POD. Timber equipment mats will be used to stabilize the work area, if needed. Sediment barriers will be placed on the downslope edge of the right-of-way if the wetland continues beyond the right-of-way or both edges of the right-of-way if there is a potential for material to leave the right-of-way. The pipe section needed for each wetland crossing will be built in an upland area and tie-in locations will be in upland areas, where possible, with a soft trench plug between the tie-in location and the wetland. Tie-in locations that require

Design Criteria	Description of Project Design Criteria
	dewatering will use a dewatering structure that is located outside the wetland boundary, so that no heavily silt-laden waters reach any water bodies or wetlands. Dewatering requirements are discussed in the Environmental Protection Plan. A typical wetland crossing detail is provided in the POD.
WS-10	Immediately after initial ground disturbance, temporary erosion control measures will be installed. This will include at a minimum, sediment barriers at the base of all slopes along the right-of-way leading to water bodies and wetlands. All temporary controls will be maintained until permanent erosion control is in place as defined in the Environmental Protection Plan of the POD. After pipe installation, trench breakers will also be placed at the base of slopes leading to water bodies and wetlands. Waterbars will be placed just below the trench breakers to carry off any excess water into vegetated areas. Streambanks and slopes above dry drainages, water bodies and wetlands require additional stabilization beyond the replacement of original contours and other normal erosion control requirements. Stabilization of water body banks with on-site materials (e.g. placing felled trees along the streambanks) will be determined on-site by a Field Compliance Inspector. Straw mulch will be required for stabilization for dry drainage and water body streambanks through the riparian zone (or 50 feet, whichever is greater) and on all streambanks with over 35 percent slope and other areas as directed by the BLM Authorized Officer or field representative. The mulch will extend up the banks 100 feet or until the slope is less than 35 percent, whichever is less. Erosion control matting will be required for stabilizing dry drainage and water body streambanks with over 40 percent slope and other areas as directed by BLM Authorized Officer or field representative. The matting will extend up the banks 100 feet or until the slope is less than 40 percent, whichever is less. Installation and stapling of erosion control matting will follow procedures specified in the details. For streambank installations, mats will be laid parallel (upper mat overlapping lower mat in a shingle pattern) to the water body to a point above the top of the bank. As mentioned above, native materials (rocks, logs, etc.) may be used in conjunction with the matting to aid in stabilization of berms. Refer to the Environmental Protection Plan of the POD for additional information on mulching and erosion control matting.
Wildlife	
WL-1	ROW grant holder shall avoid construction activities in elk production areas between May 15 and June 20. Approximately 1.5 miles on the WRNF for the Proposed Action and Alt 1 would include this seasonal restriction. Other alternatives use open existing roads and no restrictions would be needed.
WL-2	Perennial stream crossing work would occur when stream flow is at average annual low flow conditions, generally August to end of work period.
WL-3	Intermittent stream crossings would be surveyed for sensitive amphibian and fish species use. If no use is detected construction activities could begin before August 31.
WL-4	ROW grant holder shall thoroughly dry equipment used in Buzzard Creek before moving into other drainages. Would be implemented for Alternative 2 stream crossings.
WL-5	Boreal toad identification training would be required for ROW grant holder and associated contractors, employees, etc. working in and around Buzzard Creek. Would only be implemented for Alternative 2, Buzzard Creek stretch of Road 265.
WL-6	ROW grant holder shall avoid construction through ponded wetlands from May 1

Design Criteria	Description of Project Design Criteria
	through August 31 unless surveys are done in July to evaluate use and no use by breeding amphibians is detected. Would be implemented for riparian and wetland crossings.
WL-7	ROW grant holder shall conduct pre-construction surveys each spring, to identify active goshawk, boreal and flammulated owl nests. Nests of other raptor species would also be identified and considered for protection. Construction activities will not occur within species-appropriate spatial and temporal buffers as agreed upon with the appropriate land managing agency (e.g. ¼ mile of active nests between March 1 and July 31 or until fledging and dispersal of the young). Would be implemented in aspen, spruce/fir and aspen/conifer habitats. OR In lieu of additional raptor surveys, avoid construction in mature pinion/juniper, aspen, aspen/conifer and conifer habitats from March 1 through July 31.
WL-8	ROW grant holder shall install wildlife crossovers (trench plugs) with ramps on either side at maximum ¼ mile intervals and at well-defined game trails to facilitate passage of big game across the open trench and to prevent wildlife from becoming trapped in the trench.
WL-9	Hazardous materials would be stored in secure locations by ROW grant holder, 100 ft from water bodies or wetlands to protect amphibian habitats.
WL-10	Rocks and logs and/or man-made physical barriers would be placed on the surface of the ROW during reclamation to provide barriers to deter illegal motorized use and reduce impacts to wildlife habitat.

Project Monitoring Activities

Table B 2 below notes the monitoring activities that would take place during treatments and post-treatments for resource monitoring information.

Table 6B. Monitoring Activities

Monitoring Item	Description of Monitoring
Air Quality	
AQ-m1	Monitor implementation and effectiveness of project design criteria, POD design features, mitigations and project BMPs. Responsibility: ROW grant holder, FS and BLM
Botany/TES Plants	
BO-m1	Monitoring of any known rare plant populations impacted by the ROW will be completed at an interval agreed to by FS and BLM Staff. Responsibility: ROW grant holder, FS and BLM
Heritage Resources	
HR-m1	Monitoring for cultural resources during trenching would occur in grass parks, saddles, forest edges, benches and other areas designated by the project archeologist. Responsibility: Agency Archeologist or other designee
Noxious Weeds	

Monitoring Item	Description of Monitoring
NX-m1	Monitoring of noxious weeds (both existing and new populations) will occur at an interval agreed to by FS and BLM staff. Responsibility: ROW grant holder, FS and BLM
Recreation	
RE-m1	The ROW grant holder and if necessary, the FS and BLM, will conduct an annual inspection of the permitted pipeline corridor to assess and repair potential damage from ATV/4WD use. Any illegal use of the pipeline corridor by ATV's, motorcycles and 4WD will be inventoried. Closures that have been breached will be replaced, re-enforced or repaired by the ROW grant holder. Resource damage occurring on the reclaimed portion of the pipeline corridor will be rehabilitated by the ROW grant holder. Responsibility: ROW grant holder, FS and BLM
Soils	
SO-m1	Monitor implementation and effectiveness of project design criteria, POD design features, mitigations and project BMPs. Responsibility: ROW grant holder, FS or BLM
Transportation	
TR-m1	Monitor implementation and effectiveness of project design criteria, POD design features, mitigations and project BMPs. Responsibility: ROW grant holder, FS and BLM
Vegetation/Rehab Visuals	
VEG/VQ-m1	Monitor revegetation treatments at 1, 3, and 5-year intervals on the project following construction. If design criteria and mitigation measures are found to be unsuccessful from either a vegetation or visuals standpoint, the reclamation plan will be amended to help bring revegetation efforts into conformance. Responsibility: ROW grant holder, FS and BLM
Watershed	
WS-m1	Monitor implementation and effectiveness of project design criteria, POD design features, mitigations and project BMPs. Responsibility: ROW grant holder, FS and BLM
Wildlife	
WL-m1	Monitor implementation and effectiveness of project design criteria, POD design features, mitigations and project BMPs. Responsibility: ROW grant holder, FS and BLM

2.2 ALTERNATIVES CONSIDERED IN DETAIL

The BLM and Forest Service developed five alternatives: the No Action, the Proposed Action, and three other action alternatives generated in response to issues raised by the public. The five alternatives considered in detail for this analysis are listed in Table 7 below.

The range of alternatives were developed from assessing public and Interdisciplinary Team (IDT) input on the proposed action, performing field reconnaissance of the routes with the IDT, and reviewing route options brought forward by the proponent during project planning.

Table 7. List of Alternatives

No Action Alternative	The No Action is the baseline for comparing the other alternatives.
Proposed Action (Preferred Alternative)-Parallel Ragged Mountain Pipeline	The Proposed Action is the proposed pipeline route as submitted by the project proponent (SG). The Proposed Action is also the agencies' Preferred Alternative. Total length is approximately 25.5 miles.
Alternative 1-Maximize Following Existing Roads	Alternative 1 is the alternative developed in response to public and IDT input for a route that would maximize following existing roads. In the northern end of the project area, the route would follow County Road 79/344 and National Forest System Road (#800) along West Divide Creek, and follow National Forest System Roads #265 and #844 on the southern end of the project area. The middle portion of this route would be the same as the Proposed Action. No BLM lands are involved in Alternative 1. Total length is approximately 25.9 miles.
Alternative 2-Avoid Inventoried Roadless Areas	Alternative 2 responds to public input for a route that would avoid all Forest Service Inventoried Roadless Areas. The route would follow County Road 265 and National Forest System Roads to the west of the proposed action in a longer loop that would include National Forest System Roads #265, #270, #342 and #344. Total length is approximately 39.1 miles; the longest of all alternatives.
Alternative 3-Avoid IRA & Follow Powerline	Alternative 3 responds to public input for a route that would avoid all Forest Service Inventoried Roadless Areas. Alternative 3 is a variation of Alternative 2 in that it would follow the same roads as Alternative 2 at the northern and southern ends but in the middle would follow the existing Curecanti-Rifle 230-kilovolt transmission line. This alternative is shorter in length than Alternative 2, but longer than the proposed action and Alternative 1. Total length is approximately 32.4 miles.

2.2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, current management plans would continue to guide management of the project area and the gas and water pipelines and associated facilities would not be authorized or built.

The 6-inch Ragged Mountain Pipeline (RMP), built in 1983, located near the Bull Mountain Unit (the proposed Bull Mountain Pipeline would parallel it for approximately 9 miles) could be used to transport a small amount of gas produced in the Bull Mountain Unit. There are currently 3 wells in the Bull Mountain Unit; only one well is currently on-line and producing. The estimated capacity of the RMP is 7MMSCFD and it is reported to be currently operating between 1.8 and 6 MMSCFD. SG owns 7 MMSCFD of firm capacity at the Ragged Mountain Interconnect on the Rocky Mountain Natural Gas Pipeline (RMNGP) system. This means that the RMP could be used to transport some of the gas gathered from the Bull Mountain Unit, but it would not carry the amount predicted to be gathered (80 MMSCFD) at Bull Mountain Unit full build-out in the next 10-12 years.

SG would not likely expend the resources to expand the capacity of the RMP when these actions would result in gas gathered from the Bull Mountain Unit exceeding the capacities of the 6-inch RMNGP system. In scenarios that involve use of the existing pipeline transportation system, some gas could be gathered from the Bull Mountain Unit at current or future levels, but the existing systems would deliver gas to local markets only (instead of the national energy market for which Bull Mountain Pipeline is proposed) and at a much lower capacity and much slower pace than that of the proposed Bull Mountain Pipeline.

Under the No Action Alternative, there would not be an efficient means to transport the volumes of gas that is anticipated to be produced from the Bull Mountain Unit to the national energy market. This would result in reduced domestic natural gas supply available to the national market. Existing valid lease rights would not be exercised and other pipeline routes to transport gas from existing leased production areas to distribution areas would likely be proposed.

Under the No Action Alternative, any water produced from the Bull Mountain Unit would have to be disposed of in an approved location on-site (i.e. disposal well) or would have to be stored on site in tanks and transported by truck to an appropriate disposal site. Previous attempts in the Bull Mountain Unit at drilling disposal wells have shown that the formations do not take the water. SG is still searching for an appropriate disposal well site on the unit. Currently, produced water from the Bull Mountain Unit is trucked to a commercial disposal site in Grand Junction, Colorado.

Under the No Action Alternative, water produced from energy wells in the Bull Mountain Unit would not be transported from the wells via pipeline to an appropriate disposal site or system in another area. For this reason, under this alternative, production water would have to be processed in a manner so as not to adversely impact water resources in the project area or downstream of the project area. There are several possible activities that could occur under this alternative to deal with production water, they are, but limited to; treating water or demonstrating that the water produced is of sufficient quality water that the operators are able to obtain discharge permits under the Clean Water Act to allow the production water to flow into surface water drainages in the area, Storing water in tanks and then transporting the water by truck to an appropriate disposal facility, or injecting the water back into the subsurface geology.

Previous attempts in the Bull Mountain Unit to develop injection wells for disposal of production water have proved to be unsuccessful because subsurface geology is not conducive to re-injection. SG continues to search for opportunities to re-inject production water back into the local geology in the area of the Bull Mountain Unit, but will continue to truck production water from the Unit to a commercial disposal site in the Grand Junction area.

2.2.2 ACTIVITES COMMON TO ALL ACTION ALTERNATIVES

PLAN OF DEVELOPMENT (POD)

An initial Plan of Development (POD) was submitted with the Application for Transportation and Utility Systems and Facilities on Federal Lands (Standard Form 299, project file) that described specific project construction and design procedures along with measures to protect environmental resources. The POD was reviewed by agency specialists and revised to include protective measures derived from agency policy and management plans. Protective measures derived from the preliminary POD are detailed in Table 6, and are included as project design criteria of the Proposed Action and all alternatives. A final POD subject to agency approval would accompany the proposed ROW grant.

The Plan of Development contains an introduction, a detailed discussion of the proposed construction activities, and a description of operation and maintenance activities. That information is presented below in the details of the Proposed Action. In addition, the following environmental compliance plans are attached to the Plan of Development (POD) as appendices. The complete preliminary POD and appendices are available in the project files.

- Appendix 1—Biological Resources Protection Plan
- Appendix 2—Blasting Plan
- Appendix 3—Cultural Resources Protection Plan
- Appendix 4—Environmental Compliance Management Plan
- Appendix 5—Fire Prevention and Suppression Plan
- Appendix 6—Fugitive Dust Control Plan
- Appendix 7—Hazardous Materials Management and Spill Prevention, Containment, and Countermeasure Plan
- Appendix 8—Pressure Testing Plan
- Appendix 9—Noxious Weed Management Plan
- Appendix 10—Safety Plan
- Appendix 11—Transportation Management Plan
- Appendix 12—Environmental Protection Plan

Alignment Sheet Maps

In addition to the POD and appendices, SG submitted detailed "alignment sheet maps" that show the detailed route for the proposed action, including temporary use areas (TUAs), wetlands and additional information. Those alignment sheet maps (1 index map plus 10 individual sheets at 1"-500 foot scale) were used by the IDT during planning, field work and subsequent environmental analysis. These detailed alignment sheet maps are in the project files.

PIPELINE FACILITIES

The natural gas and water pipelines proposed by SG consist of approximately 25.5 miles of up to 20-inch diameter natural gas pipeline and 8-inch water pipeline and related aboveground appurtenances. The water pipeline would be installed in the same trench with a minimum 1 foot of separation between the pipelines. The gas pipeline would be designed for a maximum operating pressure (MAOP) of 1440 psig. Probable natural gas system operating pressure is approximately 900 psig with a resulting design flow rate in excess of 80 MMSCFD, the anticipated production volume from the Bull Mountain Unit over a 10 to 12 year time period based on test well pressure data. Both pipelines would be buried to a minimum depth of cover of 36 inches in soil or minimum 18 to 24 inches of cover in solid rock. Additional burial depth would be achieved at stream and roadway crossings (i.e. 48 inches of cover minimum) as per permit requirements and good engineering practices. Pipe material specifications are as follows:

- 20-inch natural gas pipeline 20-inch O.D., 0.375 w.t., Grade X-60
- 8-inch water pipeline 8-inch O.D., 0.250 w.t., Grade X-42

8-inch Water Pipeline Facilities

The 8-inch produced water line is a contingency facility that would allow transport of produced water out of the Bull Mountain Unit area should disposal well capacity in the Bull Mountain Unit prove inadequate. Installing the water line concurrently with the Bull Mountain pipeline construction is proposed to maximize benefit from a single construction event. The 8-inch water line would be installed in the same trench as the 20-inch diameter gas pipeline and would be offset a minimum of 1-foot from the gas pipeline. See FEIS Appendix A-Figure 11 for a drawing showing the relationship of the pipes in the trench.

Produced water transported in the 8-inch line would be staged at the Divide Creek Compressor Station site in a tank battery for trucking to the closest appropriate site for disposal. At this time, potential commercial disposal sites include a facility south of Debeque, CO and a facility in Vernal, Utah. The volume of water that would be produced from the Bull Mountain Unit and the size of the tank battery that would be needed is currently unknown since only one well is on-line and does not produce much water. Another facility required for the 8-inch waterline would include a single gas-fired 480 hp pump engine located on the 4-acre compressor station site at the south end of the project area which is being analyzed as a connected action in this EIS.

Aboveground Appurtenant Facilities

Associated aboveground appurtenances proposed by SG include pipeline markers, metering stations, a block valve, pig launcher and receiver, and cathodic protection equipment. On federally-administered lands, all aboveground appurtenances would be painted in conformance with color specifications provided by federal agencies from the “Standard Environmental Color Chart” issued by the Rocky Mountain Five-State Interagency Committee. SG would coordinate with the federal agency Authorized Officer in order to determine the appropriate color (See also Ch. 3, 3.12, Visuals section). SG would provide private landowners with the suggested federal color and material. Aboveground appurtenances would be constructed along the same timeframe as the pipelines. Any aboveground appurtenances outside the fence line of the compressor stations on the south end or north end would be within the 50-foot ROW grant.

Metering Stations

Metering stations would be required at each interconnect/outlet to existing/proposed pipelines at the proposed 4-acre Bull Mountain compressor station and processing facility at the south end and at the existing Divide Creek Compressor Station at the north end (located on private land). Metering stations would consist of gas quality measurement equipment, valves, and related piping located within a prefabricated metal building. The perimeter of the proposed Bull Mountain compressor station and processing facility would be surrounded with security fencing. The metering station would be located on private property at the Divide Creek Compressor Station which is already surrounded by security fencing. SG would provide exact locations, property ownership, and land requirements for the metering stations to the BLM Authorized Officer prior to construction.

Block Valve

There would be one sectionalized block valve along the pipeline route being analyzed in this EIS. The perimeter of the block valve site would be surrounded by suitable security fence. A block valve would be located within the 50-foot ROW adjacent to NFSR Road 800 (Mosquito Creek Road) on the WRNF.

Pig Launcher & Receiver

A 20-inch pig launcher would be installed within the 4-acre Bull Mountain compressor station and processing facility fence line. A 20-inch pig receiver would be installed inside the existing fence perimeter at the Divide Creek Compressor Station.

Cathodic Protection Equipment

Cathodic protection equipment "test stations" would be installed at approximately one-mile intervals along the pipeline ROW; test stations consists of a 1" plastic pipe with a cover on top for the two wires used to take electrical ground potential readings. In addition to the test stations, an electrical rectifier would be placed at the proposed compressor station on the south end and at the existing Divide Creek site within the proposed metering station. The electrical rectifier would induce a low current on the pipeline to cathodically protect the pipeline from corrosion. SG would provide exact locations for cathodic protection equipment test stations to the BLM Authorized Officer prior to construction.

Pipeline Markers

The pipeline location would be marked with aboveground markers in accordance with DOT safety requirements, land management agency requirements, and landowner preference. Markers are installed typically at road and fence crossings.

PIPELINE RIGHT OF WAY (ROW)

The right-of-way would consist of a 50-foot ROW grant issued for a period of 30 years plus additional temporary use areas (TUA) required during construction only. A 25-foot wide TUA strip adjacent to the 50-foot-wide right-of-way would be used during construction. Disturbance in the construction ROW generally would not exceed 100 feet in width; a minimum width of 100 feet was used to analyze potential effects of the proposed action and alternatives. The 50-foot ROW grant would contain both the proposed 8-inch and 20-inch pipelines. SG would install the 8-inch and 20-inch proposed pipelines generally at the edge of existing pipeline rights-of-way using a standard 25-foot offset from the center of the existing pipeline. Following construction of the pipelines, the width of the right-of-way would be reduced to 50 feet. See FEIS Appendix A-Figure 11 and Figure 12 for engineering typical drawings showing the ROW. The total length of the proposed ROW would be approximately 25.5 miles.

TEMPORARY USE AREAS (TUAS)

In order to allow an accurate comparison of the Proposed Action and the action alternatives, the construction ROW is assumed to be a total of 100-foot wide and encompasses the truck turn-arounds and other storage sites for analysis purposes. A permanent ROW will be granted for a 50 foot-width within the 100 foot wide construction ROW. The locations and sizes of the temporary workspaces identified by SG are depicted in detail in the alignment sheet maps located in the project files and in Tables 9-12 below.

CONSTRUCTION YARDS

SG proposes to use contractor, pipe storage, and off-loading yards on a temporary basis to support construction activities. These yards are located on private land. The site at the south end of the project would be on the 4-acre site for the proposed Bull Mountain compressor station and processing facility (see section below for discussion of the compressor station). In addition, at the north end of the project, a construction yard would be leased on private land at current existing construction yard sites close to Rifle and Silt.

COMPRESSOR STATION FACILITIES

South end – Bull Mountain Unit (private land)

A 2.5-acre compressor station site (within the larger 4-acre compressor station and processing facility site) would be located on the southern end of the project on private lands. For this proposal and analysis, the 4-acre site and all associated facilities are considered a connected action over which the federal agencies have no authority or jurisdiction since FS/BLM regulations do not apply to private lands. Other ancillary facilities proposed at the 4-acre site, mentioned on the previous pages above, include a metering station and associated metal building, 480 hp water pump, construction yard, a 20-inch pig launcher, and security fencing around the entire site (FEIS Appendix A-Figure 13 shows a drawing of the compressor site and the facilities). The compressor site would require approximately 1 kilowatt of electrical power; SG has already submitted permits for extending power to their private property via a 1200' line extending from an existing county road. The powerline would not cross federal lands. Stringent noise abatement structures and techniques would be employed in compliance with state and county noise regulations. The compressor site would have 4 compressor sets with a total of 15,760 HP for anticipated build out of the Bull Mountain Pipeline at 80 MMSCFD over a 10-12 year period as gas production increases in the unit.

The maximum capacity of the 20-inch pipeline at Maximum Allowable Operating Pressure (MAOP) is estimated to be 1440 psig. Assuming a 1440 psig discharge pressure at the proposed Bull Mountain compressor station site and a 1200 psig delivery pressure from the Bull Mountain Pipeline (25.5 miles in length), maximum flow capacity for the proposed Bull Mountain Pipeline is estimated to be 375 MMSCFD.

North end – Divide Creek Compressor Station (private land)

The northern terminus of the proposed Bull Mountain Pipeline is the existing Divide Creek Compressor Station located on private land (T8S, R92W, Section 1) and operated by Questar. This site is approximately 10.8 acres, is already fenced-in, and currently has one compressor set in operation. No additional compressor set(s) are being proposed with this project. For this proposal and analysis, the new facilities proposed at the Divide Creek Compressor Station are considered a connected action over which the federal agencies have no authority or jurisdiction since FS/BLM regulations do not apply to private lands. Facilities proposed at the Divide Creek site, mentioned on the previous pages above, include a metering station and associated metal building, 20-inch pig receiver and produced water tank. All these facilities would be built on the existing disturbance footprint at the existing Divide Creek Compressor Station.

TRANSPORTATION ACTIVITIES

Improvements and upgrades to all existing access roads would be needed to accommodate the oversize and heavy construction equipment needed to construct the ROW and install the pipelines. In general, roadway improvements on BLM/ USFS would involve the least amount of site disturbance and earthwork necessary to make the roads functional for project use as detailed in road use authorizations. Road modifications, ranging from grading to reconstruction, would be required to use the existing road transportation system. Hauling construction equipment and materials would be done in accordance with Colorado State requirements. Many of the roads in the project area are gravel or native surface and would require continuous maintenance when the road is in use. All maintenance and improvements shall be completed in accordance with project requirements (See FEIS-Chapter 3, Transportation and Table 6). Due to soil and moisture condition variations during the year, seasonal or temporary restrictions may be required to prevent irreparable resource damage to roads or adjacent resources.

Existing roads that are used in conjunction with construction would be periodically maintained during pipeline construction. Many of the roads in the project area are gravel or native surfaced and would require continuous maintenance when the road is in use. Maintenance would include blading throughout the construction period to maintain roadway drainage and reduce rutting. Roadways would be maintained and kept open for public access throughout construction as prescribed by the respective authorizing agencies. Following project completion, roadways would be returned to the objective maintenance level as described in the road management objective (RMO) worksheet or as prescribed by the respective authorizing agencies. Temporary roads would be decommissioned by obliteration at the end of pipeline construction or as soon as they are no longer needed.

In addition, road use on the National Forests may be restricted or terminated during times of saturation or under conditions that would cause resource damage. Generally winter closures run from mid-November to mid-May or as specified by specific area or route restrictions. Construction activities will be limited or suspended during those periods.

NFSR 701 may be used as a major haul route for road upgrades with local gravel sources because most of the commercial aggregate sources are located in the Paonia/Hotchkiss area. Before hauling aggregate for other roadwork, this road will receive spot reconstruction, maintenance activities and addition gravel surfacing due to the requirements of the Commercial Road Use Permit that will be required prior to use.

A Road Use Permit is required prior to commencement of any activities.

CONSTRUCTION SCHEDULE / ACTIVITIES

Expected construction timeframe of the Proposed Action is approximately 12 months (16 weeks) in over 3 construction years (road upgrades estimated at one season, pipeline construction estimated at 2 seasons). Pipeline construction would only be authorized to occur when conditions are not satuarated (estimated to be between May 1 and mid-October) to reduce resource impacts during winter conditions. (Note: timing restriction would not apply to hydrotesting the pipeline, hydromulching and reseeding activities, and other reclamation activities that may be required in the fall before winter sets in.) In addition, roads on the National Forests in this area are generally closed due to snow from mid-November to mid-April and would further limit construction use during those periods. No plowing of roads will be permitted to continue activities in the winter.

CONSTRUCTION ACTIVITIES

The actual construction activities are completed in phases and those phases are summarized below and are provided for general information. Detailed construction methods and project design criteria for each of the phases described below are located in the POD and POD appendices. The complete POD is in the project files.

Initial Surveying and Staking

Initial engineering surveys are performed to place the proposed pipeline ROW alignment on the ground. This information is used to develop the detailed proposed action and alignment sheet maps used in the planning and subsequent analysis. In addition, surveys and literature reviews are conducted to identify sensitive resources along the proposed route. Sensitive resources identified could include: sensitive wildlife populations and habitat; sensitive plant populations; cultural resources; wetlands and water bodies; noxious weed infestations; and areas of potential geologic instability.

Construction

Civil engineering surveys are performed to identify the centerline of the pipeline and the boundaries of both sides of the approved working limits before construction activities commence. Construction Inspectors are responsible for verifying that the limits of authorized construction work areas are staked prior to construction. Construction equipment include trucks, loaders, various sized dozers, shovels and backhoes, boring machines, cranes, side booms, generators, and bending machines. Most of the equipment to be used during ROW restoration would consist of dozers, blades, and backhoes. All action alternatives will use the following equipment in the construction of the pipeline and assumptions regarding pipe.

Table 8. Construction Equipment Types

Activity & Equipment*	Equipment Weight (lbs)
Tree and Shrub Removal Equipment	
Tigercat L870C Feller/Buncher	78,500
Tigercat 630C Skidder	37,500
Tigercat T250 Loader	57,000
Tigercat M760 Mulcher	40,000
Delimber	65,000
Truck & Lowboy Trailer	28,000
3/4 ton Pickup	5,200
1 ton Crew truck	5,800
Logging Truck (loaded)	46,800
Logging Truck (unloaded)	12,000
ROW Clearing Equipment	
D-8 Bulldozer	85,000
D-9 Bulldozer	105,500
Series 140 Motor Grader	48,000
Truck & Lowboy Trailer	28,000
3/4 ton Pickup	5,200
1 ton Crew truck	5,800
Trenching Equipment	
Series 345 Trackhoe	112,000
Series 325 Trackhoe	63,000
Air compressor	6,000
Truck & Lowboy Trailer	28,000
3/4 ton Pickup	5200
Stringing Equipment	
Series 572 Stringing Sidebooms	70,000
Truck & Lowboy Trailer	28,000

Activity & Equipment*	Equipment Weight (lbs)
3/4 ton Pickup	5,200
1 ton Crew truck	5,800
Stringing Truck & Trailer	12,000
Bending Equipment	
Bending Machine	20,000
Series 561 Sideboom	40,000
Series 572 Sideboom	70,000
Truck & Lowboy Trailer	28,000
3/4 ton Pickup	5,200
1 ton Crew truck	5,800
Pipe Gang Equipment	
Series 572 Set-in Tractor	70,000
Series 561 Welding Rigs	45,000
Utility Tractor	9,000
Truck & Lowboy Trailer	28,000
3/4 ton Pickup	5,200
Crew Truck	5,800
Crew Bus	18,000
Welding Equipment	
D-6 Tractor	40,000
Truck & Lowboy Trailer	28,000
Pickup 3/4 - 1 ton	5,200
Welding Rig 1 Ton	9,500
X-Ray equipment	
Pickup 3/4 - 1 ton	5,200
Repair as Required Equipment	
Pickup 3/4 - 1 ton	5,200
Welding Rig 1 Ton	9,500
Joint Coating Equipment	
3/4 ton Pickup	5,200
Crew Truck	5,800
Lowering In Equipment	
Series 583 Sidebooms	98,000
Series 572 Tractors	70,000
Series 325 Trackhoe	63,000
Truck & Lowboy Trailer	28,000
3/4 ton Pickup	5,200
1 ton Crew truck	5,800
Tie In Equipment	
Series 325 Trackhoe	63,000
Series 572 Sideboom	70,000
Truck & Lowboy Trailer	28,000
Pickup 3/4 - 1 ton	5,200
Welding Rig 1 Ton	9,500
1 ton Crew truck	5,800
Backfill Equipment	
D-6 Bulldozer	40,000
Series 325 Trackhoe	63,000
Truck & Lowboy Trailer	28,000
3/4 ton Pickup	5,200

Activity & Equipment*	**Equipment Weight (lbs)**
Hydrostatic Test Equipment	
160-Barrel Water Tanker & Tractor (loaded w 110 bbls)	73,500
160-Barrel Water Tanker & Tractor (unloaded)	35,000
500-Barrel Frac Tank on trailer with Truck	30,000
Compressor	10,000
3/4 ton Pickup	5,200
1 ton Crew truck	5,800
Equipment Truck	12,500
Clean Up Equipment	
D-8 Bulldozer	85,000
Series 140 Motor Grader	48,000
Series 325 Trackhoe	63,000
Truck & Lowboy Trailer	28,000
3/4 ton Pickup	5,200
1 ton Crew truck	5,800
Restoration Equipment	
4-wheel drive utility tractors	12,000
Truck & Lowboy Trailer	28,000
3/4 ton Pickup	5,200
1 ton Crew truck	5,800
Fugitive Dust Control Equipment	
80 Bbl Water Truck (loaded)	56,000
80 Bbl Water Truck (unloaded)	25,000
Fueling Truck Equipment	
Fuel Truck (loaded)	56,000
Fuel Truck (unloaded)	28,500

- 20-inch pipe weighs 78.7 lbs/foot. Each string truck would carry 9 pieces of pipe each 60-feet long.
- 8-inch pipe weighs 22.4 lbs/foot. Each string truck would carry 34 pieces of pipe each 60 feet long.
- Pipe weighs approx 46,800 lbs (conservative weight) depending on if the stringing truck is hauling 8-inch or 20-inch pipe.

Clearing, Grading, and Topsoiling

Before clearing and grading activities are conducted, landowner fences would be braced and cut, and temporary gates and fences would be installed to contain livestock, if needed. A clearing crew would follow the fence crew and would clear the work area of vegetation and obstacles (e.g., trees, logs, brush, rocks). Temporary erosion control measures such as silt fences or straw bales would be installed prior to vegetation removal along wetlands and riparian areas. Grading would be conducted where necessary to provide a reasonably level work surface. Where the ground is relatively flat and does not require grading, rootstock would be left in the ground. More extensive grading would be required in steep side-slopes or vertical areas and where necessary to prevent excessive bending of the pipeline.

Temporary erosion controls (e.g., silt fencing or straw bales) would be installed prior to vegetation removal adjacent to wetlands and riparian areas.

Vegetation would be cleared and the construction right-of-way graded to provide for safe and efficient operation of construction equipment and inspection vehicles, and to provide space for the storage of subsoil and topsoil. Construction activity and ground disturbance would be limited to approved, staked areas.

Unless otherwise requested by the landowner, topsoil would generally be separated from subsoil only over the trench itself. Separated topsoil would be stored on the near side of the trench and in a pile separate from subsoil (which would be stored on the far side of the trench) to allow for proper restoration of the soil during the backfilling process. Depending upon conditions encountered in the field during construction, topsoil separated from subsoil over the trench may be stored on the far side of the trench as an alternate topsoil location. In areas where the ROW would be graded to provide a level working surface and where there was a need to separate topsoil from subsoil, the ROW would be graded to collect topsoil before any subsoil was disturbed. Topsoil separated from subsoil under conditions where the entire ROW is to be stripped would be stored on the working side of the ROW. Again, topsoil would be piled such that the mixing of subsoil and topsoil would not occur. Topsoil would not be stripped from areas where subsoil would be stored to maintain the integrity of the natural soil horizons and preserve rootstock. Gaps would be left between the spoil piles to prevent storm water runoff from backing up or flooding. Topsoil would be returned to its original horizon after subsoil was backfilled in the trench.

Trenching and Blasting

Construction methods used to excavate a trench would vary depending on soils, terrain, and related factors. Where possible, trenching machines would be used to excavate the pipeline trench. In situations such as steep slopes, unstable soils, high water table, or deep or wide trench requirements, track hoes would generally be used.

The trench would be excavated to a depth that provides sufficient cover over the pipeline after backfilling. Typically, the trench would be about 5 to 6 feet deep to allow for the minimum 36 inches of cover that is required in most locations. The trench would be about 4 to 6 feet wide in stable soils. Additional cover for the pipeline would be provided at road and water body crossings, while less cover is required in rock.

When rock or rocky formations were encountered, tractor-mounted mechanical rippers or rock trenchers would be used for fracturing the rock prior to excavation. In areas where mechanical equipment could not break up or loosen the bedrock, blasting would be required. Excavated rock would be used to backfill the trench to the top of the existing bedrock profile.

In areas where rangeland used for grazing and livestock could not be temporarily relocated by the landowner, construction activities could potentially hinder the movement of livestock across those allotments. Wildlife accustomed to freely moving through the area in search of food and water could also be hindered by construction activities. To minimize impact on livestock and wildlife movements during construction, soft plugs (areas where the trench is excavated and replaced with minimal compaction) would be installed to allow livestock and wildlife to safely cross the open trench. Soft plugs would be constructed with a ramp on each side to enable animals that fell into the trench an avenue of escape. To allow for safe passage, soft plugs would be constructed at intervals determined in consultation with the landowner and in addition where the trench is intersected by known livestock or wildlife trails.

Boring

Boring techniques would generally be used under any paved roads to avoid disrupting traffic in accordance with the governing agency requirements and permitting agreements. The conventional bore method involves excavating a bore pit on one side of the crossing and a receiving pit on the other side and utilizes a cutting head and power unit mounted on rails or a sideboom suspended boring machine attached to a “deadman”. The power unit drives the cutting head attached to the pilot pipe until the power unit reaches the leading edge of the bore pit. The power unit is detached from the cutting head and a segment of the carrier pipe is welded to the pilot pipe already driven. Additional carrier pipe segments are added successively until the bore reaches the other side of the crossing in the receiving pit. Once through, the power unit backs out the cutting head one segment at a time, leaving the carrier pipe in place under the crossing. In the receiving pit, the pilot pipe is removed for use at the next crossing.

Pipe Installation

Pipe installation would include stringing, bending for horizontal or vertical angles in the alignment, welding the pipe segments together, inspection, coating the joint areas to prevent corrosion, and then lowering-in and padding as described in greater detail below.

Stringing

Line pipe is shipped directly from the manufacturer by rail to pipe yards and then hauled by stringing trucks to the pipeline right-of-way. Each individual joint of pipe is unloaded with a sideboom or track hoe and placed (strung) parallel to the ditch in a continuous line. Stringing operations are coordinated with trenching and installation activities in order to properly manage the construction time at a particular tract of land. Gaps are left at access points across the ditch to allow crossing of the right-of-way.

Bending

After joints of pipe are strung along the ditch but before the joints are welded together, individual joints of pipe would be bent to accommodate horizontal and vertical changes in direction. Field bends are made utilizing a hydraulically operated bending machine. Where the deflection of a bend exceeds the allowable limits for a field-bent pipe, factory (induction) bends would be installed.

Welding

After pipe joints are bent, the pipe joints would be lined up end-to-end and clamped into position. The natural gas pipelines would be welded in conformance with 49 CFR Part 192, Subpart E, “Welding of Steel Pipelines” and API 1104, “Standard for Welding Pipelines and Related Facilities,” latest edition approved by DOT.

Inspection

All welds are visually inspected by an American Welding Society (AWS) certified inspector who is part of the construction management staff. Non-destructive radiographic inspection methods are conducted in accordance with DOT requirements. A specialized contractor, AWS certified to perform radiographic inspection, would perform this work. Any defects would be repaired or cut out as required under the specified regulations and standards.

Coating

To prevent corrosion, the pipe is externally coated with fusion bonded epoxy coating prior to delivery. After welding, field joints are coated with a tape wrap, shrinkable sleeve wrap, or field-applied fusion bond epoxy. Before the pipe is lowered into the ditch, the pipeline coating is visually inspected and tested with an electronic detector, and any faults or scratches (holidays) are repaired.

Lowering-in and Padding

Before the pipe section is lowered into the ditch, inspection are conducted to verify that the pipe is properly fitted and installed into the ditch, minimum cover is provided, and the trench bottom is free of rocks and other debris that could damage the external pipe coating. Dewatering may be necessary where water has accumulated in the trench. Side-boom tractors are used to simultaneously lift the pipe section, position it over the ditch, and lower it in place. On sloped terrain, trench breakers (stacked sand bags or foam) would be installed in the trench at specified intervals to prevent subsurface water movement along the pipeline. Specialized padding machines are used to sift soil fines from the excavated subsoils to provide rock-free pipeline padding and bedding. Sandbags may be used to pad the bottom of the ditch instead of, or in combination with, padding with soil fines. In rocky areas, padding material or a rock shield is used to protect the pipe. No topsoil would be used as padding material.

Backfilling

Backfilling begins after a section of pipe has been successfully placed in the ditch. Backfill is conducted using a bulldozer, rotary auger backfiller, padding machine or other suitable equipment. Backfilling the trench would generally use the subsoil previously excavated from the trench, except in rocky areas where imported select fill material maybe needed. Backfill is graded and compacted, where necessary for ground stability, by tamping or walking with a wheeled or tracked vehicle. Compaction is performed to the extent that there are no voids in the trench. Any excavated materials or materials unfit for backfill are either be utilized elsewhere or properly disposed of in conformance with applicable laws or regulations.

Pressure Testing

Each pipeline is tested in compliance with DOT regulations (49 CFR Parts 192). The hydrostatic testing is completed after backfilling and all construction work that directly affects the pipe is completed. Prior to filling the pipeline for a hydrostatic test, each section of the pipeline is cleaned by passing reinforced poly pigs through the interior of the line. Incremental segments of the pipeline are then filled with water, pressurized to at least 1.25 times the MAOP, and held for a minimum of 8 hours. If leaks are found, they are repaired and the section of pipe retested until specifications are met. The length of each segment tested would depend on topography. Typically, the hydrostatic tests of individual segments would be conducted in sequence and the test water would be transferred from one segment to another. Hydrostatic water is tested for compliance with NPDES permit compliance and discharged using approved methodologies and locations specified in accordance with applicable permit requirements.

Final Tie-In

Following successful hydrostatic testing, test manifolds would be removed and the final pipeline tie-ins would be made and inspected.

Commissioning

After final tie-ins are complete and inspected, the pipeline would be cleaned and dried using mechanical tools (pigs) that are moved through the pipeline with pressurized, dry air. The pipeline would be dried to minimize the potential for internal corrosion. Once the pipe has dried sufficiently, pipeline commissioning would commence. Commissioning involves activities to verify that equipment has been properly installed and is working, the controls and communications systems are functional, and that the pipeline is ready for service. In the final step, the pipeline is prepared for service by purging the line of air and loading the line with natural gas

Cleanup and Restoration

Cleanup and restoration of the surface along the right-of-way and any TUAs is performed by removing any construction debris and by performing final grading to the finished contour. Steps are taken to minimize erosion, restore the natural ground contour, and account for trench settling. After backfilling, final cleanup would begin as soon as weather and site conditions permit. Every reasonable effort would be made to complete final cleanup (including final grading and installation of erosion control devices) generally within 20 days after backfilling the trench. Construction debris would be cleaned up and taken to a disposal facility.

After permanent erosion control devices are installed and final grading has occurred, all disturbed work areas would be seeded as soon as possible during the appropriate time of year. Restoration methods, structures and seeding are performed in accordance with requirements as described in the POD.

Pipeline markers would be installed at fence, road, and railroad crossings and other locations (as required by 49 CFR 192) to show the location of the pipeline. Markers would identify the owner of the pipeline and convey emergency information. Special markers providing information and guidance to aerial patrol pilots also would be installed.

SPECIAL CONSTRUCTION PROCEDURES

In addition to standard pipeline construction methods, SG would use special construction techniques where warranted by site-specific conditions. These special techniques would be used when constructing for example, across paved roads, steep terrain, water bodies, wetlands, and when blasting through rock. These are described in general below. Specific construction techniques proposed by SG are contained in the POD.

Road Crossings

Boring techniques would generally be used under paved roads to avoid disrupting traffic in accordance with the governing agency requirements and permitting agreements. The conventional bore method involves excavating a bore pit on one side of the crossing and a receiving pit on the other side and utilizes a cutting head and power unit mounted on rails or a sideboom suspended boring machine attached to a “deadman”. The power unit drives the cutting head attached to the pilot pipe until the power unit reaches the leading edge of the bore pit. The power unit is detached from the cutting head and a segment of the carrier pipe is welded to the pilot pipe already driven. Additional carrier pipe segments are added successively until the bore reaches the other side of the crossing in the receiving pit. Once through, the power unit backs out the cutting head one segment at a time, leaving the carrier pipe in place under the crossing. In the receiving pit, the pilot pipe is removed for use at the next crossing. Boring would result in minimal or no disruption to traffic at road or highway crossings. Each boring would be expected to take 2 to 10 days.

Most smaller, unpaved roads and driveways would be crossed using the open-cut method where permitted by authorized agencies or private owners. The open-cut method would require temporary closure of the road to traffic and/or establishment of detours. If no reasonable detour is feasible, at least one lane of traffic would be kept open, except during brief periods when it is essential for safety to close the road to install the pipeline. Most open-cut road crossings would be completed and the road resurfaced in 24 to 48 hours. SG would take measures, such as posting signs at open-cut road crossings and notifying local landowners, to ensure safety and minimize traffic disruptions.

Steep Terrain

Additional grading may be required in areas where the proposed pipeline route would cross steep slopes. Steep slopes often need to be graded down to a gentler slope to accommodate pipe-bending limitations. In such areas, the slopes would be cut away, and after the pipeline is installed, reconstructed to their original contours during restoration.

In areas where the proposed pipeline route crosses laterally along the side of a slope, cut and fill grading may be required to obtain a safe, flat work terrace. Topsoil would be stripped from the entire ROW and stockpiled prior to cut and fill grading on steep terrain. Generally, on steep side-slopes, soil from the high side of the ROW would be excavated and moved to the low side of the ROW to create a safe and level work terrace. After the pipeline is installed, the soil from the low side of the ROW would be returned to the high side, and the slope's original contours would be restored. Topsoil from the stockpile would be spread over the surface, erosion control features installed, and seeding implemented.

In steep terrain, temporary sediment barriers such as silt fence and certified weed-free straw bales would be installed during clearing to prevent the movement of disturbed soil off the ROW. Temporary slope breakers consisting of mounded and compacted soil would be installed across the ROW during grading, and permanent slope breakers would be installed during cleanup. Following construction, seed would be applied to steep slopes, and the ROW would be mulched with certified weed-free hay, non-brittle straw or covered with erosion control fabric. SG would use mulching materials approved by the USFS and BLM on the portion of the route that is under their jurisdictions. Sediment barriers would be maintained across the ROW until permanent vegetation is established.

Water body Crossings

The open-cut method for water body crossings involves trenching through the water body while water continues to flow through the construction work area. Pipe segments for the crossing would be fabricated adjacent to the water body. Backhoes generally operating from one or both banks would excavate the trench within the streambed. In wider rivers, in-stream operation of equipment may be necessary. Trench plugs (stacked, compacted sand bags) would be placed to prevent the flow of water into the upland portions of the trench. Trench spoil excavated from the streambed would be generally placed at least 10 feet away from the water's edge. Sediment barriers would be installed where necessary to control sediment and to prevent excavated spoil from entering the water. After the trench is dug, the prefabricated pipeline segment would be carried, pushed, or pulled across the water body and positioned in the trench. The trench would then be backfilled with native material or with imported material if required by applicable permits. Following backfilling, the banks would be restored and stabilized.

Alternatives to the open-cut method are the flume and dam-and-pump methods. The flume crossing method involves diverting the flow of water across the trenching area through one or more flume pipes placed in the water body. The dam-and-pump method is similar to the flume method except that pumps and hoses would be used instead of flumes to move water around the construction work area. In both methods, trenching, pipe installation, and backfilling are done with the streambed in a relatively dry condition while water flow is maintained for all but a short reach of the water body at the actual crossing. Once backfilling is completed, the flume or pump hoses are removed and the streambanks restored and stabilized. SG will be required to implement the flume method for crossing perennial flows (see Ch. 3 Watershed section, FEIS-Table 6, and POD guidelines).

The project would also cross intermittent water bodies. If these intermittent water bodies are dry at the time of crossing, the open-cut method would be used. If an intermittent water body is flowing when crossed, the flume method would be used. When crossing any water bodies, SG would adhere to authorizing agency project design criteria (see FEIS-Table 6) and regulations, the guidelines outlined in the POD and any applicable permit requirements.

Additional temporary workspace areas would be required on both sides of all water bodies to stage construction, fabricate the pipeline, and store materials. These workspaces would be located at least 100 feet away from the water's edge, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land. Before construction, temporary bridges (e.g., clean rock fill over culverts, timber mats supported by flumes, railcar flatbeds, flexi-float apparatus) would be installed across all perennial water bodies to allow construction equipment to cross. Construction equipment would be required to use the bridges, except the clearing crew who would be allowed one pass through the water bodies before the bridges were installed.

Clearing adjacent to water bodies would involve the removal of vegetation from the construction ROW and additional temporary workspace areas. If no herbaceous strip exists, sediment barriers would be installed at the top of the streambank. Initial grading of the herbaceous strip would be limited to the extent needed to create a safe approach to the water body and to install bridges.

During clearing, sediment barriers would be installed and maintained across the ROW adjacent to water bodies and within additional temporary workspace areas to minimize the potential for sediment runoff. Silt fence and/or certified weed-free straw bales located across the working side of the ROW would be removed during the day when vehicle traffic is present and would be replaced each night. Alternatively, drivable berms could be installed and maintained across the ROW in lieu of silt fence and/or straw bales.

In general, equipment refueling and lubricating at water bodies would take place in upland areas that are 100 feet or more from the edges of the water. When circumstances dictate that equipment refueling and lubricating would be necessary in or near water bodies, SG would follow the Spill Prevention, Containment and Countermeasure (SPCC) Plan (located in the POD) to address the handling of fuel and other hazardous materials.

After the pipeline is installed beneath the water body using one of the methods described above, restoration would begin. Water body banks would be restored to preconstruction contours or to a stable angle of repose. Rock riprap or gabion baskets (rock enclosed in wire bins) would be installed as necessary on steep water body banks in accordance with permit requirements. More stable banks would be seeded with native grasses and mulched or covered with erosion control fabric. Water body banks would be temporarily stabilized within 24 hours of completing in-stream construction. Sediment barriers, such as silt fence and/or certified weed-free straw bales or drivable berms would be maintained across the ROW at all water body approaches until permanent vegetation was established. Temporary equipment bridges would be removed following construction.

Wetland Crossings

Based on soil classifications, the proposed pipeline route would cross approximately 3.9 acres of potential wetlands (see Ch. 3 Watershed section). Pipeline construction across wetlands would be similar to typical conventional upland cross-country construction procedures, with several modifications and limitations to reduce the potential for pipeline construction to affect wetland hydrology and soil structure. To minimize impacts when crossing wetlands, SG would adhere to authorizing agency project design criteria (See FEIS-Table 6) and regulations, the guidelines outlined in the POD and any applicable permit requirements

SG would use a 75-foot-wide construction ROW through wetlands. Additional temporary workspace areas would be required on both sides of wetlands to stage construction, fabricate the pipeline, and store materials. These additional temporary workspace areas would be located in upland areas a minimum of 100 feet from the wetland edge.

Construction equipment working in wetlands would be limited to that essential for ROW clearing, excavating the trench, fabricating and installing the pipeline, backfilling the trench, and restoring the ROW. In areas where there is no reasonable access to the ROW except through wetlands, non-essential equipment would be allowed to travel through wetlands only if the ground was firm enough or had been stabilized to avoid rutting. Otherwise, non-essential equipment would be allowed to travel through wetlands only once.

Clearing of vegetation in wetlands would be limited to trees and shrubs, which would be cut flush with the surface of the ground and removed from the wetland. To avoid excessive disruption of wetland soils and the native seed and rootstock within the wetland soils, stump removal, grading, topsoil segregation, and excavation would be limited to the area immediately over the trenchline. A limited amount of stump removal and grading could be conducted in other areas if dictated by safety-related concerns. Topsoil segregation over the trenchline would only occur if the wetland soils were not saturated at the time of construction.

During clearing, sediment barriers, such as silt fence and certified weed-free staked straw bales, would be installed and maintained adjacent to wetlands and within additional temporary workspace areas as necessary to minimize the potential for sediment runoff. Sediment barriers would be installed across the full width of the construction ROW at the base of slopes adjacent to wetland boundaries. Silt fence and/or certified weed-free straw bales installed across the working side of the ROW would be removed during the day when vehicle traffic was present and would be replaced each night. Alternatively, drivable berms could be installed and maintained across the ROW in lieu of silt fence or certified weed-free straw bales. Sediment barriers also would be installed within wetlands along the edge of the ROW, where necessary, to minimize the potential for sediment to run off the construction ROW and into wetland areas outside the work area.

The method of pipeline construction used in wetlands would depend largely on the stability of the soils at the time of construction. If wetland soils are not excessively saturated at the time of construction and can support construction equipment on equipment mats, timber riprap, or straw mats, construction would occur in a manner similar to conventional upland cross-country construction techniques. In unsaturated wetlands, topsoil from the trenchline would be stripped and stored separately from subsoil. Topsoil segregation generally would not be possible in saturated soils.

Where wetland soils were saturated and/or inundated, the pipeline could be installed using the “push-pull” technique. The push-pull technique would involve stringing and welding the pipeline outside of the wetland and excavating and backfilling the trench using a backhoe supported by equipment mats or timber riprap. The prefabricated pipeline would be installed in the wetland by equipping it with buoys and pushing or pulling it across the water-filled trench. After the pipeline is floated into place, the floats would be removed and the pipeline would sink into place. Most pipes installed in saturated wetlands would be coated with concrete or equipped with set-on weights to provide negative buoyancy.

Because little or no grading would occur in wetlands, restoration of contours would be accomplished during backfilling. Prior to backfilling, trench breakers would be installed where necessary to prevent the subsurface drainage of water from wetlands. Where topsoil has been segregated from subsoil, the subsoil would be backfilled first followed by the topsoil. Topsoil would be replaced to the original ground level leaving no crown over the trenchline. In some areas where wetlands overlie rocky soils, the pipe would be padded with rock-free soil or sand before backfilling with native bedrock and soil. Equipment mats, timber riprap, gravel fill, geotextile fabric, and/or certified weed-free straw mats would be removed from wetlands following backfilling.

Where wetlands are located at the base of slopes, permanent slope breakers would be constructed across the ROW in upland areas adjacent to the wetland boundary. Temporary sediment barriers would be installed where necessary until revegetation of adjacent upland areas was successful. Once revegetation is successful, sediment barriers would be removed from the ROW and disposed of properly.

In wetlands where no standing water is present, the construction ROW would be seeded in accordance with the recommendations of the local soil conservation authorities or land management agency. Lime, mulch, and fertilizer would not be used in wetlands.

Blasting

Limited blasting might be required in areas where competent shallow bedrock or boulders were encountered that could not be removed by conventional excavation methods. If blasting were required to clear the ROW and to fracture the ditch, strict safety precautions would be followed. SG would exercise extreme care to avoid damage to underground structures, cables, conduits, pipelines, and underground watercourses or springs. To protect property or livestock, FS or BLM and/or SG would provide adequate notice to adjacent landowners or tenants in advance of blasting. Blasting activity would be performed during daylight hours and in compliance with Federal, State, and local codes and ordinances and manufacturers’ prescribed safety procedures and industry practices.

Fences and Livestock Grazing

Fences would be crossed or paralleled by the construction ROW. SG would contact grazing permittees prior to crossing any fence on public lands or any fence between public and private land, and would offer the lessee the opportunity to be present when the fence is cut so that the permittees can be satisfied that the fence is adequately braced and secured. The grazing permittees would be contacted prior to the start of construction and reclamation on their allotments. Before cutting the wires for pipeline construction, each fence crossed by the ROW would be braced and secured to prevent the slacking of the wire. To prevent the passage of livestock, the opening in the fenceline would be temporarily closed when construction crews left the area. If gaps in natural barriers used for livestock control were created by the pipeline construction, the gaps would be fenced according to the landowners or land management agency requirements. Whenever possible, a minimum of 10 feet of undisturbed area would be maintained where the pipeline parallels a fenceline.

All existing improvements, such as fences, gates, irrigation ditches, cattle guards, and reservoirs would be maintained during construction and repaired to pre-construction conditions or better. If pipelines transporting water for livestock and wildlife were damaged by construction activities, SG would repair the pipelines to the landowner or land management agency specifications. If needed, SG has committed to providing an emergency source of stock water.

PIPELINE / ROW OPERATION

The proponent would be responsible for monitoring pipeline operations after construction is completed. Maintenance and operating personnel would be coordinated from Forest Service and BLM offices so that any area can be reached within a short period in case of an emergency or malfunction. The pipeline system would be operated and maintained in accordance with industry standard procedures to ensure safe operation and to maintain the integrity of its pipeline system. The operating and maintenance procedures would be developed in accordance with the safety standards outlined in 49 CFR Parts 191, 192 and the State of Colorado and other applicable regulations. These procedures would continue to be implemented during the operations and maintenance of the pipeline facilities.

Surveillance

Communications and detection systems for the project would be developed. The frequency of aerial patrols and ground inspections of the pipeline would be in compliance with Federal and State requirements and would occur at least annually.

All buildings intended for human occupancy within 220 yards on either side of the pipeline would be identified as required by the appropriate regulations for natural gas pipelines. This information would be used to determine the class location that would be used in turn as criteria for selection frequencies of various inspection procedures, designing new pipeline facilities, and upgrading existing facilities.

The following inspection intervals would be used for pipeline systems:

- Aerial patrols: Aerial patrols would be conducted at least annually for evidence of leaks, erosion damage, and right-of-way encroachment. Intervals for aerial patrols would be in accordance with Federal and State regulations.
- Surface patrols: Facilities that cannot be observed properly by air patrol or other remote means would be patrolled by surface patrol annually or more frequently if necessary. Corrosion control surveys would generally be performed yearly or during a period not to exceed 15 months. Surface patrols would be conducted by pedestrian surveys or horseback as no motorized vehicles would be allowed on the pipeline ROW for normal surface patrols. Motorized vehicles would only be authorized on a case-by-case basis in order to access the right-of-way for emergency repair needs with notification provided to FS and/or BLM prior to access.

Right-of-Way Access

Surface travel along the right-of-way would generally be limited to periodic valve inspections, leak surveys, right-of-way maintenance, and any pipeline repairs that may be needed. Surface patrols would be conducted by pedestrian surveys or horseback as no motorized vehicles would be allowed on the pipeline ROW for normal surface patrols. Motorized vehicles would only be authorized on a case-by-case basis in order to access the right-of-way for emergency repair needs with notification provided to FS and/or BLM prior to access.

In addition to the above activities, it would also be necessary for non-motorized access to the right-of-way for the following:

- Corrosion control survey crews
- Noxious weed control surveys and maintenance
- Periodic monitoring of irrigation ditches and irrigated agricultural fields for two seasons after construction to ensure the integrity of the ditch and field flow characteristics.

Pipeline and Site Maintenance and Repair

Pipelines would be built to current standards of engineering, inspection, and cathodic protection and would require minimal maintenance. Repairs required because of minor corrosion and slight external mechanical damage to pipe and coating material can be made without interruption or with minimum interruption of service. Repairs are usually made under a reduced pipeline pressure and require a minimum amount of excavation and heavy equipment. Other minor repairs include correction of erosion, repairs to waterbars, replacement of pipeline markers, and removal of debris from the right-of-way. These repairs may require earth-moving equipment and/or hand tools and would require approval from the BLM/FS if motorized vehicles are involved.

Some settling of the backfilled trench would occur, particularly after the first winter following construction. In this case, subsidence and potholes would be filled and the surface restored to normal grade and reseeded. If subsidence is discovered in subsequent years, the potholes would be filled and the surface restored to normal grade and reseeded. Motorized equipment would be required to access the part of the trench in need of filling if subsidence occurs and would require approval from the BLM/FS if motorized vehicles are involved. Any areas disturbed during this process would be reclaimed after trench maintenance.

The proponent would also maintain the right-of-way in a safe, useable condition as directed by the BLM or FS. A regular maintenance program would include, but is not limited to, soil stabilization and noxious weed management and control. A 10-foot wide area centered on the pipeline would be managed as herbaceous vegetation so that emergency maintenance can be accomplished if needed.

Pipeline failures or external mechanical damage needing major repairs may require shutdown of the pipeline. In these instances, the pipeline segment would be isolated between mainline valves and the natural gas in the segment needing repair would be vented to the atmosphere. To facilitate these repairs, equipment, tools, pre-tested pipe, and other materials for emergency use would be stored at existing operations facilities.

The proponent would be responsible for noxious weed control on project disturbed areas, temporary use right-of-way, temporary use areas, and along forest access roads (See FEIS-Table 6-Project Design Criteria). The proponent would consult with the BLM or FS Authorized Officer or field representative and local weed districts for acceptable weed control management techniques within the limits imposed in the ROW grant.

TERMINATION AND ABANDONMENT

Prior to termination of the Right-of-Way grant, or any portion thereof, the proponent would contact the Authorized Officer to arrange for a pre-termination meeting and joint inspection of the right-of-way. The meeting and inspection would be held so that an agreement on an acceptable termination and rehabilitation plan can be reached. This plan would include best management practices of the time that may include, but not be limited to, abandonment and/or removal of aboveground facilities, drainage structures and/or surface material, recontouring, replacing of topsoil, seeding, and monitoring. The buried pipe likely would be cleaned, filled with inert gas, sealed and abandoned in-place. The Authorized Officer would approve the termination and abandonment plan. The proponent would relinquish all, or those specified portions, of the right-of-way in accordance with the termination plan and ROW grant.

LAND MANAGEMENT PLAN CONSISTENCY

The Proposed Action and all Action Alternatives are consistent with the WRNF and GMUG Forest Plans and the BLM GSFO Resource Management Plan.

2.2.3 PROPOSED ACTION (PREFERRED ALTERNATIVE) PARALLEL RAGGED MOUNTAIN PIPELINE

NARRATIVE DESCRIPTION

The BLM, in consultation with the FS, proposes to issue a 30-year 50-foot ROW grant and temporary use area (TUA) permits that would authorize SG to construct, operate and maintain the Bull Mountain Natural Gas Pipeline (BMNGP) for the purpose of transporting natural gas from the Bull Mountain Unit to the existing Divide Creek Compressor Station for delivery into interstate natural gas pipeline systems and the national energy market.. The BMNGP project would involve installing approximately 25.5 miles of 20-inch diameter buried steel natural gas pipeline and related aboveground appurtenances (See FEIS Appendix A-Figure 1).

This is the Agencies' preferred alternative as it follows an existing pipeline and estimated to cause the fewest negative impacts to soil, watershed and other resources.

The BLM and FS also propose to authorize SG to install a produced water pipeline of 8-inch diameter steel pipeline laid in the same trench as the gas pipeline. The water pipeline would transport produced water from the Bull Mountain Unit on the south end to a commercially-available disposal facility at the north end of the project because a disposal well is not available in the Bull Mountain Unit area.[3]

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[3] If the proponent elected to convey materials through the 8" pipeline other than produced water, the proponent would be required to notify the Authorized Officer of the proposed change, additional facilities that would be required, if any, identify any changes in applicable federal and state regulations, and compare the potential

In conjunction with the pipeline proposals, the FS proposes to authorize road use permits for construction, reconstruction, use, upgrade, and/or maintenance of FS and/or temporary roads needed for access to the pipeline construction ROW. 29.3 miles of existing Forest Service roads, 0.6 miles of temporary road across NFS lands, and 0.1 miles across BLM lands would be used for access to the construction ROW. No permanent roads are proposed anywhere in the project area. No permanent or temporary roads are proposed within the three IRAs affected by this proposal.

The BMNGP project would also involve the connected action of construction and operation of a four-acre compressor station, natural gas processing facility and associated facilities on private land at the southern end of the pipeline. The compressor station would have 4 compressor sets with an estimated 15,760 horsepower (HP) for anticipated build out of the BMNGP at 80 MMSCFD. Other ancillary facilities proposed at the 4-acre site, described in more detail in the following pages, include a metering station and associated metal building, 480 HP water pump, construction yard, a 20-inch pig launcher, and security fencing around the entire site. Although the BLM and FS have no authority or jurisdiction over such facilities on private land, the agencies must analyze this action in the same impact statement (40 CFR 1508.25).

The northern terminus of the proposed Bull Mountain Pipeline is the existing Divide Creek Compressor Station located on private land (T8S, R92W, Section 1) and operated by Questar. This site is approximately 10.8 acres, is already fenced-in, and currently has one compressor set in operation. Facilities proposed at the Divide Creek site, mentioned on the following pages in more detail, include a metering station and associated metal building, 20-inch pig receiver and produced water tank. All these facilities would be built on the existing disturbance footprint at the existing Divide Creek Compressor Station. For this proposal and analysis, the new facilities proposed at the Divide Creek Compressor Station are considered a connected action over which the federal agencies have no authority or jurisdiction since FS/BLM regulations do not apply to private lands.

The proposed Bull Mountain Pipeline ROW would be adjacent to existing natural gas pipeline ROWs (Ragged Mountain Pipeline (RMP) and Rocky Mountain Natural Gas Pipeline (RMNGP)) for approximately 10 miles of the total proposed 25.5 mile route. Of the 10 miles adjacent to existing pipeline ROWs, 7.7 miles would be on NFS lands and 2.3 miles on private lands. The proposed pipeline would follow the existing RMP for approximately 9 miles and the RMNGP for 1 mile (See FEIS Appendix A-Figure 1).

The proposed pipeline ROW would pass through a total of 8.33 miles of Inventoried Roadless Areas (IRAs) on NFS lands. Approximately 5.66 miles of the 8.33 miles of the proposed pipeline ROW within FS IRAs would follow an existing pipeline route constructed in 1983; the Ragged Mountain Pipeline. Specifically, the proposed pipeline ROW would traverse through approximately 5.75 miles of the GMUG Clear Creek IRA, 0.86 miles of the WRNF Baldy Mountain IRA, and 1.72 miles of the WRNF East Willow IRA.

A temporary construction ROW of 100 feet would be used during construction, with additional TUAs for vehicle, equipment parking and vehicle turn-a-rounds (as shown on alternative maps). SG would install the 8-inch and 20-inch proposed pipelines generally at the edge of any existing pipeline ROWs using a standard 25-foot offset from the center of the existing

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environmental impacts of the proposal. The BLM and/or USFS would evaluate the proposal and determine whether the ROW grant should be modified and if additional NEPA analysis is required.

pipelines which would result in a 10-foot ROW overlap where the proposed pipeline follows existing pipelines. Following construction, the width of the BMNGP ROW would remain 50 feet. Surface disturbance during construction is estimated to be approximately 309 acres considering a temporary construction ROW of 100 feet. The 50-foot ROW would encompass approximately 154 acres out of the 309 acres mentioned above. See FEIS Appendix A-Figures 11 and 12 for ROW engineering-typical drawings.

Construction operations would include clearing up to a 100-foot corridor of vegetation, in most cases 75 feet, moving in heavy equipment and the 20-inch and 8-inch pipeline sections, digging trench for pipeline up to 48 inches deep, placing and welding the pipeline segments, hydrostatic testing the pipeline, placing surface access valves, backfilling the trench, and revegetating and reclaiming the disturbed areas after pipeline construction. An approximate 10-12 feet wide corridor of non-forested (grassland and shrub) habitat would be maintained over the term specified in the ROW grant (30 years). The remainder of the cleared 50-foot ROW would be allowed to revegetate to a natural forested condition in suitable habitats.

The 20-inch and 8-inch pipeline and related facilities would be designed to Department of Transportation (DOT) CFR 49 Part 192 standards and American National Standards Institute (ANSI) Class 600 specification with launchers and receivers for pigging. Pipeline burial depths would be 18 inches below grade in solid rock, 36 inches below grade in normal soil, or 48 inches below grade across streams. Additional depth requirements would be reviewed on a case by case basis.

Pipeline operations would occur in T11S, R90W Sections 3, 4 & 10; T10S, R90W Sections 18, 19, 30, 31, 32 & 33; T10S, R91W, Sections 2, 11, 12, & 13; T9S, R91W, Sections 3, 10, 11, 14, 23, 26 & 35; T8S, R91W, Sections 5, 6, 8, 17, 20, 21, 28, 33 & 34; and T8S, R92W, Section 1, within Gunnison, Delta, Mesa, and Garfield Counties, CO. This route would start from a proposed compressor station on private land located in T11S, R90W, Section 10, run north to intersect the existing Ragged Mountain Pipeline (RMP) corridor in T10S, R90W, Section 33 and then would intersect the RMP pipeline again in-between T10S, R90W, Sections 29 & 32. From this point, the route would parallel the RMP. The pipeline route would then separate from the RMP to avoid private property located in T9S, R91W, Sections 10, 11, 14, but rejoin it after bypassing that property. The pipeline route would then intersect the 6-inch RMNGP located in T9S, R91W, Section 3, and parallel this pipeline until it separates in T8S, R91W, Section 33. It would then traverse north on the WRNF until it moves onto BLM land, following approximately the western boundary between BLM and private lands. The pipeline route would then head westerly and onto private lands at T8S, R91W, Sections 5, 6, and would connect to the existing 14-inch pipeline at the Divide Creek Compressor Station in T8S, R92W, Section 1, Garfield County, CO.

Route Variations for the Proposed Action

During the Interdisciplinary Team (IDT) analysis and preparation of the DEIS and the FEIS some minor route variations to the Proposed Action were developed. The following minor route variations are considered as part of the Proposed Action:

Route Variation #1 – South Range Road

This route variation would follow an existing unclassified range allotment road that would move the ROW slightly to the west and out of the center of a meadow that is close to the stream in this drainage. This route variation would not change (add or delete) any significant length since this route would simply parallel the original route (See FEIS Appendix A-Figure 4).

Route Variation #2 – Beaver Dam Reroute

This route variation was developed to avoid an existing beaver dam complex and an alignment that was constricted by private land. This route would stay more in a grass parkland and then over a low saddle in the ridge to the west of the proposed route and is approximately 0.7 miles less in length than the proposed route (See FEIS Appendix A-Figure 5).

Route Variation #3 – Double Road Crossing

This route variation was to avoid a double road crossing at a cattleguard. This route would stay on the east side of the road and would be routed down a dry aspen draw instead of crossing the road twice in ¼ mile distance and would not be any significant change in length since this route would parallel the proposed route (See FEIS Appendix A-Figure 6).

Route Variation #4 – Ryan's Loop

This route variation was developed to address some IDT issues regarding soils, slope stability and seeps/springs along this portion of the route that is at the highest elevation point of the proposed route and adds approximately 0.15 miles to the overall length (See FEIS Appendix A-Figure 7).

ROW LAND REQUIREMENTS

Construction of the pipelines would disturb approximately 391 acres of land across all ownerships. Approximately 154 acres disturbed during initial construction would be required for long-term operations and maintenance (i.e. 50-foot ROW grant) and 155 acres would be disturbed during initial construction but reclaimed. Table 9 identifies the associated pipeline length and land ownership status and anticipated maximum disturbance areas.

Table 9. Proposed Bull Mountain Pipeline Project Pipeline / ROW length, acreage, and land status summary

Land Status	**Pipe Length (miles)**	**50' ROW[1] (acres)**	**100' Construction ROW/TUAs[2] (acres) (Does not include permanent ROW acres)**	**Total (acres)**
PRIVATE	4.9	30.6	30.6	61.2
BLM	3.9	23.3	23.4	46.7
WRNF	8.3	49.5	49.4	98.9
GMUG NF	8.4	51.1	51.2	102.3
Totals	**25.5**	**154.5**	**154.6**	**309.1**

TRANSPORTATION SYSTEM

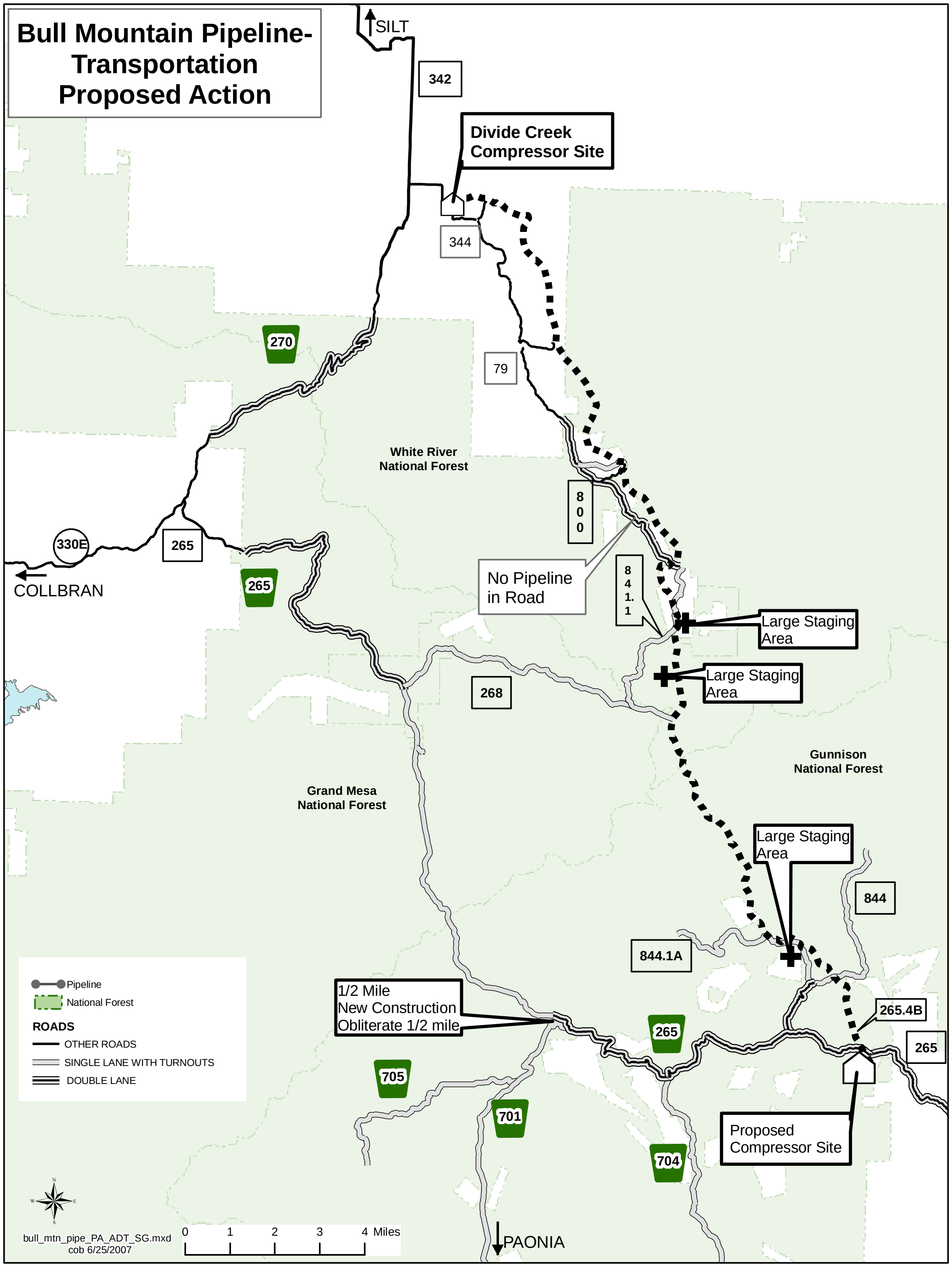
Approximately 81 acres of new disturbance will occur as a result of needed upgrades and improvements with this alternative.

ACCESS

Proposed Action involves potential use of county roads 79, 265, 311, 346, 324, 327, 342, 344, 315, 336, 331; BLM routes 8233; and Forest Service roads 265, 268, 265.4B, and 800.

At the end of NFSR 268, there is a 2-track road (approximately 0.6 miles) leading to the existing Ragged Mountain Pipeline ROW. This is not a system road. The road will be designed as temporary road construction to access the pipeline construction activity on the ROW for crew pickups only.

Figure 2. Proposed Action



2.2.4 ALTERNATIVE 1 MAXIMIZE FOLLOWING EXISTING ROADS

NARRATIVE DESCRIPTION

Alternative 1 was developed in response to public and IDT input for a route that follows more segments of existing roads along the proposed pipeline route. This alternative would follow Garfield County Road 79/344 and Forest Service Road 800 in West Divide Creek on the north end of the project area and NFSR 265 and 844 on the south end of the project area. The middle portion of this alternative route is the same as the Proposed Action route with the addition of some minor route variations to address resource concerns. Total length is approximately 25.9 miles. No BLM lands are involved in Alternative 1. See Figure 2 and also FEIS Appendix A-Figure 2 for a map of Alternative 1.

Actions proposed for Alternative 1 are essentially the same as the Proposed Action except for the portions on the south end and the north end where the pipeline is routed adjacent to existing road corridors. This route would reduce the number of intermittent stream crossings and would reduce the amount of steep slope construction. However, it could impact a larger number of private landowners since segments of the existing road corridors are immediately adjacent to or located on private property.

Under Alternative 1, 38.6 miles of existing Forest Service roads would be used for access to the construction ROW. No permanent roads are proposed anywhere in the project area. No permanent or temporary roads are proposed within the three IRAs affected by this proposal.

The proposed pipeline ROW would pass through a total of 8.16 miles of Inventoried Roadless Areas (IRAs) on NFS lands. Approximately 5.5 miles of the 8.16 miles of the proposed pipeline ROW within FS IRAs would follow an existing pipeline route constructed in 1983; the Ragged Mountain Pipeline. Specifically, the proposed pipeline ROW would traverse through approximately 5.58 miles of the GMUG Clear Creek IRA, 0.86 miles of the WRNF Baldy Mountain IRA, and 1.72 miles of the WRNF East Willow IRA.

ROUTE VARIATIONS FOR ALTERNATIVE 1

During the Interdisciplinary Team (IDT) analysis and preparation of the DEIS and the FEIS some minor route variations to the Proposed Action were developed. The following minor route variations are considered as part of Alternative 1:

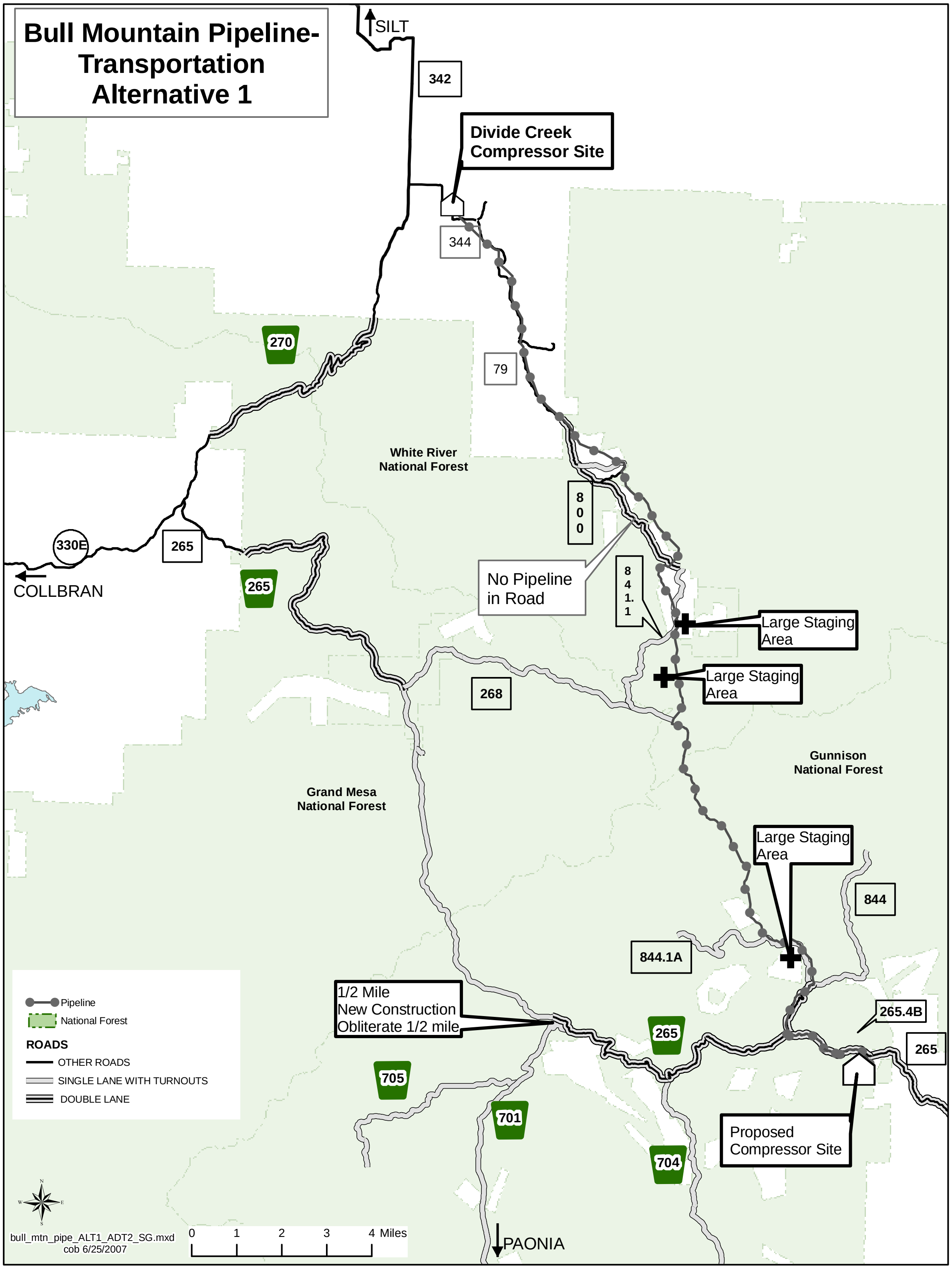
Route Variation #3 – Double Road Crossing

This route variation was to avoid a double road crossing at a cattleguard. This route would stay on the east side of the road and would be routed down a dry aspen draw instead of crossing the road twice in ¼ mile distance and would not be any significant change in length since this route would parallel the proposed route (See FEIS Appendix A-Figure 6).

Route Variation #4 – Ryan's Loop

This route variation was developed to address some IDT issues regarding soils, slope stability and seeps/springs along this portion of the route that is at the highest elevation

Figure 3. Alternative 1



point of the proposed route and is approximately 0.15 mile longer in length (See FEIS Appendix A-Figure 7).

ROW LAND REQUIREMENTS

The description of the ROW widths would be the same as described in the Proposed Action; however, the length of the ROW, the location of the ROW, and the acres affected would be changed. Table 10 below summarizes the miles and acres of the ROW for Alternative 1.

Table 10. Alternative 1: Pipeline / ROW length, acreage, and land status summary

Land Status	**Pipe Length (miles)**	**50' ROW (acres)**	**100' Construction ROW/TUAs[2] (acres) (Does not include permanent ROW acres)**	**Total (acres)**
PRIVATE	9.8	60.6	59.4	120
BLM	0.0	0.0	0.0	0
WRNF	6.6	39.0	39.8	78.8
GMUG NF	9.5	57.4	57.4	114.8
Totals	**25.9**	**157.0**	**156.6**	**313.6**

TRANSPORTATION ACTIVITIES

Transportation activities are the same as Proposed Action. Approximately 81 acres of new disturbance will occur as a result of needed upgrades and improvements with this alternative.

ACCESS

Alternative 1 involves potential use of county roads 79, 311, 346, 324, 327, 342, 344, 315, 336, 331, 9.7 and 265; BLM routes 8233; and Forest Service roads 265, 268, 265.4B, 701 and 800.

2.2.5 ALTERNATIVE 2 AVOID INVENTORIED ROADLESS AREAS

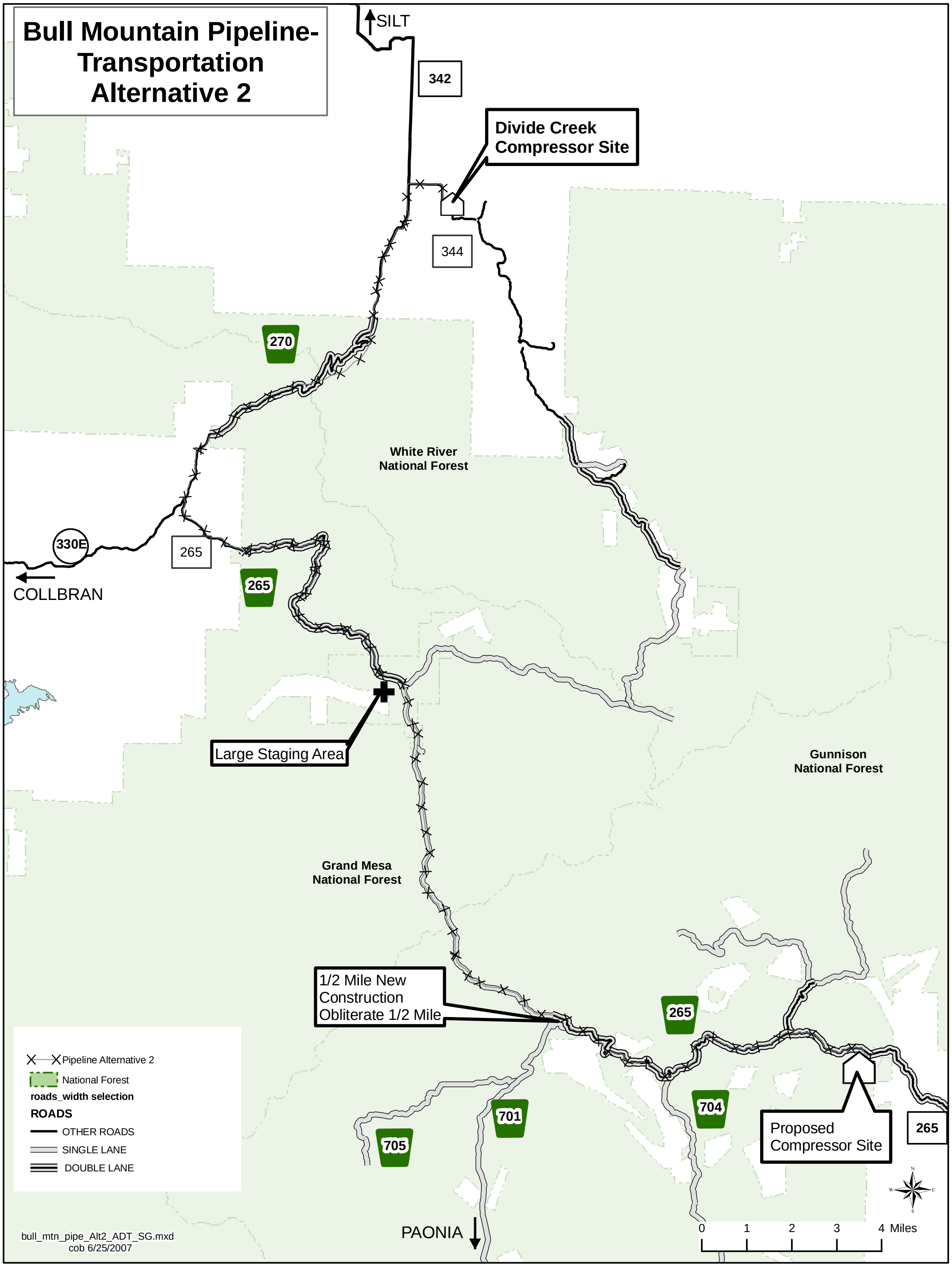
NARRATIVE DESCRIPTION

Alternative 2 was developed in response to public input during scoping for an alternative to be considered that would avoid all Forest Service Inventoried Roadless Areas (IRA's) and follow the main County and Forest Service Roads to the west in a longer loop that includes roads #265 to #270 to #342 to #344. This alternative starts at the proposed Bull Mountain Compressor site on the south end, and then follows NFSR #265 as in Alternative 1, but at the junction of NFSR #265 and # 844, Alternative 2 would continue to follow NFSR 265 to the west. Total length is approximately 39.1 miles. See Figure 4 and FEIS Appendix A-Figure 2 for maps of Alternative 2.

This route follows existing road corridors for the entire route, except at switchbacks, steep slopes and creek crossings. This route would increase the duration of construction to two years, increase the number of perennial stream crossings and amount of wetland disturbance, and increase the number of road crossings. An additional pipe storage yard would be necessary. This alternative would cross more private landowner parcels, compared to the Proposed Action. This alternative would have the greatest impact to traffic control and depending on exact location of the pipeline the road would have to be closed for extensive periods of time.

Under Alternative 2, 33.2 miles of existing Forest Service roads would be used for access to the construction ROW. No permanent roads are proposed anywhere in the project area.

Figure 4. Alternative 2



Aboveground Appurtenant Facilities

The aboveground appurtenant facilities for Alternative 2 would be only slightly different from the Proposed Action in regards to the specific location of a block valve. Alternative 2 would require two block valves; one located at Mule Park and one located at Alkali Creek along NFSR 270, both within the 50-foot ROW.

ROW LAND REQUIREMENTS

The description of the ROW widths would be the same as described in the Proposed Action; however, the length of the ROW, the location of the ROW, and the acres affected would be changed. Table 11 below summarizes the miles and acres of the ROW for Alternative 2.

Table 11. Alternative 2: Pipeline / ROW length, acreage, and land status summary

Land Status	Pipe Length (miles)	50' ROW (acres)	100' Construction ROW/TUAs[2] (acres) (Does not include permanent ROW acres)	Total (acres)
PRIVATE	8.1	49.7	48.6	98.3
BLM	1.1	6.5	6.6	13.1
WRNF	2.2	13.3	13.4	26.7
GMUG NF	27.7	167.0	167.8	334.8
Totals	**39.1**	**236.5**	**236.4**	**472.9**

CONSTRUCTION YARDS

This alternative would require an additional pipe storage yard during the construction period.

TRANSPORTATION ACTIVITIES

Transportation activities are the same as Proposed Action. Approximately 98 acres of new disturbance will occur as a result of needed upgrades and improvements with this alternative.

ACCESS

Alternative 2 involves potential use of county roads 330E, 342, 344,331, 336, 315, 333 and 265; and Forest Service Roads 265, 270 and 701 (primarily as a haul route).

CONSTRUCTION ACTIVITIES

This route would substantially increase the amount of special construction areas due to the increased number of perennial streams, wetlands, and road crossings compared to the Proposed Action.

2.2.5 ALTERNATIVE 3 AVOID IRA & FOLLOW POWERLINE

NARRATIVE DESCRIPTION

Alternative #3 was developed in response to public input during scoping for an alternative to be considered that would avoid all Forest Service Inventoried Roadless Areas (IRA's). Alternative 3 is a variation of Alternative 2 and avoids all Forest Service Inventoried Roadless Areas and follows the main County and Forest Service Roads to the west in a longer loop that includes roads #265 to #270 to #342 to #344; however, the variation of Alternative 3 is to follow the existing Western Area Power Administration's (Western's) Curecanti-Rifle 230-kilovolt transmission line ROW between road #265 and #270. This alternative is shorter in length than Alternative 2. Total pipeline length is approximately 32.4 miles. **See FEIS Appendix A-Figure 2** for a map of Alternative 3.

This route follows an existing road corridor (same as Alternative 2) until it intersects with the Curecanti-Rifle 230-kilovolt transmission line, then follows the powerline corridor until the northern portion of the project area, where it then follows existing road corridors. Construction near a high voltage powerline increases the safety concern of electrocution from "arcing" (from the powerline to the construction equipment) and from lightning strikes. During operation, the high voltage powerline increases the likelihood of a cathodic protection system failure due to the probability of induced AC current corrosion. In addition, this area is known to have unstable soils, as the existing powerline transmission towers have documented settling issues with the soil (WAPA has submitted their concerns with this alternative via letter in the Project Files). Powerlines are also installed differently than pipelines – powerlines can span ravines and steep hills, whereas pipeline construction cannot. This also increases access issues to construct the pipeline and would require greater time for hauling the pipe to the right-of-way.

Compared to the Proposed Action, this alternative would more than double the amount of steep slope construction, increase the duration of pipeline construction from two to three years, increase the amount of wetland disturbance and the number of stream crossings. One additional pipe storage yard would be necessary. This alternative would cross additional private landowner parcels compared to the Proposed Action.

Under Alternative 3, 25.8 miles of existing Forest Service roads would be used for access to the construction ROW. No permanent roads are proposed anywhere in the project area.

Aboveground Appurtenant Facilities

Alternative 3 would require two block valves and would be in the same locations as noted for Alternative 2.

ROW LAND REQUIREMENTS

The description of the ROW widths would be the same as described in the Proposed Action; however, the length of the ROW, the location of the ROW, and the acres affected would be changed. See FEIS Appendix A-Figure 2 for a map of Alternative 3. Table 12 below summarizes the miles and acres of the ROW for Alternative 3.

Table 12. Alternative 3: Pipeline / ROW length, acreage, and land status summary

Land Status	Pipe Length (miles)	50' ROW (acres)	100' Construction ROW/TUAs[2] (acres) (Does not include permanent ROW acres)	Total (acres)
PRIVATE	4.8	29.7	29.0	58.7
BLM	0.8	4.8	4.8	9.6
WRNF	3.3	19.4	20.4	39.8
GMUG NF	23.5	142.6	142	284.6
Totals	**32.4**	**196.5**	**196.2**	**392.7**

CONSTRUCTION YARDS

This alternative would require an additional pipe storage yard during the 2-year construction period.

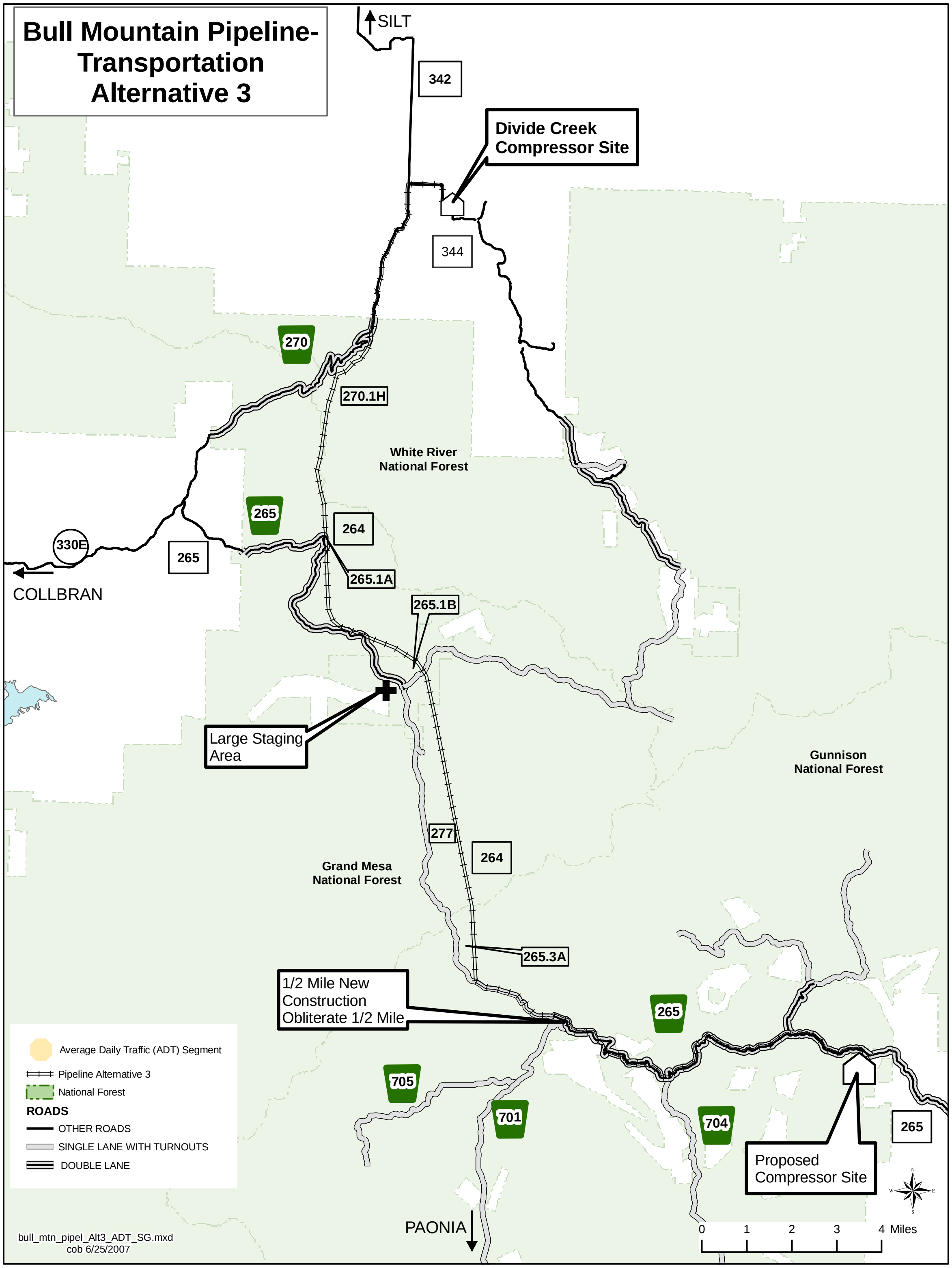
TRANSPORTATION ACTIVITIES

Transportation activities are the same as Proposed Action. Approximately 101 acres of new disturbance will occur as a result of needed upgrades and improvements with this alternative.

ACCESS

Alternative 3 involves potential use of county roads 330E, 342, 344,331, 336, 315, 333 and 265; and Forest Service Roads 265, 265.3A, 268, 277, 270 and 701 (primarily as a haul route).

Figure 5. Alternative 3



2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). During the development of the Proposed Action, the BLM, FS, and the proponent (SG) explored other potential pipeline routes. In addition, public comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives considered may have been outside the purpose and need, duplicative of the alternatives considered in detail, determined to be components that would cause unnecessary environmental harm, or not practicable or feasible to construct for engineering and environmental reasons. Therefore, a number of alternatives were considered, but dismissed from detailed consideration and are noted below.

2.3.1 MINOR ROUTE OPTIONS CONSIDERED BUT NOT ANALYZED IN DETAIL

During the development of the proposed action by the proponent (SG), BLM, and FS several route options were explored and subsequently eliminated. Those route options that were considered are described below and are recorded on a large 34” x 44” field map in the project files.

OPTION A

Option A would interconnect to the 14” Questar Gas Management (QGM) Pipeline at the Divide Creek Compressor Station in T8S, R92W, Section 1. Option A was approximately 24.7 miles long. This route starts from the proposed compressor station on private land within the Bull Mountain Unit Area, runs north to intersect the existing Ragged Mountain Pipeline (RMP) in T10S, R90W, Section 30 just north of the existing Fed 30-4 Well location on the GMUG. From this point, the route parallels existing pipeline corridors including the RMP, Rocky Mountain Natural Gas (RMNG), well tie, and QGM to the maximum extent to make use of the existing ROW corridors for construction. However, because a private landowner decided to have the compressor site moved to its new proposed location on another piece of his private land in T11S, R90W, Section 10 and because of private landowners’ refusal to having a new pipeline going through their properties (T8S, R92W, Sections 1 and 12 and T8S, R91W, Sections 7,8,17 and 18. For these reasons, this option was not considered by BLM and FS.

OPTION B

Option B would interconnect to the existing 14” QGM line in T8S, R91W, Section 17. Option B is approximately 21.5 miles long. Existing gas capacity, gas chemistry, and dedicated gathering commitments to existing wells prevent the QGM interconnect at option B. In addition, landowner refusal for ROW access resulted in this option not being considered by the BLM and FS.

OPTION C

Option C would interconnect with the existing QGM pipeline at a 14" pig launcher site on the top of Uncle Bob Mountain in T8S, R91W, Section 23. Option C is approximately 22.1 miles long. Installation of Option C would entail building up a narrow valley full of aspen trees and/or riparian vegetation and installing adjacent to a surface pipeline up the steep slope of Mosquito Mountain. Also, gas capacity, gas chemistry, and dedicated gathering commitments to existing wells prevents the QGM interconnect at Option C, as with Option B. For these reasons, this option was not considered by BLM and FS.

OPTION D

Option D reflects an initial route considered for the south portion of the project. This option would add approximately 4.3 miles to any Option referenced above or below. This option starts at a proposed compressor site located within the Bull Mountain Unit Area and then follows the existing Ragged Mountain Pipeline for the entire length. Utilizing this route would require 20-inch pipeline construction along steep side slopes or parallel and within rather extensive riparian/wetland streamside vegetation areas. Further consultation with landowners has repositioned the proposed compressor site from the Falcon Seaboard and Well 11-90-12-4 area to its present proposed location in T11S, R90W, Section 10, NE ¼. For these reasons, this option was not considered by BLM and FS.

OPTION E

Option E traverses across private land whose owner does not want a new pipeline going through the middle of their property (T10S, R90W, Sections 29, 30, 31, and 32). For this reason, this option was not considered by BLM and FS

OPTION F

Option F was abandoned due to constructability issues (T10S, R90W, Sections 19 & 30). This option followed the existing Ragged Mountain Pipeline across and up a narrow ridge leading into a steep, heavily timbered side slope. Field review with GMUG staff indicated the Proposed Action was better located to avoid this section. For these reasons, this option was not considered by BLM and FS

OPTION G

Option G was abandoned due to constructability issues in T10S, R91W, Section 13. This section was examined to avoid a non-constructible section paralleling the existing Ragged Mountain Pipeline. It crosses steep, heavily timbered benches. Field review with GMUG staff indicated that the Proposed Action route was better located to avoid this section. For these reasons, this option was not considered by BLM and FS

OPTION H

Option H traverses private land whose owner does not want a new pipeline going through the middle of their property (T9S, R91W, Sections 10, 11 and 14). For this reason, Option H was not considered by BLM and FS

OPTION I

Option I traverses private land whose owners do not want a new pipeline going through the middle of their property which is used for hunting purposes (T8S, R91W, Sections 28 and 29). For these reasons, Option I was not considered by BLM and FS.

OPTION J

Option J traverses private lands whose owners do not want a new pipeline on their property (T8S, R92W, Sections 1 and 12; and T8S, R91W, Sections 7, 17, and 18). For these reasons, Option J was not considered by BLM and FS.

OPTION L

Option L would follow an existing high clearance unimproved 4WD road (NFSR road 841). The road would have to be extensively widened and straightened to accommodate a pipeline and would need to be restored to a high-clearance unimproved road. This option would add approximately 2.7 miles to any Option referenced above and would impact the boundary edges of two IRAs: East Willow and Reno Mountain, both on the WRNF, since the pipeline could not be built to follow NFSR 841 exactly. Due to the added length and more difficult constructability issues this option was not considered by BLM and FS.

2.3.2 LARGE-SCALE ROUTE OPTIONS CONSIDERED BUT NOT ANALYZED IN DETAIL

Several larger scale routing alternatives were examined briefly before developing the proposed action route. These alternatives include:

WESTERN ROUTE - TRANS-COLORADO INTERCONNECT ALTERNATIVE

This alternative would interconnect with the Trans-Colorado Pipeline to the west of the project area (i.e. west of Delta, CO). The Trans-Colorado interconnect alternative would have entailed building approximately 50 miles of pipeline from the Bull Mountain Unit west – southwest through rugged, mountainous terrain without previous utility corridors to parallel or southwesterly more or less down Colorado (CO) State Highway (Hwy) 133 through Paonia, to a Trans-Colorado interconnect near Delta, CO. Further route development for this alternative was not pursued because of doubling the length and disturbance; poor constructability and safety issues adjacent to Hwy. 133 down to Paonia/Hotchkiss or through the mountains; and achieving an interconnect with the national market not at a market hub and at a pipeline at or near transmission capacity. For these reasons, this alternative route was not considered by BLM and FS.

EASTERN ROUTE - COLORADO STATE HWY 113 TO CARBONDALE ALTERNATIVE

This alternative would have taken the pipeline from the proposed compressor site back south to follow Hwy. 133 over to Carbondale, CO and then down Hwy. 133 to connect with the Rocky Mountain Natural Gas (RMNG) pipeline and back over to the proposed action corridor. Following Hwy. 133 over McClure Pass and down to Redstone, CO and Carbondale, CO, then intersecting the RMNG pipeline and returning west to the Divide

Creek route corridor along the RMNG would add approximately 45 - 50 miles to the proposed action length through rough terrain. Due to the additional length and constructability issues, this alternative route was not considered by BLM and FS.

2.4 COMPARISON OF ALTERNATIVES

This section provides a tabular comparative summary of the effects of implementing each alternative as derived from Chapter 3 mostly. Information in the following tables is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 13. Comparison of Alternatives: Project Objectives, Activities and Transportation

Comparison Element	No Action	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Project Objectives / Purpose and Need					
Authorize ROW grant to SG for pipeline construction, operation and maintenance	N/A	Objective met	Objective met	Objective met	Objective met
Transport up to 80 MMSCFD of natural gas from the Bull Mt Unit	N/A	Objective met	Objective met	Objective met	Objective met
Project Construction Activities					
Pipeline Route Length (total miles)	0.0	25.5	25.9	39.1	32.4
50-foot ROW Land Requirements (total acres temporary disturbance)	0.0	154.5	157.0	236.5	196.5
50-foot ROW TUA Land Requirements and Construction ROW (total acres temporary disturbance)	0.0	154.5	157	236.5	196.5
Road upgrades (additional approximate acres permanently disturbed)	0.0	81	81	98	101
GRAND TOTAL ACRES	**0.0**	**390**	**395**	**571**	**493**
Perennial Drainage Crossings by ROW	0	6	6	9	5
Intermittent Drainage Crossings by ROW	0	97	70	97	61
Road Crossings by ROW	0	15	16	34	41
Transportation System					
Temporary Road Construction (miles)	0.0	0.6	0.6	0.0	0.0
Total Usage Roads (miles)	0.0	55	55	55	56
New Specified Road Construction	0.0	0.0	0.0	0.0	0.0
Reconstruction/Upgrade of Existing Roads (acres additional disturbance)	0.0	81	81	98	101

Table 14. Comparison of Alternatives: Resource Areas and Analysis Indicators

Resource Areas / Indicators Physical Environment	No Action	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Air Quality					
NAAQS	No Effects	Standards not exceeded	Standards not exceeded	Standards not exceeded	Standards not exceeded
CAAQS	No Effects	Standards not exceeded	Standards not exceeded	Standards not exceeded	Standards not exceeded
Visibility/ Class I Airsheds	No Effects	Standards not exceeded	Standards not exceeded	Standards not exceeded	Standards not exceeded
Soils and Geology					
Disturbed ROW Soils (acres)	0	308	313.3	472.6	392.5
Side Slopes ROW (percent / length)					
0-15%		73%	68%	81%	79%
15-35%		27%	31%	19%	21%
35-50%		0.2%	0.6%	0.0%	0.0%
Up and down slope ROW (percent length)					
3-8%		40%	40%	90%	80%
8+%		60%	60%	10%	20%
Soils Excavated ROW (cubic yards)	0.0	219,906	240,466	351,324	278,692
Trench impacted soils ROW (permanently altered acres)	0.0	15.5	15.7	23.7	20.0
Slope Stability ROW (acres)					
Landslide Areas		98	81	96	81
Moderate Hazard		168	175	305	231
High Hazard		0.0	<0.1	41	83
Watershed					
ROW -Stream Crossings(miles)					
High Risk	0.0	0.18	0.06	0.09	0.08
Moderate Risk	0.0	3.97	3.01	4.17	2.35
Low Risk	0.0	1.70	1.25	1.77	1.33
Roads -Stream Crossings(miles)					
High Risk	0.0	1.68	1.60	0.0	0.16
Moderate Risk	0.0	1.84	2.39	1.33	0.87
Low Risk	0.0	6.77	9.41	9.98	7.63
Wetlands Impacted (acres)	0.0	3.91	5.19	7.98	6.38
Perennial Stream Crossings	0	6	6	9	5
Intermittent Stream Crossings	0	97	70	97	61

Resource Areas / Indicators Physical Environment	**No Action**	**Proposed Action**	**Alternative 1**	**Alternative 2**	**Alternative 3**
Watershed Disturbance Index					
Index Value (% increase over current value)	49.2 (includes non-project related increases)	52.1	52.1	52.6	52.6
Percent Change (%)	20%	27%	27%	28%	28%
Biological Environment					
Botany - Rare Plants					
• Effects on botany TES, Sensitive and Management Indicator (MIS) species	See Table 29	See Table 29	See Table 29	See Table 29	See Table 29
Range – Noxious Weeds					
• Effects on range allotments and range vegetation	No Impact	No significant impacts	No significant impacts	No significant impacts	No significant impacts
• Effects on noxious weed spread	No Impact	No significant increases	No significant increases	No significant increases	No significant increases
Fisheries	No Impact	See Table 28	See Table 28	See Table 28	See Table 28
Wildlife / Wildlife Habitat/Old Growth					
Effects on wildlife Threatened, Endangered, Sensitive and Management Indicator (MIS) species	No Impact	See Table 27	See Table 27	See Table 27	See Table 27
Effects on Old Growth (OG)					
WRNF OG Stands	No Effects	No Effects	No Effects	No Effects	No Effects
GMUG NF OG Stands					
▪ Spruce/Fir OG (ac)	No Effects	9.0	9.0	0.0	0.0
▪ Aspen OG (acres)	No Effects	29.0	29.0	8.0	13.0
Human Environment					
Heritage Resources	No Effects	No Effects	No Effects	No Effects	No Effects
Inventoried Roadless Areas	No Effects	See Table 26	See Table 26	No Effects	No Effects
Recreation					
Effects on Big Game Hunting					
Effects on rifle hunters	No Effects	No Effects	No Effects	No Effects	No Effects
Effects on muzzle-loaders and archery hunters	No Effects	Adverse Impacts	Adverse Impacts	Adverse Impacts	Adverse Impacts
Effects on Outfitter/Guide Operations at top of Owens Creek Rd #268	No Effects	Substantial adverse impacts	Substantial adverse impacts	Short-term Impacts	Short-term Impacts

Resource Areas / Indicators Physical Environment	No Action	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Effects on Illegal ATV use	No Effects	Potential Increase in illegal use in ROW and IRAs	Potential Increase in illegal use in ROW and IRAs	Potential Increase in illegal use in ROW	Potential Increase in illegal use in ROW
Effects on Dispersed Camping	No Effects	Short-term Impacts	Short-term Impacts	Short-term Impacts	Short-term Impacts
Scenic and Visuals	No Effects	See Table 26	See Table 26	See Table 26	See Table 26
Transportation	No Effects	See Table 24	See Table 24	See Table 24	See Table 24

Table 15. Comparison of Alternatives: Significant Issues

Issues	No Action	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Effects on Inventoried Roadless Areas (IRA's)					
GMUG NF Roadless Areas Clear Creek IRA	No Effects	5.75 miles	5.58 miles	No Effect	No Effect
WRNF Roadless Areas Baldy Mt. IRA	No Effects	0.86 miles	0.86 miles	No Effect	No Effect
WRNF Roadless Areas East Willow IRA	No Effects	1.72 miles	1.72 miles	No Effect	No Effect
Effects on Visuals and Scenic Integrity					
Visual Management Objectives	No Effects	Compliant	Compliant	Not Compliant on GMUG and BLM and would require a Plan amendment	Not Compliant on GMUG and BLM, and would require a Plan amendment
Effects on Soils	No Effects	See Table 25	See Table 25	See Table 25	See Table 25
Effects on Air Quality	No Effects	NAAQS and CAAQS standards are not exceeded	NAAQS and CAAQS standards are not exceeded	NAAQS and CAAQS standards are not exceeded	NAAQS and CAAQS standards are not exceeded
Effects on Vegetation (acres)[1]					
Mountain Shrubland	No Effect	125	140	127	166
Aspen	No Effect	53	53	78	111
Aspen/Conifer	No Effect	56	44	28	28
Oak Shrubland	No Effect	89	94	113	109
Spruce/Fir	No Effect	6	6	-	0
Pinion/Juniper	No Effect	11	7	14	15

Issues	No Action	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Grass/forb	No Effect	24	22	73	54
Willow	No Effect	9	10	32	12
Cottonwood	No Effect	18	19	3	1
Total Acres		391	397	539	495
Noise Impacts	No Effect	Short-term impacts	Short-term impacts	Short-term impacts	Short-term impacts
Effects on Big Game Habitat	No Effect	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives
[1] Vegetation effects analysis is found in the Wildlife Section of the FEIS. Acres used are based on 100-foot ROW width for all alternatives.					

Table 16. Comparison of Alternatives: Wildlife Listed, Sensitive and MIS Species

Species Group	Status	No Action	Proposed Action	Alternative 1	Alternative 2	Alternative 3
USFWS Listed Species						
Canada lynx	USFWS Threatened	No Effect	NLAA[1]	NLAA	NLAA	NLAA
Sensitive Species						
Boreal toad	Sensitive	No Impact	MII[2]	MII	LRLV[3]	MII
Northern leopard frog Great Basin silverspot Hudsonian emerald Great Basin spadefoot toad	Sensitive	No Impact	MII	MII	MII	MII
Wolverine	Sensitive	No Impact	MII	MII	No Impact	No Impact
American marten	Sensitive	No Impact	MII	MII	MII	MII
Townsends' big-eared bat	Sensitive	No Impact	No Impact	No Impact	No Impact	No Impact
Fringed myotis	Sensitive	No Impact	No Impact	No Impact	No Impact	No Impact

Species Group	Status	No Action	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Pygmy shrew Olive-sided flycatcher Lewis' woodpecker American three-toed woodpecker Purple martin	Sensitive	No Impact	MII	MII	MII	MII
Northern goshawk Boreal owl Flammulated owl	Sensitive	No Impact	MII	MII	MII	MII
Black swift	Sensitive	No Impact	No Impact	No Impact	No Impact	No Impact
Midget-faded rattlesnake	Sensitive	No Impact	MII	MII	MII	MII
MIS Species						
Elk	MIS	No Impact	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives
Merriam's Wild Turkey	MIS	No Impact	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives
Red-naped Sapsucker	MIS	No Impact	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives
Virginia's Warbler	MIS	No Impact	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives	Short-term impacts, but meets MIS objectives

[1] NLAA = not likely to adversely affect
[2] MII = may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.
[3]LRLV = likely to result in a loss of viability in the planning area, or in a trend toward federal listing.

Table 17. Comparison of Alternatives: Fisheries and Aquatic Species

Species Group	Status	No Action	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Listed Species						
Colorado Pikeminnow	Endangered	No Impact	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect
Humpback Chub	Endangered	No Impact	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect
Razorback Sucker	Endangered	No Impact	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect
Bonytail	Endangered	No Impact	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect	Any Water Depletion in the Gunnison Basin will result in a May effect, likely to adversely affect
Sensitive Species						
Bluehead Sucker	Sensitive	No Impact	MII	MII	MII	MII

Species Group	Status	No Action	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Colorado River Cutthroat Trout	Sensitive	No Impact	MII	MII	MII	MII
Flannelmouth Sucker	Sensitive	No Impact	MII	MII	MII	MII
Roundtail Chub	Sensitive	No Impact	MII	MII	MII	MII
MIS Species						
Common Trout	MIS	No Impact	No Impact	No Impact	No Impact	No Impact
Aquatic Macroinvertebrates	MIS	No Impact	No Impact	No Impact	No Impact	No Impact

[1] NLAA = **N**ot **L**ikely to **A**dversely **A**ffect.
[2] MII = may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing

Table 18. Comparison of Alternatives: Listed, Sensitive and Special Management Plant Species

Species Group	Status	No Action	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Sensitive Species						
Botrychium multifidum leathery grapefern	Sensitive	Unknown Impact	Beneficial Impact & MII[2]	Beneficial Impact & MII	Beneficial Impact & MII	Beneficial Impact & MII
Carex diandra lesser panicled sedge	Sensitive	Unknown Impact	No Impact	Beneficial Impact & MII	Beneficial Impact & MII	Beneficial Impact & MII
Eriophorum gracile slender cottongrass	Sensitive	Unknown Impact	MII	MII	MII	MII
Utricularia minor small badderpod	Sensitive	Unknown Impact	MII	MII	MII	MII
MIS Species						
Populus Tremuloides quaking aspen	Special Management	Unknown Impact	Beneficial& MII	Beneficial& MII	Beneficial& MII	Beneficial& MII

[1] NLAA = Not Likely to Adversely Affect.
[2] MII = may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter summarizes the physical, biological, social, and human environments of the project area and the direct, indirect and cumulative effects of implementing each alternative on that environment. The physical environment includes sections for Air Quality, Soils and Geology, and Watershed. The biological environment includes sections for Rare Plants, Range, Fisheries and Wildlife (including threatened/endangered species, FS management indicator species and sensitive species). The human environment includes sections for Economics, Heritage, Inventoried Roadless Areas, Recreation, Visuals and Transportation. This chapter also presents the scientific and analytical basis for the comparison of alternatives presented in Chapter 2.

Under NEPA, “direct effects” are caused by the action and occur at the same time and place. “Indirect effects” are caused by the action and are later in time or farther removed in distance, but still reasonably foreseeable. Under NEPA, cumulative effects are the incremental effects 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. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. A comprehensive map of potentially cumulative actions considered for this project is presented in **FEIS Appendix P.** A map was used in place of a list because many of the existing and proposed uses extend to multiple jurisdictions and would otherwise be listed multiple times. The default temporal scale (time limits for past activities) selected for this project is from twenty years ago to the present. The default spatial scale to be considered for this project is within the 6th Code HUC watersheds that may be affected by the Proposed Action and all alternatives. However, each resource area cumulative effect area can be different and possibly larger or even smaller depending on the resource area. The cumulative effects discussion at the end of each resource section analyzes the cumulative effects of the project together with past, present and reasonably foreseeable future actions listed and mapped in **FEIS Appendix P**.

BEST AVAILABLE SCIENCE

As analysis pertains to the Proposed Action and therefore by default to Alternative 1, Best Available Science was used in the form of physical surveys and modeling specific to the project area. Additionally, each section references existing Forest data where available and peer-reviewed publications where appropriate. GIS was a tool used by all specialties to determine extent of impacts.

CUMULATIVE EFFECTS

The Interdisciplinary Team worked together to identify Cumulative Impacts to all the resource areas. A list was first made which had over-lapping projects and was difficult to assess spatially. Therefore, a cumulative effects map was made to visually portray the effects of past, present and reasonably foreseeable future actions (reasonably foreseeable means where a proposal exists whether or not it has been evaluated under NEPA) and includes wells, pipelines, vegetative treatments, etc. combined with the Activities Proposed in this NEPA Document. The complete list of projects was added to the project file. The map has been added to **Appendix P** of this document for your reference.

OVERVIEW OF THE PROJECT AREA

Location

The project area lies in portions of Gunnison, Delta, Mesa and Garfield Counties, Colorado (**See FEIS Appendix A, Figure 3**). The project area includes public lands administered by the USDI- Bureau of Land Management - Glenwood Springs Field Office (BLM), and National Forest System (NFS) lands administered by the USDA- Forest Service, Grand Mesa, Uncompahgre and Gunnison National Forests (GMUG) and the White River National Forest (WRNF). In addition, private lands are included primarily at the southern and northern ends of the proposed route. The proposed pipeline starts on private land adjacent to the Paonia Ranger District, GMUG and then proceeds north, gaining elevation, to the high point at the divide between the WRNF and the GMUG (this is also the County Line between Mesa and Delta Counties). The proposed route continues downhill to the north on the WRNF and follows the Divide Creek drainage thought intermittent private land parcels and adjacent FS and BLM public lands until it reaches the existing Divide Creek Compressor Station about 10 miles south of the town of Silt, Colorado. Other nearby cities and towns include Grand Junction, Parachute, New Castle and Rifle to the north and west, and Paonia to the southwest. **See FEIS Figure 1**.

Wilderness Areas and Inventoried Roadless Areas

The proposed action route passes through portions of three Inventoried Roadless Areas (IRAs) on NFS lands on both the WRNF and the GMUG (**See FEIS Appendix A, Figure 10**). No wilderness areas are within or adjacent to the project area; the existing West Elk, Raggeds and Maroon Bells-Snowmass Wilderness areas are to the east and south (**See FEIS Appendix C, Figure C-1**).

Climate

Monthly temperature averages (closest weather station at Redstone, Pitkin County) range from 20°F to 60°F, with July producing the warmest daily maximum and daily minimum temperatures. Based on the high elevation (above 7,000 feet), it is not uncommon to have minimum temperatures below freezing for most of the year. Precipitation is dominated by winter snowfall. 75% percent of all precipitation falls as snow during the winter months. Monsoon-type rainfall occurs during the summer months of June and July. The Air Quality Section and the Watershed Sections have more details on climate for the project area.

Topography, Geology and Streams

This analysis area is within the Piceance Basin and is located on the upper elevation areas within the North Eastern portion of the Colorado Plateau Physiographic Province. This landscape is actually in an uplifted position and is dissected by many drainages. The project area is characterized by mountainous terrain. Hillslopes affected by the proposed project are generally gentle (0 – 15 percent) with some sections of moderate slopes (15 – 35 percent), and some infrequent sections of steep slopes (35 – 50 percent or steeper). Major drainages include Muddy Creek, Willow Creek, West Divide Creek, Buzzard Creek and Owens Creek. On the Paonia side the elevation at the proposed compressor site is 7,650 feet, the elevation rises toward the north to 9,600 feet at the head of Owens Creek or the Grand Mesa and White River Forest Boundary and descends to 6,600 feet on the Colorado River drainage side. The project area overlaps two major watersheds (4^{th} Code Hydrologic Units) including Colorado Headwaters Plateau (north part of project) and North Fork Gunnison River (south part of project). See the Soils section for details on topography, geology and soils. See the Watershed section for details on streams and drainages.

Vegetation

Major vegetation types in the project area include aspen, aspen/conifer, cottonwood, Douglas-fir/white fir, grass/forb, mountain shrubland, oak shrublands, pinion/juniper, spruce/fir, and willow. Oak shrublands are shrublands dominated by oak. Mountain shrublands may have an oak component, but are dominated by other species such as serviceberry, sagebrush, snowberry, and rabbitbrush. Starting from the south end, the proposed pipeline corridor passes through mountain shrublands, oak woodlands, aspen and spruce/fir habitats. Once on top, it then drops back down through aspen/conifer, aspen, mountain shrublands, and then through pinion/juniper and ends in grass/forb habitat on private lands. Wetland types along the proposed route include meadows, swales, seeps, willow complexes, and riparian areas along streams. Common plants include various species of sedge, rush, willow, and a variety of grass species. See the Rare Plants, Range and Wildlife sections for additional details on the vegetation in the project area.

Human Uses

Several livestock allotments occur on the WRNF, GMUG and BLM public lands (See the Range section for additional details on range use). In addition, many of the private lands are used for grazing livestock, raising hay and other agricultural products. Gunnison County is the top producer of coal in the state. Delta County is home to the three largest coal mines in the state. There are many active producing oil & gas wells in Garfield County. Mesa County is the population and service center for extensive Western Slope mineral and energy development.

This project area is known world-wide for its big game hunting opportunities, particularly elk hunting. Dispersed camping, all-terrain vehicle (ATV) and four-wheel drive (4WD) use, horseback riding and hiking are recreational activities that occur in the analysis area with the highest incidences of use occurring in conjunction with hunting season. Permitted commercial outfitter/guides provide guided hunting opportunities. ATV riding and 4WD use and associated dispersed camping are popular during the summer months. The White River National Forest is recognized throughout the world as a source of exceptional outdoor recreation opportunities. Recreation has grown to become the predominant use of the forest. The WRNF is home to one of the largest elk herds in North America. The WRNF is a destination elk hunting area for hunters from all around the country. The primary recreational activities on the GMUG and within the analysis area are big game hunting, dispersed camping, four-wheel driving, ATV riding, snowmobiling and horseback riding. The GMUG is also a popular destination big game hunting area for deer and elk. Within the BLM portion of the analysis area (only a small portion) the recreation resource setting character remains relatively natural. The management emphasis is custodial and geared towards dispersed recreation. See the Recreation section for additional details on recreational use in the project area.

The Bull Mountain project area has approximately 120 miles of existing roads. Beginning in the 1970's, many of the roads were constructed to provide access for timber harvest. Most existing gas well pads and facilities were built back in the early 1980's. See the Transportation section for details on the road system and road uses in the project area.

Oil and Gas Uses

The project area is on the western slope of Colorado and this area has been and is currently an area with significant deposits of oil and gas. Oil and gas drilling has occurred over the past several decades on the western slope and is on the increase recently due to increased demand and high commodity prices. The 2005 Energy Bill identified the project area BLM offices as administrative units with high oil, gas leasing and permitting activity and with additional staffing needs to manage those permits.

Existing natural gas pipelines in the project area include the north to south running Ragged Mountain pipeline (RMP), which has its northern terminus at the east to west running RMNGP (RMNG). The RMNG line is used to store natural gas for the Roaring Fork Valley/Aspen area in winter and at other times is sent to interstate markets to the west and then using the main north to south transmission pipelines that go to the major gas distribution hubs in New Mexico and Northwest Colorado. The Questar gas pipeline is also within the project area and comes from the east and goes to the existing Divide Creek Compressor Station and then continues to the north to the major distribution hubs in Northwest Colorado. In addition to the existing Divide Creek Compressor Station, there is a smaller compressor site along the RMP on the south part of the project area.

There are numerous gas lease parcels in the project area, the Bull Mountain Unit area and other areas to the north, south and east of the project area. In addition, the BLM has quarterly lease auctions that could add new leases in or close to the project area. The most current lease parcel information can be found at the Colorado Oil and Gas Commission website (http://oil-gas.state.co.us/).

3.1 AIR QUALITY

3.1.1 INTRODUCTION

Land management and development activities both on and off federally managed lands can potentially affect air quality on these lands. Air pollutants of concern include fine particulate matter, nitrogen oxides, sulfates, volatile organic carbons, and carbon monoxide. Elevated concentrations of these pollutants can adversely impact human health, reduce visibility, and lead to acidic deposition in sensitive, high-elevation lakes.

Local emission sources of these pollutants on and off federally managed lands include highway vehicles, wildland fires, wood burning stoves, and industrial facilities, including those associated with oil and gas exploration and development. It is these latter emission sources that currently dominate air quality concerns in the Western Slope Region of Colorado (CDPHE 2005).

Emission inventories are compiled by the Colorado Air Pollution Control Division for each county in the State. These inventories indicate that within the general region where the proposed project is located there has been an increase of each of these air pollutants over time. (http://www.epa.gov/air/data/geosel.html.) This information is consistent with what one would expect as this region sees a growth in population, highway vehicle travel, and oil and gas development.

3.1.2 REGULATORY AND POLICY FRAMEWORK

- The Clean Air Act (1963), as amended in 1977 and 1990, mandates the establishment of national ambient air quality standards to protect human health and welfare, prevent significant deterioration of air-quality-related values (AQRVs), and protect natural visibility. In Colorado, the primary responsibility for enforcing NAAQS rests with the Colorado Department of Public Health and Environment (CDPHE).

- Colorado Air Quality Regulations require that air pollution sources file Air Pollutant Emissions Notices with the State. These regulations also require that new or modified sources of air pollution obtain preconstruction permits. The CDPHE is the primary authority to review these permits and to require fees and control devices prior to construction and/or operations.

- The Wilderness Act (1964) directs the Forest Service to preserve and protect the natural condition of designated wilderness areas, including the intrinsic wilderness value of air quality.

- The Forest and Range Renewable Resource Act (1973), as amended by the National Forest Management Act, directs the Forest Service to ". . . recognize the fundamental need to protect and, where appropriate, improve the quality of soil, water, and air resources."

- The Colorado Smoke Management Memorandum of Understanding (MOU) requires the Forest Service to conduct its prescribed burns under the conditions permitted by the State Air Pollution Control Division.

- The Grand Canyon Visibility Transport Commission (GCVTC), created by Congress in 1991, advises the EPA on strategies for protecting visual air quality in national parks and wilderness areas on the Colorado Plateau.

- The EPA's Regional Haze Regulation specifies that states must establish goals to improve visibility to natural background conditions in Class I areas.

White River National Forest (WRNF) –Resource Management Plan, 2002 Revision.

1. The following falls under Goal 2 – Multiple Benefits to People, Objective 2c (Improve the capability of national forests and rangelands to sustain desired uses, values, products, and services.)

    - ***2c.17:*** Over the life of the plan, minimize the amount and impact of air pollutants produced from land management activities.

2. The following standards and guidelines are applicable to the proposed project:

    - Meet state and federal air quality standards and comply with local, state, and federal air quality regulations and requirements either through original project design or through mitigation for such activities as prescribed fire, ski area development or expansion, mining, and oil and gas exploration and production.

    - Perform conformity determinations or apply appropriate mitigation to zero out pollutants in order to maintain conformity with the State Implementation Plan for proposed activities that would contribute to air pollutants to Environmental Protection Agency (EPA) designated non-attainment and maintenance areas.

WRNF Air Resources Guidelines

1. For water bodies in both Class 1 and Class 2 wilderness areas for which the acid neutralizing capacity (ANC) is greater than 25 micro-equivalents per liter, the limit of acceptable change (LAC) from human-caused air pollution is no more than 10 percent change in ANC. For those extremely sensitive water bodies in which the ANC is less than 25 micro-equivalents per liter, the LAC is no greater than one micro-equivalent per liter.

2. For plume visibility impairment in wilderness, the LAC is a 5 percent change in contrast. The LAC for haze visibility impairment in wilderness is a 0.5 percent change in deciview or 5 percent change in light extinction.

3. Reduce the impacts to air quality and loss of energy resources by only allowing flaring of gas from oil wells during production testing of wells. Connection to a pipeline or reinjection would be required once production is established. Exceptions would be considered on a case-by-case basis.

- Grand Mesa, Uncompahgre, and Gunnison National Forest's (GMUG) Land and Resource Management Plan, as amended 1991. Direction specific to air resource management states the following: "Comply with state and federal air quality standards."

3.1.3 METHODOLOGY FOR ANALYSIS

Air Resource Specialists, Inc. (ARS) was contracted to provide an air quality analysis in support of the Environmental Impact Statement for the proposed project. Their report provides detailed information regarding the analysis. Air quality impacts were assessed for all activities related to construction of the pipeline, wells drilled within the Bull Mountain Unit and a compressor station sized to convey gas from the Unit after its full development.

The scope of this analysis includes effects of these emission sources over a 12-year period associated with the development of the Bull Mountain Unit. Because the proposed pipeline is sized to accommodate future natural gas development outside of the Bull Mountain Unit, this analysis also includes an estimate of emission sources over an assumed 47-year period associated with this reasonably foreseeable development.

Construction emissions were categorized into pipeline emissions, compressor station emissions, and travel emissions from mobile construction equipment, such as pickup trucks. Fugitive emissions from soil removal and replacement from pipeline construction were also analyzed.

Operation emissions from the compressor station were assessed and a dispersion model employed to analyze nitrogen oxides, carbon monoxide and visibility impacts to Class I and Class II air quality areas.

Modeling results indicate that implementation of the proposed project would not directly result in an exceedance of National Ambient Air Quality Standards or Colorado Ambient Air Quality Standards nor would it adversely impact visibility in nearby Class I wilderness areas.

3.1.4 AFFECTED ENVIRONMENT

INTRODUCTION

Potential air quality impacts directly related to the proposed Bull Mountain Pipeline project include fugitive dust emissions from pipeline construction due to vehicle travel and soil disturbance. Activities directly incidental to construction of the pipeline include well drilling in the Bull Mountain Unit Area and a compressor station sized to sufficiently transport gas gathered from the Unit Area. Emissions related to these activities include nitrogen oxides and carbon monoxide from vehicles, compressors, drill rigs and other equipment related to natural gas development.

CLIMATE

Wind Speed

The monthly average wind speed from the airport stations in Western Colorado range from 2.5 miles per hour in the winter months to 8.8 miles per hour in the summer months. Table 19 summarizes all wind speed data. Wind speeds are generally higher during the summer pipeline construction period.

Table 19. Monthly Average Wind Speed and Correlating Station Elevations from Airport Stations in Western Colorado, Data from 1992-2002. Source: Local Climatological Data Annual Summary

Airport Station	City Elev. (feet)	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Annual Avg.
Rifle	5,345	3.5	4.5	5.8	7.5	7.3	7.3	6.2	5.5	5.6	5.3	3.8	3.2	5.4
Montrose	5,806	5.4	6.3	7.6	8.6	8.8	8.8	7.5	7.0	7.0	6.8	6.0	5.5	7.1
Eagle	6,600	4.1	4.7	5.7	7.1	6.9	7.0	5.6	5.3	5.3	5.0	3.9	3.6	5.3
Aspen	7,907	5.5	6.1	6.6	7.6	7.8	7.8	7.2	7.1	7.1	6.7	5.5	5.5	6.7
Gunnison	7,703	2.8	3.5	5.1	7.1	6.7	6.4	5.3	4.8	4.8	4.8	3.4	2.5	4.8
All Stations have at least 2 years of hourly data used for averaging. Standard anemometer height is 10 meters. Wind speed listed in miles per hour (mph)														

Wind Direction

In mountainous terrain, such as in Western Colorado, winds are generally parallel to the major mountain ranges. This tendency is noted in the available wind data. The prevailing wind direction from each monitoring station is listed in Table 20. Stations have different prevailing wind directions and there is generally no correlation amongst the monitoring stations on the east side or west side of the proposed project. However, the prevailing wind direction at each station is consistent throughout the year.

Table 20 Prevailing Wind Direction from Airport Stations in Western Colorado Data from 1992-2002. Source: Local Climatological Data Annual Summary

Airport Station	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Annual Avg.
Rifle	S	S	W	W	W	W	W	W	W	W	S	S	West
Montrose	SE	SSE	SE	SE	SE	SE	SE	SE	SE	SE	SSE	SSE	South East
Eagle	E	E	E	W	W	WSW	E	E	E	E	E	E	East
Aspen	S	S	S	S	S	SSW	SSW	SSW	S	SSW	S	S	South

Airport Station	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Annual Avg.
Gunnison	N	N	N	N	N	N	N	N	N	N	N	N	North
Wind direction is based on hourly data and is defined as the direction with the highest percentage of frequency. Wind direction denotes the direction from which the wind blows.													

Temperature

Redstone, Colorado, is located in Pitkin County and is slightly north and east of the southern end of the proposed pipeline. Redstone is on the east side of the Bull Mountain area and is the closest temperature monitoring station in proximity to the project area. Redstone's elevation is 7,190 feet, which is also close to the elevation along the pipeline route. The temperature data for Redstone has been compiled from 1979 to 1994 and is summarized in Table 21.

Monthly temperature averages for Redstone range from 20°F to 60°F, with July producing the warmest daily maximum and daily minimum temperatures. Based on the high elevation (above 7,000 feet), it is not uncommon to have minimum temperatures below freezing for most of the year. Record high and low temperatures for Redstone, and their associated years, is displayed in Table 21.

Table 21. Historical Temperatures for Redstone, Colorado. Data from 1979-1994. Source: Local Climatological Data Annual Summary

Normal 1979-1994 (^{0}F)				Record Highs and Lows (^{0}F)			
Month	**Daily Max**	**Daily Min**	**Monthly Avg.**	**Highest Daily Max**	**Year**	**Lowest Daily Min**	**Year**
January	33.1	7.7	20.5	52	1986	-25	1985
February	36.2	11.5	23.9	59	1986	-29**	1985
March	42.7	17.3	30.0	65	1986	-9	1980
April	51.1	24.5	37.8	74	1992	2	1981
May	60.5	31.9	46.2	78	1984	18	1985
June	71.8	39.4	55.6	92	1990	20	1990
July	76.4	44.2	60.3	93*	1991	30	1993
August	74.6	43.8	59.2	87	1979	32	1980
September	67.0	36.7	51.8	84	1983	18	1984
October	55.3	28.0	41.7	75	1992	-3	1991
November	39.2	17.5	28.3	66	1980	-13	1979
December	31.5	9.0	20.2	56	1980	-24	1990
Annual Avg	53.3	26.0	39.6				
*All-time high ** All-time low							

Precipitation

Precipitation in Redstone is summarized in Table 22. Precipitation averages 1.5 inches to 3 inches monthly (water equivalent) with the wettest months generally occurring in the spring and fall. Maximum monthly and 24-hour precipitation values are also listed in Table 22 with the accompanying year of occurrence. The maximum monthly precipitation was received in 1981 with 7.6 inches in October. The maximum precipitation recorded for a 24-hour event occurred in June, 1984, with a little under 3.0 inches.

Table 22. Historical Precipitation for Redstone, Colorado (Water-equivalent), Data from 1979-1994. Source: Local Climatological Data Annual Summary

Normal 1979-1994 (in)		Record Rainfall (inches)				
Month	**Normal Rainfall**	**Normal Accumulated**	**Max Monthly**	**Year**	**Max 24-Hour**	**Year**
January	1.78	1.78	5.57	1980	1.16	1980
February	2.41	4.19	5.62d	1986	2.45	1989
March	3.09	7.28	5.48a	1985	1.99	1982
April	2.04	9.32	4.58b	1986	1.23	1985
May	2.30	11.62	4.37c	1983	1.42	1981
June	1.48	13.1	4.89	1984	2.92	1984
July	2.23	15.23	3.65	1990	1.48	1990
August	1.67	17.0	3.50	1984	0.96	1989
September	2.98	19.98	8.13	1986	1.42	1986
October	3.02	23.0	7.60	1981	2.02	1982
November	2.64	25.64	6.78e	1985	1.42	1985
December	2.03	27.67	5.31c	1984	1.48	1984
a = 1 day missing, b = 2 days missing, c = 3 days missing, d = 4 days missing, and e = 5 days missing						

Major Weather Events

Table 23 lists the major weather events by county. Major weather events are determined by the National Weather Service, based on magnitude (size of hail, wind speed, etc.) or the occurrence of injury or property damage. Table 23 shows the total occurrences (days) over approximately a 55-year period of record.

As this table represents an occurrence of severe weather at any location in the county, the probability that such an event impacted the project area is much less. Refer to the Air Quality Technical Report (ARS 2006) (AQTR) for detailed query results from each county.

Table 23. Major Weather Events in Delta, Garfield, Gunnison, and Mesa Counties, Colorado. Data from 1/1/1950 – 10/31/2005. As recorded by the National Weather Service

County	Hail*	Thunderstorm w/High Winds or Lightning*	Tornados or Waterspouts	Heavy Rain*	Flash Flood*	Wildland Fires
Delta	7	12	2	2	3	0
Garfield	7	17*	0	9	15*	15
Gunnison	2	12	0	1	4*	5
Mesa	24*	75*	8	13*	17*	10
* Repeated dates were omitted as it is assumed that such occurrences are actually the same severe weather event at a different location.						

AIR QUALITY STANDARDS

Ambient Air Quality Standards

Congress passed the Clean Air Act (CAA) in 1960 with subsequent amendments made in 1967, 1970, 1977, and 1990. The purpose of the Act is to protect the quality of the nation's air resources and along with human health and welfare.

Administration of the Clean Air Act (CAA), while a federal law, is a state responsibility. In Colorado, this task falls under the State's Department of Health and Environment, Air

Pollution Control Division. The Act established National Ambient Air Quality Standards (NAAQS), which were generally adopted by the State of Colorado along with more stringent Colorado Ambient Air Quality Standard (CAAQS) for sulfur dioxide (SO_2, 3-hour averaging time).

The NAAQS and CAAQS define the maximum legally allowable concentration of each criteria pollutant. Criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and particulate matter less than 10 microns (PM_{10}) and less than 2.5 microns ($PM_{2.5}$), sulfur dioxide (SO_2). The NAAQS and CAAQS are displayed in Table 24. The Project Area is located within an area designated as attainment for all these criteria pollutants.

Table 24. Ambient Air Quality Standards and PSD Increments

Pollutant	Averaging Period(s)	National Ambient Air Quality Standards (NAAQS) (µg/m3)	PSD Class II Increments (µg/m3)	PSD Class I Increments (µg/m3)
SO2	Annual	80	20	2
	24-hour	365	91	5
	3-hour	1,300 1	512	25
NO2	Annual	100	25	2.5
PM10	Annual	50	17	4
	24-hour	150	30	8
CO	8-hour	10,000	NA	NA
	1-hour	40,000	NA	NA
O3	8-hour	235	NA	NA
	1-hour	157	NA	NA
1The Colorado Ambient Air Quality Standard for the 3-hour SO2 averaging period is 700 µg/m3.				

Class I Air Quality Protection

The Clean Air Act outlines different levels or classes of air quality protection. Class I areas include areas designated as wilderness as of August 7, 1977, that are 5,000 acres or greater in size. These areas have the most stringent degree of protection from current and future air quality degradation. On the White River National Forest are three Class I wilderness areas: Maroon Bells-Snowmass, Eagles Nest, and Flat Tops. The Grand Mesa, Uncompahgre, and Gunnison National Forest also manage three Class I wilderness areas including West Elk, LaGarita and a portion of the Maroon Bells-Snowmass. The National Park Service manages the Black Canyon of the Gunnison. These Class I areas are identified in FEIS Appendix C, Figure C-1.

Under the Clean Air Act, the Forest Service has ". . . an affirmative responsibility to protect the air quality- related values (including visibility) . . . "within a Class I area it manages. As part of this responsibility, the Forest Service and National Park Service monitor air quality related values (AQRV's) in several Class I areas in the vicinity of the project area.

Table 25 provides representative measured visibility Class I areas within 100 kilometers of the project area.

Table 25 identifies the levels of acceptable change for both of these Wilderness areas (see R2 document for more info). In addition, the Forest Service uses a deposition threshold for nitrogen and sulfur above which triggers management concern and further study. The process, Deposition Analysis Threshold (DAT), was developed by the National Park Service and the U.S. Fish and Wildlife Service (National Park Service 2001). For Class I areas near the project area, the DAT is 0.005 kg/ha/year for both nitrogen and sulfur.

Table 25. Representative Standard Visual Range (SVR)*

Class I Area	Distance and Direction from Project[1]	SVR in kilometers[2]		
		10th percentile	50 percentile	90th percentile
Maroon Bells/Snowmass Wilderness	16 kilometers E	90	155	262
West Elk Wilderness	27 kilometers SE	95	190	260
Black Canyon of the Gunnison National Park	62 kilometers SW			
Flatt Tops Wilderness	77 kilometers N			

[1] Distances estimated from Class I area boundary to Bull Mountain Compression Station
[2]from: http://www.fs.fed.us/r6/aq/natarm/r2/class1r2.htm

Table 26. Levels of Acceptable Change (LAC)*

AQRV	Concern Threshold (LAC)
Flora	10% increase in tissue chemical analysis of lichen from baseline
	decrease in pollution sensitive lichen species
Visibility	5% reduction in baseline contrast
	0.5 deciview increase from baseline
	5% increase in baseline light extinction
	5% reduction in standard visual range
Water	1 ueq/liter reduction in acid neutralizing capacity
	10% reduction in acid neutralizing capacity

*from: http://www.fs.fed.us/r6/aq/natarm/r2/class1r2.htm

Class II wilderness areas in Colorado are given similar air quality protections under the Colorado Clean Air Act. Class II wilderness areas on the White River National Forest include Collegiate Peaks, Hunter-Fryingpan, Raggeds, Holy Cross, and Ptarmigan Peak. Class II wilderness areas on the Grand Mesa, Uncompahgre, and Gunnison National Forest include Fossil Ridge, Lizard Head, Mt. Sneffels, Powderhorn, Raggeds, Uncompahgre, and a portion of the Collegiate Peaks.

On the WRNF, current monitoring of air-quality-related values indicates very-good-to-excellent air quality in the wilderness areas managed by the forest. Monitoring parameters includes visibility through the Interagency Monitoring of Protected Visual Environments (IMPROVE) program, acid deposition through the National Acid Deposition Program (NADP), and lake chemistry through the WRNF's wilderness lake sampling program.

BASELINE AIR QUALITY CONDITIONS

County-wide Emissions

Table 27 lists the reported pollutant totals for 2002 for Delta, Garfield, Gunnison, Mesa, and Pitkin Counties. All but volatile organic carbons (VOC) are criteria pollutants. Ozone is a secondary pollutant formed from VOC and NO_x. These data are summarized from the WRAPEDMS database (http://www.wrapair.org/forums/ef/docs.html) and maintained by the Western Regional Air Partnership (WRAP). The Air Quality Technical Report (Air Resource

Specialists, Inc., 2006) has detailed results for each county and that report is in the project files.

Table 27. 2002 Reported Emissions (tons per year) per County in Western Colorado

Pollutant	Delta	Garfield	Gunnison	Mesa	Pitkin
NOx	1,800	15,937	1,311	7,813	1,134
CO	17,276	293,869	20,044	61,436	13,352
PM	1,914	29,891	1,065	1,771	218
PM10	1,785	26,434	1,534	5,417	456
VOC	25,417	67,861	36,498	52,093	19,902
SO2	107	1,749	69	2,441	67

NAAQS and CAAQS

No ambient air quality monitoring of NAAQS and CAAQS occurs within the project area. An estimate of background concentrations was obtained from the Draft Roan Plateau Resource Management Plan Amendment/Draft Environmental Impact Statement (BLM 2004). These data, derived from ambient air measurements collected by the Colorado Air Pollution Control Division (APCD), are considered representative of conditions in and near the project area.

The existing air quality in the four-county area appears good based on the regional monitoring data. For the most part, air pollution emission sources are limited to industrial facilities, transportation emissions along the I-70 corridor, and residential emissions in the small communities surrounding the proposed project area. Table 28 lists background concentrations, National Ambient Air Quality Standards (NAAQS), and the Colorado Air Quality Standards (CAAQS).

Table 28. Background Concentrations (µg/m3)

Pollutant	Annual	24-hour	8-hour	3-hour	1-hour	Monitoring Station Location
PM10	24	54	-	-	-	Rifle, Garfield Cnty. (1998-2000)
PM2.5	7	19	-	-	-	Grand Junction, Mesa Cnty (1999-2001)
NO2	34	-	-	-	-	Colorado Springs, El Paso Cnty (1998-2000)
CO	-	-	4,444	-	8,000	Grand Junction, Mesa Cnty (1999-2001)
SO2	11	39	-	110	-	Colorado Springs, El Paso Cnty (1998-2000)
*Background concentrations retrieved from Air Quality Assessment Report prepared for Roan Plateau Draft EIS (Trinity 2004). Values were recommended by Colorado Department of Public Health (CDPHE) based on the air quality measurements in the region.						

Visibility and Air Quality Related Value Monitoring

Visibility is monitored at two IMPROVE (Interagency Monitoring of Protected Visual Environments) sites on the WRNF. They are located on Aspen Mountain on the Aspen Ranger District and near Ripple Creek Pass on the Blanco Ranger District.

Acid deposition monitoring occurs on the WRNF through two programs. The Environmental Protection Agency operates three sites under their National Acid Deposition Program (NADP). These sites are located on Sunlight Peak and near the base of Sunlight Ski Resort on the Sopris Ranger District and near Ripple Creek Pass. Wilderness lakes are sampled each summer by the WRNF to determine baseline data and track trends in lake water chemistry.

Results of these monitoring programs indicate that baseline air quality conditions on the WRNF are good to excellent. Trend analyses of NADP data indicate an increase in nitrogen deposition in western Colorado since the program's inception in 1985 (http://nadp.sws.uiuc.edu/).

3.1.5 ENVIRONMENTAL CONSEQUENCES

A list of proposed equipment for pipeline and compressor station construction is provided in the Air Quality Technical Report (AQTR)[4]. Construction emissions were categorized into pipeline emissions, compressor station emissions, and travel emissions from mobile construction equipment, such as pickup trucks. Fugitive emission from soil removal and travel on unpaved roads were included in the construction emissions. In addition to construction related emissions, the operating emissions from the compressor station were analyzed.

Based on information provided in SG's plan of development (POD), the air quality modeling for this analysis assumed that best available air quality control technology (BACT) would be employed at the compressor station. See the AQTR for additional information related to this assessment.

EMISSION ESTIMATES

Air quality impacts associated with pipeline construction would be short term (16 weeks) due to emissions from construction related vehicle emissions and fugitive dust. Long-term air quality impacts directly and indirectly associated with the proposed project would largely be emissions from operation of one or more compressor stations.

Of the three action alternatives, Alternative 2 would result in the largest amount of construction emissions and Proposed Action the least. Because no construction of the Bull Mountain Pipeline would occur under the No Action Alternative, it would result in zero construction emissions. See Table 33 for a comparison of construction emissions of each alternative.

Construction Emissions

Construction emissions assessed for this analysis are those related to construction of the Bull Mountain Pipeline. A list of proposed equipment for construction of the pipeline and the compressor station is provided in the Air Quality Technical Report (Air Resource Specialists, Inc., 2006) along with details of the emission calculations, and this report is in the project files. The equipment list used for this project is typical of natural gas project construction, and actual equipment may vary. Table 29 through Table 32 summarizes the emissions from project construction under each alternative. Table 33 summarizes the overall emissions impacts of each action alternative and the No-Action Alternative.

Emissions for construction equipment were based on type and quantity of equipment, associated horsepower, a percent load factor assumed (fraction of available power), and an emission rate for each criteria pollutant (grams per horsepower-hour). Load factors were

[4] ARS, 2006

referenced from the EPA Report No. NR-005c, revised April 2004; and emission factors from published EPA documents (EPA420-P-04-009).

Fugitive emissions from material handling were calculated from length of pipeline, topsoil removal depths from public versus private land, and trenching requirements. The Air Quality Technical Report (Air Resource Specialists, Inc., 2006) has detailed fugitive emission calculations, and this report is in the project files. Table 29 through Table 33 lists the Total Suspended Particulate (TSP) as PM.

Construction emissions are assumed to occur for a total of 16 weeks along the pipeline. These emissions would generally occur within the construction corridor. Travel emissions would occur along roads leading from staging areas to the construction site and may sometimes occur outside the immediate construction zone.

Table 29. Proposed Action, Total Pipeline and Compressor Station Construction Emissions (tons)

Criteria Pollutants	Pipeline Construction Equipment	Compressor Station Construction Equipment	Emissions from Travel	Earthmoving (Soil) Fugitive Emissions	Fugitive Emissions from Unpaved Roads	Total Construction Emissions
NOx	113.14	17.10	169.74	NA	NA	299.98
CO	131.23	21.06	209.11	NA	NA	361.40
PM	6.45	0.99	9.84	49.74	14.70	81.72
PM10	3.23*	0.50*	4.92*	17.64	3.54	29.83
VOC	4.26	0.67	5.07	NA	NA	10.00
Sox	16.4	2.48	24.60	NA	NA	43.48
Emissions listed in tons, based on 4 months (960 hours) total construction phase. *Where no data available, value considered 50% of PM tonnage as worst-case.						

Table 30. Alternative 1. Total Pipeline and Compressor Station Construction Emissions (tons).

Criteria Pollutants	Pipeline Construction Equipment	Compressor Station Construction Equipment	Emissions from Travel	Earthmoving (Soil) Fugitive Emissions	Fugitive Emissions from Unpaved Roads	Total Construction Emissions
NOx	169.71	25.65	254.62	NA	NA	449.98
CO	196.85	31.59	313.66	NA	NA	542.10
PM	9.67	1.49	14.76	51.72	22.05	99.69
PM10	4.84*	0.75*	7.38*	18.34	5.31	36.62
VOC	6.39	1.01	7.60	NA	NA	15.00
Sox	24.59	3.72	36.90	NA	NA	65.21
Emissions listed in tons, based on 6 months (1,440 hours) total construction phase *Where no data available, value considered 50% of PM tonnage as worst-case.						

Table 31. Alternative 2. Total Pipeline and Compressor Station Construction Emissions (tons).

Criteria Pollutants	Pipeline Construction Equipment	Compressor Station Construction Equipment	Emissions from Travel	Earthmoving (Soil) Fugitive Emissions	Fugitive Emissions from Unpaved Roads	Total Construction Emissions
NOx	282.84	42.74	424.36	NA	NA	749.94
CO	328.08	52.65	522.76	NA	NA	903.49
PM	16.12	2.48	24.60	71.13	36.76	151.09
PM10	8.06*	1.24*	12.30*	25.23	8.85	55.68
VOC	10.65	1.68	12.67	NA	NA	25.00
Sox	40.99	6.19	61.50	NA	NA	108.68
Emissions listed in tons, based on 10 months (2,400 hours) split evenly over two years for total construction phase. *Where no data available, value considered 50% of PM tonnage as worst-case.						

Table 32. Alternative 3. Total Pipeline and Compressor Station Construction Emissions (tons)

Criteria Pollutants	Pipeline Construction Equipment	Compressor Station Construction Equipment	Emissions from Travel	Earthmoving (Soil) Fugitive Emissions	Fugitive Emissions from Unpaved Roads	Total Construction Emissions
NOx	254.56	38.47	381.92	NA	NA	674.95
CO	295.27	47.39	470.49	NA	NA	813.15
PM	14.51	2.23	22.14	59.80	33.08	131.76
PM10	7.26*	1.12*	11.07*	21.21	7.97	48.63
VOC	9.59	1.52	11.40	NA	NA	22.51
Sox	36.89	5.58	55.35	NA	NA	97.82
Emissions listed in tons, based on 9 months (2,160 hours) with five months year one and 4 months in year two. *Where no data available, value considered 50% of PM tonnage as worst-case.						

Table 33. Overall Alternatives Comparison. Total Pipeline and Compressor Station Construction Emissions (tons)

	NOx	CO	PM	PM10	VOC	Sox
Proposed Action	299.98	361.40	81.72	29.83	10.00	43.48
Alternative 1	449.98	542.10	99.69	36.62	15.00	65.21
Alternative 2	749.94	903.49	151.09	55.68	25.00	108.68
Alternative 3	674.95	813.15	131.76	48.63	22.51	97.82
No-Action Alternative	0	0	0	0	0	0

Long Term Operating Emissions

Long-term emissions are associated with one or more compressor stations located along the proposed pipeline. Over time, as more natural gas wells within the Bull Mountain Unit are drilled, more compression will be needed to accommodate the additional gas conveyed through the pipeline. Direct long-term effects are those associated with full development of the Bull Mountain Unit. According to SG's Plan of Development (POD) full development of the Bull Mountain Unit is assumed to occur in year 12 (based on six wells drilled annually) and reflect a maximum gas production of 80 million standard cubic feet per day (MMSCFD).

The assessment of compressor station emissions assumed that best available air quality control technology (BACT) would be employed for the Bull Mountain Compressor Station and for subsequent compressor stations developed to convey additional gas through the Bull Mountain Pipeline.

Under the action alternatives, the operating emissions of the compressor station associated with full development of the Bull Mountain Unit would be greatest under Alternative 1 and least under Alternative 2. Well drilling associated with the Bull Mountain Unit is assumed to be the same rate under each action alternative. Under the No Action Alternative the pipeline and compressor station, as proposed, would not be constructed thus excluding any associated pollutant emissions.

Because the pipeline is designed for a capacity nearly five times greater than that needed to convey gas from the Bull Mountain Unit, this assessment includes an analysis of what emissions might be at maximum pipeline capacity. Assumptions in the maximum pipeline capacity analysis include a pipeline capacity of 375 MMSCFD and the same drilling rate provided in SG's POD (six wells per year) with maximum capacity reached within a 47-year period.

Compressor Station Operation Emissions

Under each action alternative, the compressor station associated with full gas development of the Bull Mountain Unit (year 12) would include four compressor engines and one water pump engine operating at 8,760 hours per year, reflecting gas production of 80 million standard cubic feet per day (MMSCFD). Horsepower associated with the compressor engines and water pump would vary slightly with the alternatives. Total compressor horsepower would vary from 15,700 BHP to 15,840 BHP and the water pump engine per alternative would vary from 344 BHP to 485 BHP. Detailed operating emission calculations for each action alternative from startup to full gas production from the Bull Mountain Unit are available in AQTR. Operating emissions associated with the compressor station under each action alternative are summarized in Table 3-6 of the AQTR (Air Resource Specialists, Inc., 2006).

The analysis of reasonably foreseeable development connected to the Bull Mountain pipeline assumes a maximum pipeline capacity of 375 MMSCFD at 1440 pounds per square inch gauge (psig) discharge pressure and 1200 psig delivery pressure. At 375 MMSCFD, the compressor requirements would total 80,625 braking horsepower (BHP), or approximately 21 compressor engines at 3,940 BHP each. The associated emissions are included at the bottom of Table 34. Detailed calculations are included in the AQTR (Air Resource Specialists, Inc., 2006). Locations of the additional compressors needed to operate the Bull Mountain pipeline at maximum capacity are not known at this time because they would depend on the locations of additional gas wells.

Table 34. Compressor Station Operating Emissions (tons per year) for each Action Alternative At Full Gas Production of Bull Mountain Unit in Year 12, (80 MMSCFD) and Reasonably Foreseeable Development (375 MMSCFD)

	NOx	**CO**	**HC**	**NMHC**	**Formaldehyde**
Proposed Action (Total tpy)	116.50	297.17	10.98	5.01	2.97
Compressor Engine	106.53	289.15	NA	NA	NA
Water Pump	9.97	8.02	10.98	5.01	2.97

	NOx	CO	HC	NMHC	Formaldehyde
Alternative 1 (Total tpy)	116.60	297.25	11.10	5.06	3.00
Compressor Engine	106.53	289.15	NA	NA	NA
Water Pump	10.07	8.10	11.10	5.06	3.00
Alternative 2 (Total tpy)	114.21	296.36	7.87	3.59	2.13
Compressor Engine	107.07	290.61	NA	NA	NA
Water Pump	7.14	5.75	7.87	3.59	2.13
Alternative 3 (Total tpy)	115.69	297.03	9.79	4.46	2.65
Compressor Engine	106.80	289.88	NA	NA	NA
Water Pump	8.89	7.15	9.79	4.46	2.65
Reasonably Foreseeable Development (Total tpy, Compressor Engines only)	545.95	1,481.88	NA	NA	NA

Drill Rig Operations Emissions

Emissions from drill rig operations can be viewed as a secondary source since they are not directly part of the project. However, without the pipeline, there is no way to move gas away from the Bull Mountain unit, so the drilling emissions would not otherwise occur. The drill rig emissions listed in Table 35 are based on the POD prepared for the Bull Mountain Project which assumes that 55 to 60 wells would be drilled over a ten to twelve year period (assuming six wells drilled per year) to produce up to 80 MMSCFD.

The emissions estimated for future drilling activity that could supply 375 MMSCFD through the Bull Mountain pipeline were also based on the POD's assumption of six wells drilled annually. For the purposes of modeling air quality effects, the production ratio was scaled for future development assuming this same drilling rate to accommodate full capacity at 375 MMSCFD. Thus, the analysis assumes that 282 additional wells could be drilled to supply 375 MMSCFD. Calculations of the emissions from these potentially future drilled wells are included in Table 35. Detailed calculations are contained in the AQTR (Air Resource Specialists, Inc., 2006).

Table 35. Annual, 80 MMSCFD, and 375 MMSCFD Predicted Drill Rig Emissions (tpy)

Criteria Pollutants	Drill Rig Emissions (6 wells annually)	80 MMSCFD Drill Rig Emissions (6 wells annually for 10 years)	375 MMSCFD Drill Rig Emissions (6 well annually for 47 years)
NOx	38.29	382.94	1,799.84
CO	8.25	82.52	387.84
PM10	2.72	27.18	127.73
VOC	3.09	30.88	145.15
SO2	2.53	25.32	119.02

Emissions from a glycol dehydration unit were determined to be negligible for this project due to historically low levels of Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) reported for natural gas reserves in the Bull Mountain vicinity. Refer to the AQTR (Air Resource Specialists, Inc., 2006) for test results from 2004 of the V-Seam and Cameo Formations.

One concern raised was the potential for toxic air emissions, such as hydrogen sulfide, in the event of a pipeline breach during operation. However, the pipeline would contain "sales quality" natural gas and the concentrations of toxic constituents would be negligible. As such, a pipeline breach could produce a flammable vapor cloud, but would not represent a toxic hazard.

DISPERSION MODELING RESULTS

This section documents the results of the dispersion modeling study of nitrogen oxides (NOx) and carbon monoxide (CO) emissions from the proposed Bull Mountain Compressor Station. The modeling includes effects onsite and on the two of the nearest Class I Wilderness Areas (Maroon Bells-Snowmass and West Elk). All modeling represents impacts at full production of the Bull Mountain Unit. Compressor emissions from operation for maximum pipeline were not analyzed for dispersion impacts because of the uncertainty of the location(s) of the additional compressor station(s) as well as of compressor engine horsepower and quantity constrained any practicable modeling results.

Due to the relative consistency of compressor emissions from each action alternative, only the proposed action was modeled. The results are representative of all action alternatives.

Dispersion modeling was conducted using the Environmental Protection Agency (EPA) Industrial Source Complex Short Term Model (ISCST3). The application of ISCST3 follows guidance from the EPA Guideline for Air Quality Models (40 CFR 51, Appendix W) as well as procedures outlined in Colorado Modeling Guideline for Air Quality Permits. Additional detail on the modeling procedure is provided in Appendix B of the AQTR.

The No Action Alternative would result in no additional emissions directly associated with the Bull Mountain project. As such, predicted NOx and CO concentrations would be equivalent to background concentrations of each air quality parameter plus any additional concentrations related to current and reasonably foreseeable emission sources unrelated to the proposed project.

Nitrogen Oxides

All annual NOx concentrations would be below the NAAQS of 100 µg/m3. An isopleth map of the highest annual average NOx concentration for the Bull Mountain Compressor Station is available in Appendix B of the AQTR. This dispersion modeling analysis indicates that operations associated with maximum gas production from the Bull Mountain Unit at the Bull Mountain Compressor Station would not emit NOx in quantities to cause or contribute to an exceedance of the NAAQS.

Table 36 summarizes the NOx dispersion modeling results and compares the results with applicable air quality standards. The proposed action modeling results are representative of all action alternatives. A NO2/NOx ratio of 0.75 (ambient ratio method) was assumed to more accurately estimate the predicted ambient NO2 concentrations. Refer to EPA's Guideline on Air Quality Models at 40 CFR Part 51, Appendix W, Section 6.2.3 for more information on the "ambient ratio method." Dispersion modeling results are presented using the highest predicted annual average NOx concentration for the meteorological data used.

The maximum annual ground level concentration of NOx would occur within the immediate vicinity of the Compressor Station. The predicted concentration here from the project, itself, would be 7.7 micrograms per cubic meter (µg/m3). Added to an assumed background concentration of 34.0 µg/m3 the total predicted concentration would be 41.7 µg/m3 of NOx. (The background concentration values were recommended by the Colorado Department of

Public Health and Environment (CDPHE) based on the air quality measurements in Western Colorado. Refer to Table 24 or Appendix B of the AQTR for background concentration documentation).

For both Class I areas, the modeled maximum predicted concentration from the proposed project alone would be less than 0.1 µg/m3 of NOx.

Table 36. Predicted Average Annual NOx Concentrations (µg/m3) from Bull Mountain Compressor Station (80 MMSCFD). Proposed Bull Mountain Compressor Station and Class I Areas, Gunnison, Colorado

	NOx Model Prediction	Back-ground	Total NOx Impact	Primary NAAQS	Receptor UTM Easting (m)	Receptor UTM Northing (m)
Bull Mountain Compressor Station	7.7	34.0	41.7	100	291209	4332563
Maroon Bells/Snowmass Wilderness	<0.1	34.0	34.0	100	3077938.9	4329551
West Elk Wilderness	<0.1	34.0	34.0	100	317345.7	4299715

Beyond development of the compressor station to accommodate gas from the Bull Mountain Unit, it can be reasonably assumed that additional compression power will be needed to convey gas through the balance of capacity remaining in the pipeline. A precise dispersion-modeling estimate for this reasonably foreseeable development requires knowledge of the location(s) and sizes of the compressor engines. Because this information is unknown at this time, the NOx concentration resulting from one or more compressor stations necessary to convey maximum capacity of the Bull Mountain Pipeline were hypothetically determined for this analysis.

If five compressor stations, each including four compressor engines at approximately 16,000 BHP, were distributed to feed the Bull Mountain pipeline, then it could be assumed, based on the modeling of the proposed action, that the results would be consistent for each compressor station.

Under a worst-case scenario, however, one large compressor station would supply the full 80,625 HP. In analyzing this scenario, the predicted annual NOx values were scaled by a factor of five, indicating that the direct NOx impact would be 38.5 µg/m3, with a total impact of 72.5 µg/m3 at the Compressor Station. While this value is less than the NAAQS of 100 µg/m3, the worst-case analysis indicates that a compressor station sized to convey 375 MMSCFD would exceed the allowable prevention of significant deterioration (PSD) increment of 25 µg/m3 NOx in the immediate vicinity, a Class II area.

With respect to the impacts to Class I areas of one large compressor station as described above, the annual NOx values would be less than 2.5 ug/m3 (i.e. five times <0.1 µg/m3) and, therefore, not exceed the allowable PSD increment for Class I areas.

Carbon Monoxide

As previously stated, it can be reasonably assumed that additional compression power will be needed to accommodate maximum capacity use of the Pipeline. A precise dispersion-modeling estimate for this reasonably foreseeable development requires knowledge of the location(s) and sizes of the additional compressor engines. Because this information is currently unknown, CO concentrations resulting from one or more compressor stations necessary to convey maximum capacity of the Bull Mountain Pipeline were hypothetically determined.

If five compressor stations, each including four compressor engines at approximately 16,000 BHP, were distributed to feed the Bull Mountain pipeline, then it could be assumed, based on the modeling of the proposed action, that the modeled dispersion results would be consistent for each compressor station.

Under a worst-case scenario, however, one large compressor station would supply the full 80,625 HP. In analyzing this scenario, the predicted annual CO values were scaled by a factor of five, indicating that the 1-hour concentrations and 8-hour concentrations would be 20,205 µg/m3 and 7,290 µg/m3, respectively. Added to estimated background concentrations (see Table 48), the respective cumulative impacts to the 1-hour and 8-hour CO concentrations would be 28,205 µg/m3 and 11,734 µg/m3 at the Compressor Station. The worst-case analysis indicates that a compressor station sized to convey 375 MMSCFD would exceed the NAAQS for the 8-hour CO concentration (10,000 µg/m3).

Impacts of CO to PSD were not analyzed because there are no PSD increment allowance values for CO.

Table 37 summarizes the dispersion modeling results with respect to compliance with the applicable air quality standards for CO in the proposed project site and both Class I areas. Dispersion modeling results are presented using the 1st highest predicted 1-hour CO concentration and the 1st highest predicted 8-hour CO concentration.

The maximum annual ground level concentrations of CO (1-hour and 8-hour) would occur within the vicinity of the Compressor Station. The predicted 1-hour and 8-hour CO concentrations from the Bull Mountain Compressor Station (following full build out of the Bull Mountain Unit) would be 4,041 µg/m3 and 1,458 µg/m3 respectively. Added to the background CO concentrations, the model indicates a 1-hour CO concentration at 12,041 µg/m3 and the 1st highest predicted 8-hour CO concentration at 5,902 µg/m3. Isopleths of the 1st highest 1-hour and 8-hour predicted CO concentrations for the Compressor Station are in Appendix B of the AQTR.

Modeling indicates that the first highest predicted 1-hour CO concentrations at both Class I areas would be less than 10.0 µg/m3 and the first highest 8-hour concentrations would be less than 2.25 µg/m3. Because there are no Class I increments for CO emissions, CO impacts to the Class I areas were not modeled.

This dispersion modeling analysis indicates that the operations resulting from maximum gas production from the Bull Mountain Unit at the Bull Mountain Compressor Station would not emit CO in quantities to cause or contribute to an exceedance of the NAAQS.

As previously stated, it can be reasonably assumed that additional compression power will be needed to accommodate maximum capacity use of the Pipeline. A precise dispersion-

modeling estimate for this reasonably foreseeable development requires knowledge of the location(s) and sizes of the additional compressor engines. Because this information is currently unknown, CO concentrations resulting from one or more compressor stations necessary to convey maximum capacity of the Bull Mountain Pipeline were hypothetically determined.

If five compressor stations, each including four compressor engines at approximately 16,000 BHP, were distributed to feed the Bull Mountain pipeline, then it could be assumed, based on the modeling of the proposed action, that the modeled dispersion results would be consistent for each compressor station.

Under a worst-case scenario, however, one large compressor station would supply the full 80,625 HP. In analyzing this scenario, the predicted annual CO values were scaled by a factor of five, indicating that the 1-hour concentrations and 8-hour concentrations would be 20,205 µg/m3 and 7,290 µg/m3, respectively. Added to estimated background concentrations, the respective cumulative impacts to the 1-hour and 8-hour CO concentrations would be 28,205 µg/m3 and 11,734 µg/m3 at the Compressor Station. The worst-case analysis indicates that a compressor station sized to convey 375 MMSCFD would exceed the NAAQS for the 8-hour CO concentration (10,000 µg/m3).

Impacts of CO to PSD were not analyzed because there are no PSD increment allowance values for CO.

Table 37. Predicted CO Concentrations (µg/m3). Proposed Bull Mountain Compressor Station, Gunnison, Colorado

Averaging Time	CO Model Prediction	Back-ground	Total CO Impact	Primary NAAQS	Receptor UTM Easting (m)	Receptor UTM Northing (m)
Bull Mountain Compressor Station – Class II Area Results						
1-hr Avg	4,041	8,000	12,041	40,000	291209	4332563
8-hr Avg	1,458	4,444	5,902	10,000		

Visibility

Visibility impacts for the compressor station emissions were evaluated using the EPA VISCREEN model. This model evaluates for the potential presence of a visible plume from operating emissions, principally NOx and PM. A haze analysis for this project was not performed since it would have required a more complex review and software program, such as Calpuff. In addition, because the transport distance to nearby Class I areas is less than 50 km, perceptible plumes are more of an air quality concern than impacts of the proposed project to regional haze in these areas.

Construction and secondary emissions were not included in the analysis due to their short duration and the variability of locations. The proposed action impacts were evaluated based on operations resulting from maximum gas production from the Bull Mountain Unit (80 MMSCFD) or approximately 15,000 HP of compression. The location and size of the compressor station is consistent among all the action alternatives, and therefore only the proposed action was analyzed.

The VISCREEN results show that a visible plume would not occur within the boundary of either the Maroon Bells or West Elk Wilderness areas.

The VISCREEN model results indicate that a visible plume would not occur within the boundary of either the Maroon Bells or West Elk Wilderness areas. As such, visibility impacts under each alternative including the No Action alternative would not result in a visible plume. The VISCREEN modeling output of the proposed action is contained in Appendix B of the AQTR (Air Resource Specialists, Inc., 2006).

CUMULATIVE IMPACTS

Cumulative air quality impacts include effects from the proposed project as well as past, present and reasonably foreseeable emissions sources. As noted in the Introduction of this section, the region surrounding the project area (including Delta, Garfield, Gunnison, Mesa and Pitkin Counties) has seen and will continue to see increased air pollution emissions concurrent with increases in air pollution sources such as oil and gas development and population growth. The **FEIS Appendix P** identifies these foreseeable actions.

Because there would be no development of a pipeline or compressor station under the No Action Alternative, the proposed project would not contribute to the cumulative air quality impacts of other current and future emission sources.

This analysis indicates that under each action alternative cumulative air quality impacts could result in exceedances of the Class II PSD increment allowance for NOx and the NAAQS for the 8-hour CO concentration. These violations would occur within the immediate vicinity of a single compressor station constructed to accommodate maximum capacity of the Bull Mountain Pipeline (374 MMSCFD). These adverse impacts could be mitigated by adequate dispersal of compressor stations along the length of the proposed Pipeline. They emphasize the importance of employing best available air quality control technology to further mitigate air pollution emissions. They also underscore the need for additional analysis of potential air quality impacts, especially to visibility and deposition, in the event that future NEPA action authorizes increases in compression rates to accommodate maximum pipeline capacity.

The Colorado Department of Public Health and Environment identifies oil and gas exploration and development as the dominant air quality concern in the Western Slope region of the State (CDPHE, 2005). Other growing emission sources are directly related to population growth such as highway and recreation vehicles. As the industry and county populations continue to expand so, too, will emissions of air pollutants such as PM, NOx, CO, and VOC. While the proposed project, by itself, is a relatively small contributor to air pollution emissions, it adds to the cumulative impacts associated with this growth.

3.2 SOILS AND GEOLOGY

3.2.1 INTRODUCTION

This is an analysis of the affect and impact the Bull Mountain Pipeline project would have on soil resources and an assessment of geologic hazards. This analysis evaluates the amount of disturbance that is estimated to impact the soil resource for the Alternatives.

3.2.2 REGULATORY FRAMEWORK

The Forest Service is directed by a number of laws/executive orders and internal manual direction to protect the soil resource, and prevent sedimentation from reaching stream networks. The main one includes:

- *National Forest Management Act* – protect and, where appropriate, improve the quality of soil, water and air resources (Section 5)
- *Federal Land Policy and Management Act* – Each right-of-way shall contain terms and conditions which would minimize damage to scenic and aesthetic values and fish and wildlife habitat and otherwise protect the environment; require compliance with applicable water quality standards (Section 505).
- *Clean Water Act* – The objective of the Act is to restore and maintain the chemical, physical and biological integrity of the Nation's waters. (Section 101(a))
- *Clean Water Act* – Regulates discharge of dredged or fill material into navigable waters (waters of the U.S.) (Section 404).
- Also " Colorado Water Quality Control Act"

- 36 CFR 219.27(a) (1982) – Resource protection. All management prescriptions shall: (1) Conserve soil and water resources and not allow significant or permanent impairment of the productivity of the land; (4) Protect streams, stream banks, shorelines, lakes, wetlands, and other bodies of water; and (6) Provide for adequate fish and wildlife habitat to maintain viable populations of existing native vertebrate species and provide that habitat for species chosen under § 219.19 is maintained and improved to the degree consistent with multiple-use objectives established in the plan.

- EO 11990 – in order to avoid to the extent possible 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.
- FSM 2527 – Avoid adverse impacts that may be associated with the destruction, loss or degradation of wetlands… Avoid filling of land within floodplains and wetlands wherever practicable… Preserve and, where needed and feasible both economically and technically, enhance the natural and beneficial function and values of wetlands.
- FSM 2550 – Manage forest and rangelands in a manner that would improve soil productivity.
- FSM 2553 – Manage the soil resource to take full advantage of its potential for increasing the productivity of forest and rangelands.
- FSM 2503 - Design all management activities of other resources to minimize short-term impacts on the soil and water resources and to maintain or enhance long-term productivity, water quantity, and water quality.

INDIVIDUAL UNIT DIRECTION AND GUIDANCE

GMUG National Forest

Soils overall goals from Forest Plan:

- Conserve soil resources.
- Maintain long-term land productivity.
- Protect the water quality in streams, lakes, riparian areas, and other water bodies.

Applicable Standards for Soils:

- Maintain Soil Productivity, minimize man caused soil erosion and maintain the integrity of associated ecosystems.
- Give roads and trails special design considerations to prevent resource damage on capability areas containing soils with high shrink-swell capacity.
- Provide adequate road and trail cross drainage to reduce sediment transport energy.
- Revegetate all areas capable of supporting vegetation, disturbed during road construction and or reconstruction to stabilize the area and reduce soil erosion.
- Provide permanent drainage and establish protective vegetative cover on all new temporary roads or equipment ways, and all existing roads which are being removed from the transportation system.
- Restore soil disturbance caused by human use to soil loss tolerance levels commensurate with the natural ecological processes for the treatment areas.
- Obliterate and rehabilitate those existing travel ways identified for return to resource production.
- Reduce; through designed management practices and appropriate erosion measures the project caused on-site erosion rates by 75% within the first year after disturbance, and by 95% within 5 years.
- Design continuing mitigation/restoration practice and follow-up maintenance activities to insure 80% original ground cover (vegetation) recovery occurs within 5 years after disturbance.

White River National Forest

Soils overall goals from Forest Plan:

- Protect basic soil, air, water, and land resources
- Provide for multiple uses and sustainability of national forests and grasslands in an environmentally acceptable manner

Applicable standards:

- Stabilize and maintain roads and other disturbed sites during and after construction to control erosion.
- Limit roads and other disturbed sites to the minimum feasible number, width, and total length consistent with the purpose of specific operations, local topography and climate.
- Construct roads and other disturbed sites to minimize sediment discharge into streams, lakes, and wetlands.
- Reclaim roads and other disturbed sites when use ends, as needed, to prevent resource damage.

<u>Applicable Guidelines</u>

- Conduct an onsite slope stability exam in areas identified as potentially unstable. Potentially unstable land is described as having a "high" or "very high" instability ranking or classified as "unstable" or "marginally unstable." Limit intensive ground-disturbing activities on unstable slopes identified during examinations.

<u>USDI-Bureau of Land Management</u>

The BLM is also directed by a number of laws/executive orders (See Section 1.5.3 Page 7) and Resource Management Plans (Section 1.6.3 page 17) to maintain or improve water quality and Timber and Fuel Wood productivity.

Guidance to protect soil and water resources for this Project is located in the *Glenwood Springs Field Office Resource Management Plan*, Revised 1988. Applicable guidance includes:

- Water Quality Management—Emphasis is to maintain or improve existing water quality where possible.

  Practices to accomplish this may include: Land treatment: Revegetation of Disturbed areas, rehabilitation or improvement of riparian areas, along with adequate drainage and protection on all roads and surface disturbances.
- Surface disturbing activities will be restricted in or near riparian areas
- Equipment will not be allowed to move up or down stream channels. Heavy equipment will cross only at designated or constructed crossings.
- Forest Management-Woodland, Pinion Juniper; Emphasis is to manage fuelwood demand for Pinion Juniper, and maintain stand productivity.
- Roadways, landings and other heavily disturbed sites will be reclaimed by establishing a ground cover
- Areas receiving moderate to high soil disturbance during treatment or an understory ground cover less than 10% will be seeded with a mixture of grass, forb, and browse species. Livestock grazing will be prohibited on all seeded areas for two growing seasons.
- Roads will be constructed as outlined in BLM Manual 9143.

3.2.3 METHODOLOGY FOR ANALYSIS

This analysis consisted of gathering existing soils information from the published and non-published soil surveys; synthesizing spatial and tabular data; and determining soil map units and acreages within the pipeline corridor for each alternative. Soil characteristics for major soils are from the NASIS database. Remote sensing studies have also been used in this assessment.

Numerous field visits were conducted during the summer of 2005, with most of the initial proposed corridor traversed and documented by a soil scientist.

The Project Soil Scientist has been involved with many projects in these watersheds that includes the BMNGP Project over the years, and was involved in the soil survey activities on the GMUG National Forest and in many instances uses familiarity with project area soils to determine extent of additional impacts.

SLOPE STABILITY

Slope stability information relating to geologic hazards comes from each Forest. All USGS geologic information available is included in the review. Special geologic investigation reports conducted in the area are included. Geologic investigations for the WAPA power line corridor and reports for timber harvest activities in the Porter Mountain, High Tower, and Crooked Creek areas.

Geologic hazard mapping information was available for the project area. One data coverage is a general display of landslide material, landforms and terrain and is labeled Landslide areas. The second data coverage is a landslide hazard mapping product and is a combination of different geologic hazard mapping products, and rated on the degree of risk of movement **(See FEIS Appendix D-Figures 1-2** for slide areas and geologic hazard area maps). Ratings of low, moderate and high are used, with the following implications:

- Low Hazard—A slope may undergo failure under extremely adverse conditions which may have a low probability of occurrence.
- Moderate Hazard—A slope would probably fail under severe conditions which can be expected to occur at some future time.
- High Hazard—A slope is most certain to undergo failure in the future under normal adverse conditions. Has shown signs of recent failure.

SOILS

There are a several factors that are used to compare the effect of this pipeline construction on the soils. One is to calculate the amount of disturbance to the soil by each alternative. This evaluation would look at how many acres are the most directly affected by the construction activities, which for these alternatives would be the 100 ft construction area.

Another is to calculate and compare the amount of soil material that is estimated would need to be moved as cuts and fills. This would be tracked as cubic yards of material excavated. And finally the amount of area in various slope ranges. In general, disturbed soil on slopes above 35% would be considered to have a high erosion hazard.

3.2.4 AFFECTED ENVIRONMENT

SETTING

This analysis area is in the geologic Piceance Basin and geographically is located on the upper elevation areas within the North Eastern portion of the Colorado Plateau Physiographic Province. This particular area is very close to the White River Uplift portion of the Southern Rocky Mountain Physiographic Province.

Even though the term basin is used, this does not describe the position or landforms that currently exist in this area. This landscape is actually uplifted and dissected by many drainages, some of the drainages include, various tributaries to Muddy Creek, Willow Creek, West Divide Creek, Buzzard Creek and Owens Creek. The general nature of this uplift is evident in the elevation gains and losses from south to north. On the Gunnison side the elevation at the proposed compressor site is 7,650 feet. From there, the elevation rises toward the north to 9,600 feet at the head of Owens Creek or the Grand Mesa and White River Forest Boundary and descends to 6,600 feet on the Colorado River drainage side.

The landscapes and landforms within the analysis area are described as low relief mountains, hills, mesas, drainages and small valley side slopes, ridges, and small valley bottoms. More localized landforms would include residual slopes, ridges, landslides, mudflows, earth flows and landslide complexes.

GEOLOGY

The geology in this analysis area is identified by Tweto as being within the Wasatch Formation. Area is characterized by variegated clay stones, siltstones, sandstones and some conglomerates. The Wasatch formation is described as interbedded and lenticular, tan, yellowish to reddish brown, and reddish purple clay stone, siltstone, sandstone and conglomerate. The Wasatch formation unconformably overlies the Upper Cretaceous Mesa Verde Group. The Mesa Verde group is about 6,000 feet (maximum) and was deposited as non-marine sediments in lacustrine, flood-plain and high energy fluvial environments similar to the Wasatch formation.

The Wasatch formation is highly susceptible to landslides. Within this analysis area landslide deposits have been identified by Tweto, and Colton of the USGS. The Colorado Geological Survey mapped the geology on several quadrangles in the surrounding area, and identified similar landslide and mass wasting landform features (Center Mountain, Hunter Mesa, and Cattle Creek). The description of the Wasatch Formation for the Hunter Mesa Quadrangle Geologic map, includes the following statement: "Although the Wasatch Formation does not appear to be prone to landsliding in the Hunter Mesa quadrangle, under present climatic conditions, human activities that, remove support (excavation), increase soil moisture, or add weight could trigger slope failure in the fine-grained strata of this unit."

A number of special geologic investigations conducted in the vicinity also document the landslide occurrences. One document conducted by the Western Area Power Administration (Western) 1989 evaluated slope movement on numerous landslides along the right of way for the Curecanti-Rifle 230 Kv transmission line. Landslides along this ROW and a concern for the stability of the powerline's support towers prompted this special investigation. Timber sale planning on GMUG National Forest required an assessment of landslide features in the Porter Mountain, Oil Well Mountain and Crooked Creek areas in the early 1990's, on similar landscapes and terrain underlain by the Wasatch Formation. Each Forest also has a Geologic Hazard inventory that evaluates all forms of geologic hazards quad by quad. In the case of slope stability and landslides these inventories rank areas as to whether the hazard has low, moderate or high risk potential.

SLOPE STABILITY

The construction activities needed for this pipeline project may affect the slope stability. Cutting, filling and trenching are actions that alter the dynamic equilibrium by loading and unloading portions of slopes which may trigger accelerated slope movements, such as slumps and landslides (Transportation Research Board). These landscapes show evidence of slope movements in the geomorphic past and relatively current as witnessed by the WAPA phase 11 Geologic Report. Portions the Hightower road NFSR 265 was relocated due to slumping along the original alignment in 1984. The landscapes in the northern portions of this project,(Divide Creek & West Divide Creek and Flatiron Mountain areas), also show debris flow activities and recent slumps (Hughes, personal observations & White River National Forest Geologic hazard information). Mass movement events, either slow or accelerated, could exert pressures on the pipeline.

SOILS

Soil development is a function of parent material, living matter (vegetation), climate, relief, and time. Climate has a direct and indirect effect on soil development through its principal components: precipitation, temperature, humidity, wind, and sunshine. Surface relief, or topography, influences soil formation principally through its control of surface water runoff. These factors determine soils characteristics.

In this analysis area two soil forming factors-- parent material and vegetation-- have strongly influenced the soils and their dominate characteristics. Parent material derived for the most part from the Wasatch Formation produces fine textured soils with high clay percentages. There is also a lesser influence from a remnant basaltic plain from the Grand and Battlement Mesa Areas in the form of stone and boulder size rocks that occur on the surface throughout the project area.

Secondly vegetation and climate strongly influences these soils. At the lowest elevations Pinion Juniper shrublands dominate the near arid environments. Very thin surface horizons with very little organic matter content characterize the PJ soils. The Gambel Oak and Aspen associations have a moister and cooler climate, and reflect thicker surface horizons with more organic matter. The higher elevation areas supporting Spruce –Fir stands are very moist but also very cool to cold, and develop modest surface horizons with much less organic matter relative to the Aspen-Oak associations.

Soil Characteristics and other soil information have been gathered over the years as part of the National Cooperative Soil Survey (NCSS) by either the Forest Service or the Natural Resource Conservation Service (NRCS). This information was compiled from a variety of soil survey sources, which includes information from the; Grand Mesa-West Elk Soil Survey, The Rifle Area Soil Survey and the Holy Cross Soil Survey. Most of the area within the analysis boundaries has soil information. The exception is an area on the northern portion of Alternative 1. There is a gap of slightly more than 3 miles along the West Divide Road #79 that is outside the Forest boundary that has no soil information. Review of this soil information is showing that within the construction corridors of the various alternatives there are a range of soils mapped and described (**See Appendix D, Figure D-1**).

Within the 100-foot construction corridor there are 29 map units identified for the proposed alternative. Of these 29 map units, only 15 map units are considered dominate. The situation for the other alternatives is similar, with different combinations of soils being involved. All soil map units are itemized by acres by alternative. 15 map units dominated all alternatives. The characteristics for these units along with various interpretations were loaded from the NASIS database, into another spreadsheet for evaluation and comparisons.

The dominate soils in the Project Area included these map units:

333B—Fughes-Godding Families Comples, 5 to 40 percent Slopes
191 -- Tellura - Jerry complex, 5 to 40 percent slopes
195 -- Weed - Herm complex, 0 to 25 percent slopes
158 -- Herm - Fughes - Kolob family complex, 25 to 40 percent slopes
200 -- Wetopa - Wesdy complex, 5 to 65 percent slopes
155 -- Hayrack - Muggins - Nutras complex, 5 to 40 percent slopes
338B--Wetopa-Doughspon-Echemoor Families Complex, 5 to 40 percent slopes
66-- Torriorthents-Camborthids-Rock outcrop complex, steep
345B--Doughspon Family, 5 to 40 percent slopes
332B--Echemoor Family, 5 to 40 percent slopes
106 -- Booneville - Needleton family - Doughspon complex, 5 to 25 percent slopes, very stony
45-- Morval-Tridell complex, 6 to 25 percent slopes
69-- Vale silt loam, 6 to 12 percent slopes

71-- Villa Grove-Zoltay loams, 15 to 30 percent slopes
Hydric units that may possibly be wetlands include:
104A--Cryoborolls-Cryaquolls Complex, 0 to 15 percent slopes
109A--Subwell Family-Endoaquolls Association, 0 to 15 percent slopes
May also contain Fens:
127 -- Cryaquolls and Borohemists, 0 to 10 percent slopes

The soils share many common characteristics having formed from the Wasatch formation. This has resulted in most of these soils being fine textured. Typically these soils have loams, clay loams and sometimes silt loam surfaces, which grade into clay loams, silty clay loams, and clays. High runoff rates with k factors (erodability factor) dominantly ranging from .24 to .32 with a couple units at .37 up to .43 (the higher the factor the more risk for erosion) is common.. There is a high erosion risk for bared soils above 35% slopes. The soils are generally deep, and contain coarse fragments on the surface and throughout the profile. This is especially true on the upper elevation portions of the proposed alternative. Large basalt boulders were observed on most portions of the landscapes during field examinations during the summer of 2005. This Basalt boulder influence was observed at the lower elevations on the Paonia side in Oak-Brush vegetation and the Rifle side on the Pinion-Juniper hill sides and ridges.

Pertinent interpretations relating to pipeline construction activities include: Road Suitability (natural surface), suitability for shallow excavations, soil rutting hazard, and from the soil mapping unit information, mass movement potential. Overall, most of these soil tend to be fine textured throughout their profiles, clay loams, clays, silty clay loams and silty clays are the dominate textures. There is also influence from the Grand Mesa Basalt in the form of coarse fragments on the soil surface and in the profile, often times these are boulder size (24+" in diameter). Due to these characteristics most of these soils have a rating of very limited or poor suitability for native surface road situations. Specific characteristics for this rating are low soil strength, excess fines, high shrink swell, and large rock content. Not all soils received this rating, but a majority of the soils do have these characteristics. This is also true for the soil rutting hazard. The majority of the soils involved have a severe rating for rutting when wet, and this is mainly due to low soil strength. This rating is an indication that with these characteristic the soil would rut easily if driven on by vehicles when wet. A majority of the soils in these landscapes can also be described as being "untrafficable" when wet, and due to the amount of silt could also be described as being very "slippery when wet" also.

The ratings for shallow excavations ranged from somewhat limited, (very little problem for shallow excavations) to very limited. The main reason for a very limited rating was the large amount of coarse fragment in some situations and the tendency of some soils to have their banks cave in. The rating concerning the potential for mass movement or slumping is an observational rating that the soil scientists make during the soil survey process. It is general in nature, but does provide an insight as to mapping unit characteristics. Most of the soils involved have a low to moderate rating on the lower slope ranges (0-35%), but have a moderate to high rating on slopes above 35%.

OTHER EXISTING CONDITIONS

The Ragged Mountain pipeline currently crosses the project area from NFSR 844 north through the Owens Creek area, down to a compressor on the Divide Creek portion. The Proposed Alternative route is immediately adjacent to this right of way. This is an 8-inch gas pipeline that has been there since the early to mid 1980's. It appears stable and well vegetated along most of its route. No increase in slope movement has been noticed. A couple very steep portions of its route continue to have bare ground, which may be due to the steepness of the slope and livestock use.

NFSR 265 is a level 4 road that exists within the southern and western edge of the analysis area. The Proposed Alternative 2 follows this alignment. A major relocation was needed on this road 1.5 miles south of the Owens Creek intersection during 1984-85 due to slope movement/earth flow activities as a result of large snow amounts and melting activities during the 1982-83 winter and spring seasons. A large slump on the Grand Mesa side of Buzzard divide occurred during this time period, with major work being done to make the road passable.

The Owens Creek road NFSR 268 branches of NFSR 265 on the Grand Mesa Forest. This is an unsurfaced level 3 road that is known for its untrafficability when wet.

The Western (Western Area Power Administration) 230kv power transmission line (Curecanti-River section) traverses the western portion of the analysis area (just east of NFSR 265). Alternative 3 is proposing to follow close to this alignment. There was a geologic evaluation of slope conditions for an area ½ mile on either side of this alignment. Numerous landslides and areas of slope movement were mapped and described. Over the years various towers along this power line have had to be moved or repositioned due to slope movement.

A handful of aspen harvest activities have occurred on the Grand Mesa portion of this analysis area. These include Baby Ruth, Little Ruth, Crooked Creek and most recently Hightower. Special pre-harvest landslide inventories were conducted so that harvest activities would not occur on active landslide areas. Monitoring since harvest has not found any evidence of accelerated slope movement as a result of these actions.

3.2.5 ENVIRONMENTAL CONSEQUENCES

The impacts to the soil resource vary depending on the various actions that would occur within the construction corridor. In general the soil would be bladed, scraped, piled, excavated, displaced, backfilled, and compacted. In most cases this would alter the soils natural horizonation, bulk densities, infiltration rates, aeration and percolation characteristics. The soil would be treated as a construction medium. Overall, the protective vegetative cover would be removed on the 100 ft right of way and travel area. The top soil would be bladed off the 50 ft right of way and stockpiled. Within this cleared area a 4-8 foot trench would be excavated and a pipe would be laid. The soil would be removed to a depth of 4-5 foot, and piled out of the way, with the topsoil being separated from the subsoil. After the pipe is laid, the trench would be filled in with the subsoil first and the topsoil last.

The segregation and reapplication of soil material could cause the mixing or blending of shallow soil horizons, resulting in different soil characteristics and types. This would modify physical characteristics including structure, texture, and rock content, and potentially lead to reduced soil productivity in limited areas. On steep side slopes, side cuts would be necessary to provide a working surface for the heavy equipment. On these steeper sections of the landscape, cuts may be necessary. Cut-fills may alter the soil characteristics and affect soil productivity over the short term. Work areas would be compacted, and rutted, causing some displacement and destruction of natural soil structure. This would alter aeration, permeability, water holding capacity and runoff characteristics. An increase in surface runoff may result, potentially causing increased sheet, rill, and gully erosion, within the construction corridor. Construction activities and traffic, during wet periods could result in increased short term erosion on these disturbed areas.

The potential for reducing erosion off-site would be good using design criteria and use of the erosion control practices. As needed, additional soil would be disturbed for storage areas and heavy vehicle turn around areas. These areas would not be bladed, but in most cases, be compacted, somewhat displaced, and possibly rutted. When the soil is dry, dust is a problem. For consistency in the evaluation of the various alternatives it would be assumed that the most impact to the soil would occur within a 100-foot construction area. In actuality, the area of disturbance may be less than 100 feet on stream crossing areas, and on steep side slope conditions may range up to 175 feet considering the cut and fill that would be needed (See FEIS Appendix A-Figures 14-17 for cross section diagrams). On steeper side slope areas the spoil may extend down slope from the trench area 75 feet or more. This physically may not all be able to be brought up to the cut area, and may reside as fill material over an existing slope. Also, with side slope situations the cut slope may angle 1.5:1 (66%) or more. For these soils this would be a very severe hazard for erosion, and extremely difficult to revegetate.

Design Criteria
Numerous design features/mitigation measures, best management practices (BMPs) have been developed and would be implemented to minimize erosion, reduce sediment and provide for a protective vegetative cover for the soils within the areas disturbed by the construction activities. These are found in FEIS Table 6 and POD-Appendix 12 of the proposed Plan of Development. The use of these has been proven to reduce, minimize or provide protection to the soil and water resources. See Design Criteria and Mitigation in this section.

Cumulative effects
This section summaries key points to the impacts on the soil resource in relation to Proposed Actions. When considering other past impacts in this analysis area these factors also provide an additive view of soil impacts. Other similar soil impacts are the existing Ragged Mountain Gas Pipeline, and the existing road network. Due to the differences in alternatives these are addressed individually.

NO ACTION ALTERNATIVE EFFECTS

This No Action Alternative results in no pipeline construction activities and no soil disturbance. All forces acting on the soil would remain the same. There would be no indirect effects on the soils resource.

Cumulative Effects
Only those forces and actions currently on going would affect the soil resource.

PROPOSED ACTION EFFECTS

The Proposed Action is a very direct route from staring point to end point and for the most part avoids extended areas of side slope situations. This route goes straight up and down the landscapes. This alternative would result in the fewest number of acres in the 100-foot corridor. See Table 38 below for a summary of the impacts of the Proposed Action on the soils resource.

Table 38. Proposed Action - Soils Summary for ROW

Total length	25.5 miles	
Disturbed Acres	308 acres (100-ft corridor)	
Slopes	Sideslope	Up & Down
0-15%	73%	3-8slope 40%
15-35%	27%	8+ Slope 60%
35-50%	0.2%	-
Soils excavated	219,906 cubic yards	
Trench area	15.5 acres (permanently altered soil conditions)	
Slope stability	98 acres in landslide topography	
	168 acres in Moderate Hazard	

Soil Disturbance

A measure of the direct effect of this Proposed Action on the soil is the estimated amount of disturbed acres. For this evaluation this would be the 50 foot ROW plus the additional 25 foot temporary ROW granted for construction, plus the additional identified TUA areas width of 25-feet. The following Table 39 shows the soils disturbed acres relating to the pipeline ROW. During the construction of conditions, may produce large quantities of sediment to mobilize off the ROW, potentially into the drainage network. These impacts could occur for up to two (2) years.

Table 39. Proposed Action - Soils Disturbed Acres Within the ROW

OWNERSHIP	**100-foot Corridor**
BLM Total	47
GMUG Total	102
WRNF Total	98
NFS Land Total	200
Private Total	62
Grand Total	309

Slope Breaks

The percent slope is another measure of the direct effect of this alternative on the soil. On disturbed soils the higher the angle of slope the more potential there is for erosion. The following table displays the amount of area in this alternative by various slope ranges. Categories of erosion hazard are in these landscapes, slopes of 0-3% present a low risk for erosion, up and down slopes of 3-8% present a moderate potential, and slopes above 8% present a severe risk for soil erosion.

Ratings

Slight—Erosion is unlikely under ordinary climatic conditions.

Moderate—Some erosion is likely; control measures may be needed.

Severe—Erosion is very likely; control measures for vegetation re-establishment on bare areas and structural measures are advised.

Very Severe—Significant erosion is expected; loss of soil productivity and off-site damages are likely; control measures are costly and generally impractical.

The following table is a tabulation of amount of area within the various slope breaks for this alternative.

Table 40. Proposed Action - Area in various Slope Breaks and Erosion Hazard Categories

	SLOPE	Miles	Feet	ROW Width
Side-Slope	0-15 low erosion	14	71877	100
	15-35 moderate erosion	3	15956	100
	35-50 severe erosion	0.01	69	100
Side-Slope Total		17	87901	
Up & Down Slope	0-8 low-moderate erosion	7	38233	100
	8+ high erosion	2	8353	100
Up & Down Slope Total		9	46585	

Soils Excavated

Soil that is excavated piled and then replaced can drastically alter soil characteristics from their natural condition. This alternative has the potential of affecting 219,906 cubic yards of soil material in this manner. The deep excavation of these soils would greatly alter natural soil characteristics, to the point where it can be considered permanent. This relates to a long-term loss of productivity of those areas. For the purpose of comparisons, the trench area alone (5ft wide) for the total length of this alternative amounts to 16 acres that would be permanently altered for this alternative.

Slope Stability

This alternative affects 98-acres of general landslide topography. There are 168 acres with a moderate geologic hazard with this alternative.

Roads and related impacts to the Soils Resource

Also related to this alternative will be disturbances relating to the use and up-grading of the following roads and routes;

Proposed Action involves potential use of county roads 79, 265, 311, 346, 324, 327, 342, 344, 315,

Indirect Effects

The indirect effects of this alternative would be a potential for large amounts of soil material to get outside the construction areas and either become sediment in the stream network, or would be deposited as a sediment plume on the existing vegetation.

Cumulative effects

The Proposed Action is a very direct route from staring point to end point and for the most part avoids extended areas of side slope situations. This route goes straight up and down the landscapes. This alternative would result in the fewest number of acres in the 100-foot corridor. See Table 41 below for a summary of the impacts of the Proposed Action on the soils resource.

Table 41. Proposed Action - Soils Summary

Total length	25.5 miles	
Disturbed Acres	308 acres (100-ft corridor)	
Slopes	Sideslope	Up & Down
0-15%	73%	82%
15-35%	27%	18%
35-50%	0.2%	-
Soils excavated	219,906 cubic yards	
Trench area	15.5 acres (permanently altered soil conditions)	
Slope stability	98 acres in landslide topography	
	168 acres in Moderate Hazard	

ALTERNATIVE 1 EFFECTS

Alternative 1 is very similar to the Proposed Action except that it follows NFSR 265, NFSR 844 on the Paonia side of the project, and the West Divide Road on the Rifle side of the project. There are stretches of steep side hill slopes along these roads that currently have no room for a pipeline corridor. To develop a corridor these slopes would need to be cut into 75-100ft at the road elevation or a working bench would need to be cut into the slope above the road. In either case disturbance could destabilize the slopes above the road, increasing the risk for slope movements. There are slightly more acres that would be disturbed with this alternative as compared to the Proposed Action. See Table 42 below for a summary of the impacts of Alternative 1on the soils resource.

Table 42. Alternative 1 - Soils Summary for ROW

Total length	25.9 miles	
Disturbed Acres	313.3 acres (100 foot corridor))	
Slopes	Sideslope	Up & Down
0-15%	68%	3-8slope 40%
15-35%	31%	8+ Slope 60%
35-50%	0.6%	-
Soils excavated	240,466 cubic yards	
Trench area	15.7 acres (permanently altered soil conditions)	
Slope stability	81 acres in landslide topography	
	175 acres in Moderate Hazard	
	< 0.1 acres in High Hazard	

Soil Disturbance

This alternative follows existing roads on the south end and the north end. This would be 3.4 miles along NFSR 265, 844 and 844.1a on the south end (Paonia District) and 6.7 miles on the north end (Rifle District) along NFSR 344 and County Road 79. This route avoids the steep side sloped portion that goes above Flat Iron Mountain above West Divide Creek and avoids the BLM ownership portions on the north end of the pipeline. There are, however steep side hill situations along portions of these roads (estimated 2 miles in length) that would need large amounts of excavation to provide a working area for the pipeline. This has the potential for destabilizing these slopes, which may affect the road section involved. Slope stabilizing measures may be needed to protect roads.

The amount of area directly impacted (100-foot corridor) is displayed in the following Table 43. This relates to major soil disturbance areas.

Table 43. Alternative 1 - Soils Disturbed Acres

Owner	Forest	District	100' Construction ROW
NFS Land	GMUG	Paonia	115
	GMUG Total		115
	WRNF	Rifle	78
	WRNF Total		78
NFS Land Total			193
Private Total			120
Grand Total			313

Slope Breaks

The tabulation of amount of area within the various slope breaks for this alternative is in the following table.

Table 44. Alternative 1 - Area in various Slope Breaks and Erosion Hazard Categories

Slope Type	SLOPE	Miles	Feet	ROW Width
Side-Slope	0-15 low erosion	13	71940	100
	15-35 moderate erosion	4	19240	100
	35-50 severe erosion	.05	253	100
Side-Slope Total		17	91434	
Up & Down Slope	0-8 low-moderate erosion	8	40281	100
	8+ moderate erosion	.91	4815	100
Up & Down Slope Total		9	45097	

Soils Excavated

This alternative has the potential of affecting 240,466 cubic yard of soil. Deep excavations would greatly alter natural soil characteristics, to the point where it can be considered permanent. This relates to a long term loss of productivity of those areas. For the purpose of comparisons, the trench area alone (5-foot wide) for the total length of this alternative amounts to 16 acres that would be permanently altered for this alternative.

Slope Stability
This alternative affects 81acres of general landslide topography and 175 acres with a moderate geologic hazard occur in this alternative.

Roads and related impacts to the Soils Resource

Indirect Effects
The indirect effects of this alternative would be that there would be a potential for large amounts of oil material to leave the construction areas and either become sediment in the stream network, or would be deposited as a sediment plume on the existing vegetation.

Cumulative effects
Alternative 1 is very similar to the Proposed Action except that it follows NFSR 265, NFSR 844 on the Paonia side of the project, and the West Divide Road on the Rifle side of the project. There are stretches of steep side hill slopes along these roads that currently have no room for a pipeline corridor. To develop a corridor these slopes would need to be cut into 75-100ft at the road elevation or a working bench would need to be cut into the slope above the road. In either case disturbance could destabilize the slopes above the road, increasing the risk for slope movements. There are slightly more acres that would be disturbed with this alternative as compared to the Proposed Action. See Table 45 below for a summary of the impacts of Alternative 1on the soils resource.

Table 45. Alternative 1 - Soils Summary

Total length	25.9 miles	
Disturbed Acres	313.3 acres (100 foot corridor))	
Slopes	Sideslope	Up & Down
0-15%	68%	89%
15-35%	31%	11%
35-50%	0.6%	-
Soils excavated	240,466 cubic yards	
Trench area	15.7 acres (permanently altered soil conditions)	
Slope stability	81 acres in landslide topography	
	175 acres in Moderate Hazard	
	< 0.1 acres in High Hazard	

ALTERNATIVE 2 EFFECTS

Alternative 2 is the longest of all the alternatives at 39 miles. It would potentially contain more acres of soil disturbance, at 472.5 acres. This alternative would follow NFSR 265 as in Alternative 1, with the same side-hill situations. It follows NFSR 265 northwest and north into the Buzzard drainage. At the Buzzard Divide there is a slump that would need to be crossed. The terrain on the divide is rather rough and dissected, with landslides and slumps occurring frequently. See Table 46 below for a summary of the impacts of Alternative 2 on the soils resource.

Table 46. Alternative 2 - Soils Summary for a 100 ft ROW

Total length	39 miles	
Disturbed Acres	472.6 acres (100 foot corridor)	
Slopes	Sideslope	Up & Down
0-15%	81%	3-8slope 90%
15-35%	19%	8+ Slope 10%
35-50%	-	-
Soils excavated	351,324 cubic yards	
Trench area	23.7 acres (permanently altered soil conditions)	
Slope stability	96 acres in landslide topography	
	305 acres in Moderate Hazard	
	41 acres in High Hazard	

This alternative proposes to follow close to the major Forest and County Roads in these landscapes. This includes NFSR 265, NFSR 270, County Road 342 and a little of County Road 344. This proposed route would be about 13.5 miles longer than the Proposed Alternative and Alternative 1. As in Alternative 1, there are stretches of NFSR 265 on the southern portion of the proposed route that would need to cut into large, tall side slopes to get the space for construction of this pipeline. Slope stabilizing measures may be needed in those situations to protect and maintain the road. There is a landslide area just on the north side of the Buzzard Divide that has been stabilized with ERFO (Emergency Relief for Federally Owned Roads) Funds in the mid 80's that this alignment passes over. The terrain just north of the Buzzard/Divide Creek drainage is rough, dissected and contains a number of actively moving slumps and slides. Based on review of the soils data this alternative would affect 10.4 acres (2.2% of entire route) of soil unit 127. This soil unit is a wetland with the potential to support fens. This unit did not appear during the GIS evaluation of the construction corridor for the Proposed Alternative or Alternative 1. This soil unit however should not be considered on the ground mapping of wetlands or fens, due to the more general level of detail these Order III Soil Surveys were conducted at.

Soil Disturbance

The amount of area estimated to be directly impacted by this construction (100-foot corridor) is displayed in the following table:

Table 47. Alternative 2 - Soils Disturbed Acres

Owner	**Forest**	**District**	**100' Construction ROW**
BLM			13
	Total		13
BLM Total			13
NFS Land	GMUG	Grand Valley	192

Owner	Forest	District	100' Construction ROW
		Paonia	143
	GMUG Total		335
	WRNF	Rifle	27
	WRNF Total		27
NFS Land Total			361
Private Total			98
Grand Total			473

Slope Breaks
The tabulation of amount of area, miles and feet within the various slope breaks for this alternative is in the following table.

Table 48. Alternative 3 - Area in various Slope Breaks and Erosion Hazard Categories

Slope Type	Slope	Miles	Feet	ROW Width
Side-Slope	0-15 low erosion	26	134883	100
	15-35 moderate erosion	4	18950	100
Side-Slope Total		29	153833	
Up & Down Slope	3-8 low-moderate erosion	9	48624	100
	8+ high erosion	0.73	3833	100
Up & Down Slope Total		10	52457	

Soils Excavated
This alternative has the potential of affecting 351,324 cubic yards of soil material in this manner. Deep excavation would greatly alter natural soil characteristics, to the point where it can be considered permanent. This relates to a long term loss of productivity of those areas. For the purpose of comparisons, the trench area alone (5-foot wide) for the total length of this alternative amounts to 24 acres that would be permanently altered for this alternative.

Slope Stability
This alternative affects 96 acres of general landslide topography and 305 acres of moderate geologic hazard and 41 acres with a high geologic hazard rating.

Roads and Related Impacts to the Soils Resource
Also related to this alternative will be disturbances relating to the use and up-grading of the following roads and routes;

Indirect Effects
The indirect effects of this alternative would be a short-term potential for soil material to get outside the construction areas and either become sediment in the stream network, or just be deposited as a sediment plume on the existing vegetation.

Cumulative effects

Alternative 2 is the longest of all the alternatives at 39 miles. It would potentially contain more acres of soil disturbance, at 472.5 acres. This alternative would follow NFSR 265 as in Alternative 1, with the same side-hill situations. It follows NFSR 265 northwest and north into the Buzzard drainage. At the Buzzard Divide there is a slump that would need to be crossed. The terrain on the divide is rather rough and dissected, with landslides and slumps occurring frequently. See Table 49 below for a summary of the impacts of Alternative 2 on the soils resource.

Table 49. Alternative 2 - Soils Summary

Total length	39 miles	
Disturbed Acres	472.6 acres (100 foot corridor)	
Slopes	Side slope	Up & Down
0-15%	81%	93%
15-35%	19%	7%
35-50%	-	-
Soils excavated	351,324 cubic yards	
Trench area	23.7 acres (permanently altered soil conditions)	
Slope stability	96 acres in landslide topography	
	305 acres in Moderate Hazard	
	41 acres in High Hazard	

ALTERNATIVE 3 EFFECTS

Alternative 3 is similar to Alternative 2 in the fact that it follows NFSR 265 on the south end and NFSR 270 and County Roads on the northern portion. It differs however in the fact that it follows the WAPA 230 Kv transmission line for roughly 13 miles in the middle. This route goes through some high geologic hazard areas within this corridor that has been inventoried by WAPA. This is the second longest route, containing the second most amount of potential soil disturbance. See Table 50 below for a summary of the impacts of Alternative 3 on the soils resource.

Table 50. Alternative 3 - Soils Summary for 100 ft Construction ROW

Total length	32.4 miles	
Disturbed Acres	392.5 acres (100 foot corridor)	
Slopes	Side slope	Up & Down
0-15%	79%	3-8slope 80%
15-35%	21%	8+ Slope 20%
35-50%	-	-

Soils excavated	278,692 cubic yards
Trench area	20 acres (permanently altered soil conditions)
Slope stability	81 acres in landslide topography
	231 acres in Moderate Hazard
	83 acres in High Hazard

Compliance with the Forest Plan and Other Regulatory Direction

The Proposed Action disturbs the least amount of area, which relates then to the least amount of impact to the soil. It also avoids the most amounts of high geologic hazard areas, so the risk for causing accelerated slope movements are the lowest. This meets all the direction that both Forest Plans give.

Direct Effects

Staring at the point of origin in the south, this alternative follows NFSR 265 for about 12 miles to the northwest and intersects WAPA Curecanti-Rifle 230 kV power transmission line. This proposed alignment is 32.4 miles long. It follows the power line alignment, offset to the west by 100-feet, until the intersection with NFSR 270. It would then follow NFSR 270 to County Roads 342 and 344. The southern portions that follow NFSR 265 and the northern portions that follow NFSR 270 and the County Roads are the same as in Alternative 2. The same conditions exist with the side slopes on NFSR 265 and the rough terrain on NFSR 270. Along the power line alignment, WAPA has conducted geologic investigations and has inventoried documented many areas of landslides, earth slides and soil creep. This alternative would cross numerous areas with a high hazard rating. As with Alternative 2, the GIS evaluation of this alternative revealed that soil unit 127 would possibly be impacted when looking at the 100-foot construction corridor. In this case there is a potential to impact roughly 8 acres (2% of this total route) of this soil unit.

Soil Disturbance

As with the other alternatives there would be maximum soil disturbance in the construction area. The amount of area estimated to be directly impacted by this construction (100-foot corridor) is displayed in the following table:

Table 51. Alternative 3 - Soils Disturbed Acres for Construction ROW

Owner	Forest	District	100' Construction ROW
BLM	(blank)	(blank)	10
	(blank) Total		10
BLM Total			10
NFS Land	GMUG	Grand Valley	141
		Paonia	144
	GMUG Total		284
	WRNF	Rifle	40
	WRNF Total		40
NFS Land Total			325
Private Total			59

Owner	Forest	District	100' Construction ROW
Grand Total			393

Slope Breaks
The area within the various slope breaks for this alternative is in the following table.

Table 52. Alternative 3 - Area in various Slope Breaks and Erosion Hazard Categories

Slope Type	SLOPE	Miles	Feet	ROW Width
Side-Slope	0-15 low erosion	20	102722	100
	15-35 moderate erosion	3	16489	100
Side-Slope Total		23	119212	
Up & Down Slope	3-8 low-moderate erosion	9	45772	100
	8+ high erosion	1	6114	100
Up & Down Slope Total		10	51887	

Soils Excavated
This alternative has the potential of affecting 278,692 cubic yards of soil material in this manner.

For the purpose of comparisons, the trench area alone (5-foot wide) for the total length of this alternative amounts to 20 acres that would be permanently altered for this alternative.

Slope Stability
This alternative affects 81 acres of general landslide topography. There are 231 acres with a moderate geologic hazard rating and 83 acres with a high rating.

Roads and related impacts to the Soils Resource
Also related to this alternative will be disturbances relating to the use and up-grading of the following roads and routes;

Alternative 3 involves potential use of county roads 330E, 342, 344,331, 336, 315, 333 and 265; and Forest Service Roads 265, 265.3A, 268, 277, 270 and 701 (primarily as a haul route)

Indirect Effects
Indirect effects would include a short term potential for sediment transport; material leaving the construction areas and either becoming sediment in the stream network, or being deposited as a sediment plume.

Cumulative Effects
Alternative 3 is similar to Alternative 2 in the fact that it follows NFSR 265 on the south end and NFSR 270 and County Roads on the northern portion. It differs however in the fact that it follows the WAPA 230 Kv transmission line for roughly 13 miles in the middle. This route

goes through some high geologic hazard areas within this corridor that has been inventoried by WAPA. This is the second longest route, containing the second most amount of potential soil disturbance. See Table 53 below for a summary of the impacts of Alternative 3 on the soils resource.

Table 53. Alternative 3 - Soils Summary

Total length	32.4 miles	
Disturbed Acres	392.5 acres (100 foot corridor)	
Slopes	Sideslope	Up & Down
0-15%	79%	88%
15-35%	21%	12%
35-50%	-	-
Soils excavated	278,692 cubic yards	
Trench area	20 acres (permanently altered soil conditions)	
Slope stability	81 acres in landslide topography	
	231 acres in Moderate Hazard	
	83 acres in High Hazard	

COMPLIANCE WITH THE FOREST PLAN AND OTHER REGULATORY DIRECTION

The Proposed Action disturbs the least amount of area, which relates then to the least amount of impact to the soil. It also avoids the most high geologic hazard areas, so the risk for causing accelerated slope movements is the lowest. This Alternative meets all the direction that both Forest Plans give.

MITIGATION AND MONITORING

Also, all appropriate design criteria and mitigation measures described in the R-2 Soil and Water Conservation Practices Handbook, FSH 2509.25 will be used. These practices have been proven to be effective for the protection of water and soil, especially relating to the Clean Water Act.

3.3 WATERSHED

3.3.1 INTRODUCTION

The Bull Mountain Pipeline project proposes to install two pipelines (one 20-inch line for natural gas and another 8-inch line for gas production wastewater). The pipeline corridor would cross and parallel several perennial and intermittent stream segments and wetland areas. This section analyzes the risk of impacts from the construction and maintenance of the pipeline to water quality, stream, and wetland resources.

3.3.2 REGULATORY FRAMEWORK

(As applicable to the project proposal and watershed/wetland resources)

GRAND MESA, UNCOMPAHGRE, AND GUNNISON NATIONAL FORESTS LRMP DIRECTION

Goals

- Manage surface uses to maintain water quality above federal, state, and local standards.
- Increase water supply, while reducing soil erosion and stream turbidity.
- Protect water quality in streams, lakes, riparian areas, and other water bodies.

Standards, and Guidelines

- Design and implement activities in management areas to protect and manage the riparian ecosystem.
- Maintain all riparian ecosystems in at least an upper mid-seral successional stage based on the R2 Riparian Ecosystem Rating System.
- Manage riparian areas to reach the latest seral stage possible within the stated objectives.
- Prescribe silvicultural and livestock grazing systems to achieve riparian area objectives.
- Locate and construct roads to maintain the basic natural condition and character of riparian areas
- Maintain instream flows and protect public property and resources
- Improve or maintain water quality to meet State water quality standards. However, where the natural background water pollutants cause degradation, it is not necessary to implement improvement actions. Short-term or temporary failure to meet some parameters of the State standard, such as increased sediment from road crossing construction or water resource development may be permitted in some instances.
- Rehabilitate disturbed areas that are contributing sediment directly to perennial streams as a result of management activity to maintain water quality and re-establish vegetation cover.

- Reduce to natural rate any erosion due to management activity in the season of disturbance and sediment yields within one year of the activity through necessary mitigation measures such as water barring, and revegetation.
- Prevent or reduce debris accumulation in riparian areas that reduce stream channel stability or capacity.
- Prevent soil surface compaction and disturbance in riparian ecosystems. Allow use of heavy construction equipment for construction, residue removal, etc. during periods when the soil is least susceptible to compaction or rutting.
- Proposed land-use facilities (roads, campgrounds, buildings) should not be located within floodplain boundaries for the 100 yr flood. Protect future and present facilities that cannot be located outside of the 100 yr floodplain by structural mitigation (deflection structures, rip rap, etc.)
- Limit use of herbicides, pesticides, rodenticides or other chemical treatments as part of management activities to those times where possible transport to or by surface water has a low probability of occurrence. Follow all label requirements concerning water quality protection.

WHITE RIVER NATIONAL FOREST

Goals: 1 Ecosystem Health

Promote ecosystem health and conservation using a collaborative approach to sustain the nation's forests, grasslands, and watersheds.

Objectives

- Objective 1a Improve and protect watershed conditions to provide the water quality and quantity and soil productivity necessary to support ecological functions and intended beneficial uses.
    - 1a.4: Over the life of the plan, move at least 20 percent of degraded watersheds towards positive conditions. This would be accomplished either by modifying management activities that may further compromise the health of a degraded watershed or by rehabilitating degraded resources in the watershed.
    - 1a.5: Over the life of the plan, identify future Forest Service consumptive and non-consumptive water needs and estimate the quantity and quality of water needed to support stream and aquatic based resources and needs.
    - 1a.6: Over the life of the plan, use collaboration with State and local governments and other interested parties, available tools, authorities, and strategies that appropriately consider state law and the interests of holders of existing water rights to achieve desired conditions for aquatic and stream-based resources. Prioritize needs based on resource values, risks, and opportunities.

Standards

- In each stream currently supporting a self-sustaining fish population, ensure that projects maintain sufficient habitat, including flow, for all life history stages of native and desired non-native species."
- Naturally occurring debris shall not be removed from stream channels unless it is a threat to life, property, important resource values, or is otherwise covered by legal agreement. Removal in designated wilderness must consider wilderness values.

Guidelines

- When projects are implemented that can affect large woody debris, retain natural and beneficial volumes of this material for fish habitat, for stream energy dissipation, and as sources of organic matter for the stream ecosystem.
- Keep vehicles and equipment out of streams, lakes, and wetlands except to cross at designated points, build crossings, do restoration work, or where protected by one foot of snow pack or frozen soil.
- Maintain existing federal water rights. Take appropriate action to use and protect water rights, including but not limited to changing uses to meet federal needs for water. If the water rights are not needed to meet national forest purposes, sell, lease, or exchange these federal water rights.

FOREST SERVICE REGION 2 DIRECTION

Forest Service Handbook (FSH) 2509.25 – Water Conservation Practices Handbook, Region 2 Revised 5/5/06 (FSH 2509.25 Watershed Conservation Handbook)

BUREAU OF LAND MANAGEMENT

Objective

Maintain or improve water quality in the resource area where possible.

Water Quality Management Areas have been delineated for areas for where water quality is a concern. Divide Creek within Bureau of Land management administered lands has been identified as having high levels of bacteria and salinity; and high alkali concentrations (BLM, 1984).

Objective

Critical Watershed Areas are identified to protect the municipal watersheds providing domestic water for the communities of Rifle and New Castle, to manage debris flow hazard zones adjacent to Glenwood Springs, and to protect watershed conditions in erosion hazard areas. The BLM administered lands to the north of the project area in East Divide Creek are considered Critical Watershed Areas.

All practical measures will be taken to mitigate adverse impacts. These measures will be strictly enforced during implementation. Monitoring will tell how effective these measures are in minimizing environmental impacts. Therefore, additional measures to protect the environment may be taken during or following monitoring.

EXISTING LAWS, EXECUTIVE ORDERS, AND MEMORANDUMS OF UNDERSTANDING (MOUS)

Clean Water Act of 1977

The objective of the Act is to restore and maintain the chemical, physical and biological integrity of the Nation's waters (Section 101(a)). Projects such as the proposed action will have to obtain a section 401 certification under this act and since there will be dredging and fill of material into navigable waters (waters of the U.S.) a Section 404 permit will be needed as well.

Executive Order 11990, 1977; Wetlands Management

E.O. 11990 requires federal agencies to follow avoidance, mitigation, and preservation procedures with public input before proposing new construction in wetlands. To comply with Executive Order 11990, the federal agency would coordinate with the ACOE, under Section 404 of the Clean Water Act, and mitigate for impacts to wetland habitats.

Executive Order 11988, 1977; Floodplain Management

E.O. 11988 requires all federal agencies to take actions to reduce the risk of flood loss, restore and preserve the natural and beneficial values in floodplains, and minimize the impacts of floods on human safety, health, and welfare.

State of Colorado and Forest Service Memorandum of Understanding (04-MU-11020000-029)

The understanding between the State of Colorado and the Forest Service that provides for the cooperation on water quality issues and the use of agreed upon Best Management Practices to protect water quality and quantity on Forest Service lands.

3.3.3 METHODOLOGY FOR ANALYSIS

Impacts to water quality, stream channels, and wetlands are analyzed for direct, indirect, and cumulative effects. Direct and indirect effects would be determined using an analysis of miles of right-of-way (ROW) or project road which has the risk of impacting stream channels by the type of activity, magnitude of activity disturbance, and the distance that activity occurs from the stream channel or wetland. This includes an assessment of the number of stream crossings by alternative as well the proximity of the ROW to streams or wetlands. The activities with the greatest potential for impacts are the construction of the pipeline and the road use/maintenance activities. Cumulative effects would attempt to combine the past, existing, and proposed project information to develop an index of risk of negative impacts. That index would then be compared to the direct and indirect analyses to predict cumulative impacts to water quality, stream channels, and wetlands. All outputs would be in miles of right-of-way impact or miles of road risk to watershed resources. Forest Plan, Watershed Conservation Practices, and other regulatory compliance consistency are discussed at the end of the alternative effects section.

3.3.4 EXISTING CONDITION/AFFECTED ENVIRONMENT

The project lies within portions of Gunnison, Delta, Mesa, and Garfield Counties, in Colorado and overlaps two major watersheds (4^{th} Code Hydrologic Units). One portion of the pipeline ROW is within the Plateau Creek watershed that is a direct tributary to the lower Colorado River and the other portion of the ROW is within in the East Muddy Creek sub-watershed that is part of the North Fork of the Gunnison River that also is a tributary to the lower Colorado River. The specific Hydrologic Unit Code (HUC) sub-watershed map is depicted in FEIS Appendix E-Figure E-1, and watershed hierarchy is as follows:

4th Code HUC(s)

- Colorado Headwaters-Plateau-Utah (14010005)
  - **5th Code HUC(s)**
    - Divide Creek (1401000504
      - **6th Code HUCs**
      - West Divide Creek above Alkali Creek (140100050405)
      - West Divide Creek above Little Muddy Gulch (140100050406)
      - Headwaters West Divide Creek (140100050407)
      - Alkali Creek (140100050410)
    - Buzzard Creek (140100019)
      - **6th Code HUCs**
      - Lower Buzzard Creek (140100051901)
      - Road Gulch (140100051905)
      - Upper Buzzard Creek (1040100051906)
- North Fork Gunnison River (14020004)
  - **5th Code HUC(s)**
    - East Muddy Creek (1402000409)
      - **6th Code HUCs**
      - Clear Fork of East Muddy Creek (140200040903)
      - Little Muddy Creek (140200040904)
      - Little Henderson Creek (140200040905)
    - West Muddy Creek (1402000455)
      - **6th Code HUCs**
      - Upper West Muddy Creek (140200045502)

The project area is characterized by mountainous terrain. Hill slopes affected by the proposed project are generally gentle (0 – 15 percent) with some sections of moderate slopes (15 – 35 percent), and some infrequent sections of steep slopes (35 – 50 percent or steeper). The hill slopes are moderately dissected by stream channels.

The major stream channels in the area include West Divide Creek (Divide Creek 5th Code HUC), Little Muddy Creek (East Muddy Creek 5th Code HUC), Willow Creek (Divide Creek 5th Code HUC), Buzzard Creek, and Owens Creek (Buzzard Creek 5th Code HUC). These streams can generally be described as sediment transport type channels with some sections of lower gradient response type channels on the main perennial streams (Montgomery and Buffington, 1997). A majority of the streams within the project area are intermittent channels (eighty percent or greater) and indicate a generally dry climate and flashy runoff regime.

Many of these low gradient channels with perennial streams are also associated with riparian and meadow wetland areas. Wetland surveys have been completed for much of the project area. Wetland types found during surveys include meadows, swales, seeps, willow complexes, and riparian areas along streams. No fen type wetlands were identified (Supplemental Biological Evaluation, June 2007). Some hydrologic wetland characteristics were not always observed due to the survey season and a prolonged drought- but they were assumed to be present under normal conditions if soils, vegetation, and setting were indicative of wetland hydrology. Mapped wetland types and locations are included in Appendix 12 of the POD.

Precipitation is dominated by winter snowfall. Seventy Five percent of all precipitation falls as snow during the winter months. Monsoon type rainfall occurs during the summer months of June and July. The majority of runoff from the Forest results from snowmelt during April through July. It is estimated that over 75 percent of total annual runoff occurs during this period (See Table 54). The timing of peak flows varies considerably by elevation. At high elevations, where most Forest watersheds occur, stream flows are generally greatest from June through early July. At lower elevations, peak flows can occur as early as mid April.

Table 54. Typical Monthly Streamflows for USGS Gauges in or near the project area.

Stream Gauge Site (USGS Gauge # and Name)	Jan (cfs)	Feb (cfs)	Mar (cfs)	April (cfs)	May (cfs)	Jun (cfs)	July (cfs)	Aug (cfs)	Sept (cfs)	Oct (cfs)	Nov (cfs)	Dec (cfs)
09089000 West Divide Creek Below Willow Creek	1.27	1.34	3.13	35.5	167	92.9	19.5	3.54	1.74	2.12	1.98	1.58
09089500 West Divide Creek near Raven, CO	2.63	2.68	6.96	49.5	200	122	25	4.35	2.41	3.25	3.44	2.86
09130500 East Muddy Creek near Bardine, CO	13.7	14.8	26.1	173	475	209	46.6	27.1	18.9	18.5	18.4	15.0
09130600 West Muddy Creek near Ragged Mt	0.37	0.4	1.0	8.1	26.5	13.6	2.54	1.12	0.83	0.91	0.83	0.55

The USDA-FS Region 2 Watershed Conservation Practices Handbook (FSH 2509.25) describes three mechanisms for impacts to stream health, 1) Disturbances within the water influence zone, 2) Increases in Connected Disturbed areas, and 3) Changes in flow regime. This project has the potential to affect the first two mechanisms. Streamflow regime is not likely to be altered by this project as there would not be enough vegetation removed to influence watershed runoff. Generally, flow increases occur mostly during spring runoff on the rising limb of the hydrograph, and are not measurable until about 25 percent of the basal area of a forested watershed is affected.

The classified uses for water in the State of Colorado are Aquatic Life, Water Supply, Recreation, and Agriculture. Current water quality conditions within the project area appear to be supporting all of the aforementioned designated uses since none of the streams within the project area are listed or proposed to be listed on the State's 303(d) Impaired Waters list. The Colorado Department of Health and Environment, Water Quality Commission 305(b) report (2004) reaffirmed that the designated beneficial uses for the North Fork of the Gunnison River and upper Colorado are being met. However, suspended sediments in streamflow are naturally elevated due to the locally fine textured soils and streamflows often have a muddy or silty appearance.

Existing conditions will create situations were there is evidence of sedimentation, turbidity, bank instability, and wetland damage due to the natural geomorphic conditions, grazing, and human activities (e.g. roads, natural gas exploration, and development). Due to the fine textured soils found in the project area (USDA Soils Report, 2006) and the frequency of high intensity thunderstorms there is evidence of ruts and rills forming on the unsurfaced roadways resulting in increased roadside drainage sediment transport to adjacent and connected drainages and streams.

Riparian conditions along perennial streams within the project area were evaluated by Forest Service resource specialists and found that native vegetation is present and vigorous, shrubs are vigorous and growing to their expected heights, and banks are stable. There is an accumulation of litter on the ground, as well as a diversity of plant species. Portions of Little Muddy Creek, Mosquito Creek and the beaver pond areas of West Willow Creek within the project area are exceptions. These specific stream riparian systems were determined to have lower condition ratings due several factors that include; geologic instability of the area, flood damage, summer elk use, and historic grazing damage. Overall, riparian conditions are satisfactory in the project area.

3.3.5 ENVIRONMENTAL CONSEQUENCES

PROJECT DESIGN

Project design features, mitigation, and monitoring are all provided in detail in the Bull Mountain Pipeline Plan of Development (POD). The POD covers all aspects of water quality, stream bank stability, erosion control, stream crossings, and wetland protection. It was developed to provide the project proponent with a list of measures to implement so that the project would be consistent with Forest Plan direction, Forest Service Regional direction, Bureau of Land Management direction, and other Federal and State Laws and Executive Orders. All POD measures for the protection of water quality, stream stability, and wetlands are consistent with current Forest Service and Bureau of Land Management Best Management Practices and have been identified as being effective (Seyedbagheri, 1996).

The following analyses rely heavily on the fact that the POD would be fully implemented. Alternative analysis was conducted with the understanding that POD measures would be implemented and the potential for measurable effects would be greatly minimized.

NO ACTION ALTERNATIVE

Direct and Indirect Effects

Under the No Action Alternative, water produced from energy wells in the Bull Mountain Unit would not be transported from the wells via pipeline to an appropriate disposal site or system in another area. For this reason, under this alternative, production water would have to be processed in a manner so as not to adversely impact water resources in the project area or downstream of the project area. There are several possible activities that could occur under this alternative to deal with production water, they are, but limited to; treating water or demonstrating that the water produced is of sufficient quality water that the operators are able to obtain discharge permits under the Clean Water Act to allow the production water to flow into surface water drainages in the area, Storing water in tanks and then transporting the water by truck to an appropriate disposal facility, or injecting the water back into the subsurface geology.

Previous attempts in the Bull Mountain Unit to develop injection wells for disposal of production water have proved to be unsuccessful because subsurface geology is not conducive to re-injection. SG continues to search for opportunities to re-inject production water back into the local geology in the area of the Bull Mountain Unit, but will continue to truck production water from the Unit to a commercial disposal site in the Grand Junction area.

There would be no indirect effects of not implementing the Proposed Action. There would be no measurable difference between the current condition and the No Action Alternative. The current condition and trend of the water quality, stream, and wetland resources would persist.

Cumulative Effects

Since there are no direct or indirect effects from the No Action Alternative to water quality, stream, or wetland resources, there would be no cumulative effects.

PROPOSED ACTION AND ALL ACTION ALTERNATIVES DIRECT AND INDIRECT EFFECTS

The action alternatives are analyzed as a group as they would all be implemented with the same project design features regardless of which alternative is chosen. The difference in the alternatives for water resources would appear in the amount of risk of impact to water quality, stream bank stability, and wetlands. The Proposed Action and Alternatives would not typically produce or generate any point-source discharges; therefore water resource impacts would generally be associated with non-point source pollution (i.e. sediment, turbidity) and disturbance or damage to wetlands and stream channel condition.

The main areas of risk that the proposed project presents to water resources are derived from three areas:

- Construction and maintenance of the right-of-way (ROW) and the ground disturbing activities associated with the pipeline construction,
- The use and maintenance of the access roads to the right-of-way,
- The potential for a toxic spill of natural gas production water.

The direct and indirect effects to water quality and stream channel stability would generally result from the immediate impact of pipeline stream or wetland crossings and effects from stream connected road drainage. Most of those impacts would be small in scale and of short duration (<2 – 3 years for both sediment delivery and streambank stability) and would not pose a long term impact to stream health indicators. Impacts to wetlands are also expected to be relatively short term with vegetative and hydrologic recovery within 3 – 5 years. The threshold where impacts to stream or wetland health indicators cause an inconsistency with the Forest Plan Water Conservation Practices Handbook would be the case where impacts to stream health are no longer considered short term. The implementation of the POD design features would prevent the majority of the sediment delivery and negative impacts to stream channels from pipeline construction activities. In addition, these critical design features are also noted in the FEIS Table 6.

However, it is not possible to completely avoid all impacts at the stream or wetland crossing sites, especially considering the fine textured nature of the local soils (USDA, 2006). But it is not expected that the project activities would lead to long term adverse impacts to stream or wetland health. The implementation of the POD features, especially the erosion restoration components, would ensure that the impacts would remain short term. The impacts have been grouped into high moderate and low risk based on their potential to have short term adverse impacts. Those activities and locations where short term adverse impacts are likely to occur were given high risk. Areas where impacts were likely to be minimal were rated as low risk.

Table 55. Right-of-Way Stream Crossings by Alternative

Stream Crossing Type	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Perennial	6	6	9	5
Intermittent	97	70	97	61

It is most likely that adverse short term effects could occur where local terrain features make construction, sediment control, and rehabilitation measures difficult. Those situations are usually associated with steeper slopes where cut and fill volumes are greater, erosion and sediment delivery are more likely, and long-term rehabilitation is more difficult. Therefore, near-stream hillslope steepness at stream crossing sites is used as an indicator to identify the differences in risk of impacts from pipeline construction between project alternatives (See 66).

Road disturbance areas are often the main source for water quality and stream impacts. The roads within the project area are largely unsurfaced and are often sources of fine sediments for sediment delivery. The project proposes to gravel surface some of the pipeline haul route and access roads for improved access. This would constitute an overall long term benefit in disconnecting disturbance areas from streams and in reducing sediment delivery as compared to the current condition.

The road system and its use during pipeline construction would still constitute a short term impact as compared to the current condition. The implementation of the Transportation Management Plan should reduce the potential of adverse short term impacts so it is expected that there would be relatively few and minor instances of sediment delivery. The road connected disturbance areas most likely to affect stream health are those road segments which cross or are located adjacent to stream channels. Therefore this analysis of road impacts to stream health focuses on near stream roads.

The overall rankings for risk for sediment delivered (from highest to lowest) from project access road use and maintenance activities based on slope and distance is as follows:

- Alternative 1
- Proposed Action
- Alternative 2
- Alternative 3

Construction and maintenance of the ROW risks to water resources are displayed in Table 56. ROW stream crossing sites proposed for the project were stratified by proximity to stream channels and near stream channel hillslope by project alternative. Those ROW stream crossing segments located next to steep hillslopes that are located close to stream channels received a higher risk rating than those that are farther away from the stream and gentler hillslopes adjacent to the stream channel. The miles of high, moderate, and low risk ROW stream crossing segments are then displayed by project alternative to give a relative comparison between the alternatives for potential impacts to watershed resources.

Table 56. Differences in Watershed Impact Risk by Project Alternative.

Right-of-Way (ROW) Distance from Stream (ft)/ near-stream hill slope (ROW is 100 Feet)				
100 foot.	**PA (miles)**	**Alt 1(miles)**	**Alt 2(miles)**	**Alt 3(miles)**
0%- 15%	2.01	1.53	2.13	0.91
15% - 35%	0.18	0.06	0.09	0.08
35% - 50%	0.00	0.00	0.00	0.00
200 foot.				
0%- 15%	1.71	1.40	1.89	1.32
15% - 35%	0.25	0.08	0.15	0.11
35% - 50%	0.00	0.00	0.00	0.00
300 foot.				
0%- 15%	1.43	1.13	1.60	1.18
15% - 35%	0.27	0.12	0.17	0.14
35% - 50%	0.00	0.00	0.00	0.00
Total miles of High Risk	**0.18**	**0.06**	**0.09**	**0.08**
Total Miles of Moderate Risk	**3.97**	**3.01**	**4.17**	**2.35**
Total Miles of Low Risk	**1.70**	**1.25**	**1.77**	**1.33**
Total Miles of ROW/Stream Crossing sites for All Risk Scenarios	**5.85**	**4.32**	**6.02**	**3.75**

The potential for watershed impacts due to road use and maintenance activities is described in Table 56. Roads proposed to be used for the project were stratified by proximity to stream channels and road surface type by project alternative. Those road segments without any surface treatments that are located close to stream channels received a higher risk rating than those that are farther away from the stream and have a surface treatment to reduce sediment delivery. Forest Service Water Erosion Prediction Project (WEPP) computer model runs indicated that sediment delivery was notable for up to 300 feet in some soil/road slope scenarios. FS WEPP is a set of interfaces designed to allow users to quickly evaluate erosion and sediment delivery potential from forest roads, harvest activities, prescribed fires, and wildfires. The erosion rates and sediment delivery are predicted by the Water Erosion Prediction Project (WEPP) model, using input values for forest conditions developed by scientists at the Rocky Mountain Research Station (USDA, 1999).

WEPP was used to define the approximate maximum sediment delivery distances using average road slope conditions over a 30 year climate record period. The results were then rounded up to provide for a conservative potential area of stream impact zone from road crossings. The miles of road stream crossing segments were then grouped into slope classes and rated for risk of stream impacts- greater than 30 percent slope rated high, 15 percent to 30 percent rated moderate, and 0 percent to 15 percent rated low. The miles of High, Moderate, and Low risk roads are then displayed by project alternative to give a relative comparison between the alternatives for potential impacts to watershed resources

Alternatives 1, 2, and 3 are similar in the length (miles) of high-risk ROW stream crossing sites, whereas the Proposed Action is almost double the length for these areas. Alternative 2 has the longest overall exposure to stream crossing, and has the most exposure to the moderate risk stream crossing sites. Alternatives 2 and 3 also include steep sections of excavation along FS Road 265 where there is a high potential for large inputs of sediment to Little Henderson Creek. Overall, the rankings for risk (highest to lowest) for short term impacts to stream and wetland health from ROW activities are as follows

- Proposed Action
- Alternative 2
- Alternative 1
- Alternative 3

The miles of near stream access roads by surface type within 100 ft, 200 ft, and 300 ft feet of stream channels is used as an index of risk for impacts to stream and wetland health from road use and maintenance (See Table 57). Roads are considered connected disturbance areas to streams and wetlands and the heavy use and maintenance of them for pipeline construction activities elevates probability of increased runoff or sedimentation to streams or wetlands. Risk of impact by roads used for the project is assigned based on the distance a road crossing segment is from a stream channel and the surface type of that road segment. Alternatives 1 and 2 have the most road crossings with Alternative 1 having the greatest length of High and Moderate risk road segments. The Proposed Action follows Alternative 1 for the greatest length of high and moderate risk stream crossing segments- the difference is due is to the Proposed Action section of ROW from Mosquito Creek to the Divide Creek Compressor site where road access is limited. Overall, Alternative 3 has the lowest risk for impacts from road use and maintenance to Watershed resources.

Table 57. Miles of Road Risk as a function of distance to streams and road surface material

Road Distance from Stream (feet)/Road Surface Type	PA (miles)	Alt 1 (miles)	Alt 2 (miles)	Alt 3 (miles)
100 foot				
Collector Gravel	1.90	2.41	2.71	2.30
Collector Native Surface	0.00	0.04	0.00	0.00
Gravel	0.73	1.31	1.33	0.79
Local Gravel	0.22	0.22	0.00	0.00
Local Native Surface with Spot Gravel	0.04	0.04	0.00	0.00
Local Native Surface	0.52	0.52	0.00	0.08
Low Standard Native Surface	0.30	0.23	0.00	0.00
200 foot				
Collector Gravel	1.78	2.30	2.56	2.14
Collector Native Surface	0.00	0.04	0.00	0.00
Gravel	0.64	1.20	1.24	0.72
Local Gravel	0.20	0.20	0.00	0.00
Local Native Surface with Spot Gravel	0.04	0.04	0.00	0.00
Local Native Surface	0.54	0.54	0.00	0.08
Low Standard Native Surface	0.28	0.23	0.00	0.00
300 foot				
Collector Gravel	1.50	2.02	2.21	1.83
Collector Native Surface	0.00	0.02	0.00	0.00
Gravel	0.58	1.11	1.17	0.64
Local Gravel	0.12	0.12	0.00	0.00
Local Native Surface with Spot Gravel	0.05	0.05	0.00	0.00
Local Native Surface	0.54	0.54	0.00	0.08
Low Standard Native Surface	0.32	0.23	0.00	0.00
Total miles of High Risk	**1.68**	**1.60**	**0.00**	**0.16**
Total Miles of Moderate Risk	**1.84**	**2.39**	**1.33**	**0.87**
Total Miles of Low Risk	**6.77**	**9.41**	**9.89**	**7.63**

This assessment of risk shows the Proposed Action and Alternative 1 to have very similar high risk potential for road use impacts to streams, while Alternatives 2 and 3 have none or very little high risk potential for road use impacts. Moderate risk ratings are again higher for the Proposed Action and Alternative 1 than for Alternatives 2 and 3. The Proposed Action and Alternative 1 have more potential for water resource impacts due to roads and road use than Alternatives 2 and 3.

The Plan of Development (POD) incorporates Forest Service and Bureau of Land Management Best Management Practices, State Storm Water Pollution Prevention Practices, and project design features that are all designed to protect and restore watershed resources. Specific measures for protecting water and wetland resources are included in the POD Appendices 4, 7, 8, and 12. Reclamation and rehabilitation measures are described in POD Appendix 12. All of these measures incorporated into the POD have evolved through extensive research (Burroughs, 1990; Burroughs and King, 1989; Burroughs et al. 1985;

King, 1994) and development and have been monitored and modified over several decades, with the express purpose of improving measures and making them more effective. Federal and state site evaluations of BMP control measures (Davis, 1995; Seyedbagheri, 1996; USDA, 2002) have found the practices to be effective in protecting beneficial uses and have been “certified” for Forest Service application as the Agency’s means to protect water quality from non-point source pollution.

Wetlands

The ROW would cross wetlands. Excavation is planned to take place in wetlands under all Alternatives. Pipeline ROWs tend to be linear due to the physical constraints of laying steel pipe and cannot be “bent” around wetland areas, but where possible parallel shifts in alignment can, in some locations, potentially avoid wetlands. Table 69 identifies the acres of wetland that would be impacted by the pipeline ROW by alternative.

Table 58. Acres of Wetland affected by Alternative

Proposed Action (ac)	Alternative 1 (ac)	Alternative 2 (ac)	Alternative 3 (ac)
3.91	5.19	7.98	6.38

There would be short-term unavoidable impacts to wetlands under all alternatives due to construction activities (<5 years). However, wetland species do appear to be resilient enough to recover from pipeline construction activities. This is demonstrated by observations on several wetland areas that were crossed by the original Ragged Mountain Pipeline that have recovered and appear to be fully functional. Project design features are included in the POD (Appendix 12) and should minimize impacts to the extent feasible. Pipeline construction in wetland areas should not appreciably alter ground water or surface water flow to the extent that long-term hydrologic conditions would change and long-term wetland health would not be affected. Construction impacts to ground cover, water budgets, and flow patterns are expected to recover to pre-project conditions within 3 – 5 years and wetland vegetation is expected to be restored along the ROW.

Impacts to wetlands would be greatest under Alternative 2 and the Proposed Action would have the least impact on wetland areas. Under all of the alternatives, the ROW alignment seeks to avoid wetland areas if possible, but due to the physically linear nature of pipelines, sometimes it is not technically possible to “bent” the pipeline to avoid all wetland areas and where those wetlands are crossed the POD (Appendix 12) defines the construction and travel procedures, resource protection, and reclamation measures to be employed.

Under all alternatives the construction of a pipeline and associated construction travel will have impacts on water resources. Increased sedimentation, erosions, damage to wetland areas, temporary loss of riparian vegetation will occur. While the Proposed Action and alternatives have slightly differing levels of impact for the various water resource components (e.g. erosion hazard, stream crossings, wetlands impacted) there is not one of the alignments or alternatives that is clearly or measurably better or worse in terms of collective or overall water resource impacts. The POD (Appendix 12) identifies effective and tested procedures and measures to lessen or eliminate various water resource related impacts and it has reclamation procedures that will diminish the long-term effects of the pipeline on watershed condition and water resources.

Production Water Disposal

Water produced from the extraction of natural gas sometimes has high concentrations of salts, sodium, and hydrocarbons. There are reports where water from gas wells has contaminated West Divide Creek downstream of the project area due to leaking benzene into the local aquifer and later being discovered in surface streamflows (Daily Sentinel 2006). Water leaking from gas wells is not within the scope of this project analysis, but the potential for production water leaking from the proposed 8-inch water line to be constructed within the ROW does pose a potential risk to local groundwater and surface water. The risk for this project is associated with the pumping of production water through the proposed 8-inch pipeline. There is always a risk of spills of production water due to water pipeline breakage or pipeline leaks. These instances are usually infrequent and relatively small in scale, many water pipelines operate for many years without line breaks or leaks. The lack of other planned or expected excavation projects along the pipeline ROW further lessen the risk of pipeline breakage. The environmental consequences of a spill of production water from the water pipeline would be adverse to surface water quality and aquatic life if those spills reach surface water. Leakage from the production water pipeline would most likely saturate soils in the area of the leak and could flow into adjacent shallow aquifers that could potentially discharge (e.g. springs, seeps) into surface drainages. While leaks pose a potential risk, the likelihood of such leaks being of sufficient volume to impact adjacent streams is slight. Since the production water pipeline is run under pressure, leaks in the system or pipeline breakage should be able to be detected by the operator when there is a loss of pressure. Locating leaks will be more difficult that finding pipeline breaks. A Hazmat and Spill Management Plan is incorporated into the POD, Appendix 7 in the event that a break and subsequent spill does occur. This analysis assumes that every possible measure would be taken to avoid spills and that the Hazmat and Spill Management Plan would be closely followed in the event of a spill.

Bull Mountain natural gas production water would either be disposed of through re-injection into deep wells or would be treated by transporting it to water treatment facilities. The 8-inch produced water line is a contingency facility that would allow transport of produced water out of the area should disposal capacity in the Bull Mountain Unit be inadequate. Installing the line concurrently with the Bull Mountain pipeline construction is proposed to maximize benefit from a single construction event, however, the 8-inch pipeline installation could be deferred until a later time. Produced water transported in the 8-inch line would be staged at the Divide Creek Compressor Station site in a tank battery for trucking to the closest appropriate site for disposal. At this time, potential existing sites include Black Mountain, south of Debeque, Colorado. There is also a re-injection disposal well planned for the Fed. 29 #1 location in the Bull Mountain Unit Area (permitted through COGCC).

Water quality impacts would occur if the production water pipeline was to break or leak with a sufficient volume of water to discharge into adjacent streams. The likelihood of this impact occurring is very low and such impacts would be short-term. Changes in water quality due to the influence of spilled production water would be diminished as the natural surface water flows flush the spilled water downstream where it would be diluted and dissipated. Impacts to aquatic life can vary depending on the quality of the production water. Since the quality of the production water will vary and is not known at this time, it is not possible to disclose the expected effects on aquatic life if a production water pipeline spill occurs.

CUMULATIVE EFFECTS

The cumulative effects area for the Bull Mountain Pipeline Project is the area encompassed by the watersheds as depicted in FEIS Appendix E-Figure E-1 with Project Alternatives displayed over the 5th and 6th Code Hydrologic Unit Sub-watersheds.

Information for past and present projects is mapped in FEIS Appendix P. The foreseeable future projects are generally more speculative due to the nature of oil and gas leasing on federal lands. Therefore, specific location data (proximity to stream channels and wetlands for example) for foreseeable future projects was not available with any spatial context other than the projects are proposed for a general leasing area and that they may exist or may in the future exist within the cumulative effects area. The lack of spatial context in relation to stream channels and wetlands only allows for a relative analysis of the increase in disturbance within the cumulative effects area. This analysis process is similar to other cumulative effects models such as the Region 5 Equivalent Roaded Area (ERA) Model (USDA, 1988), Menning (1996), and the Equivalent Clearcut Area method (USDA, 1977).

The methodology used in this analysis assumes impacts to watershed resources through the use of an index of disturbance values to weight activities based on their potential for negative watershed impacts. Disturbance coefficients were developed to express the effect of land use on such variables as woody debris recruitment, hillslope stability and sediment flux, and changes in watershed hydrology. The relative impact of each land use activity was gauged against a fully functioning healthy watershed condition- i.e. where all streams and wetlands were functioning at their ecological potential. Ground disturbance, for this analysis, is considered as one measure of the potential for initiating erosion and sedimentation problems in managed watersheds. In general, the greater the ground disturbance of an operation, the greater the likelihood there would be resulting erosion and sediment yield to stream channels.

Further, it is necessary to adjust disturbance coefficients for past activities as they usually recover naturally or through active restoration, Recovery of the landscape from past activities is accounted for through the use of a recovery curve that adjusts disturbance coefficients for the length of time since the initial disturbance. Watershed recovery after disturbance tends to occur on longer time scales, upwards of 20 years or more for tractor logging activities and longer for roading or total soil disturbance activities such as is proposed for this project. Therefore, a watershed recovery curve for a 30-year period was used in this case. Well pads and other roading activities were considered to be maximum disturbance for the full 30 year period.

Coefficients for all activities, past, present and reasonably foreseeable future, were developed. The index values were summed for the current condition (past and present activities included) and again for the current condition plus foreseeable future projects. This gives base watershed numbers from which the Bull Pipeline Project Alternatives can be compared (See Table 59).

Table 59. Index of Watershed Disturbance for Current Condition, Current Condition and Foreseeable Future projects, and Bull Mountain Pipeline Alternatives.

Current Condition Watershed Index Value	Current Condition + Foreseeable Future Projects Index Value	Proposed Action, Current Condition, and Foreseeable	Alternative 1, Current Condition, and Foreseeable Future	Alternative 2, Current Condition, and Foreseeable Future	Alternative 3, Current Condition, and Foreseeable Future

		Future Projects Index Value	Projects Index Value	Projects Index Value	Projects Index Value
41.1	49.2	52.1	52.1	52.6	52.6
Percent Increase in Index Value over Current Condition	20%	27%	27%	28%	28%

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There is a notable increase in Index Value when the Foreseeable Future Projects or the Bull Mountain Project Alternatives are accounted for. This is due to the increase in well site and pipeline construction activities. However, at this scale, there is very little difference between the Bull Mountain Alternatives when considered in context with all the other past, current, and future projects. There would be an increase in watershed disturbance with any Bull Mountain Alternative, but the implementation of the POD measures should keep those impacts to relatively short time frames. Active restoration activities would continue until there is at least 80 % recovery of all disturbed riparian and wetland vegetation (See POD Appendix 12).

FOREST PLAN AND BUREAU OF LAND MANAGEMENT PLAN CONSISTENCY

The proposed action and alternatives do not pose a conflict with Forest Service Land Management or Bureau of Land Management plans. Neither the Forest Service nor the Bureau of Land Management Plans prohibit these types of natural gas production activities. However, both agencies do require the full application of Best Management Practices and mitigation measures. The project Plan of Development (POD) was designed to ensure that pipeline construction and maintenance activities provide for these BMP measures.

3.4 RARE PLANT SPECIES

3.4.1 INTRODUCTION

This section presents the analysis and determination of the likely effects of the alternatives on federally listed species (endangered, threatened, and proposed) Forest Service and BLM Special Status Plants and the habitats on which they depend (FSM 2670.31-2670.32 and BLM Manual 6840.06).

3.4.2 REGULATIONS

This section and the Biological Evaluation conforms to legal requirements set forth under section 7 of the Endangered Species Act (ESA) (19 U.S.C. 1536 (c), 50 CFR 402.12 (f) and 402.14). Section 7(a) (1) of the ESA requires federal agencies to use their authorities to further the conservation of listed species. Section 7(a) (2) requires that federal agencies ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of federally-listed species, or destroy or adversely modify designated critical habitat.

Forest Service policy requires that a review of programs and activities, through a biological evaluation, be conducted to determine their potential effect on threatened and endangered species, species proposed for listing, and sensitive species (FSM 2670.3). Under the Endangered Species Act (ESA) a Biological Assessment (BA) must be prepared for federal actions that are “major construction activities” to evaluate the potential effects of the proposal on listed or proposed species. The contents of the BA are at the discretion of the federal agency, and would depend on the nature of the federal action (50 CFR 402.12(f)). A BE may be used to satisfy the ESA requirement to prepare a Biological Assessment. Preparation of a Biological Evaluation as part of the NEPA process ensures that TEPS species receive full consideration in the decision-making process.

BLM policy does not require that a Biological Evaluation be prepared for Plant Species of Special Concern Status. Because of the overlap in plant species analyzed between the BLM and Forest Service lists, both Sensitive Plant species and Plant Species of Special Concern will be included in this analysis and the BE for Forest Service Species..

Under the ESA, all federal agencies, including BLM must prepare a BA when effects to a listed or proposed species have been identified through the NEPA process. Since no listed, proposed or candidate species have been identified as occurring or having potential habitat on BLM lands within the project area, BLM does not require a BA to be prepared. In addition, no BLM sensitive species or their habitat is known to occur within the project area

Activities considered in the proposed Bull Mountain Natural Gas Pipeline Project require a Biological Evaluation. The Biological Evaluation is completed to ensure that proposed actions:

- Do not cause US Forest Service Sensitive species to move toward federal listing
- Do not contribute to the loss of viability of native or desired non-native species

Sensitive Species are defined by the Regional Forester (FSM 2670.5) as those species for which population viability is a concern, as evidenced by:

- Significant current or predicted downward trends in population numbers or density.
- Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Activities considered in the proposed Bull Mountain Natural Gas Pipeline Project Environmental Impact Statement require a specialist report per BLM Manual direction (BLMM 6840). The Objectives of this policy is to:

- To conserve listed species and the ecosystems on which they depend.
- To ensure that actions requiring authorization or approval by the BLM are consistent with the conservation needs of special status species and do not contribute to the need to list any special status species either under provisions of the ESA or other provisions of the BLM Manual 6840 policy.

Special Status Plant species are defined by the State BLM Director (BLM Manual 6840) as those species which are sensitive, implying that there is a potential for endangerment or extinction.

Under BLM Manual 6840, the BLM is directed to manage candidate species in such a manner that these species and their habitats are conserved and to ensure that agency actions do not contribute to the need to list these species as Threatened or Endangered.

3.4.3 METHODOLOGY

A biological evaluation (BE) and Supplemental BE (June 2007) were completed for this project and the complete BEs are in the project files. Field Surveys were conducted for the proposed pipeline ROW and all roads. If alternatives 2 or 3 are selected, additional field surveys would be required and a supplemental BE would be issued.

3.4.4 AFFECTED ENVIRONMENT

COMMUNITIES AND ECOSYSTEMS:

The elevation along the Proposed Bull Mountain pipeline ROW ranges from approximately 7,200 feet at the compressor station on Henderson Creek at the south end of the line, to 9,900 feet on Spruce Mountain, to 6,600 feet near the compressor station on the north end of the line. Corresponding to the elevation gradient and local microsite factors, ten major vegetation types occur along the line: aspen, aspen/conifer, cottonwood, Douglas-fir/white fir, grass/forb, mountain shrubland, oak shrublands, pinion/juniper, spruce/fir, and willow. Plant community acres within the proposed 100-foot construction ROW are displayed in Table 60 by alternative and the Proposed Action.

Table 60. Approximate acreage of each plant community affected by the Proposed Action and alternatives.

Plant Community	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Aspen	53	53	78	111
Aspen/Conifer	56	54	28	28
Cottonwood	18	19	3	1
Douglas-Fir/White Fir	0	0	0	0
Grass/Forb	24	22	73	54
Mountain Shrubland	125	140	127	166
Oak Shrublands	89	94	113	109
Pinion Juniper	11	7	14	15
Spruce/Fir	6	6	0	0
Willow	9	10	32	12

Plant Community	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Unknown	•	•		

In addition to these seven major vegetation types, seventy-two wetlands were found within the 200-foot-wide survey area along the Proposed Action route. Two additional wetlands occur at the south end of the pipeline at the site of a staging area. Wetland types along the ROW include meadows, swales, seeps, willow complexes, and riparian areas along streams. Common plants include various species of sedge, rush, willow, and a variety of grass species. In total, approximately 4,011 linear feet of wetland habitat are crossed by the centerline of the ROW. Several wetlands occur within the 200-foot-wide survey corridor but are not crossed by the ROW. Detailed descriptions of each wetland site are contained within the Cirrus biological report which is in the project files.

THREATENED, ENDANGERED, AND PROPOSED SPECIES

No threatened, endangered, or proposed plant species or its habitat have been found during surveys or are expected to occur within the proposed project area. We have determined that there would be “no effect” to any Threatened or Endangered plnats and, therefore, Section 7 Consultation with USFWS was not required. Candidate species have sufficient information on their biological status and threats to warrant a proposal to list as Endangered or Threatened, but development of a listing regulation is precluded by other higher priority listing activities. Species that are candidates for listing under the Endangered Species Act are automatically placed on the USDA-FS Region 2 Forester’s sensitive species list and are also placed on the BLM State Director’s Species of Special Status List. The analysis and determination of effects for candidate species are included as part of the biological evaluation for sensitive and special status species.

The BLM does not require that a Biological Evaluation be written or determination statements be made for Special Status Plant Species. The Special Status Plant Species would typically be covered in a specialist report; they will be included in this analysis because there is overlap between the Forest Service Sensitive Plants and the BLM Species of Special Status. The plant species are analyzed more completely together in this document than would be if they were analyzed in separate documents.

No consultation with the USFWS occurred because no threatened, endangered, or proposed/candidate plant species occur in the proposed project area.

SENSITIVE SPECIES

An assessment of potential habitat for Forest Service sensitive plant species and for BLM special status plant species was completed for the Proposed Action by a contractor (Cirrus biological report, 2005). This assessment was based on the analysis of habitat for the Forest Service and BLM plant species that could potentially occur within 200 feet of the proposed route, and addressed species indicated by the Forest Service and BLM biologists assigned to the project. Four plant species associated with moist meadows, wetlands, ponds, and streams have some potential of occurring along the ROW. Therefore, targeted surveys of the wetlands along the proposed pipeline ROW between Henderson Creek on the south and Brooks Creek on the north were conducted September 3-5, 2005. The targeted species included Botrychium multifidum (leather grapefern), Eriophorum gracile (slender cottongrass), and Utricularia minor (lesser bladderwort). In addition, Carex diandra (lesser panicled sedge) was included in the survey since it is associated with wetlands, even though they are typically restricted to specialized habitats not present on the ROW (See Table 61 for a complete list of sensitive species). None of these species were found during the survey. However, if suitable but unoccupied habitat was present, then potential effects are evaluated. Populus tremuloides (aspen) is included in this analysis (Table 62) because special direction exists in the White River National Forest Land and Resource Management Plan for management and retention of the aspen forest type. Approximately 3.3 acres of potential sensitive plant habitat could be affected by the Proposed Action within the 100 foot ROW disturbance area. Six acres in Alternative 1's 100-foot ROW, ten acres in Alternative 2, and eight acres in Alternative 3 within the 100-foot ROW could also be potentially affected if an alternate route is selected.

Figure 6. Vegetation Map

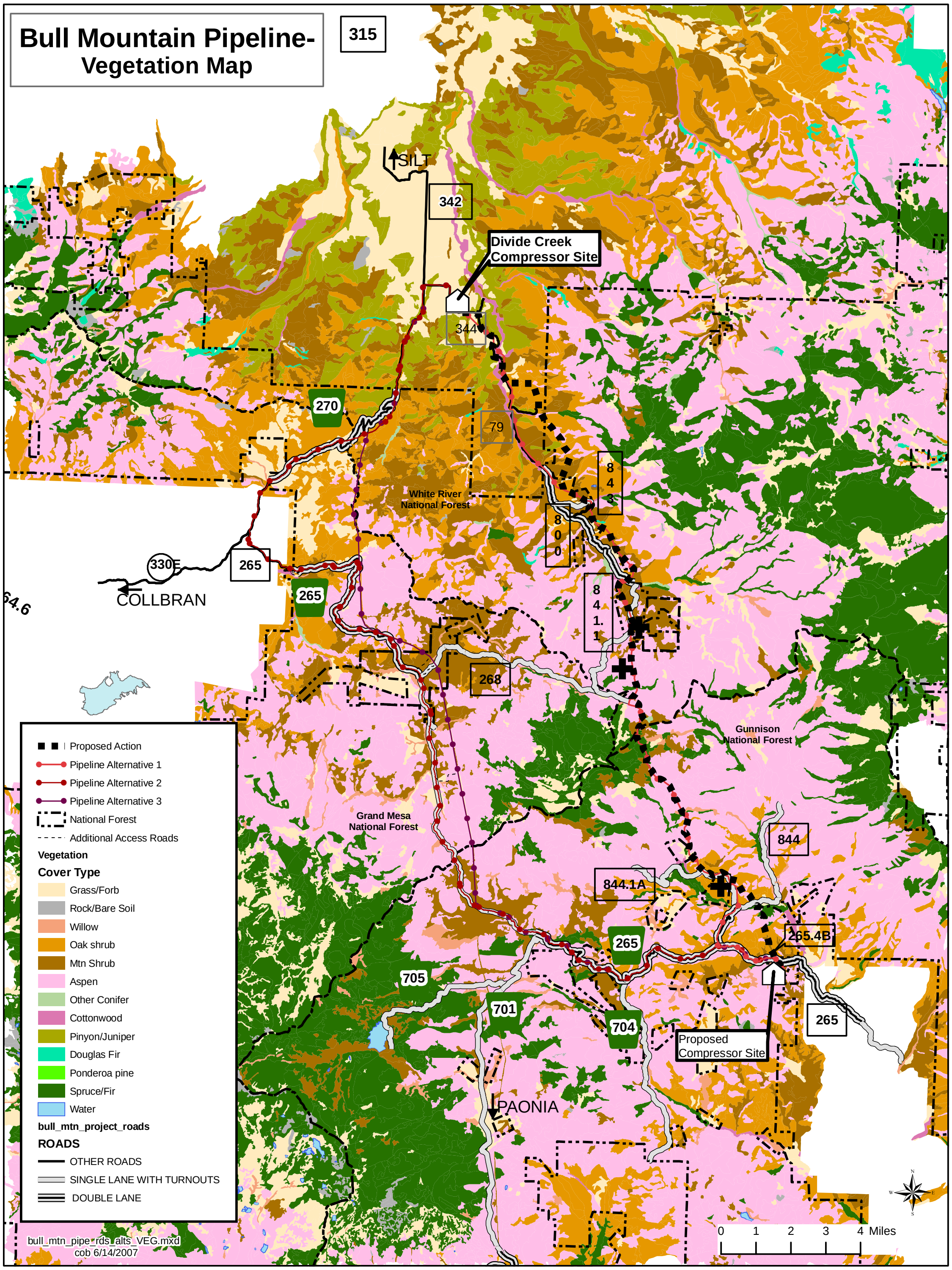


Table 61. USDA-FS R2 Sensitive Plant Species and BLM Plant Species of Special Status Surveyed for in the Proposed Bull Mountain Natural Gas Pipeline

Scientific Name	Common Name	CO state rank	Global rank	Habitat
Botrychium multifidum	Leathery grapefern	S1	G5	This species can be found in moist, open disturbed areas such as montane meadows, woodland margins, bottomlands, old pastures, wetlands and streamsides between 0 to 10,000 feet in elevation. Studies suggest that populations may be declining in Region 2 due to the limited availability of water and moist soil. Possible threats to this species include the effects of small population size, habitat conversion, exotic species invasion, sedimentation, and pollution. Suitable habitat occurs within the proposed and alternative project areas, particularly where the right-of-ways cross wet areas.
Carex diandra	lesser panicled sedge	S1	G5	Suitable habitat includes calcareous wetlands, fens, marshes, and meadows 6100-8600 feet. Carex diandra is typically found in open, unshaded sites. It is reported as a light loving plant rarely found in less than full sun environments. Population declines have been observed and are possibly related to loss of habitat. Possible threats include construction and development, and road use. Unique wetland habitats where this species is found are not known to occur along the proposed pipeline alignment, but may occur along the Alternative routes.
Comarum palustre	purple cinquefoil	S1S2	G5	Habitat for this species is found around pond margins, lake shores, fens, floating mats, bogs, and swamps 6800-8000 foot. Suitable habitat, including ponds and wetlands occur along the proposed project right-of-way and the ROW proposed for alternative one. Hydrologic alteration is considered as potentially damaging to purple cinquefoil populations.
Eriophorum gracile	slender cottongrass	S2	G5	This species lives in near-neutral-pH fens, on the margins of small lakes and ponds, and in other open, saturated wetlands with organic substrates between 8100–12,000 feet. Potential habitat such as ponds and wetlands occur along the proposed and alternative project right-of-ways. Suitable habitat is vulnerable to hydrologic alteration.
Utricularia minor	lesser badderpod	SR	G5	This species is restricted to patchy and discontinuous habitats that include shallow ponds, lakes, slow-moving streams, fens, and fresh-water wetlands between 6600-8600 feet. Potentially suitable habitat in ponds/wetlands occurs along the proposed and alternative pipeline right-of-ways. Populations may be threatened by loss or degradation of these environments.

Table 62. Other Species of Concern.

Scientific Name	Common Name	Habitat
Populus tremuloides	quaking aspen	Quaking aspen occurs on a wide variety of sites. It grows on moist upland woods, dry mountainsides, high plateaus, mesas, avalanche chutes, talus, parklands, gentle slopes near valley bottoms, alluvial terraces, and along watercourses. Quaking aspen spans an elevation range from sea level on both coasts to 11,500 feet (3,505 m) in northern Colorado. Many aspen stands to become over-mature and decline with no means of regenerating. Extensive stands of aspen occur along the proposed ROW on both the north and south slopes of Spruce Mountain. Aspen stands are also present in all three alternative routes.

3.4.5 ENVIRONMENTAL EFFECTS

INTRODUCTION

Because there are no known sensitive plant locations in the Proposed Action ROWs or the pipeline alternatives ROWs, the direct and indirect effects on those plant species noted in the previous table as having suspected habitat within the proposed project area or alternatives are discussed in this section. Table 63 summarizes the direct and indirect effects of each species with habitat within the ROW areas by Alternative, it is located after the complete discussions in the section below. Should an alternative to the Proposed Action be selected, sensitive plant surveys would be conducted in said area and the potential effects of such action, should sensitive plant species be found, would be analyzed and documented. This section would focus on any effects on sensitive plant habitat as a result of implementation of the activities proposed in all alternatives within the Bull Mountain project area. After evaluating the potential for effect, a determination statement (finding) is used to describe the impacts on the rare plant resource.

During construction of the proposed pipeline, ground within the ROW and TUAs would likely experience varying degrees of mechanical disturbance. Compaction, removal, or other perturbation of soil, as might occur in the presence of heavy equipment, could potentially affect its physical, hydrological, and or chemical characteristics. This in turn could have implications on the suitability of that site for sensitive species, and would vary among each species.

GENERAL SPECIES DISCUSSION

Botrychium multifidum

Ground disturbance in appropriate habitat may create additional habitat for this species, but the timing of disturbance as well as the intensity appears to be important. Moderate to light disturbance may be a critical part of the autecology of Botrychium species, including Botrychium multifidum because of the effects on plant community succession. It appears that this species is similar to other Botrychium species in that it is often found in areas disturbed more than 10 years ago, but it is also known to occur in relatively undisturbed sites. Although no studies have been done, it’s expected that increasing amounts and intensity of disturbance such as soil removal, compaction, and plant community alteration would lead to increasingly detrimental impacts. (Burkhart, 2005).

Botrychium species generally need some open areas for establishment. Succession in the absence of any disturbance regime may lead to unsuitable conditions for this species or its appropriate mycorrhizae. The degree to which Botrychium multifidum (BOMU) is threatened by succession is not clear since it's often documented in forest sites in the shade. However, there is strong evidence to suggest that the reproductive output of shaded plants is lower than that of plants in full sun. From these observations, there is speculation that the forest plants are "waiting" for a disturbance to occur that would create a forest opening and allow them to become reproductive. It's unknown what time period must elapse before such sites are colonized (adequate mycorrhizal development, etc.), but some observations suggest a 10-year time period. The wet habitats where BOMU is found are often dominated by highly competitive species. However, some observations suggest BOMU is not highly competitive. There are no data to suggest a direct effect of weeds on Botrychium species, but their mutual affinity for disturbance may cause Botrychium species and their habitat to be vulnerable to negative effects from weeds. There is no information on interaction with this species and seeding, however, occurrences do seem to be found in native systems. Seeding of non-local native species would likely be less detrimental than seeding exotic species, but it can be expected that species substitution that alters ecosystem processes would likely be detrimental and may eliminate Botrychium habitat (Burkhart, 2005).

Maintaining the ecosystem processes needed by this species is undoubtedly an important conservation consideration. High levels of soil and vegetation compaction would likely alter the hydrologic regime of potential habitat and result in adverse effects because of changes in overland and subsurface water and nutrient flows. This type of environmental change may cause shifts in species composition that could be detrimental for same reasons discussed previously. Soil removal may remove the mycorrhizal fungi that are critical for this species' survival. Therefore, the type and amount of disturbance resulting from soil preparation, heavy equipment, and trampling are all concerns that should be considered when operating in potential Botrychium multifidum habitat (Burkhart, 2005).

Carex diandra

Ground disturbances in habitats occupied by Carex diandra can cause direct impacts to the species including mortality resulting from damage of sedge tussocks. Ground disturbance can break substrate apart, making it more susceptible to oxidation; resulting in increased decomposition that can shift the balance between substrate accumulation and loss, with significant ramifications for habitat suitability. Factors compromising the physical integrity of the organic substrate or downed wood which plants are rooted in may represent a localized threat to this plant species. Carex diandra is typically found in open, unshaded sites. It is reported as a light loving plant rarely found in less than full sun environments. Because of its affinity for the sun, it should not be covered, piled upon or smothered. Dust from vehicle traffic and road maintenance, or cascading soils and sediment deposits as a result of mechanized equipment are potential threats to this taxon as well. Canopy removal around occupied habitat could benefit this species. However, likely of greater consequence, significant changes in basin vegetation cover are likely to alter surface runoff from basins through affects on evapo-transporation rates and snowpack accumulation patterns (Proctor, 2005).

Where this species occurs, damage to vegetation due to moderate compaction could alter soil properties, resulting in the mortality of peat forming plants that create habitat and the substrate upon which this plant species relies. Reduced infiltration could occur after moderate compaction of the soil. Compaction may be detrimental through its influence on hydrologic patterns, especially when pathways are worn into the peat that change permeability and alter the flow of water. These pathways can develop into surface drainages when wetter conditions return, and act to drain the fen. Any action that results in significant drainage of its habitat would negatively impact the viability of the species. For example, ditching can effectively intercept and divert inflow, which facilitates the formation of drier conditions, and could lead to invasion by species that are better adapted to seasonally dry habitats. Carex diandra is only an effective competitor in the wet microsites it is typically found in. A shift or change in the plant community supporting this taxon could displace this species. Introductions of other non-local native plant species could reduce select components of overall plant community that supports this species. Competition from non-native invasive plants constitutes a potential threat to this or any native plant species and its habitat (Proctor, 2005).

This species' habitat typically forms in physically stable locations where stream erosion and sediment deposition is limited because of specific moisture regimes, water pH, water depth, microtopography, light, and temperature requirements. Any activity significantly altering the water or sediment yield, or resulting in changes to water chemistry from surrounding wetlands could potentially affect this species. The effects of increased water yield and surface inflows are difficult to predict, and both positive and negative effects are possible. Generation of wetter conditions could result in expanding available habitat for C. diandra establishment and persistence. Increased sediment yields could also occur due to increased moisture. Sedimentation causes decomposition and mineralization and could negatively impact substrate formation and maintenance processes. In the opinion of some authors, soil removal would always be a detriment to this species' habitat. Mass wasting resulting from soil removal upslope could result in sediment flux rates significantly outside of the historic range of variability; adversely affecting Carex diandra populations (Proctor, 2005).

Eriophorum gracile

Because plants living in these habitats have specific moisture regimes, water pH, water depth, microtopography, light, and temperature requirements, habitat is likely to lose suitability with increasing amounts of disturbance. It has been noted that occasional light or moderate soil disturbance such as compaction/trampling is probably not detrimental to the habitat of this species, but heavy equipment or vehicles with narrow tires could easily damage its habitat because of poor soil strength. Regeneration is often poor after such disturbance (Austin, 2004).

Sedimentation causes decomposition and mineralization in the habitat that supports Eriophorum gracile and could negatively impact substrate formation and maintenance processes. Groundwater pumping, flooding, water diversion, and ditches in or near peatlands and wetlands changes water chemistry and quality and the ability of these systems to support wetland plant species. Any alteration of the water table or the flow of groundwater as a result of drainage may cause changes in plant community composition and potential loss of rare plant habitat. Peatlands or wetlands that are hydrologically modified begin to change from anaerobic ecosystems to aerobic systems and from an organic substrate accumulating system to a decomposing one. Weed invasion into E. gracile habitat is less likely due to wet anaerobic conditions. Light to heavy weed invasion may occur as habitat begins to dry out, reducing the suitability of potential habitat. Changes in the plant community resulting from the loss of certain species may also affect the quality of the habitat (Austin, 2004).

Utricularia minor

This species' habitat is susceptible to changes in hydrology as a result of compacted vegetation or changes in vegetation density on uplands or within its aquatic environment. Increased water levels in the aquatic bed wetland (this species is a submersed and floating-leaved plant) appear to have little effect in some instances, however water level increases in other instances may result in increased wave action and initially greater turbidity, which is detrimental to many aquatic plants. Conversely, drawdown of wetland water levels in some regions results in increased susceptibility to fires, which in turn can trigger significant changes in wetland chemistry and vegetation. Because Utricularia minor lives in water, it is also subject to indirect and direct effects from sediment, such as loss of light/smothering, and/or water chemistry and temperature changes produced by/during ground disturbance in adjacent areas. In some cases, sedimentation creates shoals in rivers or lakes, which provide sufficient substrate for herbaceous wetlands to become established or expand, at least until a major scouring flood re-occurs. Where sedimentation is severe, water may become too shallow for some submersed species and a shift to emergent species may occur. Reductions in plant species diversity, decreased productivity, and life cycle disruptions that result in changes in species composition are among the effects attributed to changes in nutrient levels and pH values. Changes in wetland thermal regime can cause changes in production and shifts in species composition of the herbaceous plant community as well. Changes are due both to physiological factors and (in northern wetlands) to changes in ice cover and growing season length. Besides sedimentation, direct changes to shading of pond habitat, through alterations of canopy cover, could result in water temperature changes and their accompanying effects (Roche, 2004).

While the occurrence of rarer, perennial species is often correlated with specific chemical conditions, the occurrence of aggressive, common species is not. Populations of weed species tend to tolerate a wider range of conditions, thus they often have a competitive advantage over native vegetation. Aquatic invasive weeds are notorious for their difficulty to control, although not many aquatic invasives are known from the mid-to upper montane ponds that provide habitat for Utricularia minor. Aquatic weeds comprise a direct effect on submersed vegetation and the quality of their habitat, and can shift the community composition at least temporarily as some weed species or other native species may become dominant following the catastrophic alteration of more diverse communities by dredging, herbicides, or other factors. It has also been observed that the removal of woody overstory generally increases herbaceous vegetation biomass and diversity. Because Utricularia minor is insectivorous, changes in upland species composition could change insect prey for this species, resulting in a detrimental effect (Roche, 2004).

Populus tremuloides

In the absence of adequate disturbance, and because of its intolerance to shade, the aspen cover type would convert to another forest type over time. Regeneration is usually stimulated by some form of major disturbance. Wildfire has historically played a large role as a disturbance vector for this forest type. However, suppression of fire has allowed many aspen stands to become over-mature and decline with no means of regenerating. Aspen regenerates almost solely through root sprouting, and suckers would arise following the death of the parent by fire, cutting, or browsing. Clones may be perpetuated indefinitely by managed disturbance (Barnes et al 1981).

Cutting and soil disturbance would likely effect aspen stands only in the short-term within temporary use areas of the proposed project because aspen largely relies on some form of perturbation to stimulate vegetative regeneration. Aspen would be eliminated from areas within the ROW because the ROW would be maintained in a state free of woody vegetation.

SUMMARY OF POSSIBLE DIRECT AND INDIRECT EFFECTS

Table 63. Summary of possible direct and indirect effects of the alternatives on sensitive plant species and other species with special management consideration.

Sensitive Plant Species	Proposed Action	Alternative 1	Alternative 2	Alternative 3	No Action Alternative
Botrychium multifidum	Light to moderate ground disturbance may create additional habitat for this species and its appropriate mycorrhizae by altering plant community succession. But it is expected that increased amounts and intensity of disturbance could alter potential habitat through soil compaction, soil removal, and introduction of invasive species.	Light to moderate ground disturbance may create additional habitat for this species and its appropriate mycorrhizae by altering plant community succession. But it is expected that increased amounts and intensity of disturbance could alter potential habitat through soil compaction, soil removal, and introduction of invasive species.	Light to moderate ground disturbance may create additional habitat for this species and its appropriate mycorrhizae by altering plant community succession. But it is expected that increased amounts and intensity of disturbance could alter potential habitat through soil compaction, soil removal, and introduction of invasive species.	Light to moderate ground disturbance may create additional habitat for this species and its appropriate mycorrhizae by altering plant community succession. But it is expected that increased amounts and intensity of disturbance could alter potential habitat through soil compaction, soil removal, and introduction of invasive species.	Unknown
Carex diandra	There are no direct or indirect effects as a result of the Proposed Action because ground surveys determined that neither plants nor potential habitat are known to occur in the proposed project area.	Opening the canopy and increasing soil moisture could create additional habitat. But ground disturbance can potentially reduce this species' habitat by compromising the physical integrity of the soil, drying out habitat, altering	Opening the canopy and increasing soil moisture could create additional habitat. But ground disturbance can potentially reduce this species' habitat by compromising the physical integrity of the soil, drying out habitat, altering	Opening the canopy and increasing soil moisture could create additional habitat. But ground disturbance can potentially reduce this species' habitat by compromising the physical integrity of the soil, drying out habitat, altering	Unknown

Sensitive Plant Species	Proposed Action	Alternative 1	Alternative 2	Alternative 3	No Action Alternative
		sediment yields, changing water chemistry, altering ground cover, and introducing exotic species.	sediment yields, changing water chemistry, altering ground cover, and introducing exotic species.	sediment yields, changing water chemistry, altering ground cover, and introducing exotic species.	
Eriophorum gracile	Light to moderate occasional soil disturbance from compaction or trampling would probably not affect potential habitat, but habitat can be easily damaged by heavy equipment or vehicles with narrow tires because this may result in hydrologic alteration and sedimentation. Exotic species invasion can also affect the availability of potential habitat.	Light to moderate occasional soil disturbance from compaction or trampling would probably not affect potential habitat, but habitat can be easily damaged by heavy equipment or vehicles with narrow tires because this may result in hydrologic alteration and sedimentation. Exotic species invasion can also affect the availability of potential habitat.	Light to moderate occasional soil disturbance from compaction or trampling would probably not affect potential habitat, but habitat can be easily damaged by heavy equipment or vehicles with narrow tires because this may result in hydrologic alteration and sedimentation. Exotic species invasion can also affect the availability of potential habitat.	Light to moderate occasional soil disturbance from compaction or trampling would probably not affect potential habitat, but habitat can be easily damaged by heavy equipment or vehicles with narrow tires because this may result in hydrologic alteration and sedimentation. Exotic species invasion can also affect the availability of potential habitat.	Unknown
Utricularia minor	Potential habitat can be affected by vegetation compaction or changes in vegetation density because of resulting changes in hydrology, sedimentation, and environmental conditions such as temperature and water chemistry.	Potential habitat can be affected by vegetation compaction or changes in vegetation density because of resulting changes in hydrology, sedimentation, and environmental conditions such as temperature and water chemistry.	Potential habitat can be affected by vegetation compaction or changes in vegetation density because of resulting changes in hydrology, sedimentation, and environmental conditions such as temperature and water chemistry.	Potential habitat can be affected by vegetation compaction or changes in vegetation density because of resulting changes in hydrology, sedimentation, and environmental conditions such as temperature and water chemistry.	Unknown
Populus	Cutting and soil	Cutting and soil	Cutting and soil	Cutting and soil	Unknown

Sensitive Plant Species	Proposed Action	Alternative 1	Alternative 2	Alternative 3	No Action Alternative
Tremuloides	disturbance would likely effect aspen stands only in the short-term within temporary use areas of the proposed project because aspen largely relies on some form of perturbation to stimulate vegetative regeneration. Aspen would be eliminated from areas within the ROW because the ROW would be maintained in a state free of woody vegetation.	disturbance would likely effect aspen stands only in the short-term within temporary use areas of the proposed project because aspen largely relies on some form of perturbation to stimulate vegetative regeneration. Aspen would be eliminated from areas within the ROW because the ROW would be maintained in a state free of woody vegetation.	disturbance would likely effect aspen stands only in the short-term within temporary use areas of the proposed project because aspen largely relies on some form of perturbation to stimulate vegetative regeneration. Aspen would be eliminated from areas within the ROW because the ROW would be maintained in a state free of woody vegetation.	disturbance would likely effect aspen stands only in the short-term within temporary use areas of the proposed project because aspen largely relies on some form of perturbation to stimulate vegetative regeneration. Aspen would be eliminated from areas within the ROW because the ROW would be maintained in a state free of woody vegetation.	

EFFECTS OF THE NO ACTION ALTERNATIVE

No adverse direct or indirect effects are expected to occur to any sensitive plant species from the No Action Alternative at this time. However, the assumption that existing environmental conditions would continue if the No Action Alternative is implemented may not be accurate. If the Bull Mountain Pipeline is not built, smaller pipelines transporting gas from nearby units may proliferate in the study area in order to meet the purpose and need of supplying significant amounts of natural gas to the national market. These pipelines may have effects on similar or different habitats and sensitive plant resources. The consequences of any direct, indirect, and cumulative effects are not known at this time due to populations possibly present on private lands. At a minimum, current ongoing land uses including recreation, rangeland management, timber harvest, habitat manipulation such as burning or other vegetation management, minerals exploration and development, and road management as well as other uses would occur. Therefore the determination for this alternative is Unknown Impact.

EFFECTS OF THE ACTION ALTERNATIVES

There would be no effects to threatened, endangered, or proposed plant species or their critical habitat because there are no threatened, endangered, or proposed plant species found within the area of the proposed project ROWs as determined by surveys.

Although no sensitive species are known to occur within the proposed or alternative disturbance areas either, this section analyzes the impacts to sensitive species which have potentially suitable habitat within the proposed or alternative project areas. If neither sensitive plant occurrences nor suitable habitat are known in either the proposed or alternative project areas, then there are no expected effects, and thus, no expected impacts.

Botrychium multifidum

Impacts to this species are expected to range from beneficial to not significant. Although there would be some disturbance of the proposed project area, this disturbance would be temporary in nature and the project design mitigations outlined in the Plan of Development (POD) should adequately conserve the ecosystem processes fundamental to the existence of suitable habitat (i.e., hydrologic regime, sedimentation, etc.). Disturbance would be short-term and could potentially expand suitable habitat for Botrychium multifidum by influencing plant community succession. Management activities within the ROW may adversely impact potentially suitable habitat in some areas, but are not likely to result in a loss of species viability, nor cause a trend toward listing. Species composition within the ROW is likely to change somewhat with the implementation of reclamation reseeding and the maintenance of the ROW, and the effects of this potential action are as yet unknown. However, mitigation measures in the POD are in place to prevent the spread of noxious weed species that could potentially reduce the quality of suitable habitat. Also, habitat suitability could generally improve within the ROW because an open overstory would be maintained throughout its length.

Carex diandra

Management activities within the ROW may adversely impact potentially suitable habitat in some areas, but are not likely to result in a loss of species viability, nor cause a trend toward listing. Impacts to this species are expected to range from beneficial to not significant. Although there would be some disturbance of the proposed ROW areas, this disturbance would be temporary in nature and the project design mitigations outlined in the Plan of Development (POD) should adequately conserve the ecosystem processes fundamental to the existence of suitable habitat (i.e., hydrologic regime, sedimentation, etc.). Disturbance would be short-term and could potentially expand suitable habitat by opening the overstory within the ROW. Species composition within the ROW is likely to change somewhat with the implementation of reclamation reseeding and the maintenance of the ROW, and the effects of this potential action are as yet unknown. However, mitigation measures in the POD are in place to prevent the spread of noxious weed species that could potentially reduce the quality of suitable habitat.

Eriophorum gracile

While impacts to this species may adversely affect some suitable habitat, they are not likely to result in a loss of species viability, nor cause a trend toward federal listing because any impacts that do occur are likely to be temporary in nature and would be mitigated by project implementation specifications outlined in the POD. Eriophorum gracile is also known to tolerate some measure of habitat disturbance. Because of this tolerance, and because disturbance to potentially suitable habitat would be minimized through the use of mitigation measures, it is not expected that the impacts of the proposed project would be significant in its affect on suitable habitat. Disturbed areas would be reclaimed following construction so that hydrologic and topographic features are restored to their original condition, vegetative cover would be restored during reclamation, and the ROW would be maintained so that noxious weed invasion following construction would be prevented.

Utricularia minor

Impacts to this species may adversely affect suitable habitat, but are not likely to result in a loss of species viability, nor cause a trend toward federal listing. Any impacts that do occur are likely to be temporary in nature and would be mitigated by project implementation specifications outlined in the POD. Habitat disturbance would be minimized through the use of mitigation measures and disturbed areas would be reclaimed following construction so that hydrologic and topographic features are restored to their original condition. Mitigation measures would include steps to ensure the maintenance of water quality and prevent the potentially adverse effects of runoff and sedimentation. After construction, vegetative cover would be restored during reclamation, and the ROW would be maintained so that noxious weed invasion would be prevented.

Populus tremuloides

Impacts to this species are expected to range from beneficial to not significant. Although there would be some disturbance within the proposed project area, this disturbance would be temporary in nature and the project design mitigations outlined in the Plan of Development (POD) should prevent alterations to habitat that could adversely affect this species. This is especially true in the proposed temporary use areas (TUA) of the project. Within the TUA, disturbance would be short-term and could potentially expand suitable habitat or increase the vigor of existing stands of quaking aspen by stimulating vegetative reproduction. Management activities within the ROW may adversely impact existing stands in some areas, but are not likely to result in a loss of species viability, nor cause a trend toward listing. Species composition within the ROW is likely to change somewhat with the implementation of reclamation reseeding and the maintenance of the ROW in a state free of woody vegetation, however, this potential loss would likely be offset by the enhancement of quaking aspen stands in other areas.

SUMMARY OF THE EFFECTS OF ACTION ALTERNATIVES

Table 64 below summarizes the determinations of the effects of the alternatives based on the rationale given above for species listed as sensitive species by the USDA-FS Regional Forester and species of special status designated by the BLM State Director. The determinations statements are defined below:

- “No impact'” -- where no effect is expected.
- “Beneficial impact'” -- where effects are expected to be beneficial, and no negative effects are expected to occur.
- “May adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing” (MII) -- where effects in the project area are not expected to be significant, and the species and its habitat would remain well distributed.
- “Likely to result in a loss of viability in the Planning Area, or in a trend toward federal listing” -- where effects are expected to be detrimental and substantial, and the species and its habitat would not be maintained in sufficient numbers or distribution through time.
- “Unknown Impact” -- assumptions may not be accurate, the consequences of potential actions and their impacts are not known at this time.

Table 64. Summary determination of effects: Sensitive Plants.

Scientific Name	Common Name	Status	No Action Alternative	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Botrychium multifidum	leathery grapefern	Sensitive	Unknown Impact	Beneficial Impact & MII	Beneficial Impact & MII	Beneficial Impact & MII	Beneficial Impact & MII
Carex diandra	lesser panicled sedge	Sensitive	Unknown Impact	No Impact	Beneficial Impact & MII	Beneficial Impact & MII	Beneficial Impact & MII
Eriophorum gracile	slender cottongrass	Sensitive	Unknown Impact	MII	MII	MII	MII
Utricularia minor	small badderpod	Sensitive	Unknown Impact	MII	MII	MII	MII
Populus Tremuloides	quaking aspen	Special Management	Unknown Impact	Beneficial& MII	Beneficial& MII	Beneficial& MII	Beneficial& MII

CUMULATIVE EFFECTS

The temporal scale (time limits for past activities) selected for this project is from twenty years ago to the present. The spatial scale to be considered for this project is within the 6th Code HUC watersheds that may be affected by the Proposed Action and all alternatives.

Several past, present and reasonably foreseeable future actions are common to all alternatives. These activities are and will be occurring on both public and private lands. These include recreational use (motorized and non-motorized), firewood cutting, road and trail maintenance, and livestock grazing. All of these activities on public lands have had some level of environmental analysis. All of these activities have the potential to contribute to the degradation of sensitive plant habitat by the spread of noxious weeds and the potential degradation of range condition. Although livestock grazing and noxious weed infestations have the most potential to affect sensitive plant habitat in riparian areas, these habitats are managed through the use of BMPs which should minimize impacts to riparian areas. Through analysis before a proposed action is implemented, through the compliance with BMPs (for riparian areas in particular), and through mitigation measures and project design features there should be no cumulative significant impacts to sensitive plant habitat due to the actions of this project.

Past, ongoing and foreseeable future activities may add to the alteration and decrease of sensitive plant habitat (FEIS Appendix P). These cumulative effects that add to the decrease in sensitive plant habitat should not add to the listing or change in status of the sensitive species that has habitat affected by this project.

Impacts of the Proposed Action and alternatives are not considered significant in this analysis and do not act in conjunction with other past, present, or future actions to create measurable effects. As discussed previously, the plan of development outlines design features and mitigation measures that reduce and/or eliminate potential contributions to cumulative effects by this Proposed Action and its alternatives. The effects of other actions by themselves or as a group also do not create measurable impacts on sensitive plant species or their potential habitat. Any existing or potential impacts are not thought to contribute to a loss of species viability nor contribute to a trend towards listing.

RESPONSIBILITY FOR A REVISED BIOLOGICAL EVALUATION

This Biological Evaluation was prepared based on presently available information. If the action is modified in a manner that causes effects not considered, or if new information becomes available that reveals that the action may impact endangered, threatened, proposed, or sensitive species that in a manner or to an extent not previously considered, a new or revised Biological Evaluation would be required.

3.5 RANGE AND NOXIOUS WEEDS

3.5.1 INTRODUCTION

The range resources section will discuss management direction, current conditions, and environmental consequences of the proposed alternatives on the range resource, which also includes the noxious weed discussion.

3.5.2 MANAGEMENT OBJECTIVES

Objectives of the range management program for the National Forests and BLM are to:

1. Manage range vegetation for
    - Protection of the basic soil and water resources,
    - Ecological diversity,
    - Improvement or maintaining environmental quality,
    - Multiple uses of the resource areas.
2. Obtain multiple use by integrating management of range vegetation with other resources
3. Provide for multiple uses on the land, including livestock forage, wildlife food and habitat, outdoor recreation, and other resource values dependent on range vegetation.
4. Provide opportunities for economic diversity and promote stability for communities that depend on range resources to contribute to their economic and social well-being.
5. Provide expertise on range ecology, botany, and management of grazing animals.

3.5.3 EXISTING/AFFECTED ENVIRONMENT

COMMUNITIES AND ECOSYSTEMS

The elevation along the Proposed Bull Mountain pipeline ROW ranges from approximately 7,200 feet at the compressor station on Henderson Creek at the south end of the line, to 9,900 feet on Spruce Mountain, to 6,600 feet near the compressor station on the north end of the line. Corresponding to the elevation gradient and local microsite factors, ten major vegetation types occur along the line: aspen, aspen/conifer, cottonwood, Douglas-fir/white fir, grass/forb, mountain shrubland, oak shrublands, pinion/juniper, spruce/fir, and willow. Plant community acres within the proposed 100-foot ROW are displayed in Table 65 by alternative and the Proposed Action. See Figure 6 Section 3.4 for Vegetation Map.

Table 65. Approximate acreage of each plant community affected by the Proposed Action and alternatives.

Plant Community	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Aspen	53	53	78	111
Aspen/Conifer	56	44	28	28
Cottonwood	18	19	3	1
Douglas-Fir/White Fir	0	0	0	0
Grass/Forb	24	22	73	54
Mountain Shrubland	125	140	127	166
Oak Shrublands	89	94	113	109
Pinion Juniper	11	7	14	15
Spruce/Fir	6	6	0	0
Willow	9	10	32	12
Unknown	•	•		

In addition to these seven major vegetation types, seventy-two wetlands were found within the 200-foot-wide survey area along the Proposed Action route. Two additional wetlands occur at the south end of the pipeline at the site of a staging area. Wetland types along the ROW include meadows, swales, seeps, willow complexes, and riparian areas along streams. Common plants include various species of sedge, rush, willow, and a variety of grass species. In total, approximately 4,011 linear feet of wetland habitat are crossed by the centerline of the ROW. Several wetlands occur within the 200-foot-wide survey corridor but are not crossed by the ROW. Detailed descriptions of each wetland site are contained in the Cirrus biological report.

RANGE

Each agency has described land management prescriptions in their individual Land and Resource Management Plans that outline the management direction for a given land use type. The Land and Resource Management Plan for each agency describe the current and desired management objectives for each prescription in detail.

The proposed Bull Mountain natural gas pipeline right-of-way passes through Bureau of Land Management property within the Glenwood Springs Resource Area. This resource area is managed under the Resource Management Plan for the area. The Resource Management Plan seeks to manage a variety of resources for the overall sustained health of the resource area. The plan defines management objectives for the lands that may be potentially affected by the proposed and alternative actions. These objectives are water quality, minerals management, livestock grazing, forestry, recreation opportunities, visual resource management, land tenure adjustment, off-road vehicle use, and fire management. BLM range allotments that may be affected by the proposed project and alternatives are the Dry Hollow-Reservoir Gulch allotment with 1165 head of cattle, the Pole Creek & Cottonwood with 115 head of cattle and the East Divide Common with 685 head of cattle. Additional management information for these allotments can be found in the Allotment Management Plans. Current management within the proposed or alternative management right of ways would change from the existing prescription to meet the objectives for Utility and Communication Facility Management.

The proposed pipeline and alternative routes would potentially affect GMUG National Forest lands currently operating under management prescription 5A for Non-forested Big Game Winter Range, 6B for Livestock Grazing, and 7A for Timber Management. Land managed under these prescriptions includes two range allotments. These allotments are the Muddy

S&G with 3140 sheep and 10 horses, and the Henderson-West Muddy with 663 head of cattle, 1000 sheep, and 2 horses (1665 animals). Additional current management information for these allotments is contained within the allotment management plans. Current management within the proposed or alternative management right of ways would change from the existing prescription to meet the objectives for Management Prescription 1D (Provide Transmission Corridors which blend with the Local Environment).

The proposed pipeline and alternatives would also cross management areas designated as 5.41 (deer and elk winter range), and 5.43 (elk habitat) on the White River National Forest. Lands that fall under these prescriptions include the West Divide range allotment. This allotment contains a total of 2214 head of cattle (1148 on the Divide Creek side and 1066 on the Alkali Creek side). Additional current allotment management direction is contained within the allotment management plans for the area. Current management within the proposed or alternative management right of ways would change from the existing prescription to meet the objectives for Management Prescription 8.32 (Designated Utility Corridors – Existing and Potential).

In addition to current land management prescriptions and allotment management plans, there are a number of existing and proposed range improvements that could potentially be affected by the proposed or alternative actions (See FEIS Appendix G, Figure 4 and Table 66 below). These improvements consist of physical structures used to optimize grazing capacity through the effective distribution of livestock on the landscape.

Table 66. Rangeland Resources Affected by the Proposed Action and Alternatives.

	GMUG NF	**Glenwood Springs & Grand Junction RMAs**	**White River NF**
No Action Alternative	None at this time.	None at this time.	None at this time.
Proposed Action	Livestock operations within the Muddy S&G allotment (3140 sheep and 10 horses) and the Henderson-West Muddy allotment (663 head of cattle, 1000 sheep, and 2 horses), fencing, and water developments.	Livestock operations (115 head of cattle) and fencing within the Pole Creek & Cottonwood allotments; livestock operations within the East Divide Common allotment (685 head of cattle).	West Divide range allotment (Divide Creek side) livestock operations (1148 head of cattle), fencing, and proposed ponds.
Alternative 1	Livestock operations within the Muddy S&G allotment (3140 sheep and 10 horses) and the Henderson-West Muddy allotment (663 head of cattle, 1000 sheep, and 2 horses), fencing, and water developments.	Alternative 1 would not affect existing management of BLM range allotments.	West Divide range allotment (Divide Creek side) livestock operations (1148 head of cattle), fencing, and proposed ponds.
Alternative 2	Livestock operations within the Henderson-West Muddy allotment (663 head of cattle, 1000 sheep, and 2 horses), fencing, proposed ponds, and water developments.	Livestock operations (1165 head of cattle) and fencing within the Dry Hollow-Reservoir Gulch allotment.	West Divide range allotment (Alkali Creek side) livestock operations (1066 head of cattle), fencing, and proposed ponds.

	GMUG NF	Glenwood Springs & Grand Junction RMAs	White River NF
Alternative 3	Livestock operations within the Henderson-West Muddy allotment (663 head of cattle, 1000 sheep, and 2 horses), fencing, proposed ponds, and water developments.	Livestock operations (1165 head of cattle) and fencing within the Dry Hollow-Reservoir Gulch allotment.	West Divide range allotment (Alkali Creek side) livestock operations (1066 head of cattle), fencing, and proposed ponds.

NOXIOUS WEEDS

The noxious weed survey was conducted September 29 – October 5 and October 20, 2004 (Cirrus, 2005). Five species on the Colorado State noxious weed list were found on the proposed Bull Mountain route: *Arctium minus* (burdock), *Carduus nutans* (musk thistle), *Cirsium arvense* (Canada thistle), *Cirsium vulgare* (bull thistle), *Cynoglossum officinale* (hound's tongue). Additionally, *Xanthium strumarium* (cocklebur) was also found. Weeds were not present on two sections of as noted in the Cirrus biological survey: Spruce Mountain between the "Knife Ridge" and Willow Creek, and on the rerouted segment to the BLM lands on the north end of the line.

With the exceptions noted above, *Carduus nutans* and *Cirsium arvense* are scattered along the route, occurring singly or in small patches. *Carduus nutans* is common along the proposed pipeline route. It is often associated with disturbed areas, including roads, trails, and fields, but also grows in shrub and oak communities, and in meadows. The distribution of *Cirsium arvense* is more limited, being typically restricted to meadows and along streams and channels. However, it does occur along the existing ROW in the aspen vegetation type. Cirsium vulgare is less common than *Carduus nutans* and tends to occur in meadows and along existing right-of-ways, often near streams, channels, or wetlands. *Cynoglossum officinale* has a wide distribution, primarily occurring on the north half of the proposed pipeline between Pole Creek and Willow Creek. It occurs in the shrub and oak communities, often along existing right-of-ways and in meadows. *Arctium minus* and *Xanthium strumarium* have a limited distribution and were only found on the north end of the Bull Mountain pipeline, the first in the fields near the north compressor station and the second at the West Divide Creek crossing in the flood plain.

In addition to the species noted above, there are other noxious weed occurrences previously known from the proposed project and alternative areas. FEIS Appendix G-Figure 3 shows locations of weed species from previously known noxious weed occurrences not noted in the Cirrus report. Noxious weed names and descriptions can be found in Table 67. The species listed in the table below and included on the map have been determined by county, state, or federal agencies to be noxious weeds, nuisance, or pest species.

Table 67. Noxious weed species found in the proposed pipeline route

Scientific Name	Description
Anthemis arvensis corn chamomile	A declared terrestrial noxious weed in Colorado.
Anthemis cotula stinking chamomile	A European native with worldwide distribution. This is a highly adaptable species and is found in many different growing conditions. Waste areas, cultivated pastures, and overgrazed areas commonly host this species.

Scientific Name	Description
Arctium minus burdock	Burdock is native to Europe, which is now established throughout much of North America. Seeds of burdock can become entangled in the hair of animals, allowing it to be easily distributed into new areas. Burdock commonly occurs along roadsides, ditches, in pastures and waste areas.
Asclepias speciosa showy milkweed	Common along roadsides, ditch banks, pastures, and cultivated fields. This plant is native to North America.
Carduus acanthoides spiny plumeless thistle	This native of Eurasia is usually found in pastures, stream valleys, fields, and roadsides. It is frequently found in Colorado as has the potential of becoming a widespread noxious weed.
Cardaria draba hoary cress	This plant can commonly be found on alkaline, disturbed soils and is highly competitive with other species once established.
Carduus nutans musk thistle	This was introduced from southern Europe and western Asia. Musk thistle is found in at least 40 states. Musk thistle has the ability to grow in a variety of intermountain habitats in North America, and occupies sites ranging from saline to very acidic. In Colorado it has been found up to elevations between 9,000 and 10,000 feet.
Calamagrostis nutkaensis pacific reedgrass	A perennial native grass found in California, Oregon, Washington, and Alaska.
Centaurea diffusa white knapweed	This species originated in the Mediterranean region and now represents a threat to pastures, rangelands, roadsides, and waste areas.
Centaurea maculosa spotted knapweed	Introduced from Eurasia, this plant is a major threat to western rangelands. These plants readily establish on disturbed soil and are highly competitive for soil moisture and nutrients.
Centaurea repens hardheads	Native to Eurasia, this plant is now widely established in the western United States. This species can form dense colonies in cultivated fields, pastures, along stream banks, and on roadsides.
Chrysanthemum leucanthemum oxeye daisy	This species is a native of Eurasia. It can be found in meadows, roadsides, and waste places.
Cirsium arvense Canada thistle	Canada thistle would grow on a variety of soils and does well in deep, aerated, and moist loam. Stream banks, meadows, and ditches commonly provide suitable habitat for Canada thistle, but it cannot survive in saturated soil. Canada thistle infests pastures, rangelands and utility corridors, and is a major pest on streamside grasslands.
Cinnamomum camphora camphortree	An introduced perennial tree generally found in the southeastern U.S., Hawaii, Puerto Rico, and the Virgin Islands.
Cirsium vulgare bull thistle	Native to Europe, western Asia, and North Africa, bull thistle has naturalized and is widespread throughout North America. Bull thistle is troublesome in recently or repeatedly disturbed areas and they are able to colonize relatively undisturbed rangelands or forestlands.
Convolvulus arvensis field bindweed	Introduced from Europe, this species has become widespread and a serious problem in all regions of the U.S. except the southeast. In the west, this plant is extensively established in cultivated fields and waste places. This species is remarkably adaptable and has been found at elevations as high as 10,000 feet.

Scientific Name	Description
Cynoglossum officinale hound's tongue	Hound's tongue is introduced from Europe. This plant is found in pastures, near roadsides, and in disturbed habitats. The fruit of hound's tongue easily clings to the hide of animals and is often transported this way.
Euphorbia esula leafy spurge	This species is native to Eurasia. It has become a serious problem in North America where it inhabits almost 2.5 million acres. It is highly adaptable to local growing conditions and can be found on sites ranging from flood plains, river banks, grasslands, ridges, and mountain slopes. Leafy spurge would frequently dominate bottomlands and would thrive in many soil types, especially after disturbance.
Lepidium lasiocarpum shaggyfruit pepperweed	An annual/biennial forb native to two southern and several western states including Colorado.
Limonium perezii Perez's sealavender	An introduced perennial that can take on the growth form of forb, subshrub, or shrub. This species is known in California.
Ligustrum vulgare European privet	An introduced perennial shrub found widely throughout the U.S.
Linaria vulgaris yellow toadflax	Native to Eurasia, this plant is an aggressive invader of rangelands. It is also found along roadsides, waste places, and cultivated fields.
Onopordum acanthium Scotch thistle	Native to Europe and eastern Asia, this species is now sparsely naturalized over much of North America. It can be commonly found in waste areas and roadsides.
Potentilla recta sulphur cinquefoil	Often found in disturbed areas such as roadsides and pastures. However, colonies of this plant are often found in undisturbed sites as well.
Salsola collina slender Russian thistle	An introduced annual herb found throughout much of the west and mid-west U.S.
Senecio jacobaea tansy ragwort	An introduced perennial native to Europe. Not known in all western states, but infests millions of acres of range and pasture in the U.S.
Tamarix ramosissima salt cedar	Introduced from Eurasia, this species is now widespread throughout the U.S. This species has become naturalized along streams, canals, and reservoirs in much of the west.
Tanacetum vulgare common tansy	Native to Europe, this plant has become established in the U.S. and is generally found along stream banks, roadsides, in pastures, and in waste areas.
Verbascum thapsus common mullein	Introduced from Europe, but native to Asia and common throughout temperate parts of North America. This species commonly inhabits river bottoms, pastures, meadows, fence rows, and waste areas especially on gravelly soils.
Xanthium strumarium cocklebur	Common cocklebur is an annual, native to North America, now worldwide in distribution with several species in the western U.S. This plant has the ability to fruit and set seed in a variety of conditions and soils, making it a threat in a wide range of habitats. Cocklebur is reported to be a weed in a variety of crops as well as in pastures and on rangeland. It occupies disturbed sites in fields, roadsides, streams, floodplains, and waste areas.

3.5.4 ENVIRONMENTAL CONSEQUENCES

NO ACTION ALTERNATIVE

The assumption that existing environmental and management conditions would continue if the No Action Alternative is implemented may not be accurate. If the Bull Mountain Pipeline is not built, smaller pipelines transporting gas from nearby units may proliferate in the study area in order to meet the purpose and need of supplying significant amounts of natural gas to the national market. These pipelines may have effects on similar or different resource concerns as the proposed and alternative actions. The consequences of those effects are not known at this time. At a minimum, current ongoing land uses including recreation, rangeland management, timber harvest, habitat manipulation such as burning or other vegetation management, minerals exploration and development, and road management as well as other uses would occur if the No Action Alternative is selected. All of these actions would lead to the increase of noxious weeds in the area. Continual monitoring and control of any new infestations would continue as per current land planning direction.

Cumulative Effects

Noxious weeds are spread through biological dispersal methods as well as by ongoing human activities such as hunting, grazing, firewood cutting, and other uses of the forest. Therefore noxious weeds, including current species and possible new introductions, could potentially continue to spread and increase the number of acres infested, under the No Action Alternative. This continued spread could take place regardless if future pipeline construction projects are initiated. However, there is no reason to believe that the No Action Alternative would result in any considerable increases in acres of noxious weeds in either the short or long-term.

PROPOSED ACTION AND ALL ACTION ALTERNATIVES

The potential effects of the proposed project and alternatives upon rangeland resources include, in the short term, reduced availability of forage and access to water by livestock, damage to fences and other developments, potential livestock injury as a result of construction activities, and the spread of noxious weeds. A beneficial long term effect would be increased forage for livestock. These effects, as they relate to each alternative, are discussed in Table 68.

<u>RANGE</u>

Reduced access to forage and water by livestock could occur during and after construction activities but this is expected to be short-term and temporary in nature. During construction, access to resources may be blocked by equipment and earthworks, foraging areas may be temporarily converted to bare ground or covered with soil, and improvements such as water developments may be temporarily dismantled or moved. After construction is completed, potential foraging and watering areas may be fenced off until reclamation is finished. Even if areas are not fenced off, forage production is likely to be temporarily reduced until reclamation is complete due to disturbance. Reduced access to resources, for whatever reason, could potentially result in reduced animal performance. A lack of forage and water could theoretically result in a failure to meet the dietary and energetic needs of livestock. Animals, being forced to travel farther for resources, could also expend enough energy so that their ability to gain weight is adversely affected. Finally, if forage in one area becomes unavailable and animals are forced to utilize different types of forage in other areas (i.e. a dietary shift from grass to woody vegetation), their performance may be reduced until they become conditioned to the new source.

To sustain management levels, existing improvements must be maintained and additional improvements may be needed to improve management systems. The loss of existing structures contributes to the irretrievable loss of grazing capacity; a result of the loss of management opportunities originally gained through the placement of structures. This is because ineffective distribution of livestock across the landscape could lead to uneven utilization of resources and adverse effects upon range condition and health. Poor range condition or health would likely lead toward reduced animal performance and necessitate a reduction in stocking rate. This could also lead to disruption in the grazing schedule by disrupting range pasture rotation schedules. Foraging areas along roads where road widening occurs will be permanently removed and result in similar effects listed above.

While foraging areas may be temporarily converted to bare ground or covered with soil, and improvements such as water developments may be temporarily dismantled or moved, the plan of development contains design criteria and mitigations that call for the reclamation of the construction areas with a reseeding mix and the replacement of fences and developments by the project proponent.

Physical injury to livestock, or death, could occur as a result of encounters with construction equipment or earthworks (i.e. falling into open trenches). Injury constitutes a financial loss to the producer either as a result of reduced animal performance, or veterinary expenses. Death constitutes a financial hardship due to the loss of the animal. During construction, reasonable levels of protection would be given to livestock in order to avoid physical injury or death. Safety procedures are described in detail in the POD. Because of the design criteria and mitigation measures of the Proposed Action and alternatives, there are not expected to be any likely significant impacts to range resources.

There are long term benefits associated with the construction of the pipeline under any of the alternatives. The removal of trees and shrubs along the line, and maintenance of those areas to keep trees and shrubs from growing there would lead to a net increase in production of herbaceous vegetation. This increase of available forage could cause additional weight gain as the livestock would not have to travel distances for palatable forage. Stocking rates however, would not change unless separate analysis of the area indicated an increase in range capacity. For a break down of the vegetation communities where this may occur see Affected Environment.

NOXIOUS WEEDS

Due to the presence of a number of weed species in the vicinity of the proposed and alternative pipeline locations, road upgrades and ROWs, there may be a number of adverse effects upon rangeland resources if these species are spread. Noxious weeds may potentially be spread throughout the proposed or alternative ROW areas by vehicles and equipment used during construction, and afterwards during reclamation and reseeding efforts. Humans may transport weeds from roadsides or elsewhere, and animals may carry noxious weed species as well, spreading them into areas affected by ongoing or post-construction activities. Weeds prefer highly disturbed sites and denuded ground is especially vulnerable to invasion.

Once introduced, weed species may take over a site rapidly, and alter the structure, organization, and function of ecological systems. The consequences of weed invasions can range widely, but they have the potential to alter the soil, and change the composition of plant and animal communities. Noxious weeds are known to deplete soil nutrients and soil moisture, and can increase soil erosion and runoff. Even the soil's microbial populations may be affected by changes in soil chemistry that are produced by some weeds.

Weeds may affect the abundance of native or other desirable plant species by affecting the soil in ways described previously, or they may out-compete them in other ways as well. Allelopathy, long-term seed viability, abundant seed production, and effective dispersal are also common traits of weed species. These qualities allow weeds to reduce plant community productivity, plant diversity, and species richness.

When plant communities are altered, wildlife and livestock use patterns, distribution, and abundance can be altered as well. Animals may simply avoid infested areas, seeking out more valuable and palatable forage elsewhere, or weeds may actually act as physical barriers to water or preferred foraging areas. Weeds may also directly harm animals either by physically injuring them (sometimes resulting in infection), or weeds may poison animals; killing or seriously debilitating them.

The proposed and alternative actions contain design features and mitigations that would limit and/or stop the spread of weeds. Measures, such as washing, exist to prevent human transport of weeds on vehicles. Weed free materials would also be used during construction and reclamation to stop weeds from spreading into areas affected by ongoing or post-construction activities. Because of the procedures described in the plan of development, there are not expected to be any dramatic increase in noxious weed infestations or increase in infestation size.

Table 68. Potential direct and indirect effects of the Proposed Action and alternatives on rangeland resources.

	GMUG NF and White River NF	Glenwood Springs RMA
Proposed Action & All Action Alternatives	**Short Term**: reduced availability of forage and access to water by livestock; damage to fences; damage to existing and proposed water developments; potential livestock injury as a result of construction activities; spread of noxious weeds **Long Term:** Increased forage for livestock grazing, increased accessibility to allotment/pasture through ROW	**Short Term**: reduced availability of forage and access to water by livestock; damage to fences; potential livestock injury as a result of construction activities; spread of noxious weeds **Long Term**: Increased forage for livestock grazing, increased accessibility to allotment/pasture through ROW
No Action Alternative	**Short Term & Long Term**: spread of noxious weeds, Other Unknown effects	**Short Term & Long Term**: spread of noxious weeds, Other Unknown effects

Cumulative Effects

A comprehensive map of potentially cumulative actions considered for this project is presented in FEIS Appendix P. The temporal scale (time limits for past activities) selected for this project is from twenty years ago to the present. The spatial scale to be considered for this project is within the 6th Code HUC watersheds that may be affected by the Proposed Action and all alternatives.

Several past, present and reasonably foreseeable future actions are common to all alternatives. These activities are and will be occurring on both public and private lands.

These include recreational use (motorized and non-motorized), firewood cutting, road and trail maintenance, and livestock grazing. All of these activities on public lands have had some level of environmental analysis. All of these activities have the potential to contribute to the spread of noxious weeds and to degrade range condition. But, through analysis before a proposed action is implemented, through the compliance with BMPs (for riparian areas in particular), and through mitigation measures and project design features there should be no cumulative significant impacts to the environment due to the actions of this project.

Past, ongoing and foreseeable future activities are not known to have, or potentially have any measurable effects on rangeland resources or noxious weeds. Impacts of the Proposed Action and alternatives were not considered measurable affects in this analysis, and do not act in conjunction with other past, present, or future actions to create significant cumulative effects. As discussed previously, the POD outlines design features and mitigation measures which would reduce and/or eliminate potential contributions to cumulative effects by this Proposed Action and its alternatives. The effects of other actions by themselves or as a group also do not create any significant cumulative impacts.

3.6 FISHERIES

3.6.1 INTRODUCTION

Table 69 lists aquatic TES and MIS species that may occur on the White River National Forest (WRNF), Grand Mesa, Uncompahgre, and Gunnison National Forests (GMUGNF), or Bureau of Land Management – Glenwood Springs Field Office (BLM-GSFO) administered land. Table 69 also includes the rationale for extent of consideration of each species in this section.

Table 69. Threatened, Endangered, Sensitive and MIS species that may occur on the White River National Forest, GMUG National Forest or the Bureau of Land Management.

Species	Status	Forest/BLM	Habitat	Considered	Rationale
Colorado pikeminnow (Ptychocheilus lucius)	E	WRNF/GMUGNF/ BLM-GSFO	Warm, swift waters of big rivers in the Colorado River Basin.	Yes	No suitable habitat within the analysis area but is located downstream
Humpback chub (Gila cypha)	E	WRNF/GMUGNF/ BLM-GSFO	Large river habitats in the upper Colorado River Basin and deep canyon areas of the lower basin.	Yes	No suitable habitat within the analysis area but is located downstream.
Razorback sucker (Xyrauchen texanus)	E	WRNF/GMUGNF/ BLM-GSFO	Medium to large rivers with swift turbulent waters and slow-moving backwater areas in the Colorado River Basin	Yes	No suitable habitat within the analysis area but is located downstream.
Bonytail (Gila elegans)	E	WRNF/GMUGNF/ BLM-GSFO	Medium to large rivers with swift turbulent waters and slow-moving backwater areas in the Colorado River Basin.	Yes	No suitable habitat within the analysis area but is located downstream.
Bluehead sucker (Catostomus discobolus)	S	WRNF/GMUGNF/ BLM-GSFO	Rocky riffles and runs of small to large rivers, foothill areas.	Yes	Population within West Divide Creek and downstream of the project area in Willow Creek
Flannelmouth sucker (Catostomus latipinnis)	S	WRNF/GMUGNF/ BLM-GSFO	Rocky pools, runs and riffles of medium to large rivers. Less often in creeks and	Yes	Surveys have documented this species downstream

Species	Status	Forest/BLM	Habitat	Considered	Rationale
			small rivers of Colorado River system.		of the project area in West Divide Creek
Roundtail chub (Gila robusta)	S	WRNF/GMUGNF/ BLM-GSFO	Rocky runs, sometimes pools, of creeks and small to large rivers, foothill areas.	Yes	Surveys have documented this species downstream of the project area in Divide Creek
Colorado River cutthroat trout (Oncorhynchus clarki pleuriticus)	S	WRNF/GMUGNF/ BLM-GSFO	Headwater streams and lakes, Colorado and Green river systems.	Yes	Core conservation population in Henderson Creek. Unconfirmed populations in Little Henderson Creek and North Fork Henderson Creek. Non-conservation population in West Divide Creek
Mountain sucker (Catostomus platyrhynchus)	S	WRNF/GMUGNF/ BLM-GSFO	Prefer clear, cold creeks and small to medium rivers with clear rubble, gravel or sand substrate.	No	Surveys have not located this species in the analysis area.
Common Trout (Rainbow trout, brook trout, brown trout, Colorado River cutthroat trout)	MIS	WRNF/GMUGNF	Potential habitat in most of the perennial streams on the White River National Forest and the GMUG National Forest	Yes	Populations of trout in West Divide Creek, West Muddy Creek, Little Muddy Creek, Henderson Creek, Little Henderson Creek, North Fork Henderson Creek and Gold Creek
Aquatic Macroinvertebrates	MIS	WRNF/ BLM-GSFO		Yes	Occur in all perennial streams in

Species	Status	Forest/BLM	Habitat	Considered	Rationale
					the project area and most ephemerals.

3.6.2 REGULATORY FRAMEWORK

The US Fish and Wildlife Service maintains a list of federally designated threatened, endangered, proposed, and candidate species that may occur within or be affected by actions occurring on the White River National Forest, Grand Mesa, Uncompahgre, and Gunnison (GMUG) National Forests and on the BLM Glenwood Springs Resourec Area. Similarly, the Forest Service and Bureau of Land Management designated a list of sensitive species of concern that may occur within the White River and GMUG National Forests or BLM administered lands, or could be affected by the Bull Mountain Pipeline project. The list of Threatened, Endangered, Proposed, Candidate, and USFS and BLM Sensitive Species considered in this analysis are located in Table 69.

The White River and GMUG Forest Plans specify the use of Management Indicator Species (MIS) to evaluate the effects of proposed management activities upon fish and wildlife habitat (GMUG FP Amendment 2005-01 and WR FP Amendment 2005-03). The basic concept of Management Indicator Species is the selection of certain species found in specific habitat types to represent the habitat needs of a larger group of species requiring similar habitats. Management Indicator Species (MIS) applicable to the Bull Mountain Natural Gas Pipeline Project include common trout and aquatic macroinvertebrates. The rationale is included in Table 69.

In 2005, the GMUG National Forest initiated consultation with Fish and Wildlife Service to programmatically cover small water depletions associated with minerals projects (e.g. exploration and extraction of leasable or locatable minerals, transportation or conveyance facilities associated with mineral extraction, etc.) and their potential effects on the four listed fish in the lower Colorado River. The BO was re-issued on April 27, 2007 (BO # ES/GJ-6-CO-99-F-033-CP062) and covers water depletions associated with forest management projects up to 100 acre-feet annually and no single project can exceed 50 acre-feet per year. The BO requires the applicant (proponent) to report any water depletions associated with their project to the GMUG NF by February 1 each year. In addition, when depletions occur in Upper Colorado River above the confluence with the Gunnison River (Buzzard Creek 5th level HUC on the GMUG NF), the applicant is also required to sign a recovery agreement and submit the agreement to the Fish and Wildlife Service.

APPLICABLE FOREST PLAN STANDARDS AND GUIDELINES FOR AQUATIC SPECIES

White River National Forest

Standards and Guidelines for Water and Riparian Resources

Standards

1. In each stream currently supporting a self-sustaining fish population, ensure that projects maintain sufficient habitat, including flow, for all life history stages of native and desired non-native species.

2. Apply Watershed Conservation Practices through Region 2 - Forest Handbook Direction.

Guidelines

1. When projects are implemented that can affect large woody debris, retain natural and beneficial volumes of this material for fish habitat, for stream energy dissipation, and as sources of organic matter for the stream ecosystem.

2. Keep vehicles and equipment out of streams, lakes, and wetlands except to cross at designated points, build crossings, do restoration work, or where protected by one foot of snow pack or frozen soil.

Colorado River Cutthroat Trout

Standards

1. For management activities that have the potential to impact occupied cutthroat trout habitat, tributaries of occupied cutthroat trout habitat, or identified reintroduction areas, maintain or enhance existing cutthroat trout habitat. At minimum and where necessary:

   - Reduce sediment from existing roads and trails.
   - Maintain pool depths.
   - Maintain riparian vegetation.
   - Retain large woody debris in streams.

2. When implementing management activities in 6th field Hydrologic Unit Codes (subwatersheds) containing cutthroat trout identified as recovery populations in the Colorado River Cutthroat Recovery Plan, maintain or reduce existing net density of roads (open or closed) to restore or prevent alteration of the hydrologic function of the sub-watershed. Temporary roads must be decommissioned upon project completion.

Guidelines

1. Restrict construction of new roads within 350 feet of occupied cutthroat streams or within 150 feet from the edge of the current or historic floodplain, whichever is greater, to maintain hydrologic function and limit road related stream sediment.

2. Reroute roads adjacent to cutthroat trout streams and their tributaries, when possible, to reduce direct impacts to cutthroat habitat, or to improve hydrologic function.

3. In sub-watersheds with occupied cutthroat trout habitat, methods for decommissioning roads should emphasize restoring hydrologic function.

Transportation Corridors – Water and Aquatic Resources

Guidelines

1. Avoid locating structures in floodplains.

2. Locate corridors and structures to minimize impacts to riparian areas and wetlands.

<u>GMUG National Forest</u>

Standards and Guidelines for Aquatic Habitat Management

- Maintain fisheries habitat at a level which reflects and improving trend (9059 GM).

- Work toward obtaining optimal values for pool riffle ratios, pool measure and pool structure, % bank cover, % bank stability, % bank vegetation stability and % stream bottom composition. Values should approach current habitat condition indices and priorities for more intensive management should be based on these values (9060 GM).

- Analyze aquatic habitat quantity and potential based on result of macroinvertebrate sampling as it relates to their tolerance levels to environmental stress or perturbations. (9061 GM).

- Manage stream habitat to improve habitat conditions. If alternatives to management activities which cause unfavorable conditions cannot be developed, then mitigation measures would be included in project proposals (9084 GM).

- Delineate and manage habitat far Colorado River cutthroat trout as part of the State's recovery plan for delisting the species (9076 GM).

<u>BLM – Gunnison Field Office</u>

Aquatic Habitat Management

Objectives

To increase fish production and recreational fishing use on streams having more than one-half mile of continuous flow across public land and on lakes surrounded by at least 40 acres of public land. (Only streams and lakes with existing or easily obtainable public access and either an existing or potential fishery would qualify for management.)

Aquatic and Riparian Habitat Stipulations

- Surface-disturbing activities will be restricted in or near riparian areas.
- Equipment will not be allowed to move up or down stream channels. Heavy equipment will cross streams only at designated or constructed crossings with culverts and bridges designed to allow upstream migration of fish.
- Roadways, landings, and other heavily-disturbed sites will be reclaimed by establishing a ground cover.

3.6.3 METHODOLOGY

A Biological Evaluation (BE) has been prepared to consider the potential effects of the proposed Bull Mountain Natural Gas Pipeline Project on Forest Service/BLM TES aquatic species and their habitat. This section and the TES aquatic species BE was prepared in accordance with direction in FSM 2670.3 and 2672.4. The complete TES aquatic species BE is in the project files.

Forest-wide aquatic MIS monitoring for the White River Forest Plan began in 2003. The Forest-wide MIS monitoring would be used to evaluate MIS trends associated with implementation of the Forest Plan. Monitoring sites are located across the Forest to evaluate the effects of implementing the Forest Plan across diverse physical and biological conditions with various management activities. Nine randomly selected sites were completed for trout and macroinvertebrate monitoring in 2003. Ten additional randomly selected sites were completed in 2004 and 2005 surveys. Additional sites would be sampled each year through 2007. To determine MIS trends, the Forest would resurvey the 2003 sites in 2008; resurvey the 2004 sites in 2009, etc.

3.6.4 EXISTING CONDITION

AQUATIC SPECIES - SPECIES ACCOUNTS

Bluehead Sucker (R2 Forest Sensitive Species; BLM Sensitive Species)

Distribution and Abundance

Historically, bluehead suckers occurred in streams and rivers in the Colorado River Basin as well as in the drainages of the upper Snake, Weber, and Bear rivers. Within the Colorado River Basin, bluehead suckers are found in the Colorado, Dolores, Duchesne, Escalante, Fremont, Green, Gunnison, Price, San Juan, San Rafael, White, and Yampa rivers and numerous smaller tributaries. The bluehead sucker also occurs in the Little Colorado River drainage of the Lower Colorado River Basin. Recent work suggests that bluehead sucker populations are declining throughout their historic range. Currently, they are found in only 45 percent of their historic range in the Upper Colorado River. The reasons for this decline are most likely due to the alteration of thermal and hydrologic regimes, degradation of habitat, and interactions with non-native species (Ptacek et al., 2005).

Habitat Associations

Although this species sometimes occupies areas of suitable habitat in larger, low elevation, mainstem streams, it is most commonly collected in small or mid-sized tributaries of the Upper Colorado River Basin. Most reaches of the Colorado River Basin receive heavy sediment loads, high annual peak flows, and low base flows (Ptacek et al., 2005). Divide Creek watershed in particular has an erodible geology with a high sediment load (Hirsch, C. Pers. Comm.). Little is known about the influence of these annual events, but healthy bluehead sucker populations have persisted in habitats with a wide range of annual flows, sediment transport and sediment deposition, providing that these physical events are associated with a natural flow regime. This species has been reported to typically be found in runs or riffles with rock or gravel substrate. Juveniles have been collected from shallow riffles, backwaters and eddies with silt or gravel substrate. Although the species generally inhabits streams with cool temperatures, bluehead suckers have been found inhabiting small creeks with water temperatures as high as 28 °C (Ptacek et al., 2005).

Bluehead suckers spawn in the spring and early summer. They are a long-lived species with maximum ages reported over 20 years in the Upper Colorado River Basin. Bluehead suckers are known to hybridize with the native flannelmouth sucker and mountain sucker, as well as the non-native white sucker (Ptacek et al 2005).

Forest-wide and Project Area Surveys

Past surveys indicate there is a population found within West Divide Creek and the lower stretch of Willow Creek. This species occurs both on Forest Service land within the project area and BLM land downstream of the project area.

Colorado River Cutthroat Trout (Region 2 Forest Sensitive Species; BLM Sensitive Species; MIS - White River and GMUG National Forests) and Common Trout (MIS - White River and GMUG National Forests)

A conservation population is a reproducing and recruiting population of native cutthroat trout that is managed to preserve the historical genome and/or unique genetic, ecological, and/or behavioral characteristics within specific populations and within geographic units. In general, a conservation population is at least 90% pure, but may be lower depending on circumstances. A core conservation population is a conservation population that is 99% pure, phenotypically true, and representative of the historic genome of the native cutthroat trout. A core population could be used as brood stock for reintroductions. A conservation population is 90% pure and may have had some cutthroat introductions in the past and reduced its purity.

Colorado River cutthroat trout (CRCT) life history strategies and habitat requirements are generally the same as other identified MIS trout species in the project area, and would therefore serve as a surrogate to measure habitat and viability trends for all common trout. Some exceptions may include land management practices that affect specific life history patterns of CRCT and not other MIS.

Distribution and Abundance

An assessment of the Range Wide Status of Colorado River Cutthroat Trout conducted in 2005 concluded CRCT historically occupied approximately 21,386 miles of streams with approximately 13,615 (64% of total) of those miles occurring in Colorado. Of the 3,022 currently occupied miles, 224 occur outside of historical habitats (Hirsch et al. 2006). Thirteen percent of the historically occupied habitats are currently occupied. Additionally, 224 miles (1%) of streams currently occupied occur outside historical habitat. These streams are typically above historical barriers in stream segments not believed to have been historically occupied but still within the historical range. There are 285 conservation populations of CRCT identified. These populations include 153 “core conservation populations” based on genetic testing (less than 1% introgressed) and information indicating no record of non-native stocking and no contaminating species being present. There are 132 additional conservation populations that have other attributes viewed as important to CRCT conservation. In total, conservation populations occupy 1,796 miles (8.4% of historical habitat) of habitat (Hirsch et al 2006).

Common trout occur in most of the perennial water bodies on the White River and GMUG National Forests, including streams, rivers, lakes, and reservoirs. Trout may be excluded from some areas due to chemical contamination below mines or by natural or human-caused barriers. At high elevations, trout may be absent due to water temperature.

Habitat Associations

CRCT requires cool, clear water and well-vegetated streambanks for cover and bank stability. Instream cover in the form of deep pools, boulders and logs is also important. They are adapted to relatively cold water and thrive at high elevations (Young 1995). Most remaining populations are fluvial or resident (Young 1995). Adfluvial populations largely have been eliminated, though reestablished lacustrine stocks have been reported in Wyoming and in Rocky Mountain National Park in Colorado (Young 1995).

CRCT spawn in late spring when temperature reaches about 45 °F. Spawning begins after flows have peaked in spring or early summer and ends before runoff subsides. Emergence of fry tends to occur in mid- to late summer. Most CRCT spawning on the WR and GMUG Forest appears to occur in June and July since these fish are primarily located near headwater areas, which maintain much colder water temperatures later into the season. Eggs are laid in clean gravel beds in cool flowing water although sometimes spawning may occur in intermittent streams. Spawners may quickly return to mainstem streams after spawning or may remain in tributaries until at least mid-summer. Fry may migrate to a lake or mainstem river in late summer and some fry may winter in tributaries (Young 1995).

Forest-wide and Project Area Surveys – White River National Forest

On the White River National Forest, surveys indicate there are hybridized Colorado River cutthroat trout and common trout in West Divide Creek. On the White River National Forest, streams in the project area flow into West Divide Creek and then the Colorado River.

Forest-wide and Project Area Surveys – GMUG National Forest

Colorado River cutthroat trout occur in 32 streams on the GMUG NF. Of these 32 populations, 22 are considered core conservation populations (GMUG MIS Colorado River cutthroat trout sssessment, 2005). Within the analysis area a core conservation population of Colorado River cutthroat trout is present in Henderson Creek. CRCT are also suspected in Little Henderson Creek and North Fork Henderson Creek although populations have not been confirmed.

Brook, brown and rainbow trout are present in Muddy Creek, while Gold Creek contains rainbow and brook trout and Little Muddy Creek is suspected to contain brown trout. Streams within the project area on the GMUG National Forest flow into the North Fork Gunnison River followed by the Gunnison River. A review of forest-wide fish sampling on the GMUG NF indicates that common trout are widely distributed throughout the forest. Statistics from the GMUG NF LRMP suggests that there are approximately 1,200 miles of stream on the forest that contain viable fish populations of brook, rainbow, brown, and cutthroat trout. A total of 80 sites have been sampled on the GMUG NF since 2001, revealing that trout density ranges between 12 and 2,794 fish per mile, with a mean density of 589.8 fish per mile.

Project Area Surveys – BLM

No fish species are known to occur within the BLM portion of the project area. However, it is likely that Colorado River cutthroat trout occur downstream of the project area on BLM administered lands within the Divide/West Divide watershed.

Flannelmouth Sucker

Distribution and Abundance

Flannelmouth sucker is found throughout the Colorado River Basin, from southwestern Wyoming to southern Arizona and Sonora. It is more widespread in the upper basin than in the lower basin of California, Arizona, and Nevada (Sublette et al. 1990). There are possibly 84 to over 100 occurrences although it is declining or extirpated in many areas. Flannelmouth sucker are highly threatened by ongoing activities including alteration of the hydrologic and thermal characteristics of river habitats, blockage of migration routes due to dam construction, predation by and competition with non-native aquatic species, and hybridization with other species.

It was the most abundant species collected (electrofishing) in the Little Colorado River from 1989-1992. During 1991-1995 in the Little Colorado River, the population size was calculated at 1591-5214 (average 2507), plus an additional 8-136 (average 30) hybrids with *X. Texanus* (Douglas and Marsh 1998). This species is one of the few native species that persist in the lower Colorado River basin, but it has been extirpated from the Gila River Basin and the Colorado River below Lake Mead, Arizona.

Habitat Associations

Flannelmouth sucker spawns in spring and early summer. In Colorado, ripe females have been collected in May-early June. It was mobile with random movements in the White River, Colorado, prior to closure of Taylor Draw Dam. Following closure of the dam, fishes were more active and their movements were directed (Chart and Bergersen 1992).

Habitat includes moderate to large rivers. Seldom found in small creeks and are absent from impoundments. Flannelmouth sucker are typically found in pools and deeper runs and often in mouths of small tributaries (Lee et al., 1980). Also utilizes riffles and backwaters (Sublette et al., 1990). Young are usually in found in shallower water than are adults. It spawns in riffles, usually over a substrate of coarse gravel. Flannelmouth suckers are bottom feeders, feeding on diatoms, algae, fragments of higher plants, seeds, and benthic invertebrates (Lee et al., 1980).

Forest-wide and Project Area Surveys

Surveys have documented this species downstream of the project area in West Divide Creek.

Roundtail Chub

Distribution and Abundance

In the lower Colorado River Basin, the historic range of roundtail chub included most major river drainages with the exception of the Virgin, Moapa, and pluvial White River basins, which supported other species of Gila. Roundtail chub were historically found in the mainstems and many perennial tributaries of the Colorado, Little Colorado, Bill Williams, Gila, Verde, Salt, San Francisco, San Pedro and Zuni Rivers, along with limited portions of the Agua Fria, Hassayampa, and San Simon River basins.

Roundtail chubs are currently known from larger tributaries of the Colorado Basin from Wyoming south to Arizona and New Mexico, as well as the Rio Yaqui south to Rio Piaxtla, northwestern Mexico (Sublette et al., 1990). The Zuni and San Francisco Rivers, New

Mexico represent waterways where roundtail chubs have been extirpated (Sublette et al., 1990).

Habitat Associations

Roundtail chub occupy rocky runs, rapids, and pools of creeks and small to large rivers; also large reservoirs in the upper Colorado River system. They generally prefer cobble-rubble, sand-cobble, or sand-gravel substrate. Specific habitat associations probably vary seasonally, geographically, and ontogenetically.

Adults are associated with the largest, most permanent water in streams (Minckley 1981). They inhabit pools and eddies, below or adjacent to rapids and boulders, in cool to warm water mid-elevation streams and rivers. They are usually found near cover such as rocks, root wads, undercuts, or deep water (Bestgen and Propst 1989). Large populations often occur in pools behind irrigation diversions (Barber and Minckley 1966). Bestgen and Propst (1989) observed feeding activity in moderate velocity pools and runs or at pool surfaces, but the chubs retreated to deeper water when disturbed.

Roundtail chub breed in spring and early summer as spring runoff is subsiding, often in association with submerged cover such as fallen trees and brush. Fertilized eggs are randomly scattered over gravel substrate with no prenatal care. Roundtail chub are primarily carnivorous and opportunistic; eats available aquatic and terrestrial insects, gastropods, crustaceans, fishes, and sometimes filamentous algae (Sublette et al., 1990)

Forest-wide and Project Area Surveys

Surveys have documented this species downstream of the project area in Divide Creek

Aquatic Macroinvertebrates (MIS White River National Forest and BLM)

Aquatic macroinvertebrates are those invertebrates that spend at least part of their life cycle in water. These include worms, mollusks, mites, and insects. Insects are by far the most common. Most insect species spend just the immature phase (larval or nymph phase) in water. Although sensitive species occur in most insect orders, three families are comprised primarily of species that are more sensitive to disturbance. These are Ephemeroptera (mayflies), Plecoptera (stoneflies), and Tricoptera (caddisflies). In this document, “EPT taxa richness” refers to the number of taxa in these 3 sensitive orders, while “taxa richness” refers to the number of taxa of all aquatic macroinvertebrates.

Distribution and Abundance

Macroinvertebrate communities occur in all water bodies on the White River National Forest, including ponds, lakes, reservoirs, wetlands, rivers, perennial streams, and intermittent streams. Even degraded systems usually contain aquatic macroinvertebrates; however these communities are composed of very different assemblages of species than those in pristine systems. On the White River National Forest, macroinvertebrate communities were selected to address trend and condition of flowing waters only and, therefore, macroinvertebrate communities in still water habitats would not be discussed further in this document. Because of their wide distribution and their sensitivity to disturbance and pollutants, macroinvertebrates are widely used to monitor the health of streams and rivers.

Habitat Associations

Macroinvertebrate communities are influenced by the timing of flow and water quality in the streams in which they live. Geology, elevation, temperature, gradient, and substrate distribution are other factors that commonly influence macroinvertebrate communities. As habitats are degraded, either by chemical pollutants, increased sediment, or unfavorable changes in flow (especially severe reductions), the response of the macroinvertebrate community is typically a reduction in the number of species which occur there and especially the number of sensitive species.

Forest-wide Trend Surveys – White River National Forest

Initial macroinvertebrate sampling to assess Forest-wide trends has been completed on several streams on the White River NF, none of which are located within the project area. As described in the introduction, trend data for macroinvertebrate communities is not available until at least 2008 when initial stream surveys have been repeated.

Within the project area, macroinvertebrates occur in all perennial streams, and to some degree in ephemeral stream channels. Habitat in all project area streams is degraded to some extent. According to the project hydrologist, there are some areas of impact to water quality, stream stability, and wetlands that are occurring. These are mainly due to impacts from transportation facilities and grazing.

3.6.5 ENVIRONMENTAL CONSEQUENCES

This section describes the environmental effects on aquatic TES and MIS species of implementation of the alternatives. Table 70 summarizes miles of pipeline routes adjacent to streams and the number of perennial and intermittent stream crossings by alternative.

Table 70. Comparison of Alternatives

	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Miles of Pipeline	25.5	25.9	39.1	32.4
Miles of Nearstream Pipeline*	5.9	5.5	6.2	4.0
Perennial Stream Crossings	West Divide Creek (2), Mosquito Creek, Baldy Creek, Henderson Creek, Little Muddy Creek Total: 6	West Divide Creek, Mosquito Creek, Baldy Creek, Henderson Creek, Little Muddy Creek, Salt Gulch Total: 6	Road Gulch (2), Little Henderson Creek, N. Fork Little Henderson Creek, West Muddy Creek, Gold Creek and Owens Creek Total: 9	N. Fork Little Henderson Creek, West Muddy Creek, Gold Creek and Owens Creek Total: 5
Intermittent Stream Crossings	97	70	97	61
*The nearstream buffer is the area 100’ on either side of perennial streams and 50’ on either side of intermittent streams within the project area. Miles of nearstream pipeline is the number of miles that intersect these buffers.				

MITIGATION AND MONITORING

Mitigation and monitoring for aquatic species is described in the POD Appendix 12 and in the list of Design Criteria in FEIS Table 6.

EFFECTS ON AQUATIC SPECIES: COLORADO PIKEMINNOW, BONYTAIL CHUB, HUMPBACK CHUB AND RAZORBACK SUCKER (ENDANGERED)

Habitat for the Colorado pikeminnow, bonytail chub, humpback chub, and razorback sucker does not occur at the proposed crossings of any streams within the project area. However, habitat is present for these species more than 30 miles downstream of the proposed crossings. Consequently, project effects to these fish species would be limited to potential water depletions as a result of hydrostatic testing and dust suppression. Water sources for hydrostatic testing or dust suppression will be restricted to the Gunnison River drainage, which has been previously consulted on and is covered under a programmatic biological opinion (ES/GJ-6-CO-99-F-033-CP062) dated April 27, 2005.

The project is estimated to deplete 5 acre-feet per year for dust suppression activities related to road upgrades and use, pipeline/trench construction, and hydrostatic testing of pipeline. This amount is well within the maximum annual depletion of 50 acre-feet per project allowed under the BO. Depletions will be reported to Fish and Wildlife Service annually as required by the BO.

BLUEHEAD SUCKER (SENSITIVE)

No Action Alternative

The No Action Alternative would have no effect on bluehead sucker. No activities would take place, therefore, habitat and population trends would continue at their existing level.

Proposed Action

Since the project proposes to cross West Divide Creek, where bluehead sucker reside and spawn, direct impacts may occur to individuals killed or eggs smothered during project construction. To reduce the risk of direct mortality to individuals, in-stream work would take place during low-flow periods. To reduce the risk of smothering eggs, in-stream work would not occur during spawning from April through the end of August (FEIS Table 6-Fish). To further reduce risks to bluehead sucker, the proponent would complete all crossings on perennial streams using the flume method (FEIS Table 6-Watershed). This method would facilitate continuous flow within the water body and reduce the duration of increased turbidity to two short duration events (i.e., installation and removal of the flume pipes) rather than the entire time the crossing is being constructed.

Indirect effects to bluehead sucker would occur if any of their habitat parameters were affected by the project. Those parameters most likely affected by trenching through the channel and removing riparian vegetation would be large woody debris (LWD), water quality (sediment), temperature/shade and chemical contamination.

Sediment

Sediment entering stream channels can affect channel shape and form, stream substrates, the structure of fish habitats, and the structure and abundance of fish populations (Chamberlin et al. 1991). Increased sediment loads also can affect fish populations by suffocating eggs and newly hatched larvae living in gravels and by abrading sensitive gill membranes of both young and adult fish.

There is a risk of sediment from all areas where the pipeline is proposed to be installed near a stream. Table 70 shows the total miles of pipeline that fall within a stream buffer by alternative. The Proposed Action would enter into 5.92 miles of stream buffer. The Proposed Action would also cross 6 perennial streams and 97 intermittent streams. In general, construction activities across water bodies would increase the sedimentation and turbidity of the water, the potential for streambank erosion, and the potential for fuel and chemical spills. These effects have the potential to impact aquatic resources. The potential impacts on aquatic resources in most water bodies crossed by the project would be limited because the water bodies are expected to have little or no flow at the time of construction. Because the effects of increased sedimentation and turbidity are generally limited only to the period of in-stream work, the duration of these effects would be relatively short. The proponent would minimize impacts on surface waters by implementing the water body construction and restoration procedures contained in the POD Appendix 12.

The clearing and grading of vegetation during construction could increase erosion along streambanks and turbidity levels in the water bodies. Alteration of the natural drainage ways or compaction of soils by heavy equipment during construction may accelerate erosion of the banks, runoff, and the transportation of sediment into water bodies. The degree of impact on aquatic organisms due to erosion would depend on sediment loads, stream velocity, turbulence, streambank composition, and sediment particle size. To minimize these impacts, the proponent would use equipment bridges, mats, and pads to support equipment that must cross the water body or work in saturated soils adjacent to the water body.

As discussed above, the Divide Creek watershed has an erodible geology with high sediment loads, high annual peak flows, and low base flows. Little is known about the influence of these annual events, but healthy bluehead sucker populations have persisted in habitats with a wide range of annual flows, sediment transport and sediment deposition.

Stream Shade/Temperature and Large Woody Debris

Tree removal within riparian areas that result in reduction of forest canopy can reduce shade and affect stream temperature, cover, primary production and habitat (Belt et al. 1992). Summer stream temperature increases due to the removal of riparian vegetation has been well documented (Belt et al. 1992). Measurements by Hewlett and Fortson (1983) under winter conditions also indicate that removal of riparian vegetation can reduce temperatures by about 10°C.

Large wood is important to the aquatic environment because it routes and stores sediment, provides habitat complexity, and acts as a substrate for biological activity. The potential to reduce recruitment would occur where trees are removed from the area having the highest potential for delivery to the system. Both McDade et al. 1990 and Van Sickle and Gregory 1990, reported that more than 90% of instream wood identified as coming from adjacent riparian sources came from within approximately one site potential tree height for mature stands. Site potential tree height for wet-sites is approximately 150 feet.

Localized changes in water temperature and light penetration caused by the removal of boulders, woody debris, streambank vegetation, and undercut banks could temporarily displace fish that utilize these features for cover, nesting, and feeding. However, these impacts would be temporary as the streambank recovers over time and relatively minor due to the limited amount of total stream bank area affected per water body.

Chemical Contamination

For any large construction project, there is the potential for spills of fuel or other hazardous liquids from storage containers, equipment working in or near streams, and fuel transfers. Any spill of fuel or other hazardous liquid that reaches a water body would be detrimental to water quality. The chemicals released during spills could have acute, direct effects on fish, or could have indirect effects such as altered behavior, changes in physiological processes, or changes in food sources. Fish could also be killed if a large volume of hazardous liquid is spilled into a water body. Ingestion of large numbers of contaminated fish could affect primary and secondary fish predators in the food chain.

To minimize the potential for spills, a Hazmat and Spill Management Plan is incorporated into the POD Appendix 7 in the event that a spill does occur. This analysis assumes that every possible measure would be taken to avoid spills and that the Hazmat and Spill Management Plan would be closely followed in the event of a spill. The proponent's implementation of this Hazmat and Spill Management Plan would minimize the potential for and the impact of any spill near surface water.

Cumulative Effects

The cumulative effects area for aquatic resources for the Bull Mountain Pipeline Project includes the four 5th Code Hydrologic Unit Subwatersheds in which the project lies, including; Divide Creek, East Muddy Creek, West Muddy Creek and Buzzard Creek. The full list of past, present, and foreseeable future projects is mapped and located in FEIS Appendix P. The hydrology analysis for this project calculated cumulative impacts to project area subwatersheds by alternative. The lack of spatial context in relation to stream channels and wetlands only allows for a relative analysis of the increase in disturbance within the cumulative effects area. This process assumes impacts to watershed resources through the use of an index of disturbance values to weight activities based on their potential for negative watershed impacts. Further, recovery of the landscape from past activities is estimated through the use of a recovery curve that estimates watershed recovery over a 30-year period. The index values are summed for the current condition (past and present activities included) and again for the current condition plus foreseeable future projects. This gives base watershed numbers from which the Bull Pipeline Project Alternatives can be compared (See Hydrology Analysis). The calculation for each action alternative is shown in Table 71.

Table 71. Index of Watershed Disturbance for Current Condition, Current Condition and Foreseeable Future projects, and Bull Mountain Pipeline Alternatives (taken from project Hydrology Analysis).

Current Condition Watershed Index Value	Current Condition + Foreseeable Future Projects Index Value	Proposed Action Index Value	Alternative 1 Index Value	Alternative 2 Index Value	Alternative 3 Index Value
41.1	49.2	52.1	52.1	52.6	52.6

Percent Increase in Index Value over Current Condition	20%	27%	27%	28%	28%

There is a notable increase in Index Value when the Foreseeable Future Projects or the Bull Mountain Project Alternatives are accounted for. This is due to the increase in well site and pipeline construction activities. However, at this scale, there is very little difference between the Bull Mountain Alternatives when considered in context with all the other past, current, and future projects. There would be an increase in watershed disturbance with any Bull Mountain Alternative, but the implementation of the POD measures should keep those impacts to relatively short time frames (3-5 years for 80 % recovery of all disturbed riparian and wetland vegetation) (Hydrology Analysis).

Alternative 1

Direct and Indirect Effects

Alternative 1 crosses West Divide Creek where bluehead sucker reside and spawn. Since this is the only crossing proposed in bluehead sucker habitat and there is little difference between nearstream disturbance of Alternative 1 and the Proposed Action, effects from Alternative 1 would be similar to those of the Proposed Action on bluehead sucker.

Cumulative Effects

The cumulative effects area would be the same as the Proposed Action (Table 82). As in the proposed action, implementation of the POD measures should keep those impacts to relatively short time frames (3-5 years for 80 % recovery of all disturbed riparian and wetland vegetation) (Hydrology Analysis).

Alternatives 2 and 3

Direct and Indirect Effects

Alternatives 2 and 3 do not propose crossing West Divide Creek nor do they disturb any of its buffers. Since West Divide Creek is the only creek within the project area that contains bluehead sucker, no direct or indirect effects would occur from these alternatives.

Cumulative Effects

The overall watershed index values will be higher in alternative 2 and 3 than the propsed action. However, increases in watershed disturbance do not occur in the West Divide Creek watershed and therefore no additional cumulative effects are expected.

COLORADO RIVER CUTTHROAT TROUT (SENSITIVE AND MIS) AND COMMON TROUT (MIS)

No Action Alternative

The No Action Alternative would have no effect on Colorado River cutthroat trout or other common trout species. No activities would take place, therefore, habitat and population trends would continue at their existing level.

Proposed Action

Direct and Indirect Effects

Since the project proposes to cross Henderson Creek where a core conservation population of Colorado River cutthroat trout (CRCT) resides and spawns and West Divide Creek where a non-conservation population of CRCT resides and spawns, as well as Little Muddy Creek where common trout reside and spawn direct impacts may occur to individuals killed or eggs smothered during project construction. To reduce the risk of direct mortality to individuals, in-stream work would take place during low-flow periods. To reduce the risk of smothering eggs, in-stream work would not occur during spawning from May through the end of August. To further reduce risks to trout, the proponent proposes to complete all crossings on perennial streams using the flume method (See POD Appendix 12). This method would facilitate continuous flow within the water body and reduce the duration of increased turbidity to two short duration events (i.e., installation and removal of the flume pipes) rather than the entire time the crossing is being constructed.

The other potential direct effect is the loss of passage for aquatic organisms. All crossings will be constructed to maintain passage for aquatic organisms and to maintain a properly functioning floodplain.

Indirect and Cumulative Effects

Although habitat parameters for Colorado River cutthroat trout are not the same as bluehead sucker, effects to aquatic habitat would have similar consequences. The discussion on indirect and cumulative effects of the Proposed Action on bluehead sucker would also apply to Colorado River cutthroat trout. Refer to that discussion.

Alternative 1

Direct Effects

Alternative 1 proposes to cross the same streams as the Proposed Action, therefore direct effects to Colorado River cutthroat trout and common trout from Alternative 1 would be analogous to those of the Proposed Action.

Indirect Effects and Cumulative Effects

Indirect effects and cumulative effects of Alternative 1 on Colorado River cutthroat trout would be analogous to those of the Proposed Action on bluehead sucker.

Alternative 2

Direct Effects

Alternative 2 proposes to cross Little Henderson Creek and N. Fork Little Henderson where core conservation populations of Colorado River cutthroat trout are thought to reside and spawn, as well as Little Muddy Creek and West Muddy Creek where populations of common trout reside and spawn, direct impacts may occur to individuals killed or eggs smothered during project construction. Since additional stream crossings are proposed under alternative 2, there will be an increase potential to effect cutthroat and common trout as compared to the proposed action.

To reduce the risk of direct mortality to individuals, in-stream work would take place during low-flow periods. To reduce the risk of smothering eggs, in-stream work would not occur during spawning from May through the end of August. To further reduce risks to trout, the proponent would complete all crossings on perennial streams using the flume method (See POD Appendix 12). This method would facilitate continuous flow within the water body and reduce the duration of increased turbidity to two short duration events (i.e., installation and removal of the flume pipes) rather than the entire time the crossing is being constructed.

Indirect and Cumulative Effects
Indirect and cumulative effects of Alternative 2 on Colorado River cutthroat trout would be analogous to those of the Proposed Action on bluehead sucker.

Alternative 3

Direct Effects
Alternative 3 proposes to cross N. Fork Little Henderson which supports a core conservation population of Colorado River cutthroat trout and Little Muddy Creek and West Muddy Creek support populations of common trout. Potential effects include direct impacts from individuals killed or eggs smothered during project construction and the loss of passage for aquatic organisms. To reduce the risk of direct mortality to individuals, in-stream work would take place during low-flow periods. To reduce the risk of smothering eggs, in-stream work would not occur during spawning from May through the end of August. To further reduce risks to trout, the proponent would to complete all crossings on perennial streams using the flume method (POD Appendix 12). This method would facilitate continuous flow within the water body and reduce the duration of increased turbidity to two short duration events (i.e., installation and removal of the flume pipes) rather than the entire time the crossing is being constructed.

Indirect and Cumulative Effects
Indirect and cumulative effects of Alternative 3 on Colorado River cutthroat trout would be analogous to those of the Proposed Action on bluehead sucker.

FLANNELMOUTH SUCKER AND ROUNDTAIL CHUB (SENSITIVE*)*

No Action Alternative

The No Action Alternative would have no effect on flannelmouth sucker or roundtail chub. No activities would take place, therefore, habitat and population trends would continue at their existing level.

Proposed Action, Alternatives 1, 2 and 3

Direct Effects
Flannelmouth sucker and roundtail chub do not occur within the project area, therefore there would be no direct effects for any of the action alternatives.

Indirect and Cumulative Effects
Although flannelmouth sucker and roundtail chub do not occur within the project area, alterations to habitat within the project could result in indirect downstream effects. Indirect and cumulative effects of all action alternatives would be expected to be analogous to those for bluehead sucker. Refer to that discussion.

AQUATIC MACROINVERTEBRATES (MIS)

No Action Alternative

The No Action Alternative would have no effect on macroinvertebrate communities. No activities would take place, therefore, habitat and population trends would continue at their existing level.

Proposed Action, Alternatives 1, 2 and 3

Direct Effects and Indirect Effects

Since macroinvertebrate communities are likely present in all perennial stream channels and all alternatives cross perennial stream channels, effects to macroinvertebrates for the Proposed Action and each of the three alternatives would be discussed together.

Aquatic macroinvertebrate diversity would likely decrease under all alternatives due to introduction of sediment at stream crossings. With changes to stream channels resulting from the crossings, sensitive macroinvertebrate species would decrease, while sediment tolerant burrowing mayflies fly larvae, and other taxa would proportionately increase. Alternative 2 crosses the most perennial streams as well as offers the most nearstream disturbance, followed by the Proposed Action. Alternative 3 crosses the fewest streams and has the least nearstream disturbance (See Table 77).

While trenching across stream channels may result in alteration of in-channel habitat or altered flow regimes, those included in the each of the action alternatives would have negligible effects since they would be constructed during low-flow in macroinvertebrate habitat in perennial streams.

Cumulative Effects

Effects would likely not be measurable beyond the 5th code HUC watersheds, due to other sediment sources in the watershed (e.g. roads, grazing) as discussed in the cumulative effects section for bluehead sucker.

DETERMINATION OF EFFECTS

This section summarizes the effects and the determination of effects statements for each species. Table 72 lists the determination statements for each species.

Table 72. Determinations

Species	Determination
Bluehead Sucker	MII
Colorado River Cutthroat Trout	MII
Flannelmouth Sucker	MII
Roundtail Chub	MII
Colorado Pikeminnow	MA-LAA*
Humpback Chub	MA-LAA*
Razorback Sucker	MA-LAA*
Bonytail	MA-LAA*
MII = may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing. MA-LAA – May Affect – Not Likely to Adversely Affect * Listed species were previously consulted on under a water depletions BO (ES/GJ-6-CO-99-F-033-CP062) dated April 27, 2007. The determination under that consultation was MA-LAA. Additional actions from this project will have No Effect. Depletions for this project will be tracked by the GMUG National Forest.	

Bluehead sucker

The activities associated with this project are expected to affect bluehead sucker habitat as described in the above section on habitat elements. The proposed activities may impact individual bluehead sucker or their habitat but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Colorado River cutthroat trout

The activities associated with this project are expected to affect Colorado River cutthroat trout habitat as described in the above section on habitat elements. The proposed activities may impact individual Colorado River cutthroat trout or their habitat but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Flannelmouth sucker

The activities associated with this project are expected to affect flannelmouth sucker habitat as described in the above section on habitat elements. The proposed activities may impact flannelmouth sucker habitat downstream of the project area but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Roundtail chub

The activities associated with this project are expected to affect roundtail chub habitat as described in the above section on habitat elements. The proposed activities may impact roundtail chub habitat downstream of the project area but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Colorado pikeminnow, humpback chub, razorback sucker and bonytail

Potential impacts from water depletions on Colorado pikeminnow, humpback chub, razorback sucker and bonytail have been previously consulted on in a programmatic BO (ES/GJ-6-CO-99-F-033-CP062) dated April 27, 2007. The estimated annual depletion of 5 acre-feet per year would result in a may affect, likely to adversely effect to the four endangered fish in the upper Colorado River. This depletion amount is well within the 50 acre-feet per project limit identified in the BO. Depletions will re reported annually as require b the BO.

COMPLIANCE WITH THE FOREST PLAN AND OTHER REGULATORY DIRECTION

White River and GMUG Forest Plans

In May 2005 the Forest Supervisor on the Grand Mesa, Uncompahgre and Gunnison National Forests (GMUG) issued an amendment that, in part, revised the list of Management Indicator Species (MIS). This list revision was completed under the authority and guidance provided in 36 CFR 219.19 (1982 Rule). Also as part of this amendment, the GMUG used authority provided in 36 CFR 219.14(f) in the 2005 planning Rule (2005 Rule) to make monitoring of MIS populations discretionary. However, on March 30, 2007 the Forest Service was enjoined from implementing the 2005 Rule. That ruling invalidated the authority provided by 36 CFR 219.14(f).

Revision of the GMUG list of MIS was consistent with legal authorities and, therefore, remains valid and in effect. The GMUG has reinstated MIS requirements per the 1982 planning regulations to monitor both habitat and populations. Regardless of the planning rule in effect, the GMUG has considered and will continue to consider the “best available science” in forest and project level planning, including data and analysis needs for MIS.

In March 2006, the Forest Supervisor on the White River National Forest (WRNF) issued an amendment that revised the list of MIS species. This list revision was completed under the authority and guidance provided in 36 CFR 219.19 (1982 Rule). The amendment identified that the WRNF will continue to have a MIS program with appropriate monitoring following established protocols to detect population trends and effects to habitats represented by the MIS.

The scope of analysis for MIS is determined by forest plan management direction, specifically its standards and guidelines (Chapter II) and monitoring direction (Chapter IV). Both the GMUG and the WRNF Forest Plans establish monitoring and evaluation requirements that employ both habitat capability relationships and, at the appropriate scale, population data. See Standards and Guidelines for Aquatic Species in 3.6.2 above. Specific types of surveys are identified in 3.6.4 Exising Condition. Surveying and monitoring have identified a core conservation Colorado River Cutthroat Trou tpopulation in Henderson Creek, and unconfirmed populations may exist in Little Henderson Creek and North Fork Henderson Creekm, and non-conservation populations found in West Divide Creek Macroinvertabrates for the White River are addressed on a larger scale. The analysis completed for this project examined how the project directly, indirectly and cumulatively affects selected MIS habitat and populations and how these local effect could influence Forest-wide habitat and population trends. Further the analysis indicates that the project contributes to meeting Forest Plan direction for MIS.

Several of the MIS that could be in the project area are also sensitive species and are discussed in that section. See FEIS Appendix I-1 for more information on identification of MIS in project area. See 3.6.5 for analysis of effects on MIS/Sensitive species.

BLM Land Management Plan

The Bull Mountain Natural Gas Pipeline Project is consistent with the Resource Management Plan for the Bureau of Land Management – Glenwood Springs Field Office (BLM 1988)

Endangered Species Act

The Bull Mountain Natural Gas Pipeline Project is consistent with the Endangered Species Act (ESA). Water withdrawals for hydrostatic testing dust suppression or any other water depletions meet the requirements of BO (ES/GJ-6-CO-99-F-033-CP062) dated April 27, 2007 as long as reporting and agreement requirements are fulfilled.

3.7 WILDLIFE

3.7.1 INTRODUCTION

This section serves as a Biological Evaluation of impacts to USDA Forest Service Region 2 sensitive species and Colorado BLM State Director's list of sensitive species that are known or have the potential to occur within the project area. In addition, this section serves to assess potential impacts to federally listed threatened and endangered species and management indicator species (MIS) as designated in the Revised White River LRMP (2002), GMUG Amended Plan (1991), as amended (2005).

Wildlife species considered for this analysis are shown in **FEIS Appendix I-1**. Those species that were not likely to be present in the analysis area were not carried forward for analysis. Threatened, endangered and sensitive species carried forward for this analysis and effects determinations are summarized in Table 73. These determinations are based on affected environment and environmental consequences discussions in the following subsections. Effects on elk, a MIS for both Forests, and elk hunting, were raised as issues for this project so elk have also been included in Table 73. See the analysis in the following subsections for effects on other MIS.

Table 73. Wildlife Species Analyzed in this Analysis

Species	Determination*	Rationale
Threatened and Endangered Species		
Canada lynx	MA -NLAA	There is minimal effect on creating unsuitable habitat or reducing potential denning habitat; no increased risk of mortality.
Sensitive Species		
Boreal toad	MII – PA, Alts 1 and 3, LRLV – Alt 2	Project design features for riparian pipeline crossings (timing at low flow, thoroughly drying equipment before moving into another drainage after Buzzard Creek) reduce effects on habitat and individuals. One known population on Buzzard Creek affected (Alt 2).
Northern leopard frog, Great Basin silverspot, Great Basin spadefoot toad	MII	Project design features for riparian pipeline crossings (timing at low flow) reduce effects on habitat, no known populations affected.
Wolverine	MII – PA and Alt 1 No impact for Alt 2 and Alt 3	Proposed Action and Alternative 1 may improve non-motorized access long-term into areas adjacent to roadless areas, possibly reducing suitability for wolverines. Other alternatives have less potential for effects. No wolverine has been observed in area for several decades.
American marten	MII	Project activities may impact individuals but reduction in habitat is minor compared to availability and corridor would not be a barrier to movements.
Townsends' big-eared bat, Fringed myotis	No impact	Lack of suitable roosting habitat within project area makes it unlikely that species forage along any alternative corridor.

Species	Determination*	Rationale
Pygmy shrew, Olive-sided flycatcher, Lewis' woodpecker, American three-toed woodpecker, Purple martin	MII	Project activities may impact young of the year but overall acreage affected is small and potential for effects are minor over the larger 1-mile buffer analysis area.
Northern goshawk, Boreal owl, Flammulated owl	MII	Project design features(survey corridor to locate nests before construction or avoid construction in aspen, conifer and aspen/conifer habitats until August 1st) reduce potential to affect breeding birds.
Black swift	MII	No nesting habitat within project area; foraging habitat is present and utilized.
Midget-faded rattlesnake	MII	Project activities may impact individuals but overall acreage affected is small, use of logs and rocks in the corridor would provide habitat components and potential for effects is minor over the larger area.
Management Indicator Species Other than Sensitive Species		
Elk	No Forest-wide decrease in habitat or population trends	Effects during construction would be of short duration and magnitude, and would avoid key habitat (elk production areas) during critical periods. Because elk are very adaptable, and use a wide variety of habitats, the conversion of existing vegetation to grass/forb cover types would not have any measurable effect.

***MA-NLAA** = may affect but not likely to adversely affect;
MII = may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing;
LRLV = likely to result in a loss of viability in the planning area, or in a trend toward federal listing

3.7.2 REGULATORY FRAMEWORK

Applicable requirements and other direction may be found in the Endangered Species Act, National Forest Management Act, and USDA and USDI Regulations and Manuals. The three LRMPs mentioned in the Introduction provide area-wide and site-specific standards and guidelines for maintenance of habitat for wildlife species. This direction has been incorporated into the project design where appropriate.

MANAGEMENT DIRECTION

Plan goals and objectives for wildlife and wildlife habitats are shown below. Additional area-wide, site-specific and species-specific standards and guidelines for maintenance of habitat for wildlife species is listed in the "Compliance with the Forest Plan and Other Regulatory Direction" discussion found at the end of this Wildlife section.

WRNF LRMP (2002)

- Goal 1: Promote ecosystem health and conservation using a collaborative approach to sustain the nation's forests, grasslands and watersheds.
    - Objective 1b: Provide ecological conditions to sustain viable populations of native and desired nonnative species and to achieve objectives for Management Indicator Species and focal species.

- Objective 1c: Help ensure viability of species of concern for the White River National Forest through implementation of the Forest Plan and recommendations made in the Species Viability Reports.

GMUG LRMP (1991)

- Goal: Fish and Wildlife – Increase NFS winter range carrying capacity for elk and deer. Increase or improve wildlife habitat diversity. Increase vertical and horizontal diversity.

- Goal: Old growth – Define and inventory old growth for each of the Forest types on the Forest. Develop and implement silvicultural practices to maintain and establish old growth values. Implement National policy on old growth.

BLM LRMP (1988)

Terrestrial habitat management objectives are to

- To provide approximately 57,933 animal unit months of big game forage

- To improve existing wildlife habitat conditions

- To increase wildlife species diversity

3.7.3 METHODOLOGY FOR ANALYSIS

A variety of sources were reviewed to determine which species are known from the project area and which species have suitable habitat present and could potentially occur within the project area. Sources reviewed include Colorado Natural Heritage database, Forest and BLM GIS occurrence databases, Rocky Mountain Region Endangered, Threatened, Proposed and Sensitive Species matrix by unit (updated April 2007), Colorado BLM State Director's Sensitive Species List (June 2000, and as updated by C. Scheck, BLM Ecologist, per. comm.), and species distribution information available from a variety of sources (e.g. regional species assessments, NatureServe). Specific sources are cited in individual species discussions below. Existing vegetation information was acquired from R2Veg and CVU (Common Vegetation Unit) GIS data which was a common GIS coverage available for all three land management agencies to determine what potential habitats were present in the project area.

Surveys conducted for this project include wetland inventories for the Proposed Action, as well as identification of potential habitat for TES species (Cirrus 2005, Cirrus 2006, Cirrus 2007). Field surveys were conducted on September 13-15, 2005 by Betsy Hamann (TEAMS Wildlife Biologist) and were limited to portions of the Proposed Action corridor to verify potential habitat and species presence. Observations recorded during these surveys have been incorporated into individual species discussions below. Spruce/fir stands mapped as lynx denning habitat along the proposed action and Alternative 1 route, and mature spruce/fir (habitat structural stage 4B) identified as potential old growth were surveyed by Julie Grode, USFS Wildlife Biologist in July of 2006.

The analysis area used to evaluate direct and indirect effects to wildlife species carried forward for further analysis is a one-mile buffer on each side of the access roads and pipeline corridors for each alternative. Direct effects were evaluated within the 100-foot wide ROW where the pipeline would be buried. However, the indirect effects of disturbance from increased traffic into the area on access routes; and human activities, heavy equipment and blasting on the pipeline corridor were evaluated within the one-mile buffer for most species (exceptions include lynx, wolverine and elk – see below). A one-mile buffer was used because the available literature suggests that species that are displaced would not be displaced over one mile. Specific literature is discussed in the relevant subsections below. See FEIS Appendix I, Figure I-4 for an overview of the analysis area used for the wildlife resources.

The analysis evaluates changes in vegetation cover types that will occur both immediately and over the long-term. Because each action alternative will a change in existing cover types to largely grass/forb cover types over the long-term there is little analysis based on existing structural stages of each cover type. Some species may only be associated with mature stands of a certain cover type, and all of the acres of this cover type may not currently provide habitat. However, they could provide future habitat and the analysis focuses on changes in potential habitat over the long-term. Habitat changes on private land along the corridors have been included in the direct and indirect effects analysis, because the alternatives include actions on private lands.

Alternatives differed in the proposed miles of access roads/pipeline corridor that parallel existing roads. These differences, as they relate to increases in expected disturbances over existing levels, were evaluated. Similarly, alternatives varied in the amount of access provided into inventoried roadless areas. The differences in the levels of disturbance within areas of relatively undisturbed habitat were evaluated between alternatives. The effects of alternatives on seasonal use of habitats for lynx and elk were also evaluated.

HABCAP modeling was not used for this analysis. It was developed as a comparative tool to model differences in habitat capabilities between alternatives by calculating changes in habitat types and structural stages. It estimates capability at a single point in time, and does not simulate change over time. Because of the long, linear nature of the pipeline corridors, the conversion of the existing habitat in the corridor to grass/forb habitats over the long-term, and the fact that much of the potential effects are a result of disturbance associated with construction, this modeling tool was not used. See the Compliance with Forest Plan section at the end of this section for more information on HABCAP modeling.

Timeframes used for the analysis include effects of increased traffic, human activity and equipment use during construction. Project construction activities are expected to take three seasons (May 15 to December 1 unless adverse weather conditions require shortened seasons) for the Proposed Action and all other alternatives. Over the long-term, effects of disturbance would be very minimal (only once-yearly monitoring for leaks, noxious weed spraying in the summer). Over the long-term, the pipeline corridors would become revegetated by grasses, forbs, and shrubs in some sections. Shrubs and trees would be continuosly cleared in a ten foot wide area immediately over the pipeline to prevent potential root damage to the pipeline protective coating. Over the long-term, motorized access along the pipeline corridor would be effectively prevented through implementation of design criteria to block vehicular access to the corridor (see Table 6).

The cumulative effects analysis area used for most species is the one-mile (each side) buffer along the pipeline corridor and access roads used in the different alternatives. Exceptions to this include lynx, elk and wolverine. Cumulative effects analysis areas for these species are discussed in the appropriate sections below.

3.7.4 AFFECTED ENVIRONMENT

HABITATS

The R2Veg and Common Vegetation Unit (CVU) data was used to determine existing vegetation conditions and potential habitats for analyzed species within the project area. Table 74 displays the acres and percentages of existing vegetation cover types within the 100-foot ROW, for each alternative. Cover types are based on the dominant vegetative species. Oak shrublands are shrublands dominated by oak. Mountain shrublands may have an oak component, but are dominated by other species such as serviceberry, sagebrush, snowberry, and rabbitbrush. Aspen/conifer types have aspen, Engelmann spruce and subalpine fir as codominant species.

Table 74. Existing Vegetation Cover Types within 100-foot ROW, by Alternative

Vegetative Cover Type	Proposed Action		Alternative 1		Alternative 2		Alternative 3	
	Acres	%of total	Acres	%of total	Acres	%of total	Acres	%of total
Grass/forb	20	7	18	6	64	15	44	11
Oak shrublands	79	26	85	27	92	21	88	22
Mountain shrublands	86	28	103	33	163	37	128	32
Pinion/juniper	11	4	7	2	12	3	13	3
Aspen	39	13	39	12	62	14	95	24
Aspen/conifer	51	17	39	13	23	5	23	6
Douglas-fir/white fir	0	0	0	0		0		0
Spruce/fir	6	2	6	2		0		0
Willow	5	2	6	2	23	5	3	1
Cottonwood	10	3	12	4	2	0		0
Barren		0		0		0	0	0
Water		0		0		0		0
Total	307	100	316	100	440	100	394	100

Figure 6 and Appendix I displays the pipeline corridors and access roads for each alternative related to the existing vegetation cover types. For the Proposed Action and Alternative 1, from the south end, the proposed pipeline corridor passes through mountain shrublands, oak woodlands, aspen and spruce/fir habitats. Once on top, it then drops back down through aspen/conifer, aspen, mountain shrublands, and then through pinion/juniper and ends in managed grass/forb habitat on private lands.

Alternatives 2 and 3 corridors, from the south end are dominated by aspen and mountain shrub passing through pinion/juniper and ending in grass/forb habitats on private lands on the north end. Where Alternative 2 loops out to the west and follows the existing road, it passes through an area dominated by oak shrublands.

Major perennial streams with associated riparian areas crossed by the Proposed Action and Alternative 1 corridor include Henderson Creek, Little Muddy Creek, and West Divide Creek.

Cottonwood riparian habitats are found on West Divide Creek. Other riparian areas and wetlands are found along the corridor (Cirrus 2005, Cirrus 2006). The Alternative 2 route follows existing roads that parallel West Fork Little Muddy Creek, Gold Creek, Buzzard Creek, Hightower Creek, Road Gulch and Alkali Creek. Alternative 3 follows West Fork Little Muddy, Gold Creek and then moves upslope and crosses Crooked Creek, Crane Creek, Owens Creek and Hightower Creek.

THREATENED AND ENDANGERED SPECIES

There is only one federally listed species that is found in the project area; the Canada lynx. Other federally listed species considered and rationale for not analyzing them further for the Bull Mountain Pipeline project is shown in FEIS Appendix I-1**,** Table I-1-1**.** These species would all have no effect determinations because there is no known or potential habitat or occurrence within the project area.

Canada lynx

The Canada Lynx was listed as threatened in March 2000. As a result of interagency cooperation several products have been produced to help guide conservation efforts for this species on federally managed land. "The Scientific Basis for Lynx Conservation" (Ruggerio et al, 2000), also called the Science Report, contains current scientific knowledge about the Canada lynx, its life history and habitat relationships. The Lynx Conservation Assessment and Strategy (LCAS), now in its second edition (Ruediger et al, 2000) recommends conservation measures to remove or minimize identified risks to lynx, to provide a consistent and effective approach to conserve Canada lynx on federal lands. The Canada Lynx Conservation Agreement (between FWS and USFS, revised October 2006) establishes agreement to use the Science Report, the LCAS, along with locally specific information for project analysis and decision-making processes.

The FWS prepared a Recovery Outline (USDI FWS 2005) to provide interim guidance on recovery efforts until a Recovery Plan is prepared. This Recovery Outline identifies core areas, secondary areas and peripheral areas, based on historical and current occurrence records, as well as confirmed breeding. The Southern Rockies (Colorado and Wyoming) were identified as a Provisional Core Area because this area contains a reintroduced population (Lynx were reintroduced to southwestern Colorado beginning in 1999.) In November 2005, the FWS proposed critical habitat for lynx (USDI FWS 2005a). There is no proposed critical habitat in the southern Rockies (Colorado and Wyoming).

Both Forests have mapped lynx analysis units (LAUs) and lynx habitat within them, based on Regional direction and LCAS guidance**. Appendix I-5** displays LAUs in the project area.

Lynx habitat was mapped based on existing vegetation information, including vegetation type, canopy closure and size of trees. Following regional direction (Lynx Habitat Mapping Criteria, Version 2.0 (7/27/05)) lynx habitat on the WRNF and GMUG is classified as:

> **Winter Foraging with Denning Habitat (Denning)** – comprised of mature, dense high-elevation conifer forests that contain large amounts of coarse woody debris on the forest floor, or other forest floor structural elements that constitute overhead cover and are close to foraging habitat.
>
> **Additional Winter Foraging Habitat (Winter)** - stands that are likely to sustain populations of snowshoe hare and red squirrel throughout the

winter. These conditions are usually found in younger high-elevation spruce-fir, cold-wet, and, to a lesser extent, cool-moist mixed-conifer and lodgepole, aspen mixed with significant amounts of conifer regeneration, and riparian shrublands that are near higher-elevation, primary conifer habitats.

Other Lynx Habitat (Other) - stands that currently lack sufficient regeneration or cover to sustain snowshoe hare through the winter, but are likely to sustain limited numbers of hare and other prey during snow-free seasons.

Currently Unsuitable Habitat – once suitable lynx habitat that has been altered through some management action that has the potential to become suitable lynx habitat again in the future.

The WRNF worked with BLM to incorporate adjacent BLM lands where they contributed to the LAU. The BLM land in this project was not included at that time, as it is dominated by non-forested habitats and does not contribute to lynx habitat (K. Giezentanner, WRNF Forest Ecologist, pers. comm. 2/23/06). Additional information on lynx habitat mapping and results can be found in the project record.

The LCAS includes direction about limiting the amount of currently unsuitable habitat within a LAU (to less than 30% of the total lynx habitat), as well as maintaining at least 10% of the suitable habitat as denning habitat. There are 4 LAUs crossed by the pipeline corridor alternatives. See FEIS Appendix I, Figure I-5 for location of these Lynx LAUs. All four LAUs have less than 30% of lynx habitat in currently unsuitable condition. Denning habitat is above 10% for three of the LAUs but one has only 2% denning (Huntsman Mountain LAU). The Huntsman Mountain LAU is dominated by aspen forests that regenerated following fires in the late 1800s and early 1900s. Not enough time has passed since these fires to allow development of late succession conifer forests on areas within this LAU where spruce/fir/aspen forests are the potential natural vegetation. Much of the Huntsman Mountain LAU has been mapped as aspen potential natural vegetation, and conifer dominated forest will not develop in these locations. Existing conditions of the LAUs are displayed in Table 75 and in FEIS Appendix I, Table I-2-4.

Table 75. Existing Condition in Lynx Analysis Units (LAUs) in the Project Area

LAU	NFS lands in LAU	Total Lynx habitat	Acres Denning habitat	Percent denning habitat	Currently unsuitable acres	Non habitat
GMUG						
Huntsman Mountain	32,555	24,466	468	2%	0%	8,089
Mule Park	37,068	24,268	2,564	11%	0%	12,793
Ruth Mountain	34,533	22,459	8,307	37%	1%	12,074
WRNF						
Divide Creek	86,350	30,123	11,689	39%	1%	55,989

Telemetry tracking of released lynx indicate that lynx are using or moving through both Forests, but only a few of the recorded locations lie within or adjacent to the project area (CDOW 2005). Lynx transplanted into Colorado were frequently located in well developed riparian and valley wetland shrub habitats of the upper montane and subalpine zones. These ecotones may provide quality foraging habitat for lynx. As shown in Table 81, between one and five percent of the alternative pipeline corridor routes travel through riparian habitats (denoted as willow and cottonwood cover types).

Extensive stands of pure aspen may not provide quality hare (primary prey) habitat due to deficiencies in winter habitat characteristics; however, when mixed with spruce/fir, aspen (especially younger stands) may substantially contribute to prey productivity (Ruediger et al, 2000). All of the LAUs in the project area have aspen as the most dominant cover type. (See lynx habitat information on project record.)

Lynx reproduction has been documented in the Southern Rockies but it is too early to determine whether a self-sustaining population would result. All of the dens located in 2005 and 2006 were scattered throughout the high elevation areas of Colorado, south of Interstate 70. Most of the dens were in spruce/fir forests in areas of extensive downfall, on steeper, north-facing slopes. Elevations of den sites ranged from 10,226 to 11,765 feet (CDOW 2005a, Merrill and Shenk 2006). Most of the project area is below this elevation range and no lynx denning activity has been recorded on the Grand Mesa portion of the GMUG or the WRNF. Den sites have been recorded on the GMUG in areas south and east of the project area.

This Conservation Agreement defines occupied mapped lynx habitat as all mapped lynx habitat on an entire national forest when there are at least two verified lynx observations and there is evidence of lynx reproduction on the national forest. Mapped lynx habitat on both the GMUG and the WRNF are considered to be occupied

Linkage areas are areas of movement opportunities. They exist on the landscape and can be maintained or lost by management activities or developments. They are not “corridors” which imply only travel routes; they are broad areas of habitat where animals can find food, shelter and security. The goal of linkage areas is to ensure population viability through population connectivity. The LCAS defines Linkage areas as: “Habitat that provides landscape connectivity between blocks of habitat. Linkage areas occur both within and between geographic areas, where blocks of lynx habitat are separated by intervening areas of non-habitat such as basins, valleys, agricultural lands, or where lynx habitat naturally narrows between blocks. Connectivity provided by linkage areas can be degraded or severed by human infrastructure such as high-use highways, subdivisions or other developments. (LCAS Revised definition, Oct. 2001).

The Battlement Mesa linkage area lies in the northern portion of the project area and connects the Grand Mesa to Battlement Mesa through non- lynx habitat. Access roads and proposed pipeline corridors for Alternatives 2 and 3, and only access roads for the Proposed Action and Alternative 1 pass through this linkage area. A second linkage area lies to the east of the project area. McClure Pass connects a large area of central Colorado mountains with the Grand Mesa.

SENSITIVE SPECIES

Sensitive species considered for the Bull Mountain pipeline project are listed in FEIS Appendix I-1, Table I-1-2. Only those USFS and BLM sensitive species that are known to occur or are potentially present in the project area were carried forward for further analysis. Rationale for not evaluating species further is also presented in FEIS Appendix I-1, Table I-1-2. Several of these species (northern goshawk, Brewer's sparrow and American marten) are also MIS on one or both Forests.

Boreal toad

The boreal toad was petitioned for listing in 1993. In 1994, the FWS found that listing may be warranted. Boreal toads are listed as endangered by the Colorado Division of Wildlife (CDOW 2004). The State of Colorado prepared a Recovery Plan for boreal toads in Colorado in 1994 (Nesler and Goettl, 1994). An interagency Conservation Plan and Agreement was prepared in 2001 (Loeffler, 2001) to address management and recovery efforts for this species. In March 2005, the FWS announced a finding that listing was warranted but precluded by higher priority listings. Several assessments have occurred since then. In the finding of May 2005, the FWS noted that a proposed listing determination for the boreal toad would be funded Fiscal Year 2005. They then evaluated new information, and reevaluated previously acquired information. They determined that the Southern Rocky Mountain population does not qualify as a distinct population segment and the boreal toad was removed from the candidate list (USDI FWS 2005b).

Boreal toads were once very common in the mountains of Colorado, but there were declines in abundance and distribution that began in the early 1970s and extended into the 1990s. In Colorado, recent surveys of several hundred potential breeding sites within the historic range indicate that the toad has completely disappeared or declined to extreme rarity in most of the state (Hammerson 1999). Distribution is restricted to areas with suitable breeding habitat in spruce fir forests and alpine meadows (7000 to 12,900 foot). Breeding habitat includes lakes, marshes, ponds and bogs with sunny exposure and quiet, shallow water (Nesler and Goettl, 1994). Hammerson (1999) reports that in Colorado, the boreal toad lives in damp conditions in the vicinity of marshes, wet meadows, streams, beaver ponds, glacial ponds, and lakes interspersed in subalpine forest. Successful breeding requires permanent or semi-permanent water, though breeding also takes place in temporary ponds. Snowmelt affects spring emergence and breeding.

This species is known to occur on both forests. They were once common but now exist as apparently disjunct small populations. Current populations appear to be experiencing low reproductive success and high mortality (Loeffler, 2001). There are records of boreal toads in Garfield, Mesa, Delta and Gunnison counties (Colorado Herpetological Society website).

Historically, the Grand Mesa geographic area had abundant boreal toads. Extensive surveys were conducted over Grand Mesa, but no confirmed observations of boreal toads were made for approximately 25 years. In 2002, two field crews working in the Buzzard Creek drainage observed a total of three adult boreal toads. Adult boreal toads have been observed in the years since then, but no breeding sites have been identified (Jackson 2004; L. Livo, Boreal Toad Technical Advisory Group, pers. comm.5/18/2006).

An experimental translocation of boreal toads to the Kannah Creek area in Mesa County was initiated in 2003. This area lies approximately 24 miles southwest of the sightings in Buzzard Creek. Several drainages occur between these two sites that serve to impede movements of boreal toads, preventing contact between natural and translocated populations (Jackson 2004).

The closest records from the Proposed Action and Alternative 1 corridors are from a drainage over 3 miles to the east. The Proposed Action route was surveyed in June and July and again in early September of 2005; no toads were found but suitable habitat was identified (Cirrus 2005). Surveys in 2006 covered additional areas with similar results. Suitable habitat for boreal toad exists near Stevens Gulch bridge, Owens Creek road, and Texas Hill road but no individuals were located (Cirrus 2007). The corridors for Alternatives 2 and 3 lie adjacent to or in the vicinity of a population of boreal toads in the Buzzard Creek drainage.

Northern leopard frog

This species is widespread and is known to occur on both Forests. Population trends are expected to be downward throughout much of their range. They occupy a wide variety of habitats. During the wet season leopard frogs disperse along aquatic and riparian corridors (Smith and Keinath, 2007).

The formerly abundant northern leopard frog has become scarce in many areas of Colorado. Some populations have disappeared due at least in part to changes in habitat. Typical habitats include wet meadows, and the banks and shallows of marshes, ponds, glacial kettle ponds, beaver ponds, lakes, reservoirs, streams and irrigation ditches (Hammerson 1999).

There are records of northern leopard frogs in Garfield, Mesa, Delta and Gunnison counties (Colorado Herpetological Society website). The closest records are from more than 1.8 miles to the east of the Proposed Action corridor (from the late 1990s to present); in a drainage that enters West Divide Creek below the compressor site. The Proposed Action route was surveyed in June and July and again in early September of 2005; no northern leopard frogs were found but suitable habitat was identified (Cirrus 2005). Additional suitable habitat was identified in the same locations as for boreal toad listed above (Cirrus 2007). The nearest records to the Alternative 2 and 3 corridors lie to the south in a separate watershed. Surveys along Alternative 2 and 3 corridors were not conducted; however, potential habitat occurs in riparian habitats wtihin these routes.

Wolverine

The wolverine is thought to prefer remote areas that occur within the coniferous subalpine zone or within the open and barren rock alpine zone that occurs along the Rocky Mountain chain in Wyoming and Colorado. Investigations by the state of Colorado in 1997 indicate the possible presence of wolverine in some parts of Colorado. Recent, unverified reports of wolverines have occurred in Colorado, on the Arapaho-Roosevelt and San Juan NFs. Both the GMUG and WRNF are considered likely to have wolverines (NatureServe, 2007).

The most recent record of a wolverine is from 1954, several miles west of the southern end of the Proposed Action corridor (but close to the Alternative 2 and 3 corridors). There are other older (1906, 1928) records from Colorado Natural Heritage Program (CNHP) from outside of the project area as well. There are no recent verified or unverified reports of wolverines on the WRNF or the GMUG. Biological surveys conducted in 2005 and 2006 identified suitable habitat for wolverine was present in conifer forest habitat on Spruce Mountain within the project area (Cirrus 2005, Cirrus 2007). Both the Proposed Action and Alternative 1 routes traverse the east side of this habitat. Any wolverine use would be from transitory individual because no suitable denning habitat for wolverines is found in the project area.

American marten

The American marten is known to occur on both Forests within suitable habitat. As summarized in the 2005 GMUG MIS assessment for American Martin (USDA Forest Service 2005e), marten prefer and depend on mature late successional mesic conifer and mixed conifer stands containing intermediate canopies (30-70% canopy closure). Martens have also been found strongly associated with stream and riparian corridors that are adjacent to conifer stands. Vertical and horizontal structural diversity in terms of abundant course woody debris and snags are important key habitat components, especially for den and rest sites, thermal regulation, and hunting.

A marten survey was conducted on the Grand Mesa during the winter of 1993-94 for presence/absence and habitat types in which marten were found. Marten were documented in all suitable habitats surveyed (mature spruce-fir) with track plates, and habitat conditions averaged 70% canopy cover and tree age of 150 years old. A marten was observed in suitable habitat west of route for Alternatives 2 and 3. Suitable habitat for marten within the project area is within the spruce/fir habitat located on Spruce Mountain (Cirrus 2005, Cirrus 2007). See the 2005 GMUG Management Indicator Species Assessment for more information on populations and trends.

Starting in 1997, as a result of Amendment 14 that outlaws traps and snares, there has been no legal recreational trapping for any furbearer species. In 2001, CDOW looked at opening certain furbearer species to box and cage trapping. Several species may now be legally trapped, but this does not include marten. Effects of changes in access to trappers and resultant effects on vulnerability of marten to trapping won’t be analyzed further.

Townsend’s big-eared bat

Townsend’s big-eared bats can be found throughout Colorado except on the eastern plains. Distribution is limited to areas with suitable roosting habitat (caves, abandoned mine adits) in proximity to foraging habitat. They forage on moths under a wide variety of vegetation types (Gruver and Keinath, 2006). This bat is generally solitary in the summer, but females may form maternity colonies. They may be found in suitable roosts in woodlands and forests up to elevations of 9,500 feet. Winter hibernacla are selected for low and stable temperatures and are used from October to April. Populations, especially maternity colonies and winter hibernacula are highly susceptible to disturbance (CDOW 2005b).

This species is known to occur on both the GMUG and WRNF. No roosting habitat occurs within the project area. Potential foraging habitat in open montane habitats has been located within the project area (Cirrus 2005, Cirrus 2007); however use of this habitat is no likely because of the lack of roosting habitat in the area. Townsend’s big-eared bats have only been recorded several miles north of the project area; CNHP has an occurrence from 1978. Because of the very restrictive roosting habitat requirements, and lack of those habitats along any of the alternative pipeline corridors, there is very low probability that this species occurs in the project area, so this species is not be carried forward for further analysis.

Fringed myotis

The fringed myotis is considered to be likely to occur on both Forests. Fringed myotis can be found at moderate elevations in a variety of habitats that apparently vary by geographic location. There is some evidence that even though they forage in a variety of grass and shrublands, they are never far from forested areas. They have been found in desert, grasslands and up to spruce/fir habitats within some parts of their range. Night, day and maternity roosts can occur in caves, mines, and buildings that aren't heavily disturbed by human presence (CDOW 2005b).

In Colorado, they appear to occur as scattered populations at moderate elevations (up to 7,500 foot). Typical vegetation of the habitat includes ponderosa pine, pinion/juniper, greasewood, saltbush and scrub oak (CDOW 2005b). Roost sites include rock crevices, caves, mines, buildings, and trees. They are known to hibernate in caves and buildings.

The Conservation Assessment for this species additionally identifies snags as potential roosting habitat. Removal of large-diameter, cavity forming trees suitable for roosting and modification of the forest structure around roost sites are identified as concerns. Suitable tree roosting habitat consists of largely late-successional pine with high densities of snags with early to medium stages of decay (Keinath 2004).

Foraging habitat associated with riparian areas has been identified within the project area (Cirrus 2005, Cirrus 2007). However, no roosting habitat is present within the project area. No fringed myotis have been recorded within or near the project area. The nearest records are northwest of the Uncompahgre Plateau. For these reasons this species is not carried forward for further analysis.

Pygmy shrew

A montane subspecies of pygmy shrew occurs in the high mountain forests of northern Colorado (Beauvais and McCumber 2006) The only known occurrences of this subspecies on the GMUG are from the Gunnison NF, north of Crested Butte. This subspecies is likely to occur on the WRNF and potential habitat occurs within the project area. In the Rocky Mountain Region, pygmy shrew occur in high elevation, moist coniferous forest, possibly preferring late-seral stands and the edges between wet and dry forest types (Beavais and McCumber, 2006).

Northern goshawk

This species occurs on both Forests. Nesting seems to occur in mature forest types and on both the WRNF and GMUG mature aspen mixed with conifer is preferred nesting habitat, generally within ¼ mile of a riparian area (USDA Forest Service, 2005f). Foraging habitat may include younger or more open canopy forests. The goshawk may be vulnerable to nest abandonment due to disturbance within the area. Alternate nests are commonly used, but nest tree fidelity was stronger in uncut forests compared to treated forests (Kennedy, 2003).

Based on actual known locations of nest sites, suspected breeding territories, and sightings, the northern goshawk appears to be well distributed throughout the GMUG in suitable habitat. Records of known goshawk nest activity on the GMUG show that numbers of breeding goshawks and nest success has remained relatively stable, although low over a 17-year period (USDA Forest Service, 2005f).

The primary management threat to goshawk populations is alteration of its preferred habitat from timber management practices. Although the goshawk uses a wide range of forest communities during the breeding season, it prefers mature and old growth forest for nesting and hunting. Although there is some evidence goshawks are resilient of forest fragmentation and can re-establish when cleared areas are reforested, the thresholds for population persistence have not been identified. Issues related to habitat alteration include forest fragmentation, creation of even-aged, monotypic stands, potential increase in area of younger age class, and loss of tree species diversity (Kennedy 2003).

Goshawk sightings are documented in and around the project area (Forest GIS coverages). Three nesting territories were discovered in the 1990s. There are two known nest territories to the east of the Proposed Action corridor, and one territory between the PA/Alt 1 and Alt2/Alt 3 corridors. See the 2005 GMUG Management Indicator Species Assessment for more information on populations and trends.

Boreal owl

This species is known to occur on both Forests. In most years boreal owls remain highly sedentary, remaining in the same home range throughout the year, for several years. They predominately use subalpine forests requiring mature and old growth spruce/fir with dense canopies (>40% canopy closure) and large to very large snags (>13” dbh) (USDA Forest Service 2006b).

In Colorado, boreal owls occur mainly in mature to old spruce/fir above 9000 foot elevation, but they may also use higher-elevation lodgepole pine and aspen (mixed with conifer). They prefer wet situations near streams or bogs, because these often have good populations of small rodents (Kingery 1998).

Surveys for boreal owls using established nest boxes have been conducted on the Grand Mesa, east of the project area since 1992. Boreal owls have also been documented to the east of the Proposed Action corridor on the WRNF. Surveys conducted in the project area in 2005 and 2006 identified potentially suitable habitat in the Spruce Mountain areas (Cirrus 2005, Cirrus 2007) Recorded boreal owl occurrences in nest boxes on the Grand Mesa have been on the decline in recent years. (USDA Forest Service, 2006b)

Flammulated owl

This species is known to occur on both Forests. Flammulated owls have a strong association with ponderosa pine, but also use aspen forests in the montane life zone. This species is migratory, but shows high site tenacity by adults. As an insectivore, they can occur at relatively high densities compared to other owls (USDA Forest Service 2006b). These owls depend on cavities for nesting, open forests for catching insects, and brush or dense foliage for roosting (Kingery 1998). Cirrus (2005) documented flammulated owls in two locations along the Proposed Action corridor during broadcast surveys. Additional potentially suitable habitat in aspen on the north and south sides of Spruce Mountain, along Owens Creek road, and in the Texas Hill area was surveyed by Cirrus in 2006.

Olive-sided flycatcher

This species is known to occur on both Forests. They primarily breed in spruce/fir forest, but use the forest-opening ecotone and are a colonizer of post-disturbance habitats. Essential components of olive-sided flycatcher habitat include the juxtaposition of forest openings and mature forest, with the presence of snags (Kotliar, 2007). . They occur less regularly and less abundantly in deciduous or mixed aspen/conifer forests (Kingery 1998). Cirrus (2005) noted that they observed an olive-sided flycatcher in the Proposed Action corridor in an aspen stand on a tributary to Henderson Creek.

Lewis' woodpecker

Three principal habitats for Lewis' woodpecker are: open ponderosa pine, open riparian woodland dominated by cottonwood, and burned pine forest. They also use other habitats such as pinion/juniper. Their distribution is dependent on nest cavity availability and insect abundance. They are known to occur on both Forests (USDA Forest Service, 2001). Limited potential habitat for this woodpecker was identified in riparian forests along Henderson, Little Muddy and West Divide Creeks within the project area. There are no sightings recorded in the project area.

Lewis' woodpecker is a locally common but patchily distributed woodpecker species. The combination of its sporadic distribution, its diet of adult-stage mostly aerial insects, its preference to nest in burned landscapes, and its variable migratory behavior makes it different from most other North American woodpecker (Abele et al 2004).

American three-toed woodpecker

This species is known to occur on both Forests. It is ranked as rare or localized in Colorado, but is a highly mobile species capable of dispersing across landscapes with few habitat related limitations. This species commonly occurs in mature coniferous forests especially in areas with large infestations of bark beetles or recently burned areas (Wiggins 2004).

Mature and old growth coniferous forests have been identified as primary habitat, but disturbed areas (recent burns, insect infestations) have also been cited as important habitat. The extent to which three-toed woodpeckers use habitats other than spruce/fir and lodgepole pine in the southern Rocky Mountains remains poorly known (Wiggins 2004).

Cirrus (2005) documented two three-toed woodpeckers in patches of conifer on Spruce Mountain, along the Proposed Action corridor.

Purple martin

This species is known to occur on both Forests and is primarily associated with patches of old growth aspen. The preferred habitat of purple martins in the Rocky Mountains is mature aspen forest with nearby meadows and open water. Martins nest in cavities in live aspen trees (Wiggins 2005). Nest site availability may be a key limiting factor (USDA Forest Service, 2006c).

The largest concentrations of purple martin nesting colonies in Colorado occur in the Buzzard and Muddy Creek drainages on the Grand Mesa (USDA Forest Service, 2006c). The Audubon Society has nominated this area as an Important Bird Area due to the density of colonies. It is estimated that 30 to 40% of Colorado's nesting purple martin use this area. (See additional information in project record.)

Black swift

This species is known to occur on both the WRNF and GMUG. This species nests on cliffs behind waterfalls and this very restrictive nesting requirement limits available habitat.

Nesting has been substantiated at only 23 locations in the San Juan Mountains and a few other locations in Colorado (Kingery 1998). This bird may range far from the nest site to forage; they sometimes cruise over the summits of 14,000-foot peaks and over croplands or deserts 25 miles from nesting colonies (Kingery 1998). Cirrus (2005) noted that they observed a black swift flying over the Proposed Action corridor, in the Battle Park area on the GMUG. However, because of the very restrictive nesting habitat requirements, and lack of those habitats along any of the proposed pipeline corridors, there would be no effects and this species is not be carried forward for further analysis.

Brewer's sparrow

Brewer's sparrows are tightly associated with sagebrush shrublands that have abundant, scattered shrubs and short grass; they prefer areas dominated by shrubs compared to areas dominated by grass (Paige and Ritter 1999). They will thrive best where sagebrush is maintained in tall, clumped, and vigorous stands (Paige and Ritter 1999). Brewer's sparrows are more likely to occur on sites with high shrub cover and large patch size, and generally stands that are greater than 15 acres (USDA Forest Service, 2005g).

Brewer's sparrow has been selected as a MIS on both the WRNF and GMUG because it is a good indicator of mature healthy sagebrush habitats. Sagebrush habitats occur within the project area, along all four alternative corridors. Brewer's sparrows are well distributed through big sagebrush habitats on both forests. See the 2005 GMUG Management Indicator Species Assessment for more information on populations and trends.

Great Basin silverspot

This butterfly is considered likely to occur on the GMUG. All populations in the Region are found in western Colorado and most occur as small isolated colonies associated with seeps or springs. Violets are the only plants used as caterpillar hosts and the adults use nectar from thistles and milkweeds (Selby, 2007). Habitats are expected to be found between 5,200 feet and 9,000 feet elevation. They are active from mid-July to mid-October, but are concentrated during August and September (Glassberg 2001). Surveyors did not find any suitable habitat for this species along the Proposed Action corridor (Cirrus 2005, Cirrus 2007).

Great Basin spadefoot toad

The distribution of this species in Colorado is in the northwestern and west-central parts of the state (Hammerson 1999). This species is not expected to occur on either Forest due to lack of suitable habitats. However, this species is considered to potentially occur on BLM and private lands on the north end of the project area.

There are records of Great Basin spadefoot toads in Garfield and Mesa counties (Colorado Herpetological Society website) in the Colorado River drainage (Hammerson 1999). In Colorado, this species inhabits pinion/juniper woodlands, sagebrush and semidesert shrublands. They may be active anytime from April through early September, at night when warm temperatures and rain coincide. Inactive periods are spent burrowed in the soil. In Colorado, breeding occurs in temporary pools formed by heavy rains, pools along intermittent stream courses and floodwaters along permanent streams. They may also breed in permanent pools formed by springs.

Midget-faded rattlesnake

This species was rated as being questionable for occurring on both Forests, but there may be potential on BLM and private lands on the north ends of the corridors. A tendency to aggregate at dens during winter makes them susceptible to local extirpation (Hammerson, 1999).

There are records of western rattlesnakes (midget-faded rattlesnakes) in Garfield, Mesa, and Delta counties (Colorado Herpetological Society website). The western rattlesnake occurs in virtually every terrestrial habitat within its geographic and elevation range. Typical habitats include plains grassland, sandhills, semidesert shrubland, mountain shrubland, riparian zones, pinion/juniper woodland and montane woodland. Crevices, woodpiles, brushy vegetation and the burrows of small mammals are used for cover during the active season. Winter dens are often located in rocky areas (Hammerson 1999).

MANAGEMENT INDICATOR SPECIES

In May 2005 the Forest Supervisor on the Grand Mesa, Uncompahgre and Gunnison National Forests (GMUG) issued an amendment that, in part, revised the list of Management Indicator Species (MIS). This list revision was completed under the authority and guidance provided in 36 CFR 219.19 (1982 Rule). Also as part of this amendment, the GMUG used authority provided in 36 CFR 219.14(f) in the 2005 planning Rule (2005 Rule) to make monitoring of MIS populations discretionary. However, on March 30, 2007 the Forest Service was enjoined from implementing the 2005 Rule. That ruling invalidated the authority provided by 36 CFR 219.14(f).

Revision of the GMUG list of MIS was consistent with legal authorities and, therefore, remains valid and in effect. The GMUG has considered and will continue to consider the "best available science" in forest and project level planning, including data and analysis needs for MIS. The GMUG has also considered habitat and population data for MIS in the Project area.

In March 2006, the Forest Supervisor on the White River National Forest (WRNF) issued an amendment that revised the list of MIS species. This list revision was completed under the authority and guidance provided in 36 CFR 219.19 (1982 Rule). The amendment identified that the WRNF will continue to have a MIS program with appropriate monitoring following established protocols to detect population trends and effects to habitats represented by the MIS.

The scope of analysis for MIS is determined by forest plan management direction, specifically its standards and guidelines (Chapter II) and monitoring direction (Chapter IV). Both the GMUG and the WRNF Forest Plans establish monitoring and evaluation requirements that employ both habitat capability relationships and, at the appropriate scale, population data. Specific information as it pertains to each species can be found in sections 3.7.4 and 3.7.5. The analysis completed for this project examined how the project directly, indirectly and cumulatively affects selected MIS habitat and populations and how these local effect could influence Forest-wide habitat and population trends. Further the analysis indicates that the project contributes to meeting Forest Plan direction for MIS.

Several of the MIS that could be in the project area are also sensitive species and are discussed in that section. These include northern goshawk, Brewer's sparrow and American marten. Cave bats are represented by Townsend's big-eared bat and fringed myotis, which are also sensitive species. Only the MIS that may be present and are not also sensitive species are discussed here. See **FEIS Appendix I-1** for more information on selection of MIS as it pertains to this project area.

Elk

Elk are widespread and disperse readily across landscapes, with few habitat-related limitations. Populations are abundant (and stable or increasing) on the Forests in R2 and both the GMUG and WRNF. Value of habitats on Forests is increasing as habitat on adjacent private lands is lost to human development. Females are sensitive to disturbance during calving and herds are sensitive to disturbance in the winter (USDA Forest Service, 2005c).

Elk use a combination of open meadows for foraging and woodlands for cover, calving and thermal regulation. The elk herds in the project area are migratory, using higher elevation forests and meadows during the summer. Transitional ranges include lower elevation aspen and woodland types. Winter ranges include slopes with open south to southwest aspects for foraging and wooded north to northeast aspects for cover. Winter range areas are found on the north and south ends of the project area. See **FEIS Appendix I, Figure I-6** for elk seasonal habitats in the project area.

The proposed pipeline corridors cross Game Management Units (GMUs) 42, 421 and 521. These GMUs are all part of Data Analysis Unit (DAU) E-14. The elk population estimate for this DAU, based on 2004 post hunting statistics, was 11,570 elk, while the objective is 10,500. The DAU had a ratio of 26 bulls to 100 cows at that time. CDOW estimated that there were 79 hunters per 100 elk, with an 18% success rate. This DAU provides 4% of the total elk resource in the state (CDOW 2005c). See the 2005 GMUG Management Indicator Species Assessment for more information on populations and trends.

The primary issues affecting elk distribution are lack of habitat security due to motorized and non-motorized travel and recreation activities (USDA Forest Service 2004 and USDA Forest Service, 2005c).

Merriam’s wild turkey

In Colorado, Merriam’s turkey range primarily in dry forests of broken, mountainous terrain to about 8,000 foot elevation. Surveyors found them most often in forested habitats, primarily lower-elevation conifers and oak brush. Riparian deciduous forests, usually cottonwoods are also used (Kingery 1998). On the GMUG, they were selected as MIS primarily for mountain shrub, oak woodlands, pinion/juniper, and lower elevation ponderosa pine habitat types, although the species is known to use forest-meadow edges, aspen and aspen/conifer habitats during the summer (USDA Forest Service, 2005h). Winter roosts are commonly in ponderosa pine, oak, pinion/juniper and cottonwoods.

According to Breeding Bird Survey (BBS), population trends appear to be in a significant upward trend in the United States. For the period from 1966 to 2004, turkeys have exhibited a significant positive trend of 13.3%. Within the state of Colorado, turkeys have exhibited a similar trend. Turkey populations on the Forests are apparently self-sustaining and healthy. See the 2005 GMUG Management Indicator Species Assessment for more information on populations and trends.

The project area is in GMUs 421, 52 and 521, which are open to spring and fall hunting (in 2006 seasons are April 8 to May 21 and Sept 1 to Oct 1). Turkey populations on the Forests are apparently self-sustaining and healthy, to support unlimited spring and fall hunting seasons. CDOW estimates that a minimum of 90 turkeys were harvested in GMUs 421, 52 and 521 in 2005 (CDOW 2005d).

The GMUG did an analysis of habitat trends on the Forest; oak shrublands have stayed the same in the 1983 to 2000 period, while cottonwood habitats have decreased 10% due to fires and clearing on private lands. The cottonwood component on public lands in considered stable at this time (USDA Forest Service 2005c).

Red-naped sapsucker

In Colorado, red-naped sapsuckers forage in aspen, willows and cottonwoods close to their nest sites, which are almost exclusively in mature aspen stands. Typical nest stands, dominated by large aspen, have a variety of diseases that create the heart rot needed for suitable cavity excavation (Kingery 1998). Nest stands have trees infected with shelf or heartwood fungus (for drilling nest cavities) and nearby willow stands (for drilling sap wells). This species was observed along the Proposed Action corridor by surveyors (Cirrus 2005).

According to BBS, populations appear to be stable or increasing in the United States, with areas of local declines. From the period 1966 to 2004, red-naped sapsuckers have exhibited a significant positive trend of 4.3%. Within Colorado, populations have exhibited similar but higher upward trends.

Virginia’s warbler

This species is likely to occur in the project area, based on distribution maps in Kingery (1998). Virginia’s warblers depend almost exclusively on Gambel oak, mixed mountain shrub habitats and pinion/juniper communities (USDA Forest Service, 2005c). They are the most common warbler in Colorado (Kingery 1998). Breeding bird survey (BBS) trend data from 1966 to 2004 suggests a decreasing population continent wide, with a greater decrease in population trend as the scale becomes smaller and focuses around Colorado.

The 1984 WRNF Plan indicated that 75 percent of the shrub types on the forest were in a mature age class. This is moving out of the historical range of variability due to decreases in fire frequency over the last 80-100 years. In the past 11 years, about 44,000 acres have been treated, mostly with prescribed fire, resulting in a mosaic of age classes (Potter 2006).

LANDBIRDS

The USDA Forest Service signed a MOU with FWS for management of landbirds in 2001. This MOU includes direction on incorporation of habitat management guidelines identified in Bird Management Plans. An Executive Order (EO) was signed in the same year. Section 3 of the EO says to integrate bird conservation measures into projects, and to evaluate effects on migratory birds when doing project level analyses.

The Colorado Land Bird Conservation Plan (CO PIF 2000) focuses on conservation issues and opportunities by physiographic regions. In Region 62 (Southern Rocky Mountains) the western coniferous forests have been altered by fire exclusion, timber harvesting, grazing, residential development, chemical applications and introduction of exotic diseases, plants and animals. In Region 87 (Colorado Plateau) livestock grazing, (changes in vegetation due to grazing, manipulation of sagebrush and pinion/juniper habitats for improving grazing and livestock water developments), manipulation of water, fire suppression and widespread recreation have been identified as issues.

The Colorado Land Bird Conservation Plan identified priority bird species by habitat, for physiographic areas across the state (See FEIS Appendix I-1, Table I-1-5.). All habitats identified for the two affected physiographic areas (62 and 87) that are present in the analysis area are already being analyzed as habitat for sensitive or management indicator species. It is assumed that the species being analyzed would address effects to priority birds associated with these habitats.

Table 76. Habitats and species being analyzed

Habitat	Species	Status
Aspen	Red-naped sapsucker	Priority species and MIS
	Purple martin	Priority species and MIS
High elevation riparian	Boreal toad	Sensitive species
Mixed conifer	Flammulated owl	Sensitive species
Mountain shrubland	Virginia's warbler	Priority species and MIS
Pinion/juniper	Virgina's warbler	MIS
Spruce/fir	Boreal owl	Priority species and MIS
	Olive-sided flycatcher	Priority species and MIS
Wetlands	Boreal toad	Sensitive species

3.7.5 ENVIRONMENTAL CONSEQUENCES

NO ACTION ALTERNATIVE

Under the No Action Alternative, the Bull Mountain pipeline would not be constructed. If the Bull Mountain pipeline is not built, smaller pipelines transporting gas from nearby units could increase in the project area, having their own environmental effects.

GENERAL EFFECTS COMMON TO ALL ALTERNATIVES

Clearing of vegetation along the pipeline corridor and where access roads are widened would result in habitat alteration or loss, which would vary by species and habitats affected. Habitat alteration could result in changes in providing cover, foraging habitat, or breeding habitat.

Disturbance from project activities has the potential for effects to some species as well. Behavioral responses are influenced by characteristics of the disturbance itself (type of activity, distance away, season, direction of movement, speed, predictability, frequency and magnitude) and location (based on topography or presence of vegetation) (Knight and Cole, 1995). Wildlife behavior may take the form of avoidance, habituation or attraction (Knight and Temple, 1995). These behavioral responses may be of short duration (temporary displacement) or long-term, such as abandonment of preferred habitats.

There are numerous studies showing displacement of elk as a result of traffic along roadways. Effects may vary based on season, amount of traffic on the road, and surrounding cover (see elk analysis section).

Other researchers have looked at effects of traffic on various species of birds. Goshawks have been found to be sensitive to disturbance during nesting, but have also been found successfully nesting adjacent to open roadways (see goshawk analysis). One study of willow warblers along roadways in the Netherlands found that the density of territorial males was lower because of a low presence of older males. The proportion of successfully breeding yearling males was only half that of other areas further from the road zone (Reijnen and Foppen, 1994).

Another study looked at how traffic associated with natural gas extraction affected breeding birds in sagebrush steppe habitats (Ingelfinger and Anderson, 2004). They found a 39-60% reduction in birds surveyed within 100 meters (328 foot) of a road receiving low traffic (10-700 vehicles per day).

Direct mortality associated with road traffic is a function of traffic volume and speed. Species are affected differently (see species analyses below).

A researcher from the University of Alberta is looking at the effects of noise from compressor stations (75 to 90 dB). He is looking at the effects on ovenbirds during the breeding season. Preliminary results suggest that 92% of birds in quiet areas successfully found mates compared with 77% in loud areas (CBC 12/31/06). Noise attenuation design for the compressor facility associated with this project would be targeted for 55 dB as measured at the fence line of the facility. Because the targeted dB noise level is lower than that of the study area, effects of noise at the compressor should be low.

Some actions associated with this proposal are not expected to have any effect on wildlife species being analyzed and won't be considered. These include dust control on roads, testing of the pipeline (water source and disposal), monthly pigging, and compressor station maintenance.

<u>Actions with potential for direct effects:</u>

- Habitat alteration within corridor and access road clearing limits
- Upland effects would be long-term changes in plant community composition within the corridor ROW
- Riparian effects would be short-term
- Barriers to movement from trenching during construction
- Vehicle collisions

<u>Actions with potential for indirect effects during construction:</u>

- Disturbance associated with human activities, equipment, blasting along corridor and access roads. Activities would occur from sunrise to sunset, Monday through Saturday. There may be several spreads (probably 2), with 150 workers per spread.
- Duration of disturbance would run up to 26 weeks (May 15 through December 1, unless adverse weather conditions result in shortened season) for three seasons for the Proposed Action and Alternatives 1, 2 and 3.
- Impacts to water quality

<u>Actions with potential for indirect effects after construction:</u>

- Changes in vegetation (forage, cover etc) after seeding
- Incremental expansion in developments at the compressor
- Noise levels at compressor attenuated to 55 dB at fence line
- Lighting at compressor would include 4-8 light poles, would only be used as needed, with directional shields to light target area
- Monitoring for leaks, corrosion, noxious weeds (aerial or ground surveys along pipeline corridor) at 12 to 15 month intervals
- Maintenance and repair operations along pipeline corridor on an as needed basis
- Increased travel on roads due to changes or road improvements necessary for construction
- Increases in noxious weeds (primarily thistles)
- Over the long-term, motorized access along the pipeline corridor would be effectively prevented.

DESIGN FEATURES AND MONITORING

There are several design features that have been incorporated into the project to reduce effects to wildlife. These are common to all alternatives and are shown in Table 77. Other design features that would benefit wildlife, but are based on other needs are not listed here, but are included in the effects analysis for affected species.

Table 77. Wildlife Project Design Features

Design feature	Location
Avoid construction activities in elk production areas between May 15 and June 20.	Approximately 1.5 miles on the WRNF for the Proposed Action and Alt 1 would include this seasonal restriction. Other alternatives use open existing roads and no restrictions would be needed.
Perennial stream crossing work would occur when stream flow is at average annual low flow conditions, generally August to end of work period.	Perennial riparian and stream crossings
Intermittent stream crossing would be surveyed for sensitive amphibian and fish species use. If no use is detected construction activities could begin before August 31.	Intermittent wetland and stream crossings
Thoroughly dry equipment used in Buzzard Creek before moving into other drainages	Alternative 2 stream crossings
Boreal toad identification training for crews working in and around Buzzard Creek	Alternative 2, Buzzard Creek stretch of Road 265
Avoid construction through ponded wetlands from May 1 through August 31 unless surveys are done in July to evaluate use and no use by breeding amphibians is detected.	Riparian and wetland crossings

Design feature	Location
Conduct pre-construction surveys each spring, to identify active goshawk, boreal and flammulated owl nests. Nests of other raptor species would also be identified and considered for protection. Construction activities would not occur within species-appropriate spatial and temporal buffers as agreed upon with the appropriate land managing agency (e.g. within ¼ mile of active nests between March 1 and July 31 or until fledging and dispersal of the young).	Pinion/juniper, aspen, spruce/fir and aspen/conifer habitats
In lieu of additional raptor surveys, avoid construction in mature pinion/juniper, aspen, aspen/conifer and conifer habitats from March 1 through July 31.	Pinion/juniper, aspen, aspen/conifer and spruce/fir habitats
Install wildlife crossovers (trench plugs) with ramps on either side at maximum ¼ mile intervals and at well-defined trails to facilitate passage of big game across the trench and to prevent wildlife from becoming trapped in the trench.	Installed at ¼ mile intervals in sections of open trench
Hazardous materials would be stored in secure locations, 100 foot from water bodies or wetlands.	Entire length
Rocks, logs and/or other man-made physical barriers would be placed on the surface of the ROW during reclamation to provide barriers to deter illegal motorized use.	Entire length, where rocks and logs are available

Monitoring during project activities would focus on implementation of the design features listed in Table 77 above. Post-project monitoring would monitor the pipeline corridor for illegal motorized use. If use was found to be occurring, more work might be needed (barriers, placement of logs and rocks or other methods) to discourage use.

ANALYSIS ASSUMPTIONS

There are several assumptions that have been made for this analysis:

1. Most of the 100 foot-wide corridor would be maintained as a grass/forb habitat over the long-term (width specified in Chapter Two). There may be some shrub component in some sections, but shrubs would be controlled in most locations to allow detection of gas leaks during monitoring.

2. Because of the heavy truck traffic that would occur during pipeline construction, the majority of the access roads would need some reconstruction, including widening and clearing. Temporary road construction (250 feet for PA and Alt 1) is on existing, unauthorized 2-track road; which is not considered new access for this analysis. Improved roads would result in improved access for recreationists. Summer recreation is expected to increase over the long-term.

3. Changes in habitat on all land ownerships have been included in the direct and indirect effects analyses.

4. There is some overlap with the existing Ragged Mountain pipeline corridor for the Proposed Action and Alternative 1. However, acres of habitat affected by clearing for these alternatives assume that the full 100 foot width would be cleared.

5. Access routes to be reconstructed to design standard for two-lane roads were assumed to have a 24 foot clearing width. Access routs to be reconstructed to design standards for one-lane with turn-outs were assumed to have a 14 foot clearing width.

6. Over the long-term, motorized access along the pipeline corridor would be effectively prevented

CHANGES IN VEGETATION AND HABITAT

Proposed Action

The major criteria used to measure effects to wildlife are shown in Table 78.

Table 78. Proposed Action Details

Proposed Action Details	Measure
Total length of corridor	25.5 miles
Acres within 100 foot utility corridor	307 acres
Acres within clearing width of access roads to be reconstructed	84 acres
Acres within one mile of utility corridor and access roads	62,279 acres
Miles that follow existing roads	4.0 miles
Miles that follow existing pipeline or powerlines	10.11 miles
Miles that access roadless areas	8.6 miles
Construction duration	26 weeks per season
Construction season	May 15 to Dec. 1*
Number of seasons	3

* Unless adverse weather conditions require shortened season

Direct and Indirect Effects

It is assumed that all vegetation within a 100-foot corridor would be removed (307 acres). Existing vegetation cover type is shown in Table 79. Vegetation reestablishment would be through seeding after construction, suckering from species like aspen adjacent to the corridor, and re-seeding in from adjacent areas.

Table 79. Vegetative Cover Types within the Proposed Action 100-foot Utility Corridor (6/15/07)

Vegetative Cover Type	Acres within the construction corridor	Percent in corridor	Acres within access road clearing width	Percent in clearing width
Grass/forb	20	7	4	4
Oak shrublands	79	26	10	12
Mountain shrublands	86	28	39	47
Pinion/juniper	11	4	0	0
Aspen	39	13	14	16
Aspen/conifer	51	17	5	6
Douglas-fir/white fir	0	0	0	0
Spruce/fir	6	2	0	0
Willow	5	2	4	5
Cottonwood	10	3	8	9
Barren		0	0	0
Water		0	0	0
Total	307	100	84	100

Activities associated with construction of the pipeline are likely to cause disturbance and displacement of some species, depending on season of activity. Table 80 shows the vegetation cover types within a one-mile buffer each side of the proposed corridor and access roads.

Table 80. Vegetative Cover Types within a 1-mile buffer along Proposed Action ROW and Access Roads (excluding private lands with no data, 17,225 acres) 6/15/07

Vegetative Cover Type	Acres	Percent
Grass/forb	3,713	6
Oak shrublands	9,185	15
Mountain shrublands	14,473	23
Pinion/juniper	2,115	3
Aspen	17,351	28
Aspen/conifer	11,137	18
Douglas-fir/white fir	10	<1
Spruce/fir	1,161	2
Willow	1,650	3
Cottonwood	1,462	2
Barren	19	<1
Water	3	<1
Total	62,279	100

Alternative 1

The major criteria used to measure effects to wildlife are shown in Table 81.

Table 81. Alternative 1 Details

Alternative 1 Details	Measure
Total length of corridor	25.9 miles
Acres within 100-foot utility corridor	316 acres
Acres within clearing width of access roads to be reconstructed	81 acres
Acres within one mile of utility corridor and access roads	60,181 acres
Miles that follow existing roads	9.3 miles
Miles that follow existing pipeline or powerlines	13.3 miles
Miles that access roadless areas	8.5 miles
Construction duration	26 weeks per season
Construction season	May 15 to Dec. 1*
Number of seasons	3

* Unless adverse weather conditions require shortened season

Direct and Indirect Effects

It is assumed that all vegetation within a 100-foot corridor would be removed (316 acres). Vegetation cover types are shown in Table 82. Vegetation reestablishment would be through seeding after construction, suckering from species like aspen adjacent to the corridor, and re-seeding in from adjacent areas.

Table 82. Vegetative Cover Types within the Alternative 1 100-foot Utility Corridor (6/15/07)

Vegetative Cover Type	Acres within the construction corridor	Percent in corridor	Acres within access road clearing width	Percent in clearing width
Grass/forb	18	6	4	4
Oak shrublands	85	27	9	11
Mountain shrublands	103	33	37	46
Pinion/juniper	7	2	0	0
Aspen	39	12	14	18
Aspen/conifer	39	13	5	6
Douglas-fir/white fir	0	0	0	0
Spruce/fir	6	2	0	0
Willow	6	2	4	5
Cottonwood	12	4	7	9
Barren		0	0	0
Water		0	0	0
Total	316	100	81	100

Activities associated with construction of the pipeline are likely to cause disturbance and displacement of some species, depending on season of activity. Table 83 shows the vegetation cover types within a one-mile buffer each side of the proposed corridor and access roads.

Table 83. Vegetative Cover Types within a 1-mile buffer along Alt 1ROW and Access Roads (excluding private lands with no data, 12,406 acres) 6/15/07

Vegetative Cover Type	Acres	Percent
Grass/forb	3,593	6
Oak shrublands	8,564	14
Mountain shrublands	14,425	24
Pinion/juniper	1,990	3
Aspen	16,933	28
Aspen/conifer	10,647	18
Douglas-fir/white fir	16	<1
Spruce/fir	1,161	2
Willow	1,572	3
Cottonwood	1,264	2
Barren	12	<1
Water	3	<1
Total	60,181	100

Alternative 2

The major criteria used to measure effects to wildlife are shown in Table 84.

Table 84. Alternative 2 Details

Alternative 2 Details	Measure
Total length of corridor	39.0 miles
Acres within 100-foot utility corridor	440 acres
Acres within clearing width of access roads to be reconstructed	99 acres
Acres within one mile of utility corridor and access roads	45,859 acres
Miles that follow existing roads	35.8 miles
Miles that follow existing pipeline or powerlines	15.5 miles
Miles that access roadless areas	0 miles
Construction duration	26 weeks per season
Construction season	May 15 to Dec. 1*
Number of seasons	3

* Unless adverse weather conditions require shortened season

Direct and Indirect Effects

It is assumed that all vegetation within a 100-foot corridor would be removed (440 acres). Vegetation cover types are shown in Table 85. Vegetation reestablishment would be through seeding after construction, suckering from species like aspen adjacent to the corridor, and re-seeding in from adjacent areas. All road clearing widths in Alternative 2 are for two-lane roads.

Table 85. Vegetative Cover Types within the Alternative 2 100-foot Utility Corridor (6/15/07)

Vegetative Cover Type	Acres within the construction corridor	Percent in corridor	Acres within access road clearing width	Percent in clearing width
Grass/forb	64	15	9	9
Oak shrublands	92	21	21	21
Mountain shrublands	163	37	36	37
Pinion/juniper	12	3	2	2
Aspen	62	14	16	16
Aspen/conifer	23	5	5	5
Douglas-fir/white fir		0	0	0
Spruce/fir		0	0	0
Willow	23	5	9	9
Cottonwood	2	0	1	1
Barren		0	0	0
Water		0	0	0
Total	440	100	99	100

Activities associated with construction of the pipeline are likely to cause disturbance and displacement of some species, depending on season of activity. Table 86 shows the vegetation cover types within a one-mile buffer each side of the proposed corridor and access roads.

Table 86. Vegetative Cover Types within a 1-mile buffer along Alt 2 ROW and Access Roads (excluding private lands with no data, 17,350 acres) 6/15/07

Vegetative Cover Type	Acres	Percent
Grass/forb	6,232	14
Oak shrublands	9,474	21
Mountain shrublands	8,944	20
Pinion/juniper	2,677	6
Aspen	12,415	27
Aspen/conifer	4,393	10
Douglas-fir/white fir	9	<1
Spruce/fir	7	<1
Willow	1,225	3
Cottonwood	466	1
Barren	18	<1
Water		0
Total	45,859	100

Alternative 3

The major criteria used to measure effects to wildlife are shown in Table 87.

Table 87. Alternative 3 Details

Alternative 3 Details	Measure
Total length of corridor	32.4 miles
Acres within 100-foot utility corridor	394 acres
Acres within clearing width of access roads to be reconstructed	101 acres
Acres within one mile of utility corridor and access roads	50,748 acres
Miles that follow existing roads	25.4 miles
Miles that follow existing pipeline or powerlines	15.5 miles
Miles that access roadless areas	0 miles
Construction duration	26 weeks per season
Construction season	May 15 to Dec. 1*
Number of seasons	3

* Unless adverse weather conditions require shortened season

Direct and Indirect Effects

It is assumed that all vegetation within a 100-foot corridor would be removed (393 acres). Vegetation cover types are shown in Table 88. Vegetation reestablishment would be through seeding after construction, suckering from species like aspen adjacent to the corridor, and re-seeding in from adjacent areas.

Table 88. Vegetative Cover Types within the Alternative 3 100-foot Utility Corridor (6/15/07)

Vegetative Cover Type	Acres within the construction corridor	Percent in corridor	Acres within access road clearing width	Percent in clearing width
Grass/forb	44	11	10	9
Oak shrublands	88	22	21	21
Mountain shrublands	128	32	38	38
Pinion/juniper	13	3	2	2
Aspen	95	24	16	16
Aspen/conifer	23	6	5	5
Douglas-fir/white fir		0	0	0
Spruce/fir		0	0	0
Willow	3	1	9	9
Cottonwood		0	1	1

Barren	0	0	0	0
Water		0	0	0
Total	394	100	101	100

Activities associated with construction of the pipeline are likely to cause disturbance and displacement of some species, depending on season of activity. Table 89 shows the vegetation cover types within a one-mile buffer each side of the proposed corridor and access roads.

Table 89. Vegetative Cover Types within a 1-mile buffer along Alt 3 ROW and Access Roads (excluding private lands with no data, 17,346 acres) 6/15/07

Vegetative Cover Type	Acres	Percent
Grass/forb	6,323	12
Oak shrublands	10,502	21
Mountain shrublands	10,099	20
Pinion/juniper	2,669	5
Aspen	14,435	28
Aspen/conifer	4,959	10
Douglas-fir/white fir	9	<1
Spruce/fir	10	<1
Willow	1,260	2
Cottonwood	465	1
Barren	18	<1
Water		0
Total	50,748	100

Cumulative Effects

The cumulative effects analysis area for most species is the proposed corridor and access routes identified to be reconstructed along with a 1-mile buffer on each side. Species with different cumulative effects areas include lynx, wolverine and elk. Their respective cumulative effects areas are described in the individual species sections below. Effects of the past actions have already been incorporated into the existing conditions; a complete list of the past actions is found in the project record.

Ongoing activities on all ownerships include camping, hiking, hunting, OHV use on designated trail systems, road and trail maintenance, special uses, firewood cutting, livestock grazing and associated developments. There are two ongoing timber sales on the Rifle Ranger District, two on Paonia Ranger District and one on the Grand Valley Ranger District. Ongoing oil and gas actions are shown in FEIS Appendix P. On private lands, ongoing actions include water facilities such as ponds, ditches and canals for irrigation and a natural gas pipeline to hook private wells to an existing system (Henderson Lateral). Potential actions considered for the wildlife analysis are shown in FEIS Appendix P.

THREATENED AND ENDANGERED SPECIES

Canada Lynx

Lynx standards and guidelines (LCAS for GMUG and BLM and Forest Plan Standards & Guidelines for WRNF) are shown in FEIS Appendix I-2. LAUs accessed by pipeline corridors by alternative and by Forest are shown in Table 89. FEIS Appendix I-5 displays the LAUs. During mapping of landscape linkages, the Battlement Mesa linkage was identified. This linkage area connects the Grand Mesa to Battlement Mesa through non-lynx habitat (USDA Forest Service 2004a). Pipeline corridors in both Alternatives 2 and 3 cross the linkage area; an existing access road crosses the linkage area in the Proposed Action and Alternative 1. **FEIS Appendix I-5** displays the linkage area.

Table 90. Lynx Analysis Units and Linkages Crossed by Pipeline Corridors

Alternative	WRNF	GMUG
Proposed Action	Divide Creek LAU	Huntsman Mountain LAU Mule Park LAU
Alternative 1	Divide Creek LAU	Huntsman Mountain LAU Mule Park LAU
Alternative 2	Divide Creek LAU Battlement Mesa Linkage	Ruth Mountain LAU Mule Park LAU Battlement Mesa Linkage
Alternative 3	Divide Creek LAU Battlement Mesa Linkage	Ruth Mountain LAU Mule Park LAU Battlement Mesa Linkage

No Action Alternative - Direct and Indirect Effects

There would be no changes in habitat as a result of clearing for a pipeline corridor. LAUs would continue to provide habitat, as shown in Table 71 and FEIS Appendix I, Table I-2-4. FEIS Appendix I-5 displays the existing mapped lynx habitat in the project area.

General effects of action alternatives

The following potential effects to lynx include:

- Short-term direct effects during construction (visual or auditory disturbance or displacement of individuals from machinery, vehicles and humans)
- Long-term direct effects of mortality from traffic, shooting
- Long-term direct effects as a result of changes in vegetation, which potentially provides denning and foraging habitat

Lynx have been generally described as being generally tolerant of humans, including moderate levels of snowmobile traffic (Ruediger et al, 2000). In a lightly roaded study area in northcental Washington, logging roads did not appear to affect habitat use by lynx. In contrast, a study in the southern Canadian Rocky Mountains found that lynx crossed highways within their home range less than would be expected (Ruediger et al, 2000). It is predicted that with the levels of human activity and traffic associated with this project, there would be very minor displacement of any lynx that could be using the area.

Of the total 204 adult lynx that have been released, there are 66 known mortalities (CDOW 2005a). The cause of death is unknown for a third of these, but the two leading known causes of mortality are starvation and being hit by a vehicle. Speed has been identified as the primary factor contributing to vehicle-wildlife collisions (Gunther et al, 1998). None of the roads on the Forests are built as high-speed roads, and vehicle collisions are not expected to be an issue for this project. Mortality of lynx is not expected to increase as a result of any of the alternatives.

There would be no project activities during the winter, and increases in snow compaction are not an issue for this project.

Utility corridors can have both short and long term impacts to lynx habitats, depending on location, type (e.g., gas pipelines, power lines), vegetation clearing requirements, and maintenance access. The primary effect is to disrupt connectivity of lynx habitat. When located adjacent to highways and railroads, utility corridors can further widen the right-of-way, thus increasing the likelihood of impeding lynx movement (Ruediger et al, 2000). It is assumed that the entire 100-foot wide corridor would be cleared. Initially, any suitable lynx habitat would be changed to unsuitable as a result of this clearing. Vegetation with the 50-foot ROW would be managed as a grass/forb habitat over the long-term and would convert to non-habitat. Vegetation within the 50-foot temporary construction ROW could return to suitable habitat over time. Aspen and oak could re-sprout from existing roots, if compaction is not too great. Oakbrush could provide cover for a traveling lynx. Aspen sprouts would return the affected area to the other lynx habitat category within 5 to 10 years. Changes from suitable to unsuitable and non-habitat that are expected to occur are displayed in alternative discussions below.

Lynx breed in March and April in the north, and kittens are born in May and June in the Yukon (Ruediger et al, 2000). Den surveys in May and June 2005 in Colorado found kittens in the dens at that time (CDOW 2005a). Of the 16 dens surveyed in 2005 in Colorado all were found at high elevations from 10,226 to 11,765 feet. All of the project area is below these elevations, but potential denning habitat has been mapped by the Forests. Table 91 shows that amount of denning habitat potentially affected by alternative. Note: Denning habitat needs to be field verified. Only mapped denning habitat affected in the proposed action and alternative 1 has been field verified and found not to have the characteristics of true denning habitat.

Table 91. Denning Habitat by LAU and Alternative (based on mapped habitats)

LAU	**Total acres suitable habitat**	**Existing acres denning habitat**	**Existing percent denning habitat**	***PA acres denning habitat affected**	**Alt 1 acres denning habitat affected**	**Alt 2 acres denning habitat affected**	**Alt 3 acres denning habitat affected**
WRNF							
Divide Creek	30,123	11,689	39%	1.2	1.2	0	0
GMUG							
Huntsman Mountain	24,466	468	2%	1.1	1.1	na	na
Mule Park	24,268	2,564	11%	3.4	1.2	6.9	6.9
Ruth Mountain	22,459	8,307	37%	na	na	0	0

* Denning habitat needs to be field validated.

Proposed Action and Alternative 1 - Direct and Indirect Effects

Disturbance

Project activities would occur over three seasons, between May 15 and December 1, unless adverse weather conditions require shortened seasons. Construction activities will only occur during daylight hours. Lynx using the area would be affected during each construction season by the human activity occurring along the pipeline corridor. Increases in traffic associated with construction activities will also disturb lynx along the existing access roads (increases displayed in Transportation section). Lynx displacement is expected to be less than a mile away from activities. Levels of human activities will drop following completion of the pipeline, however traffic along the access roads is anticipated to remain elevated above existing levels as a result of improved roads. As no denning has been observed, and elevations in the project area are lower in elevation than known den sites, displacement would be of individual transitory lynx moving through the area.

Currently Unsuitable Habitat Condition

All of the LAUs are currently well below the 30% limit of unsuitable habitat standard (See Table 71). Table 102 displays the changes that will occur in lynx habitat as a result of pipeline construction for the Proposed Action. Table 101 displays these changes for Alternative 1. Initially suitable habitat will be changed to unsuitable habitat, lasting five to ten years. Over time a portion of the 100-ft ROW would become other lynx habitat. Effects of road clearing are not included because of the proximity to existing roads these areas are currently not providing functional lynx habitat. Neither the Proposed Action nor Alternative 1 would result in significant increases in unsuitable habitat.

Table 92. Acres of Changes in Habitat by LAU for Proposed Action (based on mapped habitats)

	NonHabitat	Denning	Other	Winter	Unsuitable	Grand Total
Huntsman Mountain	9.8	1.1	23.1	5.1		39.1
Mule Park	46.0	3.4	18.5	3.0		70.9
Divide Creek	75.8	1.2	20.6	2.9		100.6
Total	131.6	5.7	62.2	11.0	0.0	210.6
Short-Term Change						
Huntsman Mountain	9.8				29.4	39.1
Mule Park	46.0				24.9	70.9
Divide Creek	75.8				24.7	100.6
Total	131.6				79.0	210.6
Long-Term Change						
Huntsman Mountain	24.5		14.7			39.1
Mule Park	58.4		12.4			70.9
Divide Creek	88.2		12.4			100.6
Total	171.1	0.0	39.5	0.0	0.0	210.6

Table 93. Acres of Changes in Habitat by LAU for Alternative 1 (based on mapped habitats)

	NonHabitat	Denning	Other	Winter	Unsuitable	Grand Total
Huntsman Mountain	9.7	1.1	22.6	5.1		38.6
Mule Park	67.5	1.2	15.9	3.6		88.2
Divide Creek	52.6	1.2	22.3	2.1		78.2
Total	129.8	3.6	60.8	10.8	0.0	205.0
Short-Term Change						
Huntsman Mountain	9.7				28.9	38.6
Mule Park	67.5				20.7	88.2
Divide Creek	52.6				25.6	78.2
Total	129.8				75.2	205.0
Long-Term Change						
Huntsman Mountain	24.1		14.4			38.6
Mule Park	77.9		10.4			88.2
Divide Creek	65.4		12.8			78.2
Total	167.4	0.0	37.6	0.0	0.0	205.0

<u>Denning</u>

On the White River National Forest (WRNF) the project area lies in what was mapped as Divide Creek LAU. Much of this LAU (62%) was determined to be non-habitat; and the pipeline corridor mostly passes through nonhabitat and other habitat (mountain shrub and aspen habitats). However, the corridor does go through one 66-acre stand mapped as denning habitat. This stand is surrounded by non-habitat. The corridor would remove 1.2 acres of potential denning habitat, which would not change the overall amount of denning habitat in the Divide Creek LAU.

On the GMUG, the pipeline corridor passes through the edges of two LAUs. Huntsman Mountain LAU is currently below the 10% denning habitat standard. The proposed corridor for both the PA and Alt. 1 lies on the eastern edge of a patch of spruce-fir mapped as denning habitat and could remove 1.1 acres of this habitat. Field surveys of the stands during the summer 2006 determined where the proposed corridor is within these spruce-fir stands, it is very near the edge of the stand, adjacent to a large open meadow and the existing pipeline corridor. The spruce-fir habitat in this area does not contain much down woody debris and is not suitable for lynx denning habitat with its lack of security due to lack of cover and den sites. (J. Grode, USFS Wildlife Biologist, per. comm.)

The southern end of the pipeline corridor passes through Mule Park LAU. This stretch is dominated by oak shrublands and aspen (other and nonhabitat), but does cross one stand modeled as denning habitat. These alternative routes would remove 3.4 and 1.2 acres of denning habitat respectively in this LAU. Assuming these stands are denning habitat, the LAUs would still meet the minimum 10% denning habitat direction from the LCAS.

Landscape Linkage

A portion of the existing Owens Creek road passes through the Battlement Mesa linkage area, but the powerline corridor for the Proposed Action and Alternative 1 does not. These alternatives do not affect the Battlement Mesa linkage.

Alternative 2 and Alternative 3 -Direct and Indirect Effects

Disturbance

Project activities would occur over three seasons, between May 15 and December 1, unless adverse weather conditions require shortened seasons. Construction activities will only occur during daylight hours. Lynx using the area would be affected during each construction season by the human activity occurring along the access roads and pipeline corridor. Increases in traffic associated with construction activities are displayed in Transportation section. Lynx displacement is expected to be less than a mile away from activities. Levels of human activities will drop following completion of the pipeline, however traffic along the access roads is anticipated to remain elevated above existing levels as a result of improved roads. As no denning has been observed, and elevations in the project area are lower in elevation than known den sites, displacement would be of individual transitory lynx moving through the area. Alternative 2 is expected to have slightly less effect than Alternative 3 because the pipeline ROW follows the existing road access for more of the total length.

Currently Unsuitable Habitat Conditons

All of the LAUs are currently well below the 30% limit of unsuitable habitat standard (See Table 72). Table 103 displays the changes that will occur in lynx habitat as a result of pipeline construction for the Alternative 2. Table 103 displays these changes for Alternative 3. Initially suitable habitat will be changed to unsuitable habitat, lasting five to ten years. Over time a portion of the 100-ft ROW would become other lynx habitat. Effects of road clearing are included within the 100 ft ROW where they are coincident, and not included because of the proximity to existing roads these areas are currently not providing functional lynx habitat where the ROW deviates from the road alignment. Neither Alternative 2 nor Alternative 3 would result in significant increases in unsuitable habitat

Table 94. Acres of Changes in Habitat by LAU for Alternative 2 (based on mapped habitats)

	NonHabitat	Denning	Other	Winter	Unsuitable	Grand Total
Mule Park	114.4	6.9	32.4	1.7		155.4
Ruth Mountain	29.8		6.3			36.2
Divide Creek	26.7					26.7
Total	170.9	6.9	38.7	1.7	0.0	218.3
Short-Term Change						
Mule Park	114.4				41.0	155.4
Ruth Mountain	29.8				6.3	36.2
Divide Creek	26.7				0.0	26.7
Total	170.9				47.3	218.3
Long-Term Change						

Mule Park	134.9		20.5			155.4
Ruth Mountain	33.0		3.2			36.2
Divide Creek	26.7		0.0			26.7
Total	194.6	0.0	23.7	0.0	0.0	218.3

Table 95. Acres of Changes in Habitat by LAU for Alternative 3 (based on mapped habitats)

	NonHabitat	Denning	Other	Winter	Unsuitable	Grand Total
Mule Park	113.0	6.9	34.6	1.7		156.3
Ruth Mountain	53.3		9.7		0.6	63.6
Divide Creek	40.0					40.0
Total	206.3	6.9	44.3	1.7	0.6	259.9
Short-Term Change						
Mule Park	113.0				43.3	156.3
Ruth Mountain	53.3				10.3	63.6
Divide Creek	40.0				0.0	40.0
Total	206.3				53.6	259.9
Long-Term Change						
Mule Park	134.6		21.6			156.3
Ruth Mountain	58.5		5.2			63.6
Divide Creek	40.0		0.0			40.0
Total	233.1	0.0	26.8	0.0	0.0	259.9

Denning

On the White River National Forest (WRNF) these alternative corridors lie in what was mapped as Divide Creek LAU. All of the LAU accessed by these alternatives was determined to be non-habitat. No denning habitat is affected in this LAU (See Tables 91 and 95).

On the GMUG, the pipeline corridor passes through the edges of two LAUs. Ruth Mountain LAU lies on the north end, and the pipeline corridor passes through areas modeled as non-habitat, other habitat and a small amount of currently unsuitable habitat. The southern end of the pipeline corridor passes through Mule Park LAU. This stretch is dominated by oak shrublands and aspen, but does cross two stands modeled as denning habitat. These alternative routes would reduce denning habitat by 6.9 acres, but still meet the 10% minimum denning habitat direction from the LCAS.

Landscape Linkage

These alternatives bisect the Battlement Mesa linkage with both the ROW and the access roads. This linkage is mapped as a broad area of public lands from roughly Owens Creek west to Bald Mountain. Where the pipeline corridors cross this area, the vegetation is dominated by oak shrublands and grass/forb on the north and west aspect (GMUG), and mountain shrublands and pinion/juniper on the south aspects (WRNF). Vegetation within the construction corridor would be converted to grass/forb and over the long-term the 50 foot wide ROW would be maintained as grass/forb. Lynx are known to cross and/or use sage-steppe habitats within 25 miles of boreal forest in times of high prey densities (Ruediger et al, 2000). The access road is an existing road, which will be widened to a two lane width. Existing average daily traffic (ADT) counts for this section of road are 52. During construction this use is estimated to increase to 169 vehicles per day during daylight hours for the three construction seasons. Once construction is complete, ADT is expected to return to 50-60. These levels of traffic along the access road and the disturbance and vegetation alterations within the pipeline corridor would not create a barrier to movement or affect the suitability of the Battlement Mesa lynx linkage area.

Cumulative Effects

The cumulative effects analysis area for lynx is the combined LAUs potentially affected by any of the proposed corridors. Effects of past actions have already been incorporated into the existing condition for the LAUs.

Several ongoing and reasonably foreseeable future actions are common to all LAUs. These include recreational use, firewood cutting, road and trail maintenance, and livestock grazing. Since lynx have been shown to be generally tolerant of human activities, and these activities do not remove lynx habitat, they will not be factored in. Ongoing and reasonably foreseeable future actions that would be analyzed are shown in Table 96, in the appropriate LAU.

Table 96. Lynx Analysis Units or Linkage and Actions

LAU	Alternatives	Actions
Divide Creek LAU	All	Reservoir Park Salvage, approx 750 acres Flagpole salvage, 150 acres Horse Park salvage 75 acres (dead and dying spruce/fir) Delta exploration, 2 new wells and pads Camp Creek timber sale, approx 760 acres aspen and 1,458 acres spruce Hightower Mtn O&G (non-habitat) Hells Gulch 1 and 2 well, pads and access roads
Huntsman Mountain LAU	PA and Alt 1	None
Mule Park LAU	All	Henderson Lateral pipeline Sheep Gas pipeline Aspen timber sales
Ruth Mountain	Alt 2 and Alt 3	Hightower-Porter aspen timber sales (mapped as non-habitat)
Battlement Mesa Linkage	Alt 2 and 3	Hells Gulch 1 and 2 wells pads and access roads Hightower Master Development Plan (5 well pads, 1 mi. road const.)

Currently Unsuitable Habitat Conditions

Assuming that all areas mapped as lynx habitat become "currently unsuitable" following harvest or construction in Divide Creek LAU, approximately 2,608 acres of suitable habitat would be converted to unsuitable habitat. These acres, with those already in the currently unsuitable condition would result in 10% currently unsuitable habitat in the LAU. This is well below the 30% standard.

The Henderson Lateral pipeline and aspen timber sales are located in areas mapped as non-habitat in Mule Park LAU; no changes in suitable habitat would result. The portion of the Sheep gas pipeline in Mule Park LAU is within other and non-habitat so there will be no change in acres of unsuitable habitat due to this project.

There are no planned activities in Huntsman Mountain LAU, and areas affected in Ruth Mountain LAU are mapped as non habitat. There would be no change in acres of unsuitable habitat in either of these LAUs.

Denning

Divide Creek LAU has several other projects contributing to cumulative effects. Reservoir Park salvage includes approximately 500 acres of denning habitat; Flagpole salvage includes approximately 150 acres of denning habitat; Horse Park salvage includes approximately 30 acres of denning habitat; Camp Creek includes approximately 570 acres of denning habitat. Assuming that harvest in all of these units results in eliminative denning habitat, there would be a loss of 1,250 acres of denning habitat. This would result in 35% percent of the suitable habitat being denning habitat; still well above the 10% minimum standard.

None of the projects listed in Table 104 affect mapped denning habitat in Mule Park or Ruth Mountain LAUs.

Determination

This project has only minimal effects on the amount of currently unsuitable habitat and denning habitat in all of the LAUs. Implementation of any of the action alternatives would result in a "may affect – not likely to adversely affect" for lynx. This is based on isolation of denning habitat, no risk of increased mortality, minor increases in currently unsuitable habitat condition and minimal effect on availability of potential denning habitat.

SENSITIVE SPECIES

Boreal toad Direct and Indirect Effects

The following potential effects to boreal toads include:

- Short-term direct effects from construction (loss of individual adults, egg masses or juveniles)
- Loss of adults moving to or from breeding ponds, due to road traffic
- Impacts to water quality during construction

Young toads are restricted in distribution and movements by available aquatic habitat, while adults can move up to several miles away. Adult toads emerge from hibernacula in May (depending on snowmelt) and return in late August or early September. Most toads are in hibernation by October (Nesler and Goettl, 1994).

Adults may linger at breeding sites for up to several weeks, and then disperse. Larval development takes 2 months or more, depending on temperatures. Larvae commonly are present in the breeding ponds into August. Metamorphosis occurs primarily in August. Juveniles can often be found in wetlands adjacent to breeding sites (Hammerson 1999).

Potential effects to boreal toad are associated with reconstruction of access roads and pipeline construction. The first phase would be the clearing of vegetation within the corridor and installation of equipment bridges for equipment access to the working area. Equipment bridges may include clean rock fill over culverts, timber mats supported by flumes, railcar flatbeds, flexi-float apparatus, or other types of spans. Installation of the equipment bridges in wetlands could affect breeding habitats and eggs or larvae.

Several design features have been incorporated to reduce the potential for effects. Construction through ponded wetlands is to be avoided between May 1 and August 31 unless surveys in July find no evidence of amphibian use. Installation of pipeline crossings would be done later in the season, during low-flow periods (from August on). This would reduce the potential for effects to egg masses and larvae where water from the stream channel is put into a culvert. After installation of the pipe, riparian channels would be put back into place, and riparian vegetation is expected to quickly become re-established. Hazardous material would be stored in secure areas and stored 100 feet from water bodies or wetlands to prevent potential impacts from spills. See the Hydrology Report for more information on changes to water quality.

Suitability of the intermittent streams for boreal toads would vary by year, depending on snowmelt and spring rains. Based on the information from wetland surveys (Cirrus 2005, Cirrus 2007) on the Proposed Action route, there would be 5 acres of riparian/wetlands affected. Approximately half of this was identified as potential habitat for boreal toads. Alternative 2 follows Buzzard Creek, which has documented use by boreal toads. This alternative has the most stream crossings and the most potential for effects to boreal toad known and potential habitat. Stream crossings for each alternative are shown in Table 97.

Table 97. Stream crossings (includes all ownerships)

	PA	Alt 1	Alt 2	Alt 3
Perennial streams	6	6	9	5
Intermittent streams	97	70	97	61

Road 265, which follows Buzzard Creek, is expected to be reconstructed under alternatives 2 and 3. Traffic use is expected to increase from 33-75 ADT to approximately 270 ADT due to this project during the three construction seasons (May 15 to December 1, unless adverse weather conditions require shortened seasons). An indirect effect of this traffic increase is that adult toads that may be moving towards or away from breeding ponds in the Buzzard Creek drainage may be killed by road traffic.

The project activities associated with the Proposed Action or Alternative 1 corridors would not affect wetland areas with documented locations for these species.

Cumulative Effects

The cumulative effects analysis area for this species is the pipeline corridor and associated 1-mile buffer. Several ongoing and reasonably foreseeable future actions are common to all alternatives. These include recreational use (motorized and non-motorized), firewood cutting, road and trail maintenance, and livestock grazing. All of these activities have had some level of environmental analysis, and riparian and wetland habitats are managed through the use of BMPs.

Based on traffic counter data, traffic on Road 265 is currently an average of 60 vehicles per day (J.Grode, District Biologist, pers. comm.). The Hightower timber sale would be completed in the summer of 2006. Porter timber sale would start in 2007 and would take 2 to 3 years to complete harvest. The haul road used is close to Buzzard Creek and adjacent to boreal toad locations and there could be impacts to toads moving to or from breeding ponds. These additional activities are expected to add an additional 10-30 vehicles per day above those identified for the Bull Mountain pipeline project, bring the ADT up to approximately 300 ADT.

Livestock grazing is the most widespread activity that has the potential to affect breeding habitat for these species. Grazing can result in loss of riparian vegetation (foraging habitat and cover) and trampling of egg masses.

Of concern is the spread of *Batrachochytrium dendrobatidis*, a chytrid fungus that is believed to be the cause of the demise of several populations of boreal toads in Colorado. This fungus has been found in boreal toads in the Buzzard Creek drainage (CDOW 2004). Chytrid infection has been found in apparently healthy amphibians in many areas. It is not known what triggers it to cause lethal outbreaks and population declines (Ouellett et al, 2005). General preventive measures to prevent spread of the fungus to new sites are to remove wet or dried mud, vegetation and other debris from equipment, and then sterilize (either through bleach, Quat 128 or thoroughly drying). Only Alternative 2 includes perennial stream crossings on Buzzard Creek. Equipment used to work on this section of pipeline corridor should be thoroughly dried before moving into other drainages.

Determination

Implementation of the Proposed Action, or Alts 1 and 3 would result in a “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing” determination for boreal toads. This is based on the design features for riparian crossings to be done at low flow, and lack of known populations in the corridors. Individuals from the Buzzard Creek population could be impacted by traffic associated with these alternatives.

Alt 2 parallels and crosses a drainage used by boreal toads. The Buzzard Creek population is one of 37 known populations in the state Toads were originally sighted in 2002. Follow-up surveys found 2 adults in 2003, 2 adults in 2004 and one adult in 2005. In 2006, surveyors found a breeding site, with numerous tadpoles. This population will be considered a viable population for this analysis (based on worst-case scenario).

There are two known populations on the Grand Mesa unit, which includes the Buzzard Creek population. The Kannah Creek population is not considered a breeding population at this time as it does not meet the criteria for viable populations established in the Conservation Plan and Agreement (Loeffler 2001). Further analysis will be needed to determine if the Buzzard Creek population is actually a viable population (based on Conservation Plan criteria).

Adults may move more than 4 km (2.5 miles) away from water after breeding, and juveniles may disperse up to approximately 4 km from their natal sites (in Maxell 2000). The other known population (Kannah Creek) is approximately 24 miles to the west from Buzzard Creek. Historically, an individual dispersing from one breeding area would likely encounter another breeding site within a short distance (Carey et al, n.d.). Based on statewide surveys in Colorado that found historical populations gone or greatly reduced, individuals dispersing away from these two areas may not encounter another occupied breeding site due to the distance between them.

In 2005, the USFWS determined that the southern Rockies population was not a distinct population segment (USDI FWS 2005b). While Alternative 2, in combination with other activities may result in the loss of individuals from the population in Buzzard Creek, it would not lead to an overall loss of viability for the species in Colorado or across its range (which in western North America is from Canada and Alaska south into Colorado). It may, however, affect the viability of the species on the planning unit (Grand Mesa National Forest). This is because of the small number of individuals and distance of this population from other known populations. Because of this, the determination for Alt 2 would be “likely to result in a loss of viability in the Planning Area, or in a trend toward federal listing”.

Northern leopard frog Direct and Indirect Effects

The following potential effects to northern leopard frogs include:

- Short-term direct effects from construction (loss of individual adults, egg masses or juveniles)
- Impacts to water quality during construction

There are no known occupied sites in any of the four corridors, and effects are based on potential habitat.

Effects to northern leopard frog are similar to those described for boreal toad. The first phase would be the clearing of vegetation within the corridor and installation of equipment bridges for equipment access to the working area. Equipment bridges may include clean rock fill over culverts, timber mats supported by flumes, railcar flatbeds, flexi-float apparatus, or other types of spans. Installation of equipment bridges in ponds or wetlands could affect breeding habitats, eggs or larvae.

Several design features have been incorporated to reduce the potential for effects. Construction through ponded wetlands will be avoided May 1 to August 31 unless surveys in July find no evidence of amphibian use. Installation of pipeline crossings would be done later in the season, during low-flow periods (from August on). This would reduce the potential for effects to egg masses and larvae where water from the stream channel is put into a culvert. After installation of the pipe, riparian channels would be put back into place, and riparian vegetation is expected to quickly become re-established. Hazardous material would be stored in secure areas and stored 100 feet from water bodies or wetlands to prevent potential impacts from spills.

Cumulative Effects

The cumulative effects analysis area for northern leopard frog is the corridor and associated 1-mile buffers. Several ongoing and reasonably foreseeable future actions are common to all alternatives. These include recreational use (motorized and non-motorized), firewood cutting, road and trail maintenance, and livestock grazing. All of these activities have had some level of environmental analysis, and riparian and wetland habitats are managed through the use of BMPs.

Livestock grazing is the most widespread activity that has the potential to affect breeding habitat for these species. Grazing can result in loss of riparian vegetation (foraging habitat and cover) and trampling of egg masses.

Determination

Implementation of any of the action alternatives would result in a “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing” determination for the northern leopard frog. This is based on the design features for riparian crossings to be done at low flow and lack of observations in the area.

Wolverine Direct and Indirect Effects

Researchers have generally agreed that wolverine habitat is probably best defined in terms of adequate year-round food supplies (primarily large mammal carrion, along with berries, small mammals, beetles and insect larvae) in large, sparsely uninhabited areas, rather than in terms of topography or plant associations (Ruggerio et al, 1994).

Actions with the potential for effects are limited to disturbance during construction. This applies to disturbances in higher-value roadless habitats, as well as overall habitat. Length of time that construction takes is also a consideration. These criteria are displayed in Table 98.

Table 98. Effects criteria for wolverine

	PA	Alt 1	Alt 2	Alt 3
Miles of pipeline in roadless	8.6	8.5	0	0
Miles following existing roads	4.0	9.3	35.8	25.4
Construction duration per season	26 weeks	216 weeks	26 weeks	26 weeks
Number of seasons	3	3	3	3

The Proposed Action and Alternative 1 access about 8.5 miles of existing roadless areas. Disturbance during construction would occur during the summer and any wolverine that might be in the area would be expected to be displaced.

Under the Proposed Action and Alternative 1, road maintenance done to allow equipment into the area would result in improved road conditions on Road 268 (Owens Creek Road) which runs between several roadless areas. Traffic is expected to increase from less than 10 vehicles per day to 24 during construction. Improvement in this road would be expected to increase recreational use in these roadless areas. Much of the pipeline corridors for these alternatives follow existing pipeline corridors. The existing corridor does not show signs of extensive recreational use. Design features have been incorporated to reduce the potential for illegal motorized use along the corridor (logs and rock barriers scattered over corridor) following completion.

Human activities during pipeline monitoring would be done using non-motorized access. Maintenance activities may require occasional motorized access under special authorization which would have minimal effects to wolverine.

The corridors in alternatives 2 and 3 would not affect any inventoried roadless areas. All access roads used are existing and much of the pipeline length follows existing roads or existing powerline corridors, which currently provide lower-quality habitat.

Cumulative Effects

The cumulative effects analysis area for wolverines is the combination of roadless areas accessed by or adjacent to the proposed pipeline corridors. Disturbance is the main factor that has the potential to affect this species. Project activities would occur from May 15 to December 1 (unless adverse weather conditions result in shortened seasons) over three seasons for the PA and all alternatives.

Past actions located in unroaded areas are the Ragged Mountain pipeline (East Willow IRA in 1983) and the Rocky Mountain line (Reno Mountain IRA in 1961). These actions resulted in linear corridors that do not affect wolverine movements. None of the reasonable foreseeable site-specific actions are in unroaded areas, but ongoing activities such as recreation, hunting, and livestock grazing are continuing activities in the unroaded areas. Currently, summer recreational use is fairly low in the area, but ATV use is increasing. Motorized use is limited to existing roads and trails. Livestock grazing occurs during the summer and includes some riding/herding.

Camp Creek timber sale and the development of Bull Mountain Unit are actions that are expected to occur during the construction period (2007-2008). The Bull Mountain Unit is well south of the Forest boundary, in areas not expected to be used by wolverines. The Camp Creek timber sale has units dispersed across a wide area, and some harvest may occur during the same time period as pipeline construction. This would result in widespread disturbance to any wolverine that might be using the area (transitory or resident).

Determination

Implementation of the Proposed Action or Alternative 1 “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”. This is due to the presence of higher-quality secure habitats (roadless areas) but low potential for the area to be occupied by wolverine. Alternatives 2 and 3 would have “no impact” on wolverine habitat as activities occur along existing, open roads and there is a low potential for the area to be occupied by wolverine.

American marten Direct and Indirect Effects

Actions with the potential for effects to this species include:

- Short-term effects of disturbance during construction
- Short-term potential for loss of young during construction

- Long-term changes to habitat

Marten tend to be shy but occasionally appear fearless of humans and may approach closely (Ruggerio et al, 1994). They are active at various times of the day and night and appear to be flexible in their activity patterns. Activities associated with this project may cause avoidance or may result in changes in activity patterns.

Studies of home range size of male martens shows a range 16 km2 (Minnesota) to 0.8 km2 in Montana (Ruggerio et al, 1994). Overall, marten home ranges are large by mammalian standards. Female home ranges are smaller and home range size also varies based on prey abundance. Assuming a mid-range home range size (8 km2), that would be a home range size of approximately 3 square miles. Because this species appears to be generally tolerant of disturbance, and they would have abundant habitat outside of the corridor within their territory (Table 99), disturbance is not an issue for this species.

No new roads will be constructed under any alternatives, so there will not be any change in road densities. Road use, as a result of construction and construction activities will increase during the three seasons of construction. Roads can have a range of effects on martens, including mortalities from vehicle collisions, displacement of martens near active roads, facilitating human collection of fuel woods near roads, and increasing exposure of martens to pets and human foods (USDA Forest Service, 2005e). The increase in road use is not expected to have any significant effects on marten due to the low design speeds the time of use – daylight hours.

Denning habitat includes natal dens and maternal dens. Young are born in March and April in natal dens, but may be moved to other dens by their mother. They leave dens at about 50 days (Ruggerio et al, 1994). Young born in late April would leave dens around mid-June. Where spruce/fir stands are extensive enough, timing restrictions would be in place. Project activities would not begin until August 1st (unless raptor surveys find no nesting). Where work does begin earlier, there is some potential for loss of individual young during tree clearing, depending on the age and mobility of the young.

The greatest long-term effect for this species is the loss of spruce/fir forested habitat (10 to 13 acres). Under all alternatives, it would be less than one percent of the existing spruce/fir habitats within the 1-mile buffer.

Table 99. Acres of potential marten habitat*

Vegetative Cover Type	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Habitat in pipeline corridor	10	10	136	13
Habitat in 1-mile buffer	2,619	2,520	483	823

*Habitat is based on acres of mature spruce/fir

Marten make little use of early successional types as they lack overhead cover, high volumes of coarse woody debris, small-scale complex vegetation patterns and result in a conversion to a moist cool site to a warm, dry site (and changes in prey densities) (Ruggerio et al, 1994). Martens would generally avoid forest openings, but studies have found them crossing openings of 10m (Spencer et al, 1983), to 40 m (Simon 1980) to 100 m (Koehler and Hornocker 1977) (in Ruggerio et al, 1994). Maximum width of any of the pipeline corridors in 100 feet (30 m) and the opening should not be a barrier to movements.

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor. None of the ongoing or reasonably foreseeable timber harvest is in spruce/fir cover types within the 1-mile buffers of any of the alternatives.

Determination

Implementation of any of the alternatives “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”. This is due to the small acreage of potential habitat affected and that the corridor is not expected to be a barrier to movements.

Fringed myotis Direct and Indirect Effects

Actions with the potential to affect this species or habitat include:

- Short-term disturbance during construction
- Long-term changes in habitat

Because suitable tree roosting habitat consists of largely late-successional pinion and ponderosa pine, there is no high-quality roosting habitat in the project area. Stands of pinion/juniper, oak shrublands, spruce/fir and aspen are composed of smaller diameter trees and lack bark suitable to provide roosting sites (lack platy bark that provide crevices for roosting). Loss of roosting habitat is not an issue. Because the corridors and the 1-mile disturbance buffer lack suitable roosting habitat, disturbance is not an issue either.

Females at maternity colonies are sensitive to disturbance, but there are no suitable caves, abandoned mines or buildings along the corridors. Disturbance of maternity colonies is not an issue.

Over the long-term, the corridor could provide foraging habitat for individuals roosting in other areas. However, because of the distance from suitable roosting habitat, the potential of this is low.

Implementation of any of the alternatives would have no impact on this species or its habitat.

Cumulative Effects

Because there are no direct or indirect effects, there are no cumulative effects.

Determination

Implementation of any of the alternatives would have “no impact” due to the lack of suitable roosting habitat in the corridors and low potential for indivudals to utilize potential foraging habitat in the project area.

Pygmy shrew Direct and Indirect Effects

Actions with the potential to affect this species or habitat include:

- Short-term potential for loss of individuals during construction
- Long-term changes to habitat

Pygmy shrews reproduce only once, at about 10 months of age, which means that populations turn over almost completely within one year and are rather vulnerable to disturbance. Patches of suitable habitat are naturally rare and fragmented. Pygmy shrews cannot move long distances to access such patches. Ground-disturbing actions that may appear minor to larger species (and to human resource managers), such as road beds, patch cuts, powerline corridors, or plowed fields, may represent significant barriers to pygmy shrews. It is likely that the combination of habitat specialization, prey specialization, and reduced movement capabilities predisposes pygmy shrew populations to fragmentation (Beauvais and McCumber 2006)

Because all access roads are currently existing, and road locations currently do not provide any suitable habitat for this species, there should be no new impacts to pygmy shrews associated with road reconstruction.

Because of this species' affinity for edges along wet and dry areas within spruce/fir habitats, potentially suitable habitat is limited in the project because spruce/fir habitats are limited to the Spruce Mountain area. Project design features to avoid construction in wetland areas until after August will provide some protection of potential habitat for this species.

Cumulative Effects

The cumulative effects analysis area for this species is the ROW corridor due to the limited mobility of this species. There would be no further cumulative effects analysis for this species.

Determination

Implementation of any of the alternatives "may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing". This is because very limited potential habitat will be affected by this project; design features should limit potential effects.

Northern goshawk Direct and Indirect Effects

Actions with the potential for effects to this species include:

- short-term effects of disturbance during construction
- short-term potential for loss of young during construction
- long-term changes to habitat

Kennedy (2003) identifies several of the major threats influencing the viability of goshawks in Region 2 as habitat alteration and direct human disturbance. Human disturbances to goshawk nests have been a suspected cause of nest abandonment (Reynolds et al, 1992). Alternate nests are used commonly, but Crocker-Bedford found yearly nest tree fidelity remained at 67% in uncut forests, while treated units dropped to 15-20%, even with no-cut buffers around the nests (USDA Forest Service, 2005f).

The nearest known nest territory is over 2.3 miles from any of the proposed corridors or access roads. Project design features include avoiding construction in aspen, aspen/conifer and spruce/fir stands until August 1 or completing raptor surveys prior to construction in these habitats to determine no occupied raptor nests are present. This design feature would help reduce the potential for loss of young during nesting as a result of clearing in the corridor or nest abandonment due to disturbance. Activities associated with this project would have no effect on these known territories, if they were occupied.

Table 100 shows the amount of potential goshawk nesting habitat within the pipeline corridor. Over the long-term, the corridors would not provide nesting habitat but could provide foraging habitat.

Table 100. Potential northern goshawk habitat* within construction ROWs

Vegetative Cover Type	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Habitat in corridor	36	25	48	79
Habitat in 1-mile buffer	12,563	12,193	7,714	9,542

*Habitat is based on mature aspen, spruce/fir and aspen/conifer

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor. There are approximately 159 acres of aspen harvest ongoing or planned within the buffer for PA and Alt 1 (Camp Creek Timber Sale). This project is expected to be implemented in 2007-2008 and pipeline construction could overlap in time with this project. The corridor is 2.3 miles from the nearest known goshawk nesting territory, and should not contribute cumulative effects to this territory.

The corridor for Alt 2 and 3 intersect portions of the Hightower and Porter aspen sales. The Hightower sale cut 174 acres from 2003 to 2006. The Porter Mountain sale would cut 400 acres of aspen in the area. Assuming all 574 acres are within the 1-mile buffer of the Alternative 2 and 3 corridors (worst case), this would result in a decrease of 2% of the suitable habitat. These corridors are 3.7 miles from the nearest known goshawk territory, and should not contribute cumulative effects to this territory.

Determination

Implementation of any of the alternatives “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”. This is based on the small amount of potential habitat affected, and design features for implementing a seasonal restriction in suitable habitats unless surveys find no occupied territories, and the fact that goshawk are widely distributed across the GMUG in suitable habitats (USDA Forest Service, 2005f).

Boreal owl Direct and Indirect Effects

Actions with the potential for effects to this species include:

- short-term effects of disturbance during construction
- short-term potential for loss of young during construction
- long-term changes to habitat

Boreal owls tolerate human and machine noise. There is no evidence that disturbance is an important factor in nest loss or owl movements (Hayward and Verner 1994).

The breeding season for boreal owls begins early. and nest occupancy begins in mid to late April for boreal owls in Idaho. In Colorado, nests with young have been observed through early July (Kingery 1998).

Project design features include avoiding construction in aspen/conifer and spruce/fir stands until August 1 or completing surveys for owls prior to construction in these habitats. This design feature would help reduce the potential for loss of young during nesting as a result of clearing in the corridor.

Habitat requirements of mature spruce/fir forests for boreal owl are similar to American marten. Table 99 shows the amount of habitat affected within the corridor. Currently, the stand structure may provide nesting habitat. Over the long-term, the corridors would not provide nesting habitat. They could provide foraging habitat once the area is re-vegetated and rocks and logs provide cover for small mammals.

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor. None of the ongoing or reasonably foreseeable timber harvest is in spruce/fir cover types within the 1-mile buffers of any of the alternatives.

Determination

Implementation of any of the alternatives “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”. This is based on the small amount of potential habitat affected, and design features for implementing a seasonal restriction in suitable habitats unless surveys find no occupied nesting territories.

Flammulated owl Direct and Indirect Effects

Actions with the potential for effects to this species include:

- short-term effects of disturbance during construction
- short-term potential for loss of young during construction
- long-term changes to habitat

These owls are very tolerant of humans, nesting close to occupied areas and tolerating observation by flashlight at night. The effects of mechanical disturbance have not been assessed, but moderate disturbance may not have an adverse impact on the species (Hayward and Verner, 1994).

Territory occupancy began in May for flammulated owls in Colorado and young fledged in July (Reynolds and Linkhart, 1986). Project design features include surveying suitable habitat and construction activities would be prohibited within 0.25 miles of an active nest until July 31st. This design feature would help reduce the potential for loss of young during nesting as a result of clearing in the corridor.

Table 101 shows the amount of habitat affected within the corridor. Currently, the stand structure may provide nesting habitat. Over the long-term, the corridors would not provide nesting habitat. They could provide foraging habitat where owls could hunts for moth and other insects.

Table 101. Potential flammulated owl habitat* within construction ROWs

Vegetative Cover Type	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Habitat in corridors	41	33	43	73
Habitat in 1-mile buffer	11,530	11,138	7,494	8,992

*Habitat based on mature aspen

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor. There are approximately 159 acres of aspen harvest ongoing or planned within the buffer for PA and Alt 1 (Camp Creek Timber Sale). This project is expected to be implemented in 2007-2008 and pipeline construction could overlap in time with this project. Assuming all 159 acres, along with acres from these alternatives are suitable habitat, there would be a loss of 214 acres of habitat within the 1-mile buffer. This would result in a decrease of 1% in the analysis area.

The corridor for Alt 2 and 3 intersect portions of the Hightower and Porter aspen sales. The Hightower sale cut 174 acres from 2003 to 2006. The Porter Mountain sale would cut 400 acres of aspen in the area. Assuming all 574 acres are within the 1-mile buffer of the Alternative 2 and 3 corridors (worst case), when combined with this proposal, there would be a decrease of 2% to 3% of the suitable habitat.

Determination

Implementation of any of the alternatives “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”. This is based on the small amount of potential habitat affected, and design features for implementing a seasonal restriction in suitable habitats unless surveys find no occupied territories.

Olive-sided flycatcher Direct and Indirect Effects

Actions with the potential for effects to this species include:

- short-term effects of disturbance during construction
- short-term potential for loss of young during construction
- long-term changes to habitat

The nest-building through fledging period runs from about June 5 through August 2 for this species (Kingery 1998). This species is associated with spruce/fir habitats, similar to martens (Table 99). These habitats may be avoided until August 1st (unless surveys are done and find no use by raptors), so loss of nests during ROW clearing may not occur. If ROW clearing does occur before August 1st, nests in the 10 to 13 acres of spruce/fir would be lost. Acres within the corridor would be lost as nesting habitat over the long-term, but would provide areas for foraging on insects in the future.

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor. None of the ongoing or reasonably foreseeable timber harvest is in spruce/fir cover types within the 1-mile buffers of any of the alternatives.

Determination

Implementation of any of the alternatives “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”. This is due to the small number of acres of habitat affected, both for short-term direct effects, and long-term indirect effects of loss of habitat.

Lewis’ woodpecker Direct and Indirect Effects

Actions with the potential for effects to this species include:

- short-term effects of disturbance during construction
- short-term potential for loss of young during construction
- long-term changes to habitat

Potential habitats present in the project area include cottonwood riparian forests. The nest-building through fledging period runs from about April 16 through August 4 for this species (Kingery 1998). Because these are lower elevation areas, project activities may begin here earlier in the season. If disturbance occurs during the nest selection period, birds may be displaced into nesting in adjacent areas. If nest sites are already selected and egg-laying has occurred, nest abandonment and loss of young immediately adjacent to corridors or access roads could occur. There is also potential for loss of nest cavities with eggs or young due to clearing of the corridor. However, the potential for these effects is low due to the low number of acres of habitat affected (Table 102).

Acres shown in Table 102 below over-estimate effects to cottonwood habitats, as efforts would be made to minimize clearing of riparian vegetation. However, these are only a small part of the acres in the Proposed Action and Alternative 1, and overall acres are low for all alternatives.

Table 102. Potential Lewis’ woodpecker habitat* within construction ROWs

Vegetative Cover Type	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Habitat in corridor	10	10	2	2
Habitat in 1-mile buffer	1,414	1,210	348	347

*Habitat based on mature cottonwood

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor. Most ongoing and reasonably foreseeable actions are not focused on cottonwood habitats, except for livestock grazing in both types, and recreational use in cottonwood types. These activities should not affect availability or suitability of trees for nesting.

Determination

Implementation of any of the alternatives “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”.

American three-toed woodpecker Direct and Indirect Effects

Actions with the potential for effects to this species include:

- short-term effects of disturbance during construction
- short-term potential for loss of young during construction
- long-term changes to habitat

The nest-building through fledging period runs from about June 26 through August 19 for this species (Kingery 1998).This species is associated with spruce/fir habitats, similar to martens (Table 99). These habitats may be avoided until August 1st (unless surveys are done and find no use by raptors or owls), so loss of nests during ROW clearing may not occur. If ROW clearing does occur before August 1st, nests in the 10 to 13 acres of spruce/fir would be lost. Acres within the corridor would be lost as nesting and foraging habitat over the long-term.

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor. None of the ongoing or reasonably foreseeable timber harvest is in spruce/fir cover types within the 1-mile buffers of any of the alternatives.

Determination

Implementation of any of the alternatives "may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing". This is due to the small number of acres of habitat affected, both for short-term direct effects, and long-term indirect effects of loss of habitat.

Purple martin Direct and Indirect Effects

Actions with the potential for effects to this species include:

- short-term effects of disturbance during construction
- short-term potential for loss of young during construction
- long-term changes to habitat

The nest-building through fledging period runs from about June 6 through July 31 for this species (Kingery 1998). This species uses aspen habitats, similar to flammulated owls (Table 101). These habitats may be avoided until August 1st (unless surveys are done and find no use by raptors or owls), so loss of nests during ROW clearing may not occur. If ROW clearing does occur before August 1st, nests in the affected acres of aspen would be lost. Acres within the corridor would be lost as nesting habitat over the long-term, but would provide areas for foraging on insects.

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor. There are approximately 159 acres of aspen harvest ongoing or planned within the buffer for PA and Alt 1 (Camp Creek Timber Sale). This project is expected to be implemented in 2007-2008 and pipeline construction could overlap in time with this project. Assuming all 159 acres, along with acres from these alternatives are suitable habitat, there would be a loss of 214 acres of habitat within the 1-mile buffer. This would result in a decrease of 1% in the analysis area.

The corridor for Alt 2 and 3 intersect portions of the Hightower and Porter aspen sales. The Hightower sale cut 174 acres from 2003 to 2006. The Porter Mountain sale would cut 400 acres of aspen in the area. Assuming all 574 acres are within the 1-mile buffer of the Alternative 2 and 3 corridors (worst case), when combined with this proposal, there would be a decrease of 2% to 3% of the suitable habitat.

Determination

Implementation of any of the alternatives “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”.

Brewer’s sparrow Direct and Indirect Effects

Actions with the potential for effects to this species include:

- short-term effects of disturbance during construction
- short-term potential for loss of young during construction
- long-term changes to habitat due to fragmentation and increases in invasive plant species

Brewer’s sparrow is a migrant, arriving in sagebrush and mixed mountain shrub habitats on the GMUG and WRNF in mid-April. Nesting season extends from mid-April to early August, with most nesting activity concentrated between mid-May and late July (USDA Forest Service, 2005g). Table 112 displays the potential habitat for Brewer’s sparrow that occurs within the ROW corridor and within the 1-mile buffer along access roads and corridors, for each alternative.

Table 103. Potential Brewer’s sparrow habitat* within construction ROWs

Vegetative Cover Type	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Habitat in corridor	107	109	90	80
Habitat in 1-mile buffer	14,134	13,563	7,298	8.478

*Habitat based on sagebrush and mountain shrub with sagebrush habitats

Holmes and Johnson (2005) compiled research indicting that energy development and natural resource extraction directly alter sagebrush habitats at the site of operation. Associated road networks, pipelines, and power transmission corridors fragment habitat and/or create soil conditions facilitating the spread of invasive species. The density of sagebrush-obligate birds within 100 m of roads constructed for natural gas development can be 50 percent lower than at greater distances.

Clearing of the ROW corridor will result in direct loss and fragmentation of sagebrush habitat. Active nests may also be disturbed within the corridor and up to 100 m away. No new roads will be constructed as a result of this project.

Design criteria to seed disturbed areas and requirements to monitor and treat invasive plant species along the ROW corridor are intended to reduce potential loss of habitat due to invasive plant species.

Cumulative Effects

The cumulative effects area for Brewer’s sparrow is the 1-mile buffer along the corridor and access roads. Additional energy related activities (Henderson Lateral pipeline, Sheep gas pipeline, Hells Gulch 1 and 2 well pads and access roads) will affect additional areas of sagebrush habitats on the north and south ends of the cumulative effects area.

Determination

Implementation of any of the alternatives “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”.

Great Basin silverspot Direct and Indirect Effects

Actions with the potential for effects to this species include:

- short-term potential for loss of caterpillars and host plants during construction
- long-term changes to habitat

These butterflies are active from mid-July to mid-October, which overlaps with the construction season. Caterpillars use violets in areas around seeps and springs. Project design features include minimized clearing in riparian areas, and doing crossings at low-flow.

Over the long-term, foraging habitat for adults (thistles and milkweeds) would likely increase, as thistles are abundant along the existing pipeline corridor.

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor.

Livestock grazing is the most widespread activity that has the potential to affect breeding habitat for these species. Grazing can result in loss of riparian vegetation (foraging habitat and cover) and trampling of egg masses or caterpillars.

Determination

Implementation of any of the alternatives “may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing”.

Great Basin spadefoot toad Direct and Indirect Effects

The following potential effects to Great Basin spadefoot toads include:

- short-term direct effects from construction (loss of individual adults, egg masses or juveniles)
- impacts to water quality during construction

Effects for this species are limited to the direct effects during construction. Project design features include narrowing down clearing and the area of vegetation affected. Riparian channels would be put back into place, and riparian vegetation is expected to quickly become re-established. Crossings would be done during low-flow periods which would reduce the potential for effects. The numbers of stream crossings that may affect habitat for this species are much lower than those displayed in Table 97, as this species uses lower elevations in pinion/juniper habitats. Suitability of the intermittent drainages would vary by year, depending on snowmelt and spring rains. The Proposed Action has 6 stream crossings, Alt 1 has 3, and Alts 2 and 3 have 8 stream crossings in pinion/juniper habitats.

Hazardous material would be stored in secure areas and stored 100 feet from water bodies or wetlands to prevent spills from affecting water quality.

The greatest potential for effects is crushing of adults or young toads after they move out of the riparian habitat. A design feature has been incorporated to reduce the potential for these effects. Construction through ponded wetlands is to be avoided May 1 to August 31 unless surveys in July find no evidence of amphibian use. There is still some potential for effects as equipment may still cross through habitat to access other sections of the corridor, and there could be juveniles or adults that could be crushed later in the season. However, the design feature should reduce the potential for effects during the most critical period, when the greatest numbers of individuals are concentrated in wet habitats.

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor. Livestock grazing is the most widespread activity that has the potential to affect breeding habitat for these species. Grazing can result in loss of riparian vegetation (foraging habitat and cover) and trampling of egg masses.

Determination

Implementation of any of the alternatives "may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing".

Midget-faded rattlesnake Direct and Indirect Effects

The following potential effects to the midget-faded rattlesnake include:

- short-term direct effects from construction (loss of individuals)

This species is associated with habitats similar to the Virginia's warbler (see MIS section). There is the potential for loss of individuals during construction. However, because of the small proportion of suitable habitat that would be affected within the 1-mile buffer, effects should be minimal.

Project design features include placement of rocks, and logs on the corridor to discourage motorized use following construction. These habitat components would provide cover for this species.

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor.

Determination

Implementation of any of the alternatives "may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing".

MANAGEMENT INDICATOR SPECIES

Elk Direct and Indirect Effects

The following potential effects to elk include:

- short-term direct effects during construction (visual or auditory disturbance or displacement of individuals away from machinery, vehicles and humans)
    - calving season/elk production areas (May 15 to June 20)
    - summer concentration areas (June 16 to October 14)
- long-term direct effects as a result of changes in forage and cover
- long-term indirect effects as a result of changes in human use in the area

No project activities would occur during winter and effects of disturbance during winter are not analyzed.

The analysis for disturbance focuses on effects to elk in production areas and summer concentration areas, as mapped by CDOW. Elk production areas are part of the overall range occupied by female elk from mid May to mid June for calving. Only known areas are mapped. Summer concentration areas are areas where elk concentrate from mid-June through mid-August. High quality forage, security, and lack of disturbance are characteristics of these areas to meet the high energy demands of lactation, calf rearing, antler growth, and general preparations for the rigors of fall and winter. These maps are updated every four years.

Declines in elk use of habitat adjacent to forest roads have been documented in many studies (Lyon 1979; Rowland et al, 2000). A study of elk in relation to logging disturbances found that there was a buffer zone of 500 to 1,000 meters (1,640-3,280 feet) separating areas of high elk use from areas of disturbance (Edge and Marcum, 1985). Another study looked at reproductive success of elk following disturbance by humans during calving season (Phillips and Alldredge, 2000). They found that elk subjected to human-induced disturbance through a 3-4 week period during calving season over two years showed lower calf survival. Generally, habitats provide more effective security the further they are from roads. Considering documented road avoidance by elk, the minimum distance between secure habitats and an open road is ½ mile (Hillis et al, 1991).

Efforts have been made to avoid construction in elk production areas during calving, but the whole project area is elk habitat, and elk are expected to be displaced during project activities. Numerous studies have shown that elk would move back into an area once the disturbance is over and the displacement would be temporary.

Currently, summer recreational use is fairly low in the area, but ATV use is increasing. Motorized use is limited to existing roads and trails. Access roads used in all alternatives would be improved and summer recreational use could increase over the long-term. A design feature for placement of logs and rocks in the corridor during reclamation to discourage motorized use has been incorporated.

Project activities may continue until December 1 for all alternatives unless adverse weather conditions require shortened seasons. Elk could be displaced from the project area prior to the beginning of hunting season. Roadless areas generally provide secure habitats and elk would be expected to resume use of these areas after construction activities cease.

Table 104 shows the miles of corridor within elk production areas, and acres of elk production areas and summer concentration areas accessed or within 1-mile of the corridors and access roads, by alternative. Appendix I-6 displays elk production and summer concentration areas in relationship to the 1-mile buffer along corridors and access roads.

Areas within ½-mile are expected to have reduced suitability and elk would be displaced, due to disturbance from project activities.

Table 104. Elk production areas and summer concentration areas*

Elk habitat	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Elk production areas	Seasonal restriction on 1.6 miles; 4,330 acres within ½ mile of corridor/roads	Seasonal restriction on 1.6 miles; 4,046 acres within ½ mile of corridor/roads	Crosses 4.5 miles but on open road, no additional displacement expected 1,709 acres within ½ mile of corridor/roads	Crosses 4.5 miles but on open road, no additional displacement expected 2,215 acres within ½ mile of corridor/roads
Summer concentration areas	1,517 acres within ½ mile of corridor/road	1,517 acres within ½ mile of corridor/road	515 acres within ½ mile of corridor/road	515 acres within ½ mile of corridor/road

*Based on habitat mapped by CDOW

Only a small number of acres of elk severe winter habitat occurs within the project area; however, no project activities would occur during the winter period so effects on winter range are not analyzed.

Proposed Action and Alternative 1 Direct and Indirect Effects

Appendix I-6 displays the elk production areas (calving) crossed by the PA/Alt 1 corridors and access roads. A seasonal restriction (May 15 to June 20) would be applied to about 1.6 miles along these routes and disturbance to this area would be avoided during calving season. An estimated 4,330 of elk production areas within one-half mile of access roads and corridor for the proposed action would be influenced by project activities. Approximately 4,046 acres of elk production areas within one-half mile of access roads and corridor for alternative one would be influenced.

CDOW has also mapped elk summer concentration areas. The PA/Alt 1 corridor passes through about 1.8 miles of mapped summer concentration areas. If effects were felt out ½ mile each direction from the corridor and access roads, there would be approximately 1,517 acres of the mapped summer concentration areas that would not be effective habitat due to disturbance.

Because elk are very adaptable, and use a wide variety of habitats, the conversion of existing vegetation to a grass/forb cover type would not have any measurable effects. Creation of the corridor, especially where adjacent to the existing corridor, would create a wider open area without vegetative cover. Instead cover would be provided by horizontal and vertical bends in the corridor. Vulnerability to hunters could increase in the corridor, but abundant cover is found immediately adjacent to most of the corridor.

The elk population estimate for this DAU, based on 2004 post hunting statistics, was 11,570 elk, while the objective is 10,500. Because this area is well over the population objective, the potential increase in vulnerability to hunters as a result of the loss of cover is not expected to be an issue.

Under the Proposed Action and Alternative 1, road maintenance done to allow equipment in to the area would result in improvement of road conditions. Road 268 (Dry Owens Road) provides access to roadless areas improvement in this road could increase recreational use in these roadless areas and mapped elk production areas and summer concentration areas. Much of the proposed corridors follow existing corridors though this area. The existing corridor does not show signs of extensive recreational use. Design features to reduce illegal motorized use along the corridor have been incorporated (logs and rock barriers to be placed in corridor to discourage use).

Alternative 2 and Alternative 3 Direct and Indirect Effects

The corridor for Alternative 2 crosses approximately 4.5 miles of mapped elk production areas. However, this section follows an existing, open, major access road (Rd 265) and no calving season restrictions would apply. It also is within ½ mile of approximately 1,709 acres of elk production areas. Alternative 3 also crosses one additional short section of elk production area, and is within ½ of approximately 2,215 acres of elk production areas. However, the corridor follows an existing powerline corridor and an open, existing designated route. No seasonal restrictions would apply to this route.

Corridors for Alternatives 2 and 3 do not pass through mapped summer concentration areas. Both alternatives lie within ½ mile of 515 acres of summer concentration area. Some displacement of elk could from these areas during construction activities.

Because elk are very adaptable, and use a wide variety of habitats, the conversion of existing vegetation to a grass/forb cover type would not have any measurable effects. Creation of the corridors for these alternatives follows existing roads and powerline corridors. Because of use along these roads during hunting season, elk may already be displaced from the area and vulnerability would not increase as a result of the loss of cover in the corridor.

Cumulative Effects

The cumulative effects analysis area for elk is a combination of 12 6th code HUCs (see **Appendix A-Figure 9**. This area is approximately 260,728 acres. Because activities associated with this project would occur from May 15 to December 1 unless adverse weather conditions require shortened seasons, elk production areas and elk summer concentration areas would be affected. CDOW has mapped 35,918 acres of elk production areas within this area (or 14% of the area). 75% of the area has been identified as summer range; 40,275 acres (or 15%of the area) has been mapped as summer concentration areas.

Most projects listed in Table 105 lie within the elk cumulative effects analysis area. All of the Horse Park project and approximately 490 acres of the Camp Creek timber sale and 30 acres of Reservoir Park salvage lie within elk production areas in West Divide Creek above Alkali Creek watershed. There are also approximately 200 acres of harvest from Reservoir Park salvage in elk summer concentration areas.

Table 105 shows the acres of mapped elk production areas and summer concentration areas by watershed and how many acres would be affected by each identified project. Activities associated with the oil and gas projects would have more effect on disturbance, rather than changes in acres of habitat and are discussed later. Several areas of severe winter habitat occurs within the cumulative effects analysis area for elk. There are several projects listed in Table 105 that are located in winter habitat, but there would be no overlap in timing and very little measurable change in habitat quality.

Table 105. Elk production areas and summer concentration areas affected by other actions*

Watershed	Acres existing elk production areas	Acres elk production areas affected	Acres existing summer concentration areas	Acres summer concentration areas affected
Alkali Creek, Hightower Mtn O&G project, WAPA, Hell's Gulch North Phase 1, Rifle burn blocks	320	160	0	0
Clear Fk E Muddy Creek	725	0	85	0
Headwaters W Divide Creek, Delta exploration	4,767	0	13,665	0
Lower Buzzard Creek, WAPA fuels reduction	5,255	0	4,412	0
Lower E Muddy Creek, Bull Mountain unit	222	0	0	0
Road Gulch	164	0	1,477	0
Upper Buzzard Creek, Porter Mtn timber sale	13,361	0	14,921	400
W Divide Creek above Alkali Creek, Horse Park salvage, Flagpole salvage, Camp Creek timber sale, Reservoir Park salvage, DCU wells and pad	3,266	595	0	
W Divide Creek above L Muddy, Camp Creek timber sale,	7,838	0	5,715	0
Total	35,918	595	40,275	400

*Based on habitat mapped by CDOW

Ongoing oil and gas activities shown in Table 106 are expected to be completed by the time that this project would begin. Reasonably foreseeable oil and gas activities are concentrated at the lower elevations on the south and north ends of the corridors, predominately in winter range areas. Because none of the activities associated with this project would occur in the winter when elk would be in these areas, no cumulative effects from these future actions are expected.

Summary and Conclusion

As mentioned above, the estimated population of elk within the DAU is above objective population levels The negative effects from this project are of short duration and magnitude and are not expected to result in a Forest-wide decrease in population or habitat trends nor deter from meeting the MIS objectives in the Forest Plans.

<u>Merriam's wild turkey Direct and Indirect Effects</u>

Actions with the potential for effects to this species include:

- short-term effects of disturbance during construction
- short-term potential for loss of young during construction
- long-term changes to habitat

The nest-building through fledging period runs from about June 28 through October 8 for this species (Kingery 1998). Individual nests with eggs could be lost during clearing of the ROW corridors (Table 106). However, the young are able to leave the nest within 12-24 hours (NWTF 2006) and young should not be trampled during clearing activities. Over the long-term, nesting and night roosting habitat would be lost in the corridor but it could still provide foraging habitat.

Spring and fall turkey hunting season would overlap with project activities. Because of the large amount of traffic associated with the proposal, hunters may choose to hunt in other areas for the 1 three seasons affected by pipeline construction.

Table 106. Potential wild turkey habitat* within construction ROWs

Vegetative Cover Type	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Habitat in corridor	99	101	104	101
Habitat in 1-mile buffer	12,148	11,352	12,439	13,458

*Habitat based on oak shrublands, pinion/juniper and cottonwood

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor. Most ongoing and reasonably foreseeable actions are not focused on cottonwood, pinion/juniper or oak shrubland habitats, except for livestock grazing, and recreational use in cottonwood types. These activities should not affect availability or suitability of trees for roosting or foraging.

Summary and Conclusion

The negative effects from this project are of short duration and magnitude and do not result in a Forest-wide decrease in habitat or population trends or deter from meeting the MIS objectives in the Forest Plans.

<u>Red-naped sapsucker Direct and Indirect Effects</u>

Actions with the potential for effects to this species include:

- short-term effects of disturbance during construction
- short-term potential for loss of young during construction
- long-term changes to habitat

The nest-building through fledging period runs from about May 20 through August 25 for this species (Kingery 1998). Individual nests with eggs or young could be lost during clearing of the ROW corridors. This species uses aspen habitats, similar to flammulated owls (Table 101). These habitats may be avoided until August 1st (unless surveys are done and find no use by raptors or owls), so loss of nests during ROW clearing may not occur. If ROW clearing does occur before August 1st, nests in the affected acres of aspen would be lost. Acres within the corridor would be lost as nesting habitat over the long-term.

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor. There are approximately 159 acres of aspen harvest ongoing or planned within the buffer for PA and Alt 1 (Camp Creek Timber Sale). This project is expected to be implemented in 2007-2008 and pipeline construction could overlap in time with this project.

The corridor for Alt 2 and 3 intersect portions of the Hightower and Porter aspen sales. The Hightower sale cut 174 acres from 2003 to 2006. The Porter Mountain sale would cut 400 acres of aspen in the area. Assuming all 574 acres are within the 1-mile buffer of the Alternative 2 and 3 corridors (worst case), this would result in a decrease of 2% of the suitable habitat.

The GMUG did an analysis of habitat trends on the Forest; aspen have stayed the same in the 1983 to 2000 period, while mature spruce/fir habitats have decreased 0.3% due to management activities (USDA Forest Service 2005c).

Summary and Conclusion

The negative effects from this project are of short duration and magnitude and do not result in a Forest-wide decrease in trends or deter from meeting the MIS objectives in the Forest Plans.

<u>Virginia's warbler Direct and Indirect Effects</u>

Actions with the potential for effects to this species include:

- short-term effects of disturbance during construction
- short-term potential for loss of young during construction
- long-term changes to habitat

The nest-building through fledging period runs from about June 9 through August 16 for this species (Kingery 1998). Individual nests with eggs or young could be lost during clearing of the ROW corridors. Over the long-term, habitat would be lost in the corridor (see Table 107).

Table 107. Potential Virginia's warbler habitat* within construction ROWs

Vegetative Cover Type	Proposed Action	Alternative 1	Alternative 2	Alternative 3
Habitat in corridor	176	195	267	228
Habitat in 1-mile buffer	25,773	24,979	21,094	23,270

*Habitat based on pinion/juniper, mountain shrubland, and oak shrublands

Cumulative Effects

The cumulative effects analysis area for this species is the 1-mile buffer along the corridor and access roads to the corridor. There is a reasonably foreseeable future action (Rifle burn blocks) that could affect up to 14,000 acres of mountain shrublands, through prescribed burning (in the Alkali Creek watershed). Assuming that all of the mountain shrubland habitats along the Alternatives 2 and 3 1-mile buffer corridors in the Alkali Creek watershed were burned (worst case scenario), this would affect approximately 2,300 acres within the Alternative 2 1-mile corridor. If these acres are added to the acres affected by the Alt 2 pipeline corridor, there would be approximately 6% of the mountain shrubland habitats within the 1-mile corridor affected.

Under Alternative 3 there could be 3,800 acres affected by burning. This, in combination with the Alt 3 pipeline corridor, would result in approximately 9% of the mountain shrublands within the 1-mile corridor affected. This probably overstates the actual acres affected as the burn prescriptions include an objective for 40-60% top kill of shrubs, so actually only about half of the acres would likely be affected by prescribed burning. Prescribed burning would result in a mix of age classes of mountain shrub in the watershed and along these 1-mile corridors. Over the short-term suitable nesting habitat for Virginia’s warbler would decrease.

The GMUG did an analysis of habitat trends on the Forest; this analysis showed a 2.8% decrease in pinion/juniper habitats from 1983 to 2000. These decreases are from management activities and natural disturbances that replaced these stands with grass/forbs (USDA Forest Service 2005c). Oak shrublands have not changed in this period; while sagebrush and shrublands decreased 3% due to prescribed burning and wildfire events.

The WRNF reviewed status of Virginia’s warbler and habitat in 2006. They found that current information suggests that populations have likely remained static or slightly increased from 1984 due to increases in suitable habitat as a result of fire suppression in the mountain shrub habitats. The use of prescribed fire could influence suitability by reducing nesting and foraging habitat. Burning, as well as other activities, including pipeline construction, contributes to the reduction of shrub cover, patch size, increases edge habitats and may contribute to vulnerability to nest predation (Potter 2006).

Summary and Conclusion

The negative effects from this project are of short duration and magnitude and do not result in a Forest-wide decrease in trends or deter from meeting the MIS objectives in the Forest Plans.

COMPLIANCE WITH THE FOREST PLAN AND OTHER REGULATORY DIRECTION

The Revised White River LRMP (2002), GMUG Amended Plan (1991) and the RMP for Glenwood Springs Resource Area (1988) and BLM Standards for Public Land Health (1997) provide area-wide and site-specific standards and guidelines for maintenance of habitat for wildlife species. This has been incorporated into the project design where appropriate (mostly through seasonal timing restrictions). This direction is displayed in Table 119, along with how the project is consistent with this direction.

Table 108. Compliance with Relevant Plan Wildlife Standards and Guidelines

Habitat or component	**BLM (1988 and 1997)**	**WRNF (2002)**	**GMUG (1991)**	**Consistency**
Special status species	Special status species and their habitat are maintained or enhanced by sustaining healthy, native plant and animal communities (S4)	Restrict activities to avoid disturbance during breeding, brood rearing and other sensitive periods (PTES S2 and 3).	Species-specific direction includes 1) openings should be less than 300 foot in width for marten; and 2) provide 20% pole/mature trees stands next to goshawk nesting sites.	Project design features include timing restrictions in aspen, spruce/fir and aspen/conifer habitats. Construction ROW clearing would be 100 feet and there are no goshawk nesting sites within the analysis areas.
MIS	NA	O 1b.4 – Within 15 years, demonstrate positive trends in habitat availability, habitat quality or other factors affecting sensitive species and MIS	Species-specific direction includes 1) openings should be less than 300 foot in width for marten; and 2) provide 20% pole/mature trees stands next to goshawk nesting sites.	The WRNF direction is an objective and done during Plan monitoring. The corridor is less than 300 foot wide and there are no goshawk nests next to any corridor.
Raptor nesting	Buffers around raptor nest sites (App B, Terr Hab Stip 4)	Protect known active and inactive raptor nest areas March through July (Wildlife S5)	No activities within ¼ mile from nest March 1 to July 31 if they would cause nest failure	Project design features include timing restrictions in aspen, spruce/fir and aspen/conifer habitats and preconstruction surveys for raptors.

Habitat or component	BLM (1988 and 1997)	WRNF (2002)	GMUG (1991)	Consistency
Snags	Adequate snags would be left at forest edges, adjacent to aquatic and riparian areas, and near clearcut edges (App B, Terr Hab Stip 3)	In aspen leave 3 snags plus 3 recruitment snags at least 8" dbh per acre. In spruce/fir leave 3 snags plus 3 recruitment snags at least 10" dbh per acre. (Biodiversity S2)	In aspen leave 120 to 300 snags per 100 acres and in spruce/fir leave 90-225 per 100 acres.	Snag retention is to be calculated as per-acre averages for each 1,000 acres over a silvicultural landscape assessment area (WRNF) and per 100 acres on the GMUG. Corridors would not provide snags but they would be provided in adjacent forested areas.
Downed logs	N/A	In aspen leave 8" diameter, 50 linear foot/acre; in spruce/fir leave 10" diameter, 150 linear foot/acre (Biodiversity S2) Soils CWD standard is for veg and fuels treatments	Maintain 10-20 tons of logs and other down woody material per acre. In spruce/fir they should be 12" diameter and 50 linear foot/acre and in aspen they should be 10" diameter and 50 linear foot/acre.	WRNF – woody debris retention is to be calculated as per-acre averages for each 1,000 acres over a silvicultural landscape assessment area. Logs would be placed on the corridor to deter illegal motorized use, where they are available.
Old Growth	N/A	In LSAA 4 maintain a minimum of 30% spruce/fir, 10% LPP and 10% DF (App FF)	In forested areas of a unit 5-12% or more would be in an old growth forest classification. In spruce/fir and mixed conifer it would be in patches of at least 30 acres in size and should average 100-200 acres where possible. In aspen old growth patches can be smaller.	The WRNF has mapped old growth; none of the alternatives affect any mapped old growth. On the GMUG, analysis strongly suggests that old growth direction would be met. See FEIS Appendix I-3, for analysis.

Habitat or component	**BLM (1988 and 1997)**	**WRNF (2002)**	**GMUG (1991)**	**Consistency**
Elk calving	Conifer and aspen harvesting prohibited in elk calving areas (App B, Terr Hab Stip 7)	MA 5.43 includes guidelines for restrictions (May 15 to June 20) for calving	Provide hiding cover within 1000 feet of known calving areas.	There would be no conifer or aspen harvested on BLM lands. Project design features restrict activities in mapped elk production areas during calving season. Some cover adjacent to mapped elk production areas would be removed, but overall cover would be maintained.
Elk summer	N/A	MA 5.43 includes guidelines for restrictions from June 16 to Oct 14 in the summer, plus a motorized route density guideline for .5 mile of motorized routes per square mile	N/A	There would be disturbance during the summer period and the guideline for summer would not be met.
Elk winter	PJ woodland harvesting in crucial big game WR would be restricted from Jan 16 to Apr 30 if determined to be detrimental	MA 5.41 includes a desired condition to restrict motorized travel during winter and spring. MA 5.	N/A	There would be no project activities before May 1st and no effects to wintering elk are expected.

Habitat or component	**BLM (1988 and 1997)**	**WRNF (2002)**	**GMUG (1991)**	**Consistency**
Riparian habitats	Riparian systems function properly and have the ability to recover from major disturbance. Riparian vegetation captures sediment and provides forage, habitat and biodiversity (S2)	Vegetation cover would be managed to provide suitable wildlife habitat along a minimum of 80 percent of the length (Wildlife S6)	Provide habitat diversity through vegetation treatments in conjunction with other resource activities designed to maintain or improve the riparian habitat. Provide habitat diversity for viable populations of all native vertebrate species of fish and wildlife in conjunction with other resource activities. Manage riparian areas to reach the latest seral stage possible within the stated objective.	There have been several project design features incorporated for riparian and wetland habitats. See POD. Plan direction would be met.
Boreal toads and northern leopard frogs		Allow no loss or reduction in habitat quality of occupied or known historic habitat.		The GMUG has no specific direction for boreal toads but there is a goal to increase or improve wildlife habitat diversity. All alternatives would potentially affect one known population on the GMUG due to truck traffic on Rd 265.

Several of the wildlife standards in the WRNF and GMUG Forest Plans relate to the use of the HABCAP model to measure habitat effectiveness over Diversity Units (roughly based on fourth order watersheds 5000 to 20,000 acres in size). These standards were not considered to be relevant to this analysis because this project is for a long, linear utility corridor. HABCAP was developed as a tool for spatially comparing the effects of alternatives on habitat.

HABCAP may be used to factor in natural processes such as succession. The areas within the pipeline corridor would have shrubby vegetation in some sections, over time, but would largely be maintained as grass/forb vegetation. Taller vegetation, such as aspen and conifer would interfere with monitoring of the pipeline for leaks. HABCAP does not addresses spatial distribution of habitat and only looks at the overstory vegetation. The results are expressed in numbers of animals the area can support; even though animals may or may not be in the area (USDA Forest Service, 1994). HABCAP does include a disturbance factor based on road densities. However, none of the alternatives result in a change in road density. Disturbance associated with the construction phase along the pipeline corridor and access roads to the corridor is a significant effect for some species; maybe more than the actual changes in vegetation. As a result, HABCAP modeling was not used to compare alternatives. Consistency with these standards was not analyzed.

3.8 SOCIAL AND ECONOMICS

No significant social or economic issues were identified through the public scoping process. There are no reportable costs or benefits from the standpoint of the agencies.

ENVIRONMENTAL JUSTICE

The alternatives were assessed to determine whether they would disproportionately impact minority or low-income populations, in accordance with Executive Order 12898. No minority or low-income populations would be disproportionately impacted by implementation of any of the alternatives.

3.9 HERITAGE RESOURCES

3.9.1 INTRODUCTION

Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations require inventory and consideration of potential effects of any federal undertaking on historic properties – (heritage resources) that are listed on or eligible for the National Register of Historic Places (NRHP). Construction activities associated with the Bull Mountain pipeline could lead to impacts to historic properties and possibly to undiscovered heritage resources. To comply with the NHPA, Section 106 a cultural resource inventory was conducted of the pipeline corridor, compressor, and access roads. During this inventory one historic property (5ME14577) was identified. It is recommended that the pipeline be rerouted to avoid this resource. In the event that undiscovered historic properties are identified during the construction phase the Forest Service and the Bureau of Land Management (BLM) would immediately implement practices to avoid and/or protect historic properties in accordance with the Forest Service Plan, the Bureau of Land Management Glenwood Springs Resource Management Plan (1984), the National Programmatic Agreement Among the Bureau of Land Management and the National Conference of State Historic Preservation Officers, and Colorado Protocol (1997 and 1998 respectively). If these resources are identified on private lands, the appropriate State regulations would be implemented by the Authorizing Officer.

3.9.2 REGULATORY FRAMEWORK

Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, require that any federal undertaking consider impacts to historic properties. Historic properties would be identified and protected by completing heritage resource survey prior to any direct or indirect impact from the project. Cultural resource values can be protected effectively by implementing the provisions of the following federal laws and their respective regulations:

- National Historic Preservation Act of 1966 (P.L. 89-665 as amended)
- National Environmental Policy Act of 1969 (P.L. 91-190)
- American Indian Religious Freedom Act of 1978 (P.L. 96-341)
- Native American Grave Protection and Repatriation Act (P.L. 101-601)
- Religious Freedom Restoration Act of 1993 (P.L. 103-141)
- Bureau of Land Management Glenwood Springs Resource Management Plan (1984), the National Programmatic Agreement among the Bureau of Land Management and the National Conference of State Historic Preservation Officers (1997) and the Colorado Protocol (1998)
- Historical, Prehistorical and Archaeological Resources Act (CRS 24-80-401)
- Unmarked Human Graves Act (CRS 24-80-1301)

In the event of accidental disturbance of historic graves or reinternment, the appropriate tribal, state, forest and the Bureau of Land Management regulations and policies would be followed. State laws apply to state and private lands and are contained in the Historical, Prehistorical and Archaeological Resources (CRS 24-80-401) and Unmarked Human

Graves Act (CRS 24-80-1301). Forest policies are contained in the Burial Policy for the White River National Forest and BLM Regulations 8120. The policies of the Southern Ute Indian Tribe are presented in Burial Policy for the Protection of Burial Sites, Human Remains and Funerary Objects. The Forest Plan also establishes guidelines for protecting significant heritage resources sites from damage by project activities or vandalism through project design, specified protective measures, monitoring, and coordination. In addition, the guidelines specify the sites on the National Register of Historic Places be managed under approved management plans or annul operation plans (Forest Plan, page 2-33).

Forest-wide goals include incorporating tribal resource management values into forest management activities (Forest Plan, page 1-16). Forest-wide standards for American Indian rights and interests and heritage resources include protecting important cultural areas for current and future tribal use by recognizing the cultural landscape and geographic diversity left by Ute ancestors. This includes acknowledging intellectual property rights; protecting sensitive and proprietary traditional tribal knowledge; conducting all land management activities in such a manner as to comply with all applicable federal, state, and local regulations; and leaving human remains undisturbed unless there is an urgent reason for their disinternment (Forest Plan, page 2-33). Consultation with American Indian people is recommended when projects have the potential to affect cultural rights and practices. The purpose of consultation is to help ensure the protection, preservation, and uses of areas that are culturally important to tribes. Physically affecting the integrity of traditional cultural properties, including forest product collecting places, should be avoided when possible. The Forest Service National Resource Book on American Indian and Alaska Native Relations should be used when developing an agency-to-tribe consultation process (Forest Plan, page 2-33).

3.9.3 METHODOLOGY FOR ANALYSIS

This analysis is based on one cultural resource inventory conducted in the project area. Alpine Archaeological Consultants, Inc. was contracted by Trigon-EPC, on behalf of SG Interests, to conduct a site file and records search and to do a cultural resource inventory of the proposed Bull Mountain Gas Pipeline preferred route in October 2004. Site file searches were done at the Office of Archaeology and Historic Preservation (OAHP), the BLM Glenwood Springs Field Office, the White River National Forest Supervisor’s Office, and the Grand Mesa, Uncompahgre & Gunnison National Forests in 2004. Alpine also reviewed General Land Office survey plats and Historical Index information to identify potential historic sites. Alpine conducted an additional cultural resource inventory of a rerouted segment in 2005.

With the formulation of Alternatives 1, 2, and 3, additional file searches were conducted of the OAHP records and White River National Forest Supervisor’s Office and the Bureau of Land Management - Glenwood Springs Field Office in 2006. No cultural resource inventory has been done specifically for these alternatives; however, portions of the alternatives have been previously surveyed for other developments. Pursuant to the following, a cultural resource inventory of federally managed lands would be undertaken prior to the agency considering the proposed surface disturbing actions - Historic Sites Act of 1935 (Pl 74-292), National Historic Preservation Act, 1966 (Pl 95-515), as amended (PL 102-575), National Environmental Policy Act 1969 (PL 91-190), Executive Order 11593, 1971 (16USC 470), Archaeological and Historic Data Preservation Act, 1974 (PL 93-291), American Indian Religious Freedom Act, 1978 (PL 95-341), Native American Graves Protection and

Repatriation Act 1990 (PL 101-601), and the BLM/SHPO PA/Colorado Protocol Section VIII. A.

3.9.4 EXISTING CONDITION

The site file and record searches reveal that a low number of cultural resource inventories have been completed in the preferred Bull Mountain pipeline corridor. Inventories have been conducted for telephone repeater stations, a proposed dam site, a seismic exploration project, oil well pads and associated access roads, small gas pipeline, timber sales, and a burn area. These projects have resulted in the identification of a variety of site types that include prehistoric lithic scatters, prehistoric isolated fines, and historic structures. These earlier inventories indicate that prehistoric and historic properties are sparsely distributed across the landscape in the project analysis area.

Alpine Archaeological Consultants, Inc conducted a Class III cultural resource inventory for the preferred pipeline route to determine whether cultural resources were present, and, if present, the effect of the Proposed Action on those resources (Greubel 2004, 2005). A 200-foot wide corridor was inventoried following the pipeline centerline (714.6 acres). Three segments of access road were surveyed at a corridor width of 100 feet centered on the road or trail (32.3 acres). Finally, a 4.7-acre compressor site and a 2.2-acre staging area in Battle Park were also examined intensively for cultural resources.

The inventory resulted in the discovery of one prehistoric lithic scatter site, a prehistoric isolated find, and a historic homestead site. The prehistoric lithic scatter is potentially eligible for listing on the NRHP. Most of the inventoried Project Areas are covered with heavy vegetation that limited the observation and identification of cultural resources. The results of the inventory may be more an indication of the heavy ground cover, rather than the absence of cultural resources.

NATIVE AMERICAN CONCERNS

The Southern Ute Tribe of Ignacio, Colorado, and the Ute Indian Tribe of Fort Duchesne, Utah, were sent initial consultation letters with information on this project. The letters provided the tribes with the opportunity to comment on the project and identify sites or places that might be of religious or cultural significance to the tribes. The tribes also received copies of the inventory reports conducted of the Preferred Alternative. At this time, no Traditional Cultural Properties have been identified in the project area. Should a site of this type be located on Forest Service lands before or during project implementation, all activities would cease and the Forest Archaeologist at the Supervisors Office in Glenwood Springs, Colorado would notify the tribal representatives of the find. All sacred sites and Traditional Cultural Properties on Forest lands would be protected and avoided, as if these sites were Eligible to the NRHP. If sites of this type are found on lands managed by the BLM, all activity would cease and the BLM archaeologist in Glenwood Springs would be immediately contacted. On private lands the Authorized Officer would follow Colorado State Statutes (CRS 24-80-401 and/or CRS 24-80-1301).

CONSTRUCTION AND OPERATIONAL IMPACTS

Project impact or effects include not only the physical disturbance of a historic property, but also may include the introduction, removal or alteration of various visual or auditory elements, which could alter the traditional setting or ambience of the property or cultural landscape. If a historic property is going to be adversely affected, mitigation would be proposed. Mitigation may include, but is not be limited to, one or more of the following measures: 1) avoidance through the use of realignment of the pipeline route, relocation of temporary extra workspace, or changes in the construction and/or operation design; 2) data recovery, which may include the systematic professional excavation of an archaeological site or the preparation of photographic and/or measured drawings documenting standing structures; and 3) the use of landscaping or other techniques that would minimize or eliminate effects on the historic setting or ambience of standing structures.

On January 18, 2005, the WRNF sent a letter to the Colorado SHPO requesting consultation on the preferred Bull Mountain Pipeline report and cultural resources identified during the inventory. SHPO responded via a letter dated February 7, 2005, that one site should be tested to determine the presence of subsurface features or deposits. Until testing can occur the site should be avoided by all project activities. The SHPO determined that the remaining cultural resources identified along the preferred route are considered not eligible for listing on the NRHP. The specific mitigation and monitoring measures are identified in FEIS Table 6.

3.9.5 ENVIRONMENTAL CONSEQUENCES

Prior to the construction process, a Class III cultural resources survey was completed by a qualified permitted archaeologist on all areas proposed for ground disturbance within the preferred Bull Mountain Pipeline corridor. This cultural resource inventory report was produced in accordance with OAHP, FS, and BLM guidelines, documenting all cultural resources located, and made recommendations to avoid impacts or mitigation of these resources. Trigon would be responsible for coordination with the Forest Service and BLM/GSFO to comply with the mitigation measures as noted in FEIS Table 6.

NO ACTION ALTERNATIVE - DIRECT AND INDIRECT EFFECTS

Under the No Action Alterative, the pipeline would not be built resulting in no direct impacts to cultural resources or identified traditional cultural properties.

PROPOSED ACTION - DIRECT AND INDIRECT EFFECTS

A cultural resource inventory of the Preferred Alternative route resulted in the identification of one historic property (5ME14577) eligible to the NRHP. This site is situated within the proposed pipeline corridor and would be adversely impacted by project activities as currently planned. To mitigate this adverse impact it is recommended that the pipeline be rerouted to avoid the site along with construction restrictions. If this is not possible then data recovery would have to be undertaken.

Construction activities may adversely affect undiscovered cultural resources in areas where surface visibility and deep soils may have obscured cultural resources. Therefore, it is recommended that an archaeological monitor be conducted for all ground disturbing construction activities on those portions of the pipeline route identified by project archeologists. Indirect and long-term cumulative effects as a result of increased visitation and access could range from illegal collection to vandalism of unknown cultural resources.

All areas that were identified by project archaeologists as needing additional survey along the pipeline corridor and providing access to the pipeline corridor would require a cultural resource survey and consultation with SHPO prior to any construction in these areas (BLM/SHPO PA/Colorado Protocol, Section VIII. A.).

ALTERNATIVE 1 - DIRECT AND INDIRECT EFFECTS

Most of this alternative route has not been inventoried for cultural resources. The property identified above (5ME14577) would also be impacted by this alternative route. In addition, there are two unevaluated sites (5ME741 and 5ME742) located within this alternative corridor. These sites would have to be revisited and evaluated as to NRHP status. Depending upon the NRHP evaluation additional mitigation measures might have to be added to the mitigation recommendations for the Preferred Alternative. Construction of the pipeline and the associated use by construction crews are likely to cause a short-term increase in the use of access roads during the implementation phase. This has potential to create an increase in direct and indirect impacts to cultural resources in the vicinity such as illegal collection, excavation and vandalism, during pipeline construction. Once construction of the pipeline is completed, it is expected that the use of access roads will not significantly increase long-term impacts to cultural resources.

This alternative corridor would require a cultural resource survey and consultation with SHPO, prior to construction (BLM/SHPO PA/Colorado Protocol, Section VIII. A.), if it is selected.

ALTERNATIVE 2 - DIRECT AND INDIRECT EFFECTS

Portions of this alternative have not been inventoried requiring additional cultural resource survey and consultation with SHPO, prior to construction (BLM/SHPO PA/Colorado Protocol, Section VIII. A.), if this alternative is selected. Construction of the pipeline and the associated use by construction crews are likely to cause a short-term increase in the use of the road during the implementation phase. This has potential to create an increase in direct and indirect impacts to cultural resources in the vicinity such as illegal collection, excavation and vandalism, during pipeline construction. Once construction of the pipeline is completed, it is expected that the use of the road will not significantly increase long-term impacts to cultural resources.

ALTERNATIVE 3 - DIRECT AND INDIRECT EFFECTS

This alternative route has not been completely inventoried for cultural resources requiring additional cultural resource survey and consultation with SHPO, prior to construction (BLM/SHPO PA/Colorado Protocol, Section VIII. A.), if this alternative is selected. Indirect long-term cumulative impacts from increased access and personnel could result in a range of impacts to known and undiscovered cultural resources in the vicinity of the location, from illegal collection and excavation to vandalism.

CUMULATIVE EFFECTS ALL ALTERNATIVES

The overall trend is loss of cultural resources. This is often due to development, public access, natural weathering, erosion and fire to list a few examples. Cultural resources are a non-renewable resource. The increase in oil and gas development with the associated roads and facilities has the potential to adversely impact the cultural landscape. Indirect long-term cumulative impacts from increased access and personnel could result in a range of impacts to known and undiscovered cultural resources in the vicinity of the location, from illegal collection and excavation to vandalism. To remedy some of these potential impacts the importance of the Education/Discovery Stipulation needs to be stressed to SG Interests and their subcontractors informing them of their responsibilities to protect and report any cultural resources encountered on public land during operations under this permit

COMPLIANCE WITH THE FOREST PLAN AND OTHER REGULATORY DIRECTION

The project alternatives are consistent with the Forest-wide goals to incorporate tribal resource management values into forest management activities (Forest Plan, page 1-16) and the Bureau of Land Management – Glenwood Springs Field Office Resource Management Plan. All alternatives can meet these goals by implementing avoidance and protective measures for heritage resources and traditional cultural uses.

3.10 INVENTORIED ROADLESS AREAS

3.10.1 INTRODUCTION

This section analyzes the Bull Mountain Pipeline Proposed Action and Alternatives for Inventoried Roadless Area (IRA) resources. It covers two different National Forest System land units in the proposed project area: the White River National Forest (WRNF) and the Grand Mesa, Uncompahgre, and Gunnison (GMUG) National Forests. Because the BLM does not have IRA designations or direction, BLM lands are excluded from analysis in this section.

Pipeline construction and ROW maintenance activity would occur in IRAs only under the Proposed Action and Alternative 1. Three IRAs would be affected: the Baldy Mountain and East Willow IRAs on the WRNF and the Clear Creek IRA on the GMUG NF (See FEIS Appendix L, Figure 1). Effects of the Proposed Action and Alternative 1 are both short-term (less than five years) and long-term (over five years) in duration. The effects of the pipeline construction would generate short-term and long-term effects on the values and characteristics of these three roadless areas. The actions and associated effects between the proposed Action and Alternative 1 are about the same. Alternative 1 varies slightly from the Proposed Action due to the increased impacted acreage. Slightly less disturbed acreage under the Proposed Action would result in a slightly higher benefit to IRA values and characteristics than Alternative 1.

Alternatives 2 and 3 do not enter into IRAs and therefore have no effects on IRAs. This section therefore concentrates on the effects to IRAs in the Proposed Action and Alternative 1.

3.10.2 REGULATORY FRAMEWORK

The recent decision (Sept 19th, 2006) in California v. Dept. of Agriculture set aside the State Petitions Roadless Rule and reinstated the Roadless Area Conservation Rule of Jan. 12, 2001(RACR).

It is the responsibility of the Regional Forester to review and agree to the purpose and need statements for the notice of intent for projects in inventoried roadless areas where it has been determined an environmental impact statement is required. The Regional Forester has agreed to the purpose and need for the pipeline construction. A letter to this effect is in the files.

FOREST PLAN DIRECTION

IRAs are an inventory of lands on each forest that met criteria set forth in the RARE II inventory in the late 1970s and were reanalyzed during Forest Plan revision. Use and activities on these lands are guided by regulations (e.g. RACR) and applicable management area prescriptions in the Forest Plan. Several management area prescriptions apply to the three IRAs inwhich the Bull Mountain Pipeline would be constructed under the Proposed Action and Alternative 1. IRAs are not management areas as identified in Forest Plans but rather are an inventory based on its own set of criteria for mapping.

WRNF LRMP Direction

Direction for management of IRAs in the WRNF LRMP is embodied in guidelines that link roadless area management with various management area prescriptions.

Management Area (MA) Prescriptions and IRA Guidelines

The inventoried roadless areas Baldy Mountain and East Willow are within Management Area 5.4 General Flora and Fauna: MA 5.41 Deer and Elk Winter Range and MA 5.43 Elk Habitat, respectively. These management areas contain the following guidelines for inventoried roadless areas and road construction within IRAs (See Table 116).

- Management Area 5.41 – Deer and Elk Winter Range – Inventoried Roadless Guideline: Management activities in inventoried roadless areas should emphasize long-term maintenance of roadless characteristics and habitat improvement for threatened, endangered, proposed, or sensitive species; or maintenance and restoration of ecosystem composition and structure such as reducing the risk of uncharacteristic wildfire effects or threat of insect or disease epidemics.
- Management Area 5.43 – Elk Habitat – Inventoried Roadless Guideline: Minimize road construction in IRAs, emphasizing temporary roads over permanent roads. Roads would only be constructed when necessary to meet management area objectives and only after other options have been examined for feasibility

On the WRNF the Scenery Management System was used to determine the Scenic Integrity Objectives (SIO) for the Forest and these are included in the Forest Plan. The SIO for the area including Baldy Mountain and East Willow IRAs is Low. The definition of a Low SIO is that the landscape character appears moderately altered.

GMUG LRMP Direction

The GMUG LRMP does not provide specific direction for IRAs Direction for management of IRAs is indirectly provided for in general forest direction and management area direction. Management areas potentially affected by the Bull Mountain Pipeline proposal are displayed in Table 109 and FEIS Appendix L, Figure 2.

Table 109. Management Area Direction Applied to IRAs – WRNF and GMUG NF

IRA NAME WHITE RIVER NF	**Management Area Direction**	**Alternative**
East Willow	MA 5.43 – Elk Habitat	Proposed Action Alternative 1
Baldy Mountain	MA 5.41 – Deer and Elk Winter Range	Proposed Action Alternative 1
IRA NAME GMUG NF	Management Area Direction	Alternative
Clear Creek	6B – Livestock Grazing – Manage Forage Composition 7A – Timber management on < 40% Slope	Proposed Action Alternative 1

None of the management prescriptions on the GMUG affected by the Bull Mountain proposal have specific direction related to IRAs. However, Visual Quality Objectives (VQO) guides the design and development level of projects which helps to retain roadless characteristics.

On the GMUG, the Visual Management System establishes the desired visual and landscape characteristic. The VQO for the Clear Creek IRA is predominately Modification with Partial Retention along Forest Road 265 and within Semi-primitive Non-motorized lands, and Maximum Modification within the existing Ragged Mountain pipeline corridor and 7A management areas (See Table 110).

Table 110. Visual Quality Objectives – GMUG NF

Visual Quality Objective within Clear Creek IRA	Applicable Lands
Partial Retention	Management Prescription 3A and up to ½ mile visible foreground along NFSR 265, “West Muddy Road”
Modification	Management Prescription 6B
Maximum Modification	Management Prescription 7A and1D – (1D is the existing utility corridor along west boundary of Clear Creek IRA)

3.10.3 METHODOLOGY FOR ANALYSIS

The effects analysis focuses on impacts to Inventoried Roadless Area character and value. The RARC identifies the following nine values or features that often characterize inventoried roadless areas. These features are described in the applicable resource section of this document as analyzed in the Proposed Action and Alternative 1. Some features are not applicable to the roadless units within the analysis area.

1. High quality or undisturbed soil, water and air – described in section 3.1, 3.2, 3.3.

2. Sources of public drinking water –Municipal watersheds are not present.

3. Diversity of plant and animal communities – described in section 3.4, 3.5.

4. Habitat for threatened, endangered proposed, candidate and sensitive species and for those species dependent on large, undisturbed areas of land – described in section 3.7.

5. Primitive, Semi-Primitive Non Motorized and Semi-Primitive Motorized classes of dispersed recreation – described in section 3.11.

6. Reference landscapes – these landscapes were not identified as Reference landscapes in any of the land management plans.

7. Natural appearing landscapes with high scenic quality – described in section 3.12

8. Traditional cultural properties and sacred sites – no cultural properties or sacred sites have been identified in any of the roadless units within the analysis area.

9. Other locally identified unique characteristics – no locally unique characteristics have been identified within any of the roadless units within the analysis area.

The three roadless units wihin the analysis area were identified during the RARE II inventory effort. That effort utilized characteristics such as the areas' naturalness and ability to provide a sense of remoteness and opportunities for solitude. Therefore, **naturalness**, **remoteness** and **solitude** will be used as a measure of change to the roadless character. Naturalness is measured by the function of natural ecological processes along with the degree of human-caused changes to the landscape. The values of remoteness and solitude consider how the sites and sounds of developments influence the user's experience. Therefore, measures of the effects to roadless character are described quantitatively in terms of disturbed acres and qualitatively with respect to visible physical changes to the landscape.

Short-term (less than five years) immediate effects analysis for roadless characteristics and visual qualities in IRAs include pipeline construction and associated construction activities. The effects of initial construction of the project on the roadless character of the area would be of a limited intensity and duration that is measurable and direct. Long-term (beyond five years) effects on roadless character include potential to affect landscape scale patterns and the ability of these IRAs to maintain the characteristics which caused them to be inventoried. Analysis focuses on overall effects on roadless character and quality.

The effects area boundary for pipeline construction is the boundary of the IRAs.

3.10.4 EXISTING CONDITION

Both the GMUG and WRNF have an inventory of roadless areas based on criteria described in FSH direction 1901.12 Chapter 70. The official IRAs are listed in a set of maps contained in Forest Service Roadless Area Conservation, Final Environmental Impact Statement; Volume 2 dated November 2000, which are held at the national headquarters office of the Forest Service, or any subsequent update or revision of those maps. Under the Proposed Action and Alternative 1, the proposed Bull Mountain Pipeline would be located within three IRAs. One IRA, Clear Creek, is on the GMUG and two, East Willow and Baldy Mountain, are on the WRNF. None of the potentially effected IRAs have been recommended by the Forest Service for Wilderness designation.

The GMUG Clear Creek IRA comprises 43,330 acres of montane and subalpine forest. This IRA is in the southern part of the project and is predominantly un-roaded. The existing Ragged Mountain Pipeline, which a portion of the Bull Mountain Pipeline would parallel under the Proposed Action and Alternative 1, runs northwest-southeast through the approximate middle of the Clear Creek IRA. As of March 1, 2006 there are approximately 42,500 acres under lease for oil and gas exploration and potential development. Surface occupancy would be allowed on all but 5300 acres on these leases. Oil and gas leases constitute valid existing rights to development of oil and gas resources. Four producing gas wells are in or immediately adjacent to the Clear Creek IRA.

The WRNF East Willow IRA comprises 7,118 acres of montane forest, predominately aspen vegetation type where the pipeline is being proposed. This IRA is in the middle part of the project and is predominantly un-roaded. The Ragged Mountain Pipeline runs north-south through the western quarter of the East Willow IRA; under the Proposed Action and Alternative 1, a portion of the Bull Mountain Pipeline would be constructed along the existing Ragged Mountain Pipeline. The East Willow IRA is within the area noted as "available and authorized" for leasing (WRNF O&G Appendix Map G), and contains existing leases (WRNF O&G Appendix Map D). Oil and gas leases constitute valid existing rights to development of oil and gas resources.

The WRNF Baldy Mountain IRA comprises 6,030 acres of oak and mountain shrub vegetation. This IRA is in the northern part of the project area and is predominantly un-roaded. Under the Proposed Action and Alternative 1, the Bull Mountain Pipeline would be constructed northwest-southeast along the western edge of the Baldy Mountain IRA. The Baldy Mountain IRA is within the area noted as "available and authorized" for leasing (WRNF O&G Appendix Map G), and contains existing leases (WRNF O&G Appendix Map D). Oil and gas leases constitute valid existing rights to development of oil and gas resources.

The Ragged Mountain Pipeline, constructed in 1983, traverses the Clear Creek and East Willow IRAs. The path of the pipeline is marked by a 20-foot wide right-of-way vegetated with grasses, forbs, and low shrubs for 22.6 miles across NFS lands on both the WRNF and GMUG. The path of the pipeline is evident in timbered areas, as trees are excluded from the pipeline right-of-way. There is some localized evidence of the pipeline through meadows and grasslands where the composition of species is slightly different than that of the native species adjacent to the revegetated areas. Effects on the IRAs from this existing pipeline are predominantly restricted to the pipeline right-of-way and the area immediately adjacent to that right-of-way – an area approximately 20-foot wide over approximately 7 miles of the East Willow and Clear Creek IRAs (See FEIS Appendix L, Figure 3).

3.10.5 ENVIRONMENTAL CONSEQUENCES

Only the Proposed Action and Alternative 1 would generate activity within IRAs. Three IRAs would be affected: the Baldy Mountain and East Willow IRAs on the WRNF and the Clear Creek IRA on the GMUG NF (See FEIS Appendix L, Figure 1). Effects of the Proposed Action and Alternative 1 are both short and long-term in duration for a one time entry. There is very little difference on associated impacts and effects between the Proposed Action and Alternative 1. Alternative 1 has a slight route variation from the Proposed Action which adds 16.2 acres due to topography and temporary use area locations. The difference in impacts and effects to IRA values and character is slightly less with the Proposed Action by very slightly reducing the amount of acreage the pipeline would transect.

SUMMARY OF IRA ACRES AND MILES OF PIPELINE CONSTRUCTION

Table 111. Miles of Pipeline Right-of-Way Proposed within Inventoried Roadless Area by Alternative and National Forest.

Forest	District	IRA Name	Miles of pipeline Right-of-Way in IRAs				
			No Action	Proposed Action	Alt 1	Alt 2*	Alt 3*
GMUG	Paonia	Clear Creek		5.75	5.58		
	Paonia Total			5.75	5.58		
	Grand Valley	Priest Mtn				0.82	
		Clear Creek					0.48
		Hightower					0.03
	Grand Valley Total					0.82	0.51

GMUG Total				***5.75***	***5.58***	***0.82***	***0.51***
WRNF	Rifle	Baldy Mt.		0.86	0.86		
		East Willow		1.72	1.72		
	Rifle Total			2.58	2.58		
WRNF Total				***2.58***	***2.58***		
Grand Total				**8.33**	**8.16**	**0.82**	**0.51**

* Miles of pipeline shown in Alternatives 2 & 3 are within or along a road bed which was in existence prior to the 1979 RARE II inventory. In reality, roadless boundaries do not overlap existing roads. The miles of pipeline ROW indicated in this table for alternatives 2 & 3 are due to mapping errors and advances in mapping technology between 1979 and present. Therefore, for purposes of analysis it is assumed that there is no intrusion into IRAs in conjunction with alternatives 2 & 3.

Table 112. Total IRA Acres Disturbed by Alternative.

Pipeline Construction Activity	Proposed Action	Alternative 1
25' TUA[1]	43.40	48.61
50' ROW	50.44	96.37
Special TUA	8.77	0
Total Acres	**102.61**	**144.98**

[1]TUA = Temporary Use Area

Table 113. Total Acres Disturbed by IRA and Alternative

IRA Name	Alternative	25' TUA[1]	50' ROW	Additional TUA	Total Acres
Clear Creek	Proposed Action	28.97	34.87	6.13	69.97
	Alternative 1	28.68	57.4	0	86.08
Baldy Mountain	Proposed Action	4.05	5.16	0	9.21
	Alternative 1	2.69	4.81	0	7.50
East Willow	Proposed Action	10.38	10.41	2.64	23.43
	Alternative 1	17.24	34.16	0	51.4

[1]Temporary Use Area

NO ACTION ALTERNATIVE

Under the No Action Alternative the proposed pipeline would not be constructed, and consequently, no additional pipeline-related activities would affect the un-roaded state or roadless character of any IRAs. The current condition of the IRAs would continue to show the evidence of the existing pipeline. Vegetation along the existing pipeline would continue to be cleared to facilitate inspections for leaks and other maintenance needs.

Existing oil and gas leases would continue for their terms until or unless they are developed with wells and associated infrastructure, as lease terms allow. Current active gas well operations within and adjacent to the IRAs would continue. The likelihood of other gas transmission facilities could be high due to the current level of gas development in the area.

No direct, indirect, or cumulative effects would occur to IRAs as a result of the selection of the No Action Alternative with regards to the pipeline. This Alternative would have a higher likelihood of maintaining and enhancing roadless qualities and characteristics than the Action Alternatives.

PROPOSED ACTION

The Proposed Action would result in construction and maintenance activities within portions of all three IRAs. Disturbance activities include a 100' wide construction zone spanning 8.33

miles of trenching, vegetation clearing, grading, and temporary use areas within the IRAs. Temporary use areas are generally a 25-foot extension on either side of the 50-foot ROW. Long term disturbances include maintenance of a 50-foot ROW, and a 10' – 12' foot permanent clearing width in which active vegetation management would occur. Additional special temporary construction zones may be required due to environmental and terrain considerations. No permanent or temporary roads are proposed within the three IRAs affected by this proposal. Construction would occur over three years between May 1 and December 1 annually.

Of the 8.3 miles of construction within the three IRAs, approximately 5.7 pipeline miles would be located adjacent to the existing Ragged Mountain Pipeline located within the Clear Creek and East Willow IRAs. Of the remaining 2.6 miles of pipeline proposed in the IRAs approximately 0.86 miles would skirt the western edge of the Baldy Mountain IRA.

Visual Quality Objectives (GMUG) and Scenic Integrity Objectives (WRNF) identified in each forests' Resource and Management Plan are expected to be met within three to five years after construction is completed.

Table 114. Proposed Action Miles Adjacent to Existing Pipeline in IRAs

Segment	**Miles**
Proposed ROW adjacent to existing pipeline ROW on WRNF	2.1
Proposed ROW adjacent to existing pipeline ROW on GMUG	3.6
Proposed ROW adjacent to existing pipeline ROW in IRAs (total for WRNF and GMUG)	5.7
Total Proposed ROW miles within IRAs	**8.3**

Direct and Indirect Effects

Direct effects are those effects resulting directly from proposed activities on roadless area quality and character.

<u>Short-term effects</u>

The Proposed Action affects the Clear Creek, East Willow and Baldy Mountain Roadless Areas. The proposed 100-foot construction zone will show obvious disturbances within the roadless area. Solitude will be affected during the construction period from May to December. Naturalness and sense of remoteness will be reduced during the three year construction timeframe and following years until revegetation of the construction zone is achieved. The pipeline location can be seen from several viewing platforms both inside and outside the IRAs.

The proposed 100 foot construction zone being immediately adjacent to and often overlapping the existing 20-foot Ragged Mountain Pipeline ROW would create a combined clearing (during construction) of up to 110 feet in width over a length of 5.7 miles in the Clear Creek and East Willow IRAs where the two pipelines parallel each other.

Long-term effects

Pipeline maintenance activities within the 50-foot ROW would generate direct negative effects over the life of the pipeline, the extent of which is variable along the length of the pipeline and based predominately on vegetation type. For maintenance purposes, only grasses, forbs and low growing shrubs will be allowed to reestablish directly over the pipe (a 10'-12' clearing). Tree species would generally not be reestablished. The permanent 10'-12' clearing through forested vegetation types will alter the naturalness of the roadless character in these places. Where this clearing is adjacent to the existing 20-foot Raggeds Mountain ROW, the long term effects through forested areas would be visually obvious and less so through grass and shrub lands.

Indirect effects

Indirect effects take place in a separate time and space from the cause of the effect, but are directly linked. One potential indirect effect to IRAs is unauthorized motorized use into the area if the closure of the area after construction is ineffective. Project design criteria listed in FEIS Table 6 have been proposed to effectively keep the pipeline corridor off-limits to unauthorized motorized use after construction.

All three of the IRAs are within areas noted as "available and authorized" for leasing and are also in areas with existing leases (WRNF and GMUG Forest Plans, leasing maps – Project Record). Oil and gas leases issued prior to Jan 12, 2001 hold valid existing rights to development of oil and gas resources including road construction within the IRAs. An indirect effect of this action may or may not lead to increased development of existing leases – those are business decisions that lease holders have to make and have been making independent of this proposed action. As of the writing of this document no additional development has been proposed or is anticipated on existing leases beyond that which is included in FEIS Appendix P.

Cumulative Effects

Cumulative effects are the past, present and reasonably foreseeable actions that are relevant to IRA resource analysis (character, value). The scope of the IRA analysis is bounded to the WRNF and the GMUG NF. These forests contain roughly 30% of the IRA resources for National Forests in Colorado. The decision to focus the analysis in this manner was made due to the considerable IRA resource base contained by each unit. Additionally, IRA characteristics are based on landscape scale patterns in geographical contexts which are unique to this region and are contained within the units as a study area.

Current and past events include the exploration, construction and production of gas wells, associated facilities and infrastructure servicing these wells (See FEIS Appendix L, Figure 4). Four producing wells currently exist within the Clear Creek IRA. A gathering system of flow lines from these wells to the existing Ragged Mountain Pipeline is currently in place. See FEIS Appendix P for complete list of activities considered for cumulative effects analysis. No additional leasing is proposed in IRA at this time.

The incremental increase of the existing ROW width through the IRAs increases the amount of land with diminished roadless character. Because roadless character and value is unaffected immediately adjacent to the ROW corridor, concentrating the utility needs in one location retains larger undisturbed tracts of land. The Visual Resources Protection Plan (FEIS Appendix N) and project design criteria listed in FEIS Table 6 outlines design strategies and steps to ensure the ROW corridor is designed in ways that blend with the surrounding landscape character and values thus minimizing visual impacts within the ROW.

Previous pipeline activity (Ragged Mountain Pipeline) in the IRAs has affected the current roadless character of this landscape, and the impacts from the proposed project cannot be considered in isolation from them. The direct effects of the proposed project permanent 10-foot clearing located immediately adjacent to the existing 20-foot ROW would create up to a 30-foot swath of combined ROW through forested vegetation types that will alter the naturalness of the roadless character in these places. However the impacts to roadless character away from the ROW are negligible.

ALTERNATIVE 1

Alternative 1 follows the same route as the Proposed Action with limited route variations. The number of pipeline miles in IRAs affected by Alternative 1 is 0.17 miles less than the Proposed Action (See Table 115 below). However, the number of acres in IRAs affected by Alternative 1 is increased by 42.37 acres over the Proposed Action due to topography constraints and temporary use area locations. No permanent or temporary roads are proposed within the three IRAs affected by this proposal.

The direct, indirect, and cumulative effects of Alternative 1 would essentially be the same as the Proposed Action, with a slightly greater affect due to the increase in impacted acres within the IRAs. The overall loss of roadless character and value are considered almost equal to the Proposed Action.

ALTERNATIVE 2

The selection of Alternative 2 would result in no construction or activity in IRAs. No direct, indirect, or cumulative effects would occur to IRAs as a result of the selection of this Alternative.

ALTERNATIVE 3

The selection of Alternative 3 would result in no construction or activity in IRAs. No direct, indirect, or cumulative effects would occur to IRAs as a result of the selection of this Alternative.

MITIGATION AND MONITORING –

Project design criteria that would reduce potential effects to IRAs are covered in FEIS Table 6. Table 6 includes project design criteria applicable to all resources affected by pipeline and related facilities construction. Specific IRA project design criteria include naturalizing all the areas disturbed by project construction outside of the 10’-12’ permanent clearing and the requirement of an Environmental Protection Plan and applicable reclamation measures as part of the Plan of Development (POD). Other design criteria and guidelines related to visual resources are disclosed in the Visual Resource Protection Program (VRPP) (See Visuals - FEIS Appendix N). These design criteria include using existing vegetation and/or topographic buffers to reduce or eliminate views of the pipeline right-of-way and related facilities and reducing visual contrast by blending the site or facility with existing natural visual patterns.

As stated in FEIS Table 6, revegetation treatments would be monitored at 1, 3, and 5-year intervals following pipeline construction. If design criteria and VRPP guidelines are found to be unsuccessful from either a vegetation or visuals standpoint, the reclamation plan will be amended to help bring revegetation efforts into conformance.

COMPLIANCE WITH THE FOREST PLAN AND OTHER REGULATORY DIRECTION

The Proposed Action and Alternative 1 would involve construction, including temporary use areas, in three IRAs. For the No Action Alternative and Alternatives 2 and 3, no IRA impacts would occur because these alternatives propose no construction or activity in IRAs. These alternatives are consistent with current Forest Plan direction on both the WRNF and the GMUG for IRAs.

Consistency with the Roadless Area Conservation Rule of 2001, Proposed Action & Alternative 1:

- The 2001 Roadless Rule does not prohibit pipelines or utility corridors (2001 Roadless Rule, FR 66(9): 3273, interpretation of paragraph (b) (2) of the Rule. In addition the following is from the 2001 Rule preamble (Federal Register / Vol. 66, No. 9, p 3249):
    - *The Roadless Area Conservation rule, unlike the establishment of wilderness areas, will allow a multitude of activities including motorized uses, grazing, and oil and gas development that does not require new roads to continue in inventoried roadless areas.*
- Roadless Rule prohibits road construction in IRAs unless certain exceptions apply. No road construction in IRAs is proposed as part of this Project.
- Definition of Road construction: *Activity that results in the addition of forest classified or temporary road miles* (2001 Roadless Rule at 294.11). There will be no road construction under this proposal because there will be no addition of classified or temporary roads within IRA. There is a construction zone around the pipeline, but no classified, unclassified or temporary road construction is proposed within IRA.
- For the BMNG pipeline, construction vehicles would use existing NFSR roads to access the construction zone for the pipeline Right-of-Way (ROW). No new road construction or maintenance is proposed in any roadless area. No temporary or permanent roads are needed in Roadless Areas to allow motorized access of equipment to build the BMNG pipeline. Equipment and vehicles needed to support pipeline construction and reclamation would be authorized to access the pipeline ROW in a defined “construction zone”, which would <u>not</u> be considered a “road” (temporary or otherwise) by the Agency.
- After ROW rehabilitation, the holder of the ROW grant would not be allowed to use the pipeline Row or utility corridor as a vehicle access way except under emergency conditions, as authorized by the surface land management agency.

In addition, the 2001 Rule provides for *“cutting, sale, or removal of timber incidental to the implementation of a management activity not otherwise prohibited by this subpart”* (2001 Roadless Rule, Section 294.13 (2)). Utility/pipeline corridors are examples of a management activity that is not prohibited.

Interim Directive 1920-2006-1

The Regional Forester’s review of the purpose and need for this project as described in the Notice of Intent to prepare an EIS is consistent with Interim Directive No. 1920-2006-1. The Regional Forester has concurred with the stated purpose and need for this project, and the possibility that portions of the proposed route of this pipeline may be located within IRAs (letter is located in the project record).

Consistency with Forest Land and Resource Management Plans, Proposed Action & Alternative 1:

Management area prescriptions of the affected area for the White River N.F. (Management Prescription 5.4 General Flora and Fauna, Management Prescription Deer and Elk Management Area 5.41 and Management Prescription Elk Habitat Management Area 5.43) outline the need to focus on allowing management activities which maintain roadless characteristics. The detailed study of additional action alternatives in the EIS is consistent with this management direction because no roads are being proposed in IRA.

The GMUG LRMP does not provide specific direction for IRAs Direction for management of IRAs is indirectly provided for in general forest direction and management area direction. The detailed study of action alternatives in the EIS is consistent with current management direction.

3.11 RECREATION

3.11.1 INTRODUCTION

The White River National Forest, the Grand Mesa, Uncompahgre and Gunnison National Forests and the Glenwood Springs Resource Office of the Bureau of Land Management provide a wide variety of recreational opportunities to millions of visitors in all seasons.

This area is known world-wide for its big game hunting opportunities, particularly elk hunting. Dispersed camping, all-terrain vehicle (ATV) and four-wheel drive (4WD) use, horseback riding and hiking are recreational activities that occur in analysis area with the highest incidences of use occurring in conjunction with hunting season. Permitted commercial outfitter/guides provide guided hunting opportunities and are dependent on access to public lands to operate successfully.

ATV riding and 4WD use is becoming more popular during the summer months. Summer dispersed camping associated with ATV/4WD use is increasing in the analysis area.

3.11.2 REGULATORY FRAMEWORK

Authorities to manage recreation come from the general laws related to National Forest management, e.g., the Multiple Use-Sustained yield Act of 1960, the Wilderness Act (1964), the Wild and Scenic Rivers Act (1968) and the National Forest Management Act (1976) the Land and Water Conservation Fund Act (1964), the Architectural Barriers Act (1968), the Americans with Disabilities Act (1990), National Trails System Act (1968) and the Forest and Rangeland Renewable Resource Act (1974). In addition, many specific federal regulations (Code of Federal Regulations), policies (Forest Service Manuals and Handbooks) and other technical manuals and papers direct management of the recreation resource for the Forest Service.

The White River National Forest Land and Resource Management Plan 2002, Chapters 2 and 3 (USDA 2002) and the Grand Mesa, Uncompahgre and Gunnison National Forests Amended Land and Resource Management Plan, Chapter 3 (USDA 1991), provide specific direction for management of the recreation resource on these National Forest lands.

Authorities to manage U.S. Department of Interior, Bureau of Land Management lands (BLM) come from the Federal Land Policy and Management Act of 1976. In addition, federal regulations and policies also direct management of recreation on BLM lands.

The Glenwood Springs Resource Area, Resource Management Plan 1988, Chapter 2 (USDI 1988) provides specific direction for the management of recreation on these BLM lands.

3.11.3 METHODOLOGY FOR ANALYSIS

This section describes the affected environment and analyze the effects to the recreation resource on the White River National Forest (WRNF), the Grand Mesa, Uncompahgre, and Gunnison National Forests (GMUG) and the Glenwood Springs Resource Area of the Bureau of Land Management (BLM).

The environmental analysis evaluates short-term effects related to construction activities and long-term effects related to the operation, maintenance and existence of the pipeline on the landscape, by alternative. It analyzes the effects of the connected action, a compressor station located at the south end of the pipeline that is anticipated as a result of the pipeline construction. A forest plan amendment for both the WRNF and GMUG may be considered to change the management direction for the right of way selected to a utility corridor designation. The alternatives, proposed forest plan amendments and connected action are explained in detail in Chapter 2 of the Final Environmental Impact Statement (FEIS).

The analysis would determine consistency with Forest land management plans and BLM Resource Area Plans and disclose impacts to big game hunting, dispersed camping, summer motorized recreation, winter motorized recreation, non-motorized recreation and other recreation resources.

The analysis area is defined by Forest Development Roads (NFSR) 265 to the south and west, NFSR 270 and County Road 342 to the northwest and north and the Proposed Action pipeline location to the east. The effects analysis would include impacts to recreation resources adjoining the roads and proposed pipeline location along the analysis boundary.

3.11.4 AFFECTED ENVIRONMENT

WHITE RIVER NATIONAL FOREST

The White River National Forest is recognized throughout the world as a source of exceptional outdoor recreation opportunities. Recreation has grown to become the predominant use of the forest. The Forest Plan Record of Decision states that outdoor recreation, including both summer and winter, is the primary use of the WRNF (USDA 2002).

Recreation use on the WRNF for fiscal year 2002 was estimated at 9,674,543 national forest visits. The top primary activities according to the National Visitor Use Monitoring (NVUM) study conducted on the WRNF were downhill ski/ snowboarding, hike/walking, mountain biking, cross-country skiing, and relaxing (USDA 2003). The primary recreational activities in the analysis area are big game hunting, dispersed camping, four-wheel driving, ATV riding, snowmobiling and horseback riding. There are no developed recreation facilities in the analysis area on the WRNF.

The WRNF is home to one of the largest elk herds in North America. The WRNF is a destination elk hunting area for hunters from all around the country.

Management Area Direction

The Forest Plan Management Area prescriptions that apply to the analysis area are 5.41 Deer and Elk Winter Range and 5.43 Elk Habitat. The management area prescriptions describe the general theme, desired condition and standards and guidelines for the area.

Management Area 5.41 - Deer and Elk Winter Range

The 5.41 management prescription emphasizes providing adequate amounts of quality forage, cover and solitude for deer, elk and other species. The desired condition as it relates to recreation includes road systems and trails that are relatively undeveloped. To protect wintering big game from disturbance, motorized and non-motorized winter recreation use is confined to designated travel ways or use corridors. This management prescription applies to the area around Forest Development Road (NFSR) 800 and County Road 342.

Management Area 5.43 - Elk Habitat

The 5.43 management prescription emphasizes areas managed for elk, characterized by low road densities and optimum forage and cover ratios. The desired condition as it relates to recreation includes providing non-motorized recreation including hiking, mountain biking, horseback riding, hunting and cross-country skiing. Motorized recreation opportunities are limited and travel closures may exist based on elk habitat objectives. This management prescription applies to the area east of NFSR 841and south to the forest boundary.

Recreation Opportunity Spectrum (ROS)

The Recreation Opportunity Spectrum (ROS) is a planning and management tool for recreation. Recreation opportunities are arranged along a spectrum and describe the relationship between activities and settings that produce the recreation experience. Characteristics of an area are defined in terms of their physical, social and management settings (USDA 1982).

The WRNF assigns a different ROS class for summer and winter. The ROS classes assigned include:

- Roaded Modified (RM)
- Semi-Primitive Motorized (SPM)
- Semi-Primitive Non-Motorized (SPNM)

The White River National Forest Land and Management Plan, page 2-31 states:

> *Management activities should be consistent with guidance in the ROS User's Guide for the adopted summer and winter ROS classes on the ROS maps.*

Summer

The Proposed Action and Alternative 1 are in Roaded Modified (RM). Alternatives 2 and 3 are in Semi-Primitive Motorized (SPM).

Roaded Modified is characterized by substantially modified environments except for campsites. Roads, landings, slash and debris may be strongly dominant from within yet remain subordinate from distant sensitive roads and highways. Interaction between users and evidence of others may be moderate on roads, but there is little evidence of others or interaction at camp sites. The area is managed in such a way that few on-site controls may be present except for gated roads. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.

Semi-Primitive Motorized is characterized by a predominantly natural or natural appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but would be subtle. Motorized use is permitted.

Winter

The Proposed Action and Alternative 1 are in SPM. Alternatives 2 and 3 are in Semi-Primitive Non-Motorized (SPNM).

Semi-Primitive Non-Motorized is described as an area characterized by a predominantly natural or natural appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but would be subtle. Motorized recreation is not permitted, but local roads used for other resource management activities may be present on a limited basis. Use of such roads is restricted to minimize impacts on recreational experience opportunities.

The SPNM area coincides with management prescription 5.41 Deer and Elk Winter Range and is assigned to protect wintering big game from disturbance from motorized winter recreation.

Hunting

Big game hunting is the primary recreation use within the project area. There is a mix of day use hunters and overnight hunters throughout the project area. The WRNF portion of the project area lies in Colorado Division of Wildlife (CDOW) game management unit (GMU) #42 (CDOW 2006). During the 2004 hunting season, there were 3,525 licensed hunters in this GMU for an estimated 16,979 recreation days (CDOW 2004). The hunters harvested 894 elk. The project area is only a small portion of the game management unit, however, hunting use in the project area is considered very high.

Big game hunting season begins in late August with archery season. Hunting during archery season is considered moderate to high in the analysis area. Muzzle loading season occurs in mid-September and use is typically moderate. Rifle season is mid-October through mid-November. Rifle season is the most popular big game season and use in the analysis area is very high.

There is a permitted outfitter camp located at the end of NFSR 268. The outfitter/guide has provided guiding services on the WRNF and GMUG for over 40 years. The outfitter has a developed water source, stock corrals and temporary camping facilities including trailers and tents. This outfitter is permitted 1141 service days annually for big game hunting and 100 service days in summer for trail rides, horse pack trips and fishing trips. The outfitter accesses the back country by following portions of the Ragged Mountain Pipeline (RMP). The RMP was constructed in the 1980's and was built over an old jeep trail that had been the original access to the back country area. His primary hunting areas lie within the GMUG National Forest to the south of the camp.

Dispersed Camping

Dispersed camping occurs along the forest development road system and any open roads. Overall incidence of summer dispersed camping is low and is associated primarily with OHV riding and four-wheeling. Dispersed camping during the hunting season would be considered very high with camps occurring along all accessible roads. Many hunter campsites have been used by the same hunting group year after year.

Summer/Fall Motorized Recreation

Primary access to the WRNF portion of the project area is from the north along NFSR 800, NFSR 270 and County Road 342. These roads provide access for the communities of Silt and Rifle. CR 342 and portions of 270 are all weather aggregate roads. Except during very wet conditions, they are usable by passenger vehicles. NFSR 800 originates at the Garfield/Mesa county line. North of the county line it is called County Road 344 and is an aggregate, all weather road. South of the county line it is a native surface road. NFSR 800 turns east at the intersection with NFSR 841 and continues until it intersects with NFSR 300.

NFSR 800 is suited for high clearance vehicles and 4-wheel drives (4WD) and is open to ATV use.

NFSR 843 and 800 are part of a popular motorized 4WD loop. The loop consists of NFSR 843, 800, 801 and 812 and provides 4WD recreation opportunities and access to areas east of the project area.

Currently, ATV's and motorcycles are allowed on all open roads in the WRNF. There are approximately 24 miles of roads and trails open to ATV's and motorcycles within the WRNF portion of the analysis area. Use of ATV's has increased substantially in the past few years. Many visitors are using these vehicles for pleasure riding along roads and to access more remote areas of the forest to pursue other recreational activities.

Illegal ATV/4WD activity does occur off roads and trails, on closed roads and along existing pipeline right of ways during the snow-free season. The majority of the illegal use occurs during the hunting season and is typically associated with people utilizing ATV's to access remote hunting areas away from open roads or retrieve game. Efforts to close roads and areas to ATV use have met with mixed success. Efforts have been successful using a combination of physical barriers such as gates, earthen berms, boulders, down timber and consistent law enforcement presence.

Driving for pleasure using passenger vehicles to view scenery, fall colors wildlife are popular activities for the recreating public. These motorized activities occur along all open roads but are mostly concentrated along the main arterial routes.

Winter Motorized Recreation

The Sunlight to Powderhorn Snowmobile Trail (SP Trail) is a designated, groomed trail that follows portions of NFSR 800, 841 and 843 in the project area. This trail system is heavily used by the snowmobiling public throughout the winter months. The typical use and grooming season is mid-November through mid-April. This trail is supported and maintained by local volunteer groups.

The NFSR routes in the project area are not plowed or maintained for regular vehicle traffic during the winter months. The general public utilizes many of the road corridors in the analysis area for snowmobile routes. These corridors, regardless of whether or not they are part of the official SP Trail system, provide excellent opportunities for obstacle free loops and access to a wide variety of snowmobile terrain.

Sunlight Snowmobiles is a permitted outfitter/guide who provides guided snowmobile tours on the Sunlight to Powderhorn Trail and other roads and trails. They are permitted for 700 service days within and adjacent to the analysis area.

Non-Motorized Recreation

Non-motorized use occurs on system trails, non-system trails, open roads, and roads that are closed to motorized vehicles throughout the project area. Snow-free non-motorized uses include hiking, mountain biking and horseback riding.

System trails in the area include Cayton Gulch, Lake Fork, East Fork and Muddy Creek Trails. This network of trails lies west of NFSR 800 and is primarily accessed from the Cayton Guard Station primitive trailhead, located on NFSR 800. Reno Gulch Trail is a loop trail that begins along NFSR 800 and ends to the south along NFSR 841. These trails provide access to the Reno Mountain Inventoried Roadless Area (IRA).

Many non-system trails exist in the area. They range from game trails to roads that are closed to motorized use. Many of these could be considered non-system trails for discussion purposes. The Forest Service does not maintain non-system trails, nor does it regularly maintain an inventory of these trails.

Hikers, horseback riders and mountain bikers are the primary non-motorized users of system trails, non-system trails and closed roads. This type of use would be characterized as relatively low during the summer months when compared with other areas of the Forest. Hiking and horseback riding increases significantly during the various hunting seasons and would be characterized as high during that time of year.

The distances to the project area from plowed road surfaces prevent most non-motorized users from accessing the area during the winter months, with the exception of dog sledders. Much of the SP snowmobile system is utilized by dog sledders, and they are occasionally encountered within the project area.

Other Recreation Resources

Limited fishing opportunities occur in the WRNF portion of the analysis area. West Divide Creek, along NFSR 800, receives some fishing use. Overall use would be considered low when compared to other areas of the forest.

GRAND MESA, UNCOMPAHGRE, GUNNISON NATIONAL FORESTS

Recreation use on the GMUG forests for fiscal year 2003 was estimated at 3,385,808 national forest visits (USDA 2004). The top primary activities according to the National Visitor Use Monitoring (NVUM) study conducted on the forest were downhill skiing, snowmobiling, hunting, viewing natural features, hiking/walking (USDA 2004). The primary recreational activities on the GMUG and within the analysis area are big game hunting, dispersed camping, four-wheel driving, ATV riding, snowmobiling and horseback riding. There are no developed recreation facilities on the GMUG within the analysis area.

The GMUG is a popular destination big game hunting area for deer and elk.

Management Area Direction

The GMUG Forest Plan Management Area prescriptions that apply to the analysis area and that the alternatives intersect are 6B – Livestock Grazing – Maintain Forest Composition, 7A - Timber Management on Slopes Under 40 Percent and 5A – Big Game Winter Areas in Non-Forest Areas. The management area prescriptions describe the general theme, desired condition and standards and guidelines for the area.

Management Area 6B - Livestock Grazing – Maintain Forest Composition

The 6B management prescription emphasizes livestock grazing. Range condition is maintained through use of forage improvement practices, livestock management and regulation of other resource activities. The desired condition as it relates to recreation includes providing dispersed recreation opportunities that vary between semi-primitive non-motorized and roaded natural. Motorized vehicle use off roads and trails is prohibited. This management prescription covers the majority of the analysis area on the GMUG.

Management Area 5A – Big Game Winter Areas in Non-Forest Areas

The 5A management prescription emphasizes forage and cover for big game animals during winter. The desired condition as it relates to recreation includes closing the area to cross country travel by ski or snowmobile and close areas to human use to the degree necessary to prevent disturbance to wildlife. Parking or trailhead areas would not be provided. New roads other than short-term temporary roads are located outside the management area. New motorized recreation use is managed to prevent unacceptable stress on big game animals during the primary big game use season. This management area covers only a small portion of the analysis area and is located along NFSR 270 and the western end NFSR 265.

Management Area 7A - Timber Management on Slopes Under 40 Percent

The 7A management prescription emphasizes even-aged saw timber production on slopes less than 40%. The desired condition as it relates to recreation includes providing recreation opportunities that range between semi-primitive non-motorized and rural. Motorized vehicle use off roads and trails is prohibited. This management area covers a small portion of the analysis area and is located in the Clear Creek Inventoried Roadless Area, just south of the WRNF border.

Recreation Opportunity Spectrum

The GMUG assigns a different ROS class for summer and winter. The ROS classes assigned include:

- Roaded Modified (RM)
- Roaded Natural (RN)
- Roaded Natural Non-Motorized (RN-NM)
- Semi-Primitive Motorized (SPM)
- Semi-Primitive Motorized – Restricted (SPM-R)
- Semi-Primitive Non-Motorized (SPNM)

Summer

The Proposed Action and Alternative 1 are in Roaded Modified (RM), Roaded Natural (RN) and Roaded Natural Non-Motorized (RN-NM). Alternatives 2 and 3 are in Roaded Natural or Roaded Modified.

Roaded Modified is characterized by substantially modified environments. The Ragged Mountain Pipeline within the Clear Creek basin and the High Tower Transmission utility corridors are classified as RM.

Roaded Natural area is characterized by predominantly natural-appearing environments with moderate evidence of the sights and sounds of people. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities. The RN classification applies to the area along NFSR 265 and 270, north to the forest boundary.

Roaded Natural Non-Motorized is similar to RN but no motorized activity is allowed. RN-NM occurs on both sides of the existing Ragged Mountain Pipeline corridor within the Clear Creek IRA.

Winter

The Proposed Action and Alternative 1 are in Semi-Primitive Motorized (SPM). Alternatives 2 and 3 are in Semi-Primitive Non-Motorized (SPNM) and Semi-Primitive Motorized – Restricted (SPM-R).

The SPNM designation applies to the area along NFSR 270, north to the forest boundary with the WRNF. The SPM-R designation applies to the remaining lands administered by the Grand Valley District of the GMUG. Use of motor vehicles is prohibited April 15- May15 to protect big game in spring habitat.

Hunting

Big game hunting is one of the primary recreation uses within the project area. There is a mix of day use hunters and overnight hunters throughout the project area. The GMUG portion of the project area lies in Colorado Division of Wildlife game management unit (GMU) #521 (CDOW 2006). During the 2004 hunting season, there were 3800 licensed hunters in this GMU for an estimated 18,183 recreation days (CDOW 2004). The hunters harvested 1022 elk. The analysis area is only a small portion of the GMU, however, hunting use in the project area is considered very high.

Big game hunting season begins in late August with archery season. Hunting during archery season is considered moderate to high in the analysis area. Muzzle loading season occurs in mid-September and use is typically moderate. Rifle season is mid-October through mid-November. Rifle season is the most popular big game season and use in the analysis area is very high.

There are two permitted outfitter guides operating on the GMUG within the analysis area. One outfitter is permitted and based on the WRNF but his primary hunting areas are located on the GMUG within the Clear Creek basin. He operates a “drop camp” along NFSR 268, approximately 3 miles west of his primary base camp at the end of NFSR 268. The drop camp is an outfitted and supplied camp for his clients but hunters are self-guided.

A different outfitter is permitted on the Grand Valley District. He operates a base camp at the intersection of NFSR 263 and NFSR 266, approximately 3 miles west of NFSR 265. NFSR 265 is the primary access to his camp and hunting area. This outfitter is permitted 216 service days annually.

Dispersed Camping

Dispersed camping is concentrated along forest development roads. Overall incidence of summer dispersed camping is low and is associated primarily with ATV riding and four-wheeling. Dispersed camping during the hunting season would be considered high with camps occurring along all accessible roads. Many hunting campsites have been used by the same hunting group year after year.

There is a large dispersed camping area at the end of the NFSR 844. It is primarily used by hunters to access the Clear Creek basin using the Clear Fork Trail. During archery, muzzle loader and the 2nd rifle season 20 – 30 vehicles can typically be found there. This area is also used by 3 permitted outfitters as a horse rental drop off point for hunters.

Summer/Fall Motorized Recreation

Primary access to the GMUG portion of the project area is from the south and east along NFSR 265 and State Highway 133. These roads provide access for the communities of Marble to the east and Paonia to the southwest. Highway 133 is a paved highway. NFSR 265 begins approximately 6 miles north of the Paonia State Recreation Area and provides access to the southern end of the proposed pipeline. NFSR 265 is an all weather aggregate road and is open to ATV use. Except during very wet conditions, it is usable by passenger vehicles. NFSR 265 terminates at the junction of County Road 330/NFSR 270. NFSR 270/CR 330 is an all weather road, passable by passenger vehicles. NFSR 268 is a native surface road that terminates at Davies' permitted outfitter/guide camp and provides public access to the Clear Creek basin.

Use of ATV's has increased substantially forest-wide. The Grand Mesa National Forest has completed travel management planning forest -wide. ATV's and motorcycles are allowed on a network of designated forest development roads and trails. The Gunnison National Forest issued a decision in April 2001 that restricted travel to existing roads and trails. Cross-country travel during the snow-free season is prohibited on both forests.

Many users are using ATV's for thrill riding along roads and to access more remote areas of the forest. The majority of ATV use occurs in conjunction with hunting season; however, summer recreational riding is increasing.

There are approximately 89 miles of roads and trails open to ATV's and motorcycles within the GMUG portion of the analysis area. NFSR 265 is part of a popular motorized ATV loop that originates in Vega State Park to the west. ATV use originating from this park is increasing. ATV use is allowed on the trail that follows the Hightower Transmission corridor. It is called the Powerline Trail. The Oil Well Mountain ATV Trail is in development. It would provide a loop trail riding opportunity originating from NFSR 265 near Muddy Creek, going north on existing roads and connecting into the Powerline Trail. This trail is anticipated to be operational in 2006.

Illegal ATV/4WD activity is occurring off roads and trails, on closed roads and along existing pipeline right of ways during the snow-free season. The majority of the illegal use occurs during the hunting season and is typically associated with people utilizing ATV's to hunt, access remote hunting areas away from open roads or retrieve game. Efforts to close areas to ATV use have met with mixed success. Closing areas to ATV/4WD use have been successful using a combination of physical barriers such as gates, earthen berms, boulders, downer timbers, etc. and consistent law enforcement presence.

Driving for pleasure using passenger vehicles to view scenery, fall colors wildlife are popular activities for the recreating public. These motorized activities occur along all open roads but are mostly concentrated along the main arterial routes.

Winter Motorized Recreation

The Sunlight to Powderhorn Snowmobile Trail follows portions of NFSR 265 and 268. NFSR 265.2D, locally known as the Buzzard Cow Camp Rd., is also part of the SP Trail and connects NFSR 265 and 268 in the system.

The NFSR routes in the project area are not plowed or maintained for regular vehicle traffic during the winter months. The general public utilizes most of the road corridors in and around the project area for snowmobile routes. These corridors, regardless of whether or not they are part of the official SP Trail system, provide excellent opportunities for obstacle free loops and access to a wide variety of snowmobile terrain.

Non-Motorized Recreation

Non-motorized use occurs on non-system trails, open roads, and roads that are closed to motorized vehicles throughout the project area. Snow-free non-motorized uses include hiking, mountain biking and horseback riding. There are no non-motorized system trails within the GMUG portion of the analysis area. However, the Clear Fork, Jones Creek and Gooseberry Trails are accessed from the Clear Fork dispersed campsite which is part of the cumulative effects area.

Many non-system trails exist in the area. They range from game trails to trails developed for human use. Many of the roads that are closed to motorized use are also being used for non-motorized activities and could be considered non-system trails for discussion purposes. The Forest Service does not maintain non-system trails, nor does it regularly maintain an inventory of these trails.

Hikers, horseback riders and mountain bikers are the primary non-motorized users of non-system trails and closed roads. This type of use would be characterized as low during the summer months when compared with other areas of the Forest. Hiking and horseback riding increases significantly during the various hunting seasons and would be characterized as high during that time of year.

America’s Adventure is a permitted outfitter/guide that offers guided mountain bike rides. They were permitted approximately 65 service days in 2005. They utilize a dispersed campsite on NFSR 263 near the junction with NFSR 265. They utilize NFSR 265 to access the area and as part of the guided route.

Other Recreation Resources

The Clear Fork provides fishing opportunities and is accessed along the Clear Fork Trail. Use is considered low to moderate.

BLM GLENWOOD SPRINGS RESOURCE AREA

The area managed by the Glenwood Springs Field Office includes 568,000 acres of public lands, extending from Vail in the east to Parachute in the west and from Toponas in the north to Aspen in the south. The area offers diverse natural resources and provides for a variety of natural resource uses, including livestock grazing, firewood cutting, oil and gas development, and motorized and non-motorized recreation.

There is only a small portion of BLM managed lands within the analysis area and affected by the Proposed Action and alternatives. The BLM lands adjoin the White River National Forest lands within the analysis area.

Within the BLM portion of the analysis area the recreation resource setting character remains relatively natural. The management emphasis is custodial and geared towards dispersed recreation. There are no developed recreation facilities on BLM lands within the analysis area.

Recreation Opportunity Spectrum (ROS)

The BLM has inventoried ROS classes in 1984 that apply year-round. The ROS classes that apply to the analysis area are:

- Semi-Primitive Motorized (SPM)
- Roaded Natural (RN)

Semi-Primitive Motorized is defined by the BLM as predominantly unmodified natural environments of moderate to large size that provide some opportunity for isolation from the sights and sounds of man, an opportunity to have a high degree of interaction with the natural environment, an opportunity for moderate challenge and risk, the ability to use outdoor skills, and an explicit opportunity to use motorized equipment. The SPM designation includes the area east of County Road 344/NFSR 800 and west of County Road 342. The BLM's use of the ROS is descriptive and not prescriptive for management purposes.

Roaded Natural area is characterized by predominantly natural-appearing environments with moderate evidence of the sights and sounds of people. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities. The RN designation follows County Road 344/NFSR 800 and West Divide Creek.

Hunting

Big game hunting is one of the primary recreation uses on BLM lands within the project area. The affected environment would be described the same as that of the WRNF.

There are two big game outfitter/guides operating in the BLM June Creek Unit. The June Creek Unit is consists of all BLM lands bound on the north and east by East Divide Creek, south by the WRNF, west by West Divide Creek. Elk Mountain Outfitters operates a base camp in T7S, R91W, Sec. 33, SW1/4. Minimal use is occurring on this permit and it is currently for sale. Another outfitter is authorized for day use only hunts in the June Creek Unit. Additionally, there are 9 outfitters who are permitted for commercial operations in connection with lion hunting within GMU 42.

Dispersed Camping

Dispersed camping would be similar to that described for the WRNF with the highest use occurring during hunting season. Dispersed camping occurs along County Road 311/NFSR 801 and near Uncle Bob Spring. This road lies north of the proposed pipeline location.

Summer/Fall Motorized Recreation

Primary access to BLM lands in the analysis area are from the north on County Road 311 and County Road 342. These roads become NFSR 801 and 270, respectively, as they cross into the WRNF.

Currently, BLM lands are designated as open, closed or limited use to off-road vehicles. The open designation allows motorized vehicle use on all routes and trails and also permits cross-country travel if it does not cause resource damage. The limited designation has seasonal restrictions and use restricted to roads and trails only.

The area around CR 311 is designated as open to ATV use year-round. The area around CR 342 is designated as limited use and ATV's are restricted to existing roads and trails from May 1 – November 30.

There are approximately 4 miles of roads and trails open to motorized vehicle use within the BLM portion of the analysis area.

Winter Motorized Recreation

There are no designated snowmobile trails on BLM lands within the analysis area. Existing roads and trails on BLM lands are open to snowmobiles. The West Divide Creek Snowmobile Trailhead is located along NFSR 800, just south of the Divide Creek compressor location.

Non-Motorized Recreation

There are no designated non-motorized system trails on BLM lands within the analysis area.

Hikers, horseback riders and mountain bikers are the primary non-motorized users of non-system trails and closed roads. This type of use would be characterized as low during the summer months. Such use increases significantly during the various hunting seasons and would be characterized as high during that time of year.

Other Recreation Resources

There are no other recreation resources on BLM lands within the analysis area.

3.11.5 ENVIRONMENTAL CONSEQUENCES

SUMMARY OF EFFECTS

The Proposed Action and Alternative 1 would directly impact an outfitter/guide's base camp at the end of NFSR 268 and his ability to utilize the existing Ragged Mountain pipeline corridor as access to his traditional hunting areas. He may not be able to operate his guiding service for one to two seasons, due to construction activities being staged at his base camp and along the ROW. The wider ROW may change the recreation setting such that clients seeking a back country hunting experience may choose to hunt elsewhere, affecting the long-term viability of the outfitter's business.

The Proposed Action and Alternative 1 have potential for increased illegal ATV activity in the IRAs. This is anticipated due to difficulties in effectively closing the ROW after construction and the potential for illegal ATV users to pioneer trails from the ROW into the IRAs.

Some illegal ATV activity is anticipated with Alternatives 2 and 3 along NFSR 265 and the Powerline Trail. The illegal activity could impact the reclamation and rehabilitation of the ROW since both NFSR 265 and the Powerline Trail would be adjacent to the ROW.

Changing the management prescription of the area surrounding the pipeline route to a designated utility corridor through forest plan amendments would allow for additional utilities to be developed within the corridor. The utility corridor designation is compatible with adjacent management prescriptions on both forests. Future developments that could result from the designation would have similar effects as those described for each alternative.

EFFECTS ON RECREATION OPPORTUNITY SPECTRUM

No Action Alternative

There would be no direct, indirect or cumulative effects to the Recreation Opportunity Spectrum by implementing the No Action Alternative.

Effects Common to all Action Alternatives

The action alternatives would be consistent with ROS designations on all public land ownerships. The assigned ROS class would not change as a result of any of the alternatives.

Proposed Action

Summer

The Proposed Action would be consistent with the assigned ROS classes of RM, RN and RN-NM on the WRNF and GMUG. The IRAs (IRA) are assigned ROS classes of RN-NM and RM. The existing Ragged Mountain Pipeline passes through the IRA's and these designations. Placement of the proposed pipeline corridor adjacent to the existing pipeline could affect the recreation setting to the extent that people seeking a back country experience may go elsewhere to recreate; however the ROS designation would not change.

The BLM land is classified as SPM. The Proposed Action is not in a BLM Special Recreation Management Area (SRMA) where recreation is the primary focus. It is in the Glenwood Springs Extensive Recreation Management Area (ERMA), where recreation is a significant activity but not the principal management focus. The pipeline ROW would be noticeable to visitors but its presence is not expected to change their recreation experience.

Winter

The Proposed Action is within SPM on all ownerships. The majority of the Proposed Action pipeline route follows the existing Ragged Mountain Pipeline corridor. Additional ROW adjacent to Ragged Mountain Pipeline would be consistent with SPM.

Alternative 1

Summer

Alternative 1 would be consistent with the assigned ROS classes of RM, RN and RN-NM on all ownerships.

Winter

Alternative 1 is within SPM on the WRNF and GMUG lands. The effects on the WRNF and GMUG would be that same as those described in the Proposed Action.

Alternative 2

Summer

Alternative 2 would be consistent with the assigned ROS classes of RN, RM and SPM. The portion of Alternative 2 that falls within SPM follows NFSR 270/CR 342 on the WRNF and BLM. Placement of the pipeline corridor adjacent to an existing road corridor within SPM would not affect the recreation experience or setting.

Winter

Alternative 2 would be consistent with the assigned ROS classes of SPNM, SPM and SPM-R. Alternative 2 follows NFSR 265 and 270. Placement of the pipeline corridor adjacent to an existing road corridor would not affect the recreation experience or setting.

Alternative 3

Summer

Alternative 3 would be consistent with the assigned ROS classes of RN, RM and SPM. The SPM portion of Alternative 3 follows the existing Hightower Transmission utility corridor, NFSR 270 and County Road 342. Placement of the pipeline corridor adjacent to the existing road and utility corridors would not affect the recreation experience or setting.

Winter

Alternative 3 would be consistent with the assigned ROS classes of SPNM, SPM and SPM-R. Alternative 3 follows NFSR 265, 270 and the Hightower Transmission utility corridor. Placement of the pipeline corridor adjacent to the existing road and utility corridors would not affect the recreation experience or setting.

EFFECTS ON HUNTING AND OUTFITTER/GUIDES

No Action Alternative

There would be no direct, indirect or cumulative effects on hunting by implementing the No Action Alternative.

Direct/Indirect Effects Common to all Action Alternatives

The general effects on hunting are primarily a result of a combination of effects to other resources and activities such as transportation, wildlife, dispersed camping, motorized and non-motorized recreation. Refer to those analysis sections for a detailed description of effects as they relate to hunting.

Construction would not occur during the big game rifle season (See FEIS Table 6). During the 2004 season, within game management units 42 and 541, there were a total of 7325 hunters during rifle, archery and muzzle loading seasons combined. Approximately 74% were rifle (5422 hunters), 19% archery (1355 hunters) and 7% muzzle loading (548 hunters) (CDOW 2004). By not permitting construction during big game rifle season, the majority of hunters would not be impacted by construction activities.

Archery season begins the last Saturday of August and ends the last Sunday in September. Muzzle loading season begins in mid-September, is approximately 9 days long, and is concurrent with archery season. Both archery and muzzle loading season are gaining in popularity.

There would be short-term displacement and disturbance of game animals and archery/muzzle loading hunters. This would be primarily along access roads and the ROW during construction. There is similar terrain for both animals and hunters in the analysis area that should not be directly affected by construction activities and available for hunting.

Areas under forest closure due to construction would be unavailable for hunting. The closure area may shift as construction and rehabilitation of the ROW is completed. These effects would last during the construction phase of the project.

Temporary closures on forest roads during construction may delay hunters. Hunters may become frustrated due to delay in reaching their hunting areas or camps. These effects would last during the construction phase of the project.

Hunters who are displaced may be frustrated that they are not able to hunt in their “traditional” areas. Hunters that have traveled a long distance and are not aware of the construction activity and closures would be upset that their planned hunting vacation has to be modified and a new hunting area found. Displaced hunters would have the opportunity to explore new areas that may enhance their outdoor recreation experience. Displaced hunters may move to adjacent areas and crowd other hunters, impacting others’ hunting experience. These effects would last during the construction phase of the project.

Longer term hunting success may increase due to long distance, open, shooting views down the ROW corridor. This effect would last through the life of the permitted ROW.

Proposed Action Direct/Indirect Effects

NFSR 268 would be used as a major access for pipeline construction. NFSR 268 would be improved to allow for large truck traffic. The end of NFSR 268 is a mid point in the proposed pipeline and construction is planned to occur downhill, both north and south. There is a large staging area proposed for construction activities at the end of NFSR 268, including pipe stockpiling and truck turn-a-rounds. A high volume of vehicular traffic, both light and heavy trucks, is anticipated at this site.

A permitted outfitter/guide base camp is located at the end of NFSR 268. The outfitter uses approximately 3-4 miles of the Ragged Mountain Pipeline corridor to the south of his camp to access his traditional hunting area. The campsite would be unavailable and undesirable for commercial hunting opportunities while construction activities are based out of this area. The outfitter/guide would potentially lose business during archery and muzzle loading season due to construction activity. The degree to which the outfitter would be affected depends on construction and reclamation progress along the ROW and at the campsite. If construction was finished and the staging area and ROW to the south of his camp were reclaimed by mid August, the outfitter may be able to utilize the camp in time for archery season. The outfitter/guide would lose revenue if construction were not completed and reclaimed in time for archery and muzzle loading season. These direct effects would last during the construction phase of the project and until the ROW was successfully reclaimed and re-vegetated.

The new ROW would parallel the existing Ragged Mountain Pipeline through the Clear Creek, East Willow and Baldy Mountain Inventoried Roadless Areas. This would create a corridor approximately 100 feet wider than what presently exists. This may detract from the experience that some hunters are seeking for back country hunting. This effect would last through the life of the permitted ROW, and until the ROW was abandoned and revegetated.

If the outfitter/guide has to shut down his operation for a season, his clients may choose to hire another guide. These clients may not return and this may lead to a loss of business. The impacts to the outfitter camp and the access along the ROW could change the hunting recreation setting. Clients may decide to hunt elsewhere, using a different outfitter/guide business.

Alternative 1 Direct/Indirect Effects

The direct effects to hunting and outfitter/guides would be the same as those described as common to all action alternatives and the Proposed Action.

The indirect effects to hunting and outfitter/guides would be the same as those described as common to all action alternatives and the Proposed Action.

Alternative 2 Direct/Indirect Effects

Direct effects to hunting under this alternative would be related to access along NFSR 265. Hunters and outfitter/guides that use any part of the analysis area for hunting may encounter delays and road closures during construction along NFSR 265. As construction progresses, different sections of the road would be subject to delays and closures. There are other forest development roads that intersect NFSR 265 at various locations and would provide limited access to certain stretches of NFSR 265. Hunters may not be familiar with these alternate roads. Some alternate roads would require substantial detours around the analysis area. Hunters may experience frustration with not being able to use NFSR 265 to access their traditional hunting areas. These effects would last during the construction phase of the project.

The indirect effects would be similar to those effects described as common to all action alternatives. Due to the length of the pipeline under this alternative, construction and the associated impacts are anticipated to last 2 years.

Alternative 3 Direct/Indirect Effects

The direct effects under this alternative are similar to Alternative 2; however, impacts would be reduced as the pipeline would leave NFSR 265 and follow the Hightower Transmission line. NFSR 265 would have construction along it for a much shorter distance, resulting in less delays and closures. There would be construction traffic along NFSR 265 and associated access roads to the utility corridor. These effects would last during the construction phase of the project.

The indirect effects would be similar to those effects described as common to all action alternatives. Due to the length of the pipeline under this alternative, construction and the associated impacts are anticipated to last 2 years.

EFFECTS ON DISPERSED CAMPING

No Action Alternative

There would be no direct, indirect or cumulative effects on dispersed camping by implementing the No Action Alternative.

Direct/Indirect Effects Common to all Action Alternatives

There would be short-term loss and/or disturbance of existing dispersed campsites where ROW construction is adjacent to roads and where dispersed sites are along roads that are used to access the ROW. Short-term loss of sites would occur as a result of construction of the pipeline across a site, the site being used as a staging/parking area for construction activities or site closure for safety reasons. Disturbance of campers would occur due to machinery noise, presence of construction workers, increased traffic on roads and dust.

Direct effects would be most noticeable during big game hunting season when use is very high. These effects would last during the construction phase of the project.

Additional campsites may be created due to pipeline construction activities such as truck turn-a-rounds, parking areas, pipe staging areas and road widening and improvements. Existing campsites may be enlarged if used for construction parking or staging.

Use of the new ROW for dispersed camping may occur. Where the ROW is adjacent to existing roads, the new opening created may be level and large enough to accommodate vehicles and trailers. Non-motorized users, such as pack-in hunting camps may find the ROW an easy access route to the back country and a desirable place to set up camp. There may be impacts to post-construction reclamation efforts as a result of dispersed camping use of the ROW.

Proposed Action Direct/Indirect Effects

The Proposed Action may impact the Clear Fork dispersed camping area located at the end of NFSR 844. NFSR 265 and 844 would be used to access the construction area. The proposed pipeline location crosses NFSR 844 approximately 0.8 miles west of the Clear Fork dispersed camping area. Delays and closures may occur, restricting access to the dispersed camping area. NFSR 844 may be impassable due to trenching for a short amount of time. If delays, closures and trenching along NFSR 844 and 265 occur outside of archery and muzzle loading hunting seasons, impacts to dispersed camping at Clear Fork would be minimal.

Dispersed camping occurs along NFSR 268, 800 and 841. These roads would be used significantly for construction access and staging equipment. Impacts to dispersed camping would be similar to those described in effects common to all action alternatives.

All other direct effects associated with the Proposed Action would be the same as those effects described as common to all action alternatives.

There are no indirect effects unique to this alternative other than those already indicated for all action alternatives.

Alternative 1 Direct/ Indirect Effects

This alternative would have similar impacts as the Proposed Action. The pipeline would cross NFSR 844, following the existing Ragged Mountain Pipeline; approximately 1.4 miles west of the Clear Fork dispersed camping area.

Dispersed camping occurs along NFSR 268 and 841. These roads would be used significantly for construction access and staging equipment. Impacts to dispersed camping would be similar to those described in effects common to all action alternatives.

Hunter access to private lands along NFSR 800 may be impacted by delays and road closures. Some of these private lands are hunting camps that are heavily used during the various big game seasons. These effects would last during the construction phase of the project

There are no indirect effects unique to this alternative other than those already indicated for all action alternatives.

Alternative 2 Direct/Indirect Effects

This alternative would have direct effects similar to those effects described as common to all action alternatives, although there is potential for substantially more dispersed camping opportunities being created along NFSR 265. The ROW would be adjacent to NFSR 265 along its entire length. ROW construction could create level areas adjacent to the road that would be large enough to accommodate large vehicles and trailers.

Reclamation efforts may be impacted by hunters and recreationists camping on the ROW. Closing the ROW to dispersed camping may be difficult along NFSR 265.

Due to the length of the pipeline under this alternative, construction and the associated impacts are anticipated to last two years.

There are no indirect effects unique to this alternative other than those already indicated for all action alternatives.

Alternative 3 Direct/Indirect Effects

The direct effects would be similar as those described in Alternative 2, although to a lesser extent as the pipeline would follow NFSR 265 for a much shorter distance. Dispersed camping may increase along the access roads leading to the transmission line. Where the access road intersects the transmission line, dispersed camping may occur on the ROW.

Due to the length of the pipeline under this alternative, construction and the associated impacts are anticipated to last two years.

There are no indirect effects unique to this alternative other than those already indicated for all action alternatives.

EFFECTS ON SUMMER /FALL MOTORIZED RECREATION

No Action Alternative

There would be no direct, indirect or cumulative effects on summer motorized recreation by implementing the No Action Alternative.

Direct/ Indirect Effects Common to all Action Alternatives

It is expected that most direct impacts would be common to all action alternatives, but the extent or number of incidences of those impacts would vary by alternative. The effects described would last during the construction phase of the project.

The major access roads to the analysis area, NFSR 800, 265, 268 and 844, are open to ATV use. Recreationists may encounter trucks hauling heavy equipment and pipe sections. Large truck traffic in conjunction with ATV use can create a safety issues related to visibility due to dust, size difference of vehicles using the same roads and condition of roads. The potential for encountering large trucks coming from the opposite direction would likely require increased attention to driving, and a willingness to yield the right-of-way on the part of the recreational driver. Slow moving vehicles may be encountered. Passing opportunities are limited on forest development roads. Mitigation to provide for public safety on forest roads is included in the transportation section and the safety plan.

Recreational motorists may experience traffic delays during pipeline construction operations. Recreationists may experience significant delays, resulting in frustration. Mitigation measures are in place that allow for a two-hour delay; however, depending on the construction activity that is occurring, delays could be longer. See the transportation section for a description of the effects and mitigation proposed.

Impacts to ATV users would be greatest during big game hunting season. ATVs are used by hunters to access campsites, hunting areas and scout for game. During hunting season, ATV traffic would be considered heavy. Impacts to summer ATV use would be greatest on weekends and holidays, although use would be considered moderate.

See the transportation section for additional information about descriptions and frequencies of impacts and proposed mitigation related to construction activities and the use of forest roads.

There is potential for illegal ATV activity along and originating from the ROW with all alternatives. All alternatives either follow or intersect the Ragged Mountain Pipeline, Hightower Transmission line or forest roads. The wider corridors would be difficult to close, depending on adjacent vegetation and terrain. Reclamation of the newly constructed ROW could be lost.

Illegal ATV users may be tempted to pioneer trails through the reclaimed ROW, looking for challenging rides. Some illegal ATV users enjoy “mud bogging” in wet conditions and that opportunity would be present for several years, until vegetative cover was well established on the ROW. Illegal ATV riders sometimes engage in “high siding” cut banks along roads and utility corridors, causing resource damage. These types of illegal activities would be difficult to discourage due to the wide open condition of the ROW.

Resource damage associated with illegal ATV/4WD use includes road proliferation, soil erosion and compaction, destruction of vegetation, fragmentation of wildlife habitat, introduction of noxious weeds on disturbed ground, disruption of wildlife, impacts to water quality, disturbance to other forest visitors and conflicts with private landowners. The magnitude of these types of effects depends on many factors including the level of use occurring, effectiveness of physical closures, law enforcement presence and information available to users. Project design feature RE-2 describes methods to close the ROW to illegal ATV use. Project design feature RE-3 (FEIS Table 6) identifies the ROW grant holder as responsible to replace, repair and reinforce motorized access barriers if they are breached, throughout the life of the permitted ROW. This design feature addresses the long term effectiveness of ROW closures. These effects would last through the life of the permitted ROW.

Proposed Action Direct/ Indirect Effects

Conflicts with ATVs and large truck traffic associated with construction would potentially occur on NFSR’s 800, 841, 843, 844, 844.1A and 265. Other effects would be similar as those described as common to all action alternatives.

Illegal ATV use may impact those hunters seeking a secluded, backcountry hunting experience.

The indirect effects would be similar as those described as common to all action alternatives, with the addition that this alternative has potential to increase illegal ATV use in the East Willow, Baldy Mountain and Clear Creek IRAs.

There Proposed Action follows the existing ROW through the three IRAs. Approximately 8.6 miles of existing ROW would be widened within the IRAs.

Alternative 1 Direct/ Indirect Effects

The direct effects would be the same as the Proposed Action and those that are common to all action alternatives. The effects along NFSR 800 would increase as the proposed route would follow the road corridor, impacting use along that road to a greater extent.

The indirect effects would be the same as those described in the Proposed Action.

Alternative 2 Direct/ Indirect Effects

ATV users would experience delays and closures along NFSR 265 when construction activities are taking place. Other routes are available in the area; however, NFSR 265 is the arterial route through the area and it connects several other ATV riding opportunities. Effects would be similar to those described as common to all action alternatives.

Due to the length of the pipeline under this alternative, construction and the associated impacts are anticipated to last two years.

The indirect effects anticipated are illegal ATV use of the ROW and the resource damage associated with illegal use. It would be difficult to stop illegal ATV use of the reclaimed ROW where it is adjacent to NFSR 265. Illegal activity and associated resource damage would be similar to those effects described as common to all action alternatives.

Alternative 3 Direct/ Indirect Effects

NFSR 265 and the Powerline Trail are open to ATV use. The Powerline Trail would have to be closed during construction activities for safety purposes. ATVs could be re-routed along NFSR 265, which parallels the Powerline Trail. The riding experience would be different on NFSR 265; however, access through the area would be maintained so there would not be a loss of ATV recreation opportunity in the area.

Other effects would be similar as those described as common to all action alternatives.

Due to the length of the pipeline under this alternative, construction and the associated impacts are anticipated to last two years.

The indirect effects anticipated are illegal ATV use of the ROW and the resource damage associated with illegal use due to proximity of the ROW to the Powerline Trail. It would be extremely difficult to stop illegal ATV use of the reclaimed ROW where it is adjacent to the Powerline Trail. ATV users may be tempted to pioneer trails through the reclaimed ROW, looking for challenging rides. Some illegal ATV users enjoy “mud bogging” in wet conditions and that opportunity would be present for several years, until vegetative cover was well established on the ROW. Illegal ATV riders sometimes engage in “high siding” cut banks along roads and utility corridors, causing resource damage.

EFFECTS ON WINTER MOTORIZED RECREATION

No Action Alternative

There would be no direct, indirect or cumulative effects on winter motorized recreation by implementing the No Action Alternative.

Effects Common to all Action Alternatives Direct/ Indirect Effects

There would not be any unique effects related to the individual alternatives. This section encompasses the effects to winter motorized recreation regardless of alternative.

There would not be any direct effects to winter motorized recreation. Construction is planned to occur May 1 – mid October, which is outside the typical snow season.

Road improvements for construction access may make some roads more desirable for snowmobiling. Straightening and widening roads may encourage recreationists to travel at higher speeds, possibly beyond their skill level. Higher speeds can lead to an increase in the incidence of accidents and injuries to snow mobile users.

Road improvements that coincide with the S-P trail may change the character of the recreation experience along this trail. Wider and straighter roads may decrease the skill level necessary to navigate this trail. This may make the snowmobiling experience more desirable for some users and less desirable for those looking for a challenging ride.

EFFECTS ON NON-MOTORIZED RECREATION

No Action Alternative

There would be no direct, indirect or cumulative effects on non-motorized recreation by implementing the No Action Alternative.

Direct/ Indirect Effects Common to all Action Alternatives

The majority of non-motorized use occurs on the weekends with the exception of hunting season. Most non-motorized recreationists also utilize motor vehicles to access the area so they would experience the same delays and road closures due to pipeline construction.

The action alternatives do not intersect any forest system trails. No system trails are proposed to be used for construction access. System trails would not be directly affected by forest area closures along the construction ROW.

Non-system trails and closed roads that are traditionally used by hunters, horseback riders, hikers and mountain bikers may not be available due to construction activities and forest area closures. Horseback riding and hiking in association with hunting would be impacted the most. Similar terrain and routes would be available for use within and adjacent to the analysis area. Displacement to other areas would be short-term, lasting during the construction phase of the project.

Mountain bikers that ride along open roads may experience the same impacts of dust, noise, and safety concerns that would impact the motorized user.

Recreational horseback riding, excluding hunting use, is not significant when compared to other areas of the forests. Impacts to this use would be low and similar to the impacts that effect mountain bikers.

Recreationists who are displaced may be frustrated that they are not able to utilize there favorite routes and areas. This effect would be short-term, lasting during the construction phase of the project.

Road improvements may change the character of the routes historically used by recreationists, making them undesirable for the recreation experience they are seeking. Other recreationists may enjoy the improved routes as they may be less difficult to negotiate. These effects would last long-term due to the changed character of the routes.

There could be minor impacts to adjacent areas of the forest due to displacement of those non-motorized users. However, the potential for any noticeable increase in use to any other particular area due to such displacement would be negligible.

Proposed Action Direct/Indirect Effects

The Proposed Action may impact access to the Clear Fork Trailhead (Trail #810) located at the end of NFSR 844. NFSR 265 and 844 would be used to access the construction area. The proposed pipeline location crosses NFSR 844 approximately 0.8 miles west of the Clear Fork Trailhead. Delays and closures may occur, restricting access. NFSR 844 may be impassable due to trenching for a short amount of time. If delays, closures and trenching along NFSR 844 and 265 occur outside of hunting season, impacts to the Clear Fork Trail would be minimal. These effects would last during the construction phase of the project.

The Ragged Mountain Pipeline ROW between NFSR 268 and Battle Park is being used by an outfitter/guide as a horseback travel route to access his traditional hunting areas. The Proposed Action parallels the RMP in this area. The hunting area is primarily south of the outfitter guide camp and encompasses the area around Spruce Mountain and June Creek. If construction and reclamation along the ROW in this area is not finished before archery season begins the traditional access to this outfitter’s hunting area may be impacted. These effects would last during the construction phase of the project and impact non-motorized travel on the new ROW until reclamation is completed and vegetation re-established.

The indirect effects would be the same as those described as common to all action alternatives.

Alternative 1 Direct/Indirect Effects

Alternative 1 may impact access to the Cayton Guard Station and the primitive trailhead for Cayton Gulch, Lake Fork, East Fork and Muddy Creek system trails. The guard station and trailhead is approximately a half mile off NFSR 800. The proposed pipeline route intersects NFSR 800 just north of the trailhead access road. Access may be limited along NFSR 800 when construction is occurring there. There are other roads such as NFSR 268/841 and 801/843 available to access the trailhead, although depending on construction location there may be delays or closures due to construction.

Reno Gulch system trail originates along NFSR 800 approximately 0.75 miles north of the intersection with NFSR 841 and terminates along NFSR 841 midway between NFSR 800 and 268. Access to this trail would be similar to those impacts described above.

The Ragged Mountain Pipeline ROW between NFSR 268 and Battle Park is being used by an outfitter/guide as a horseback travel route to access his traditional hunting areas. The hunting area is primarily south of the outfitter guide camp and encompasses the area around Spruce Mountain and June Creek. If construction and reclamation along the ROW in this area is not finished before archery season begins the traditional access to this outfitter's hunting area may be impacted.

The indirect effects would be the same as those described as common to all action alternatives.

Alternative 2 Direct/Indirect Effects

There are no system trails or trailheads that would be impacted by this alternative.

America's Adventure, the outfitter/guide that offers guided mountain bike rides, may experience delays and encounters with construction traffic under this alternative. There are other riding opportunities available in the area. The impacts to this outfitter/guide would last during the construction phase of the project. Other direct effects would be the same as those described as common to all action alternatives.

Due to the length of the pipeline under this alternative, construction and the associated impacts are anticipated to last two years.

There are no system trails or trailheads that would be impacted by this alternative. The indirect effects would be the same as those described as common to all action alternatives.

Alternative 3 Direct/Indirect Effects

There are no system trails or trailheads that would be impacted by this alternative. The direct effects would be the same as those described as common to all action alternatives.

Due to the length of the pipeline under this alternative, construction and the associated impacts are anticipated to last two years.

There are no system trails or trailheads that would be impacted by this alternative. The indirect effects would be the same as those described as common to all action alternatives.

EFFECTS ON OTHER RECREATION RESOURCES

No Action Alternative

There would be no direct, indirect or cumulative effects on other recreation resources by implementing the No Action Alternative.

Direct/Indirect Effects Common to all Action Alternatives

The direct, indirect and cumulative effects on other recreation activities such as fishing are primarily a result of a combination of effects to other resources such as transportation, dispersed camping, motorized and non-motorized recreation. Refer to those analysis sections for a detailed description of effects as they relate to fishing.

CONNECTED ACTIONS

The compressor site is a connected action associated with the Proposed Bull Mountain Pipeline. It would be constructed on private land at the southern terminus of the pipeline, regardless of the alternative selected. The compressor site would include several buildings that house compressors, cooling fans and pumps. Other developments would include water tanks, secondary pipelines and water disposal wells.

Developments associated with oil and gas may change the character of the private land to the extent that people typically recreating on those private lands may choose to recreate elsewhere. However; changes in the behavior patterns of recreationists are difficult to predict and the effects of the connected action on recreation is unknown.

Dispersed camping is a term used to describe a camping experience on public land that is not associated with a developed recreation facility. Dispersed camping on national forest land may occur within the vicinity of the compressor site. The noise of the compressor fans may disturb campers to the extent that they choose to camp elsewhere on national forest lands. The degree to which it would effect dispersed camping is dependent on the proximity of dispersed campsites to the compressor, the noise level of the compressors and the tolerance of recreationists to disturbance.

Roads and trails on private land are controlled by the land owner. County and state governments manage public roads and highways and set regulations regarding use of vehicles on roads. The connected action is not expected to have an effect on summer or winter motorized recreation use.

CUMULATIVE EFFECTS

The cumulative effects discussion considers past, present and reasonably foreseeable actions that occur within the analysis area. These actions include existing, ongoing and planned pipelines and associated oil and gas activity, vegetation management, grazing and recreation activities. A list of the potential cumulative actions considered in this analysis is included as FEIS Appendix P.

The cumulative effects analysis area for the recreation resource is defined by Forest Development Roads (FDR) 265 to the south and west, FDR 270 and County Road 342 to the northwest and north and the Proposed Action pipeline location to the east. These boundaries define the extent of potential impacts of the pipeline on the recreation resource and recreationists. Short term effects associated with construction would occur near or adjacent to the selected route. Long term effects are related to the operation, maintenance and existence of the pipeline on the landscape and how its presence affects recreationist's choice to utilize the area.

Under the Proposed Action and Alternative 1, the effects of the existing Ragged Mountain Pipeline and the addition of the Bull Mountain Pipeline may change the recreation experience for hunters seeking a back country hunt in the IRAs. Hunters may choose to hunt in areas where oil and gas development is not evident. The outfitter may lose clients that are seeking a back country experience. This could affect the long-term viability of the outfitter guide business permitted in the area.

Illegal ATV/4WD use of existing pipelines is already occurring. All alternatives have the potential to create additional opportunities for illegal ATV activity. Resource damage associated with illegal ATV/4WD use could occur along and adjacent to the ROW under all alternatives. The Proposed Action and Alternative 1 have the most potential for increased illegal ATV activity in the IRAs. This is anticipated due to difficulties in effectively closing the ROW after construction and the potential for illegal ATV users to pioneer trails from the

ROW into the IRAs. Project design features would reduce the impacts of some illegal ATV use; however past experience has shown that it is difficult to completely eliminate illegal use.

There may be short-term loss of use of dispersed camp sites, lasting during the construction phase of the operation under all alternatives. There is an increase expected in the number of potential dispersed camping sites due to road improvements and construction activities under all alternatives. There are no cumulative effects associated with snowmobiling. Road improvements may change the riding experience; however, there are unimproved roads throughout the analysis area and in adjacent areas that are available for riding.

After construction and reclamation activities are complete, the ROW may be used as non-motorized access for recreationists. This feature would exist indefinitely on the landscape. Similar features are already present on the landscape; i.e., the Ragged Mountain Pipeline, the Rocky Mountain Natural Gas Line and the Questar Line and non-motorized use is occurring on them. It is anticipated that any new pipeline construction would also be used by non-motorized recreationists.

Designating the pipeline route as a utility corridor through a forest plan amendment would allow for future developments within the corridor. Potential new utilities adjacent to the Ragged Mountain Pipeline and the Bull Mountain Pipeline may further impact the recreation setting of the IRAs under the Proposed Action and Alternative 1. Hunters and recreationists seeking a back country experience may go elsewhere to recreate.

Development associated with oil and gas is a foreseeable action that would occur primarily on private land. These developments include drill pads, wells, associated roads and pipelines. These developments may change the character of the private land to the extent that people typically recreating on those private lands may choose to recreate on public lands nearby or in areas where oil and gas development is not evident. Changes in behavior patterns of recreationists are difficult to predict and the cumulative effect on recreation is unknown.

The alternatives analyzed comply with the management direction for recreation provided in the White River Land and Resource Management Plan and the Grand Mesa, Uncompahgre and Gunnison National Forests Plan and the Bureau of Land Management Glenwood Springs Resource Management Plan and federal regulations and policies concerning the recreation resource.

3.12 VISUAL RESOURCES

3.12.1 INTRODUCTION

This section analyzes the Bull Mountain Pipeline proposed action and alternatives. It covers three different visual resource management systems for the White River National Forest (WRNF), Grand Mesa Uncompahgre Gunnison (GMUG) National Forest, and the BLM Glenwood Springs Field Office (BLM). The effects of each alternative under each system are fairly cohesive, since all the visual systems are based upon the same principles of enhancing and protecting landscapes, viewsheds, and visual integrity. All are inventoried, classified, and prescribed for management of visual resources based upon proximity, duration and intensity of visitor viewing. The newer Scenery Management System (SMS) adds additional weight to landscape values and perceptions. All the systems are based on minimum visual retention standards for compliance review (e.g. actual remedies can and should be sought above minimum requirements), and all seek to achieve the highest scenery values possible.

Due to the issues and potential impacts associated with analysis in preliminary design stages for the proposed pipeline, a detailed Visual Resource Protection Program (FEIS Appendix N) has been created which is intended to mitigate impacts for all Alternatives except the No Action Alternative. A single review system is being used for the impacts of the project, and where variances occur in interpretation they would be called out by the visual system in point. A description of each system is provided which details the system classifications and highlights the system methodology in the methodology section of this report. Much of the information contained in the FEIS would be the same under either system. The landscape character and existing condition descriptions are appropriate for both systems, as are the descriptions of short and long-term impacts to visual resources and the design features described in the VRPP. Additionally, the cumulative impacts and unavoidable and adverse impacts are essentially the same under all systems.

All the agencies involved in the application of this project value scenic resources to the level that they have been incorporated into policy, regulation, and management direction. The Council on Environmental Quality (CEQ) regulations require agencies to “ensure that presently unqualified environmental amenities and values be given appropriate consideration in decision making along with economic and technical considerations. (CEQ 102 (2) (B). This analysis is based on visual resource qualities and characteristics as they relate to the human environment and fulfills this direction.

3.12.2 REGULATORY FRAMEWORK

The methodology of each visual management system is provided in the methodology section of this report. The following laws and direction are relevant to the protection of visual resources.

MANAGEMENT DIRECTION

The LRMP for the FS units and the RMP for the BLM unit provides general management direction for visual resources, stating that the quality of the existing scenic resources and viewing opportunities are to be maintained or enhanced.

AGENCY MANAGEMENT AREA STANDARDS AND GUIDELINES

The Forest Service LRMPs and the Bureau of Land Management RMP identify specific Standards and Guidelines pertaining to the protection and enhancement of visual quality as follows:

WRNF

Forest-wide guidelines for Scenery Management

- Scenery Management Guidelines #1 p. 2-34, WRNF LRMP: Management activities should be designed and implemented to achieve, at a minimum, the level of scenic integrity shown on the scenic integrity objective map.
- Scenery Management Guidelines #2 p. 2-34, WRNF LRMP: Rehabilitate all existing projects and areas that do not meet the scenic integrity objectives. Set priorities for rehabilitation considering the following:
    - Relative importance of the area and the amount of deviation from the scenic integrity objectives;
    - Foreground of high public use areas has highest priority;
    - Length of time it would take natural processes to reduce the visual impacts so that they meet the scenic integrity objective(s);
    - Length of time it would take rehabilitation measures to meet the scenic integrity objectives; and
    - Benefits to other resource management objectives to accomplish rehabilitation.
- Scenery Management Guidelines #3 p. 2-34, WRNF LRMP: Plan, design, and locate vegetation manipulation on a scale that retains the color and texture of the landscape character, borrowing directional emphasis of form and line from natural features.
- Scenery Management Guidelines #4 p. 2-34, WRNF LRMP: Choose facility and structure design, scale, color of materials, location, and orientation to meet the scenic integrity objective on the Scenic Integrity Objective Map.
- Scenery Management Guidelines #5 p. 2-34, WRNF LRMP: Facilities, structures, and towers with exteriors consisting of galvanized metal or other reflective surfaces would be treated or painted dark non-reflective colors that blend with the forest background to meet an average neutral value of 4.5 or less as measured on the Munsell neutral scale.
- Scenery Management Guidelines #6 p. 2-34, WRNF LRMP: Rehabilitate areas classified as “unacceptable alteration” in the existing scenic integrity inventory to the scenic integrity objective on the Scenic Integrity Objective Map.

GMUG FOREST

LRMP Guidelines

- Apply the Visual Management System to all National Forest System lands

- Follow direction provided in FSM 2311, 2380, and FSH 2309 16 through FSH 2309 25
- The accepted range of adopted Visual Quality Objectives for individual land areas would correspond to the Adopted Recreation Opportunity Spectrum as displayed in the FSM 2311 11 Exhibit 1
- In areas of Partial Retention foreground through middle ground clear cutting of vegetation for ROW can not exceed 20% of the seen area for a travel corridor and cannot exceed 25% in areas of Partial Retention background through Modification foreground.
- In areas of Partial Retention foreground, develop corridor or viewshed reports for all travel corridors before starting ground disturbing activities.
- In areas of Partial Retention foreground through Modification foreground, cutting units must not dominate natural patterns of form, line, color, and texture.
- All ground disturbances to be returned to natural appearances where feasible on all forest system lands.
- In areas of Partial Retention foreground, stump height to be held to the minimum possible in visible areas.
- In areas of Partial Retention foreground through Modification foreground, landings are to be located outside seen areas or rehabilitated.
- In areas of Partial Retention foreground, snags for cavities are to be located to conform with natural vegetation patterns.
- In areas of Partial Retention foreground through Modification foreground, roads must not dominate natural patterns of form, line, color, and texture within clearcut areas one year after cutting.
- All cut and fill slopes with in project area to be revegetated.
- Utility ROW clearing to conform to natural vegetative pattern throughout project area.
- All seen structures would be of naturally harmonious colors.

BLM

- Visual Resource Management-Objectives-Glenwood Springs, Record of Decision RMP, 1988, page 38. To maintain existing visual quality throughout the resource area and protect unique and fragile resource values.
- Management Actions- Manage visual resources on public land according to the objectives for each class. Review future projects proposals to determine whether of not proposed management actions are consistent with the designated VRM Classes to identify possible mitigation measures."

MANAGEMENT PRESCRIPTIONS

The LRMPs and the RMP identify specific Management Prescriptions pertaining to the protection and enhancement of visual quality as follows:

WRNF

Desired conditions

- Management Area 5.41: Deer and Elk Winter Range - Scenery is managed to provide a range of scenic integrity objectives from low to moderate.
- Management Area 5.43: Elk Habitat - Scenery is managed to provide a range of scenic integrity objectives from low to moderate.
- Management Area 8.32: Designated Utility Corridors – Existing and Potential - Scenery is managed to provide a range of scenic integrity objectives from low to very high.

Standards and Guideline for Scenery Management in 8.32 Designated Utility Corridors – Existing and Potential

- **Standard:** 1. Vegetation management plans, for new or reissued permits, are designed to minimize and rehabilitate visual impacts.
- **Guideline:** 1.The boundaries of the cut areas bordering utility corridors are blended into the surrounding vegetation in locations visible from key viewpoints.

GMUG

- Management Area 6B: Livestock Grazing
- Management Area 7A: Timber Management on Slopes Under 40%

VISUAL QUALITY OBJECTIVES, SCENIC INTEGRITY OBJECTIVES, AND VISUAL RESOURCE CLASSES.

The LRMPs and the RMP identify specific Visual Quality Objectives (GMUG), Scenic Integrity Objective Classes (SMS) (WRNF) and Visual Resource Management Classes (BLM) pertaining to the protection and enhancement of visual quality as described in the Methodology section and as identified in the effects analysis for each alternative.

3.12.3 METHODOLOGY FOR ANALYSIS

The analysis and inventory methodology for visual resources differ for all three units in the project area. The BLM uses the Visual Resource Management (VRM) system. The GMUG is under the Visual Management System (VMS), and the WRNF is under the new Scenery Management System (SMS).

The analysis is bounded in both short-term and long-term effects of the project. These bounds were selected due to the fact that the effects of initial construction of the project on the visual quality and character of the area would be of a limited intensity and duration that is measurable and direct. Long-term effects on visual quality and landscape character have been isolated due to the higher potential to effect landscape scale patterns and the ability of these areas to maintain their inventoried characteristics. Long-term effects are focused within the maintenance right of way and the cumulative effects analysis. The scope of the analysis is limited to the Bull Mountain Pipeline project area for direct and indirect effects analysis and focuses unit wide in consideration of cumulative effects. The description of the Visual Resource Systems of each Unit follows:

BLM VISUAL RESOURCE MANAGEMENT SYSTEM (VRM)

- Different levels of scenic values require different levels of management. For example, management of an area with high scenic value might be focused on preserving the existing character of the landscape, and management of an area with little scenic value might allow for major modifications to the landscape.

- Determining how an area should be managed first requires an assessment of the area's scenic values.

- Assessing scenic values and determining visual impacts can be a subjective process. Objectivity and consistency can be greatly increased by using the basic design elements of form, line, color, and texture, which have often been used to describe and evaluate landscapes, and to describe proposed projects. Projects that repeat these design elements are usually in harmony with their surroundings; those that don't create contrast. By adjusting project designs so the elements are repeated, visual impacts can be minimized.

BLM's VRM system provides a way to identify and evaluate scenic values to determine the appropriate levels of management. It also provides a way to analyze potential visual impacts and apply visual design techniques to ensure that surface-disturbing activities are in harmony with their surroundings and meet VRM objectives established in land use plans. Basically, BLM's VRM system consists of two stages:

- Inventory (Visual Resource Inventory)

- Analysis (Visual Resource Contrast Rating)

Inventory Stage

The inventory stage involves identifying the visual resources of an area and assigning them to inventory classes using BLM's visual resource inventory process. The inventory process is described in detail in BLM Handbook H-8410-1, Visual Resource Inventory. Classes are assigned based on a combination of scenic quality, sensitivity level, and distance zones. This process involves rating the visual appeal of a tract of land, measuring public concern for scenic quality, and determining whether the tract of land is visible from travel routes or "Key Observation Points" (KOPs).

Visual values are considered throughout the Resource Management Planning (RMP) process, and the area's visual resources are then assigned to management classes with established objectives. The RMP establishes how the public lands would be used and allocated for different purposes, and is developed through public participation and collaboration. VRM management classes for all public lands are based on an inventory of visual resources and management considerations for other land uses. VRM management classes may differ from VRM inventory classes, based on management priorities for land uses. All lands within the Glenwood Springs Resource Area were inventoried and assigned visual resource management classes in the 1984 Resource Management Plan.

Implementation Decisions

"Manage resource uses and management activities consistent with the VRM objectives established in the land use plan. Design all BLM resource uses, management activities, and other implementation decisions to meet VRM objectives established in the land use plan. Utilize visual resource design techniques and best management practices to mitigate the potential for short- and long-term impacts. Contrast ratings are required for all major projects proposed on public lands that fall within VRM Class I, II and III areas which have high sensitivity levels (see handbook H-8341-1 for contrast- rating procedures)." BLM H-1601-1 Appendix C, page 11.

If proposed actions can not meet VRM objectives through Best Management Practices (BMP's), mitigation, or modified proposals, the proposed action would be denied or an RMP amendment must be done. RMP amendments to change VRM Classes are only done when all other alternatives have been exhausted and a BLM authorized officer has made a decision that other resource values are more important. RMP amendments must follow BLM planning regulations described in 43 CFR Part 1610. Such an undertaking involves a public notification process and protest period that could delay a decision on the APD for as much as 60 days.

VRM Class Objectives:

Class I Objective

The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; and may allow very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class II Objective

The objective of this class is to 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 the 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 Objective

The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape may be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV Objective

The objective of this class is to provide for management activities, which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements as described in BLM's Best Management Practices (BMP's) for Fluid Minerals: http://www.blm.gov/bmp/Technical_Information.htm

GMUG VISUAL MANAGEMENT SYSTEM

Visual Quality Objectives (VQOs) are established by the Forest Service's Visual Management System. Under this system, VQO categories are: Preservation, Retention, Partial Retention, Modification and Maximum Modification. VQOs are established based on an evaluation of (1) sensitivity level (the public's concern for scenic quality—high, moderate, and low); (2) variety class (the diversity of natural features—distinctive, pleasing but common, and dull or monotonous); and (3) distance zones (subject's placement in the landscape relative to the viewer—foreground, middleground, and background).

By comparing the sensitivity levels, landscape variety classes, and distance zones, VQOs for a specific land area can be determined. VQOs can be characterized as indicating the desired level of scenic quality and diversity of natural features, based on physical and sociological characteristics of an area. The definition of each VQO, as presented in National Forest Landscape Management, Volume 2, Chapter 1, The Visual Management System, is described below:

Preservation (P)

Only ecological changes are allowed. Management activities, except for very low visual impact recreation facilities, are prohibited. This objective applies to wilderness areas, primitive areas, other special classified areas, areas awaiting classification, and some unique management units that do not justify special classification.

Retention (R)

Only management activities that are not visually evident are allowed. Under Retention, activities may only repeat form, line, color, and texture that are frequently found in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc., should not be evident. Immediate reduction in visual contrast (form, line, color, and texture) should be accomplished either during construction or immediately after.

Partial Retention (PR)

Management activities are to remain visually subordinate to the characteristic landscape when managed according to the Partial Retention VQO. Activities may repeat form, line, color, or texture common to the characteristic landscape, but changes in their qualities of size, amount, intensity, direction, pattern, etc., remain subordinate to the characteristic landscape. Reduction of visual contrast to meet Partial Retention should be accomplished as soon after project completion as possible, or at a minimum, within the first year.

Modification (M)

Management activities may visually dominate the original characteristic landscape. However, activities resulting in vegetative and landform alteration must borrow from natural established form, line, color, or texture so completely and at such a scale that the visual characteristics of the activity are the same as those naturally occurring in the surrounding area. Reduction in visual contrast should be accomplished in the first year, or at a minimum, should meet existing regional guidelines.

Maximum Modification (MM)

A visual quality objective (VQO) meaning human activity may dominate the characteristic landscape. However, when viewed as background, the visual characteristics must be those of natural appearance within the surrounding area.

WRNF SCENERY MANAGEMENT SYSTEM

Goals of the Scenery Management System Process:

- Define the scenery management system process
- Determine the landscape character descriptions based on the subsection or equivalent unit of the national ecological hierarchy.
- Determine the existing scenic integrity level of the Forest.
- Determine scenic attractiveness utilizing land form/geology, water features, vegetation, and topography.
- Determine landscape visibility utilizing road and trail travel routes and use area concern levels.
- Rate Forest lands with a scenic class value (representing the level of public value for scenery) to be used as a management tool.
- Determine the scenic integrity objectives for the Forest.

Overview of the Scenery Management System Process

The scenery management system process involves identifying scenic components as they relate to people, mapping these components and assigning a value for aesthetics. The value unit provides information to planning teams to assist them in making a decision relative to scenery as a part of ecosystems and at project levels.

Ecological Unit Description- A mapping unit description. The ecological mapping unit used to describe the Divide-Plateau Creeks Uplands administrative unit on the White River National Forest is based on general terrestrial ecological unit (GTES) information described in the General Ecosystem Survey by Carlton. Combining the GTES units into two larger units is equivalent to a subsection. An objective description of the biological and physical elements is drawn from the data available at the subsection unit and combined with identified landscape character attributes in combination with the human elements to develop the Landscape Character Description. Landscape Character creates a “Sense of Place,” and describes the image and feel of an area. The Landscape Character Description provides the frame of reference for defining the Scenic Attractiveness classes.

The Landscape Character Description gives a geographic area it’s visual and cultural image, and consists of the combination of physical, biological and cultural attributes that make each landscape identifiable or unique. The description includes the valued attributes of the landscape, human habitat of the social environment, environmental regimes, and landscape stability.

The landscape character description is used as a reference for the Existing Scenic Integrity of all lands. Existing Scenic Integrity (ESI) indicates the degree of intactness and wholeness of the Landscape Character. Conversely, ESI is a measure of the degree of visible disruption of the Landscape Character. A landscape with very minimal visual disruption is considered to have high ESI. Those landscapes having increasingly discordant relationships among scenic attributes are viewed as having diminished Existing Scenic Integrity.

Existing Scenic Integrity (ESI) and Scenic Integrity Objectives (SIO) values

Six terms are used to describe the levels of existing scenic integrity and proposed scenic integrity as well as scenic integrity objectives. These levels are expressed and mapped as follows:

Very High – The valued landscape character is intact with only minute if any deviations. The existing landscape character and sense of place is expressed at the highest possible level.

High – The valued landscape character appears intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so that they are not evident.

Moderate – The valued landscape character appears slightly altered. Noticeable deviations must remain visually subordinate to the landscape character being viewed.

Low – The valued landscape character appears moderately altered. Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, edge effect, and pattern of natural openings, changes in vegetation types, or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed, but they should be compatible or complementary to the character within.

Very Low – The valued landscape character being viewed appears heavily altered. Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect, and pattern of natural openings, changes in vegetation types, or architectural styles within or outside the landscape being viewed. However, deviations must be shaped and blended with the natural terrain so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

Unacceptably Low – The valued landscape character being viewed appears extremely altered. Deviations are extremely dominant and borrow little if any form, line, color, texture, pattern, or scale from the landscape character. Landscapes at this level of integrity need to be rehabilitated. This level should only be used to inventory existing integrity. It must not be used as a management reference.

Scenic Attractiveness Classes are developed to determine the relative scenic value of lands within a particular Landscape Character. The three scenic attractiveness classes are: Class A- Distinctive; Class B- Typical; Class C- Indistinctive. The landscape elements of landform, vegetation, rocks, cultural features and water features are considered when determining each of these classes.

Landscape Visibility is composed of two parts: Human values as they relate to the relative importance to the public of various scenes and the relative sensitivity of scenes based on distance from an observer. Human values that affect perceptions of landscapes are derived from constituent analysis. Constituent Analysis serves as a guide to perceptions of attractiveness, helps identify special places, and helps to define the meaning people give to the landscape. Constituent analysis leads to a determination of the relative importance of aesthetic to the public. This importance is expressed as a concern level. Sites, travel ways, special places and other areas are assigned a concern level value of 1, 2, or 3 to reflect the relative high, medium or low importance.

Seen Areas and Distance Zones are mapped from these 1, 2 or 3 areas to determine the relative sensitivity of scenes based on their distance from an observer. These distance zones are identified as:

- Foreground – up to 1/2 mile from observer
- Middleground – 1/2 to 4 miles from the observer
- Background – 4 miles from the observer to the horizon

Seldom Seen Areas are areas not seen from travel routes. These areas are assigned a concern level 3, and may occur in any distance zone or scenic attractiveness class.

Using the data gathered and mapped for scenic attractiveness and landscape visibility, a numerical Scenic Class value is assigned to Forest lands. The ratings 1-5, indicate the scenic importance of landscape areas. Mapped scenic class values are used during forest planning and project planning to compare the value of scenery with other resources.

Issues and Criteria for Determining Visual Impact Significance

The factors considered in determining impacts on visual resources typically include (1) landscape character and viewer exposure of the project site and vicinity; (2) scenic integrity of the existing visible landscape; (3) the degree of visual change that would be caused by implementation of the proposed project (in terms of project-induced visual contrast, dominance, and view blockage); and (4) the level of public interest in the existing landscape characteristics and concern over potential changes. This determination includes both direct and indirect effects as well as short-term, long-term, and cumulative effects.

The criteria used to assess the significance of visual impacts resulting from the project take into consideration the factors described above, as well as Federal and State policies and guidelines pertaining to visual resources. The management plans establish guidance pertaining to the protection and enhancement of visual resources on each management unit.

For the purposes of this project, an impact on visual resources may be considered significant (depending on the nature of the impact and viewing circumstances) if it results in one or more of the following:

- Long-term inconsistency with established Forest Service Management Plan Direction including Management Direction, Forest-wide Standards and Guidelines and Management Prescriptions.
- Long-term effect considered potentially significant
    - A substantial adverse effect on a scenic vista;
    - Substantial degradation of the existing visual character or quality of the site and its surroundings; and
    - Creation of a new source of light or glare that would adversely affect day or nighttime views in the area.

The following questions are considered in assessing whether a project would cause a significant impact:

- Would the project substantially alter the existing viewshed, including any changes in natural terrain?
- Would the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?
- Would the project eliminate or block views of valuable visual resources?
- Would the project result in significant amounts of backscatter light into the nighttime sky?
- Would the project be in conflict with directly identified public preferences regarding visual resources?
- Would the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?

An impact is considered “long-term” if it would require more than three to five years to be mitigated (restoration to original or better landscape character). The three to five year time limitation reflects a time frame that is frequently used as a guideline in vegetation and habitat restoration programs. The impact analyses contained below evaluate the significance of project-related impacts on visual resources in accordance with the above criteria.

3.12.4 EXISTING CONDITION

Current visual resource management objectives for federal lands are aimed at retaining the existing character of the landscape. The area was evaluated in management plans to identify landscape features that are at greatest risk of being adversely affected by surface disturbing activities (including utility and transmission corridor construction, gas well drilling, etc). Visual sensitivity values were based on a combination of visual exposure and viewing distance. The western edge of the Southern Rocky Mountains physiographic province contains predominant vegetation types of Pinion, Juniper, Sagebrush, Saltbush-Greasewood, Mountain Mahogany-Oakbrush and Western Spruce-Fir with Aspen in the upper elevations. Overall topographic relief is considerable with the skyline rising well over 4, 000 feet above the valley floor in places. Numerous side drainages and gulches dissect the landforms adding to the variety and topographic texture. Existing landscape identifications are characteristic of rural agricultural-ranching land uses. Transportation, rail, utilities and small towns with gas field development are increasing. Scattered rural residences are evident in the valley and adjacent terraces, mainly east of Battlement Mesa.

For the project area portion of the WRNF, the current Scenic Integrity Objective (SIO) Level is Low (See FEIS Appendix N).

For the project area portion of the GMUG, the current Visual Quality Objective (VQO) includes Partial Retention and Modification (See FEIS Appendix N).

For the project area portion of the BLM, the current Visual Resource Management (VRM) class includes Class II and Class IV (See FEIS Appendix N).

The landscape condition for the Proposed Action and Alternative 1 include portions of three Inventoried Roadless Areas: Clear Creek, Baldy Mountain, and East Willow IRAs. Under the

Proposed Action and Alternative 1, the proposed pipeline would traverse approximately 8.3 miles of these IRAs along the entire 25.5 mile proposed pipeline length. These IRAs retain roadless characteristics although impacted by installation and maintenance of the Ragged Mountain Pipeline (see IRA section). The existing 6" Ragged Mountain underground gas pipeline, built in 1983, created a devaluation of the values and characteristics of these roadless areas through construction and maintenance activities which have created changes that do not reflect the patterns and scale found in the immediate landscape.

The proposed Bull Mountain Pipeline ROW would parallel and overlap approximately 10 feet of the existing Ragged Mountain Pipeline ROW for approximately 5.7 miles of the 8.3 miles in IRAs.

In Alternative 2, the majority of the route runs parallel to NFSR 265 and other Forest Service and County roads. Alternative 3 is similar to Alternative 2 for portions of the route that follows Forest Service and County roads but diverges from Alternative 2 by following a portion of an existing overhead powerline (Curecanti-Rifle 230-kilovolt transmission line). The project area in general sees moderate visitation, predominantly for hunting and passive touring recreation (including ATV) in the fall big game season. Summer use is low to moderate.

In addition to the disturbance created by the proposed Bull Mountain Pipeline and ROW, all alternatives except the No Action Alternative have some amount of road widening depending on alternative. Some sections of road will need to be upgraded/reconstructed to a two lane road due to safety considerations. While road widening will still meet visual resource goals, the appearance and feel of the roadway will change. The road way will decrease in its sinuous character, and the increased width will allow users to go faster.

DESIRED CONDITION

All three potentially affected administrative units (WRNF, GMUG and BLM) include direction to maintain visual resources using the current designations as the minimum standard to be achieved.

3.12.5 ENVIRONMENTAL CONSEQUENCES

KEY OBSERVATION POINTS (KOPS) AND VISUAL SIMULATIONS

Because the alignments of the pipelines for the action alternatives are at preliminary design development scales, and because the VRPP implementation program would require KOP development and review based upon construction drawing proposals to agency compliant standards, no KOPs have been identified at this time. KOP's would be identified through the VRPP process or as directed by the Responsible Official. The ability to generate simulations from preliminary design drawings is highly speculative at best. As a result, this section presents documentation of typical construction scenarios and describes potential visual impacts as well as provides examples of existing conditions and landscapes within project alternative areas. The VRPP would address these issues in design development and mitigate to compliance with management direction for each unit unless otherwise noted (e.g. potential lowering of visual classifications through LRMP and RMP amendments).

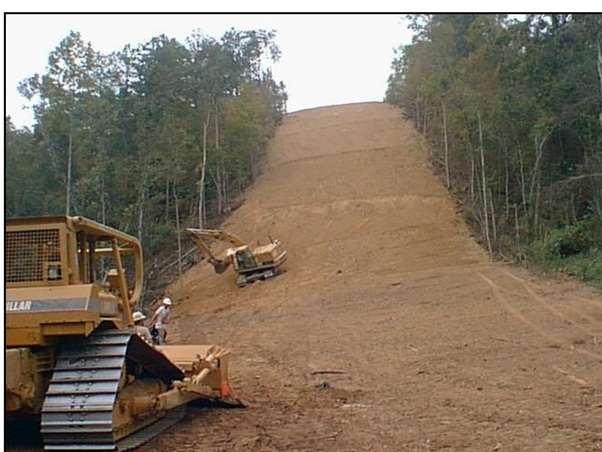
TYPICAL CONSTRUCTION SCENARIOS

In side slope construction the cut and fill requirements require a greater limit of construction. The cut and fill is sharply contrasted with the surrounding landscape elements (See Figure 7). The use of feathering techniques can be utilized to contour the grade into the surrounding landscape for a more natural appearance. Visibility remains high in the first few years following construction, but can be mitigated through vegetation improvements and careful site design. The VRPP details these design guidelines and criteria for implementation. Involvement and oversight by agency personnel or their designees provides additional monitoring from construction through reclamation/restoration and compliance review.

Figure 7. Typical Side Slope Construction.

Cross slope construction, particularly in canopied aspen environments would result in a broad linear feature formed by the vegetation removal (See Figure 8) that would remain visible for many years in the Proposed Action and Alternative 1, even with VRPP implementation, but could be minimized with revegetation and siting. This feature would be highly visible in background perspectives and create a condition referred to in the VRPP as “ribboning”.

Figure 8. Typical Cross Slope Construction.



The broad linear feature of the pipeline would not be as evident in the foreground, but the sharp contrast of the vegetation cleared corridor would remain visible for several years, possibly indefinitely (cut and fill) even with VRPP implementation. The linear feature of the pipeline can be mitigated through careful planning and implementation using existing topography and screening, but it may also generate the need for a LRMP/RMP amendment to change VQOs on the GMUG and the BLM to ones that conform to this level of visual change (modification or Class I or II to Class III (depending largely on cut and fill and associated features) if Alternatives 2 or 3 were selected. Through the lifetime of the project it is anticipated that the GMUG would transition to the SMS system with the update of their LRMP.

The compressor site which is located on private land in the Bull Mountain Unit would remain visible, even with VRPP implementation until project abandonment (See Figure 9). These impacts can be addressed through careful planning and implementation to keep associated features from view using existing topography and screening.

Figure 9. Typical Compressor Site

TYPICAL EXISTING CONDITIONS

The following photos catalog typical conditions within the Bull Mountain Unit across the WRNF, GMUG and BLM management areas.

Figure 10. Typical Foreground View.

In these areas the pipeline, associated features and associated construction activities (i.e. temporary use areas (TUAs)) would differ considerably from the surrounding landscape. Even with the VRPP implementation and associated guidelines and design criteria, changes in existing visual classifications may be needed which would require plan amendments for the GMUG and BLM in Alternatives 2 and 3.

Figure 11. Typical Middleground View.

Although less dramatic than foreground views, in middleground perspectives the pipeline, associated features and associated construction activities (TUAs) would differ considerably from the surrounding landscape. They are anticipated to meet existing visual resource classifications with implementation of the VRPP and associated design criteria and guidelines.

Figure 12. Typical Valley Background View.

In the distance cut and fill in cross slope alignments would be visible, as well as TUAs ("ribboning" in the VRPP). Even with the VRPP implementation and associated design criteria and guidelines, changes in existing visual classifications may be needed which would require plan amendments for the GMUG and BLM in Alternatives 2 and 3.

Figure 13. Typical Foreground Roadside View.

In these areas the pipeline, associated features, and associated construction activities (TUAs) would differ considerably from the surrounding landscape, whether located on the upslope or downslope of the road prism. Even with the VRPP implementation and associated design criteria and guidelines, changes in existing visual classifications may be needed which would require plan amendments for the GMUG and BLM in Alternatives 2 and 3.

NO ACTION ALTERNATIVE

Under the No Action alternative no construction activities would occur that would affect landscape character or visual quality. The current condition would continue to show the evidence of the existing pipelines in the project area, which would gradually diminish over time until they are taken out of service depending on levels of restoration and time necessary for revegetation to the original landscape. The likelihood of other gas transmission facilities could be high due to the current level of gas development in the area. The selection of the No Action Alternative would maintain the existing visual objectives on each unit and not generate the need for LRMP amendments for visuals. No direct, indirect, or cumulative effects would occur as a result of the selection of this Alternative.

PROPOSED ACTION

The Proposed Action would include construction and maintenance activities in a temporary construction ROW of approximately 100 ft. including trenching, vegetation clearing, grading, temporary use areas, and maintenance of the long-term 50ft ROW in which active vegetation management would occur.

Direct/Indirect Effects

Direct effects are those effects resulting directly from proposed activities on visual classifications and associated LRMP and RMP management direction. The Proposed Action would result in short-term adverse effects to visual quality. However, construction activities of the proposed action within the roadless (landscape) characteristics of the Clear Fork, East Willow, and Baldy Mountain IRAs would result in adverse affects likely lasting more than three to five years after implementation.

These activities would cause the construction area and ROWs to differ considerably from the surrounding landscape through clearing, grading, trenching, temporary use areas and temporary road construction. Permanent road width will increase from 16-18 ft to 24 ft for approximately 14.5 miles and decrease from 16-18ft to 14 ft for approximately 1 mile. Although a pipeline and ROW currently exists in these roadless areas, roadless characteristics would further depart from those in the surrounding landscape. Construction impacts within the construction ROW and temporary use areas would meet the scenic objectives within a shorter duration if temporary use areas are obliterated and all project design criteria and VRPP guidelines are employed. Impacts would decrease over time and the landscape characteristics would be reintroduced with VRPP implementation. One area of some concern is the rock cliff section on BLM land visible from county road 344. In the proposed alternative the pipeline would require cutting into this rock face and the resulting transformation of the rock surface would be a permanent change. Although the rock cut occurs in a class IV area, which allows for major modifications of the existing character of the landscape, care should be taken in the method of placing the pipe in this location because of the high visibility of the rock cliffs for a long distance. Employing the VRPP guidelines in this area would greatly decrease the visibility of this scar.

Maintenance activities would generate direct effects of a longer duration and intensity within the 50 foot ROW. These effects would be adverse to the visual and landscape characteristics of the area by maintaining clear access with minimum vegetation for the duration of the project and through restoration and rehabilitation. These effects would be long-term and adverse, but likely less than significant with the implementation of the VRPP, associated design criteria and VRPP guidelines over the course of several years. Previous pipeline activity within the IRAs has affected the visual quality of this landscape, and the project impacts cannot be considered in isolation from this in the context of direct effects. As a result, the direct effects of the proposed project in the 50 foot ROW are considered adverse to landscape character and visual conditions in the surrounding areas.

Indirect effects take place in a separate time and space from the cause of the effect, but are directly linked. Because the proposed action is routed adjacent or parallel to an existing pipeline corridor for much of its length in an already disturbed visual landscape that is apparent to the casual visitor, it would be speculative to assume that the indirect effects of pipeline construction would generate effects outside the immediate corridor to visual resources elsewhere on the units. As a result they are determined to not be causally related and no indirect visual effects are anticipated to occur. However, the potential of additional gas transmission facilities does exist just due to the current level of gas development in the area.

Cumulative Effects

Cumulative effects are the past, present and reasonably foreseeable actions that are relevant to visual resource analysis (character, value). The scope of the visual analysis is bounded to the three units (BLM, GMUG, and WRNF). The decision to focus the analysis in this manner was made because visual and landscape characteristics are based on landscape scale patterns in geographical contexts, which are unique to this region and are contained within the units as a study area.

The past events in this area include the construction of the existing Ragged Mountain Pipeline and associated structures, and Rocky Mountain Natural Gas Pipeline and associated structures, which diminished the existing visual quality and landscape characteristics of the area. Natural gas wells and associated infrastructure also exist on the WRNF, GMUG and BLM. Foreseeable future actions in this area include the Sheep Pipeline and its associated structures. The addition of the proposed pipeline would not generate a significant change in landscape condition and visual quality long term if the VRPP is implemented.

Conclusion

The Proposed Action would be compliant with current visual resource direction on the WRNF, GMUG and on BLM lands for pipeline construction and ROW grant with full implementation of the project design criteria and VRPP guidelines. The Proposed Alternative has less adverse (long and short term) effects on the visual resource than Alternative 2 & 3 but more long term effects than Alternative 1 due to the cliff cuts in the Proposed.

ALTERNATIVE 1

Alternative 1 follows the same route as the Proposed Action with limited route variations. The direct, indirect, and cumulative effects of Alternative 1 would be the same as the Proposed Action, but slightly greater in duration and intensity due to the increased impacted acreage. The scope and intensity of the project would be considered slightly higher than those of the Proposed Action, but not in a way that would considerably affect the impact that construction and maintenance would have on diminishing the visual resource quality and landscape characteristics. The overall loss of landscape character and value are considered almost equal to those of the Proposed Action because they do not constitute a considerable additional commitment of resources that would diminish visual resource quality and roadless (landscape) characteristics. Permanent road width will increase from 16-18 ft to 24 ft for approximately 14.5 miles and decrease from 16-18ft to 14 ft for approximately 1 mile.

Conclusion

Alternative 1 would be compliant with the current visual resource direction on the WRNF, GMUG and on BLM lands for pipeline construction and ROW grant with implementation of project design criteria and VRPP guidelines. In comparison with the other alternatives, Alternative 1 has less adverse long and short term effects on the visual resource than Alternative 2 & 3 and less long term effects than the Proposed Alternative due to the cliff cuts in the Proposed.

ALTERNATIVE 2

Direct Effects

Under Alternative 2, construction activities would occur that would primarily affect visual resources on the GMUG and the BLM. In Alternative 2, the majority of the route runs parallel to NFSR 265 and other Forest Service and County roads. The majority of this corridor is in GMUG VQO Partial Retention. In the short term, impacts from construction would be severe, and the amount of cut and fill required to locate the pipeline would have a highly likely outcome of being visible beyond a three year restoration period even with VRPP implementation. These impacts would cross into a long-term impact realm, and the presence of a highly modified landscape would remain visible indefinitely. The construction may also impact KOPs in other locations on the unit, although it is not anticipated that they would be adverse due to the low elevation of the roadway for the alignment and distances to other KOPs. Construction and operations of the pipeline would be adverse to the extent that they simultaneously are directly visible from surface travel ways or from areas used for recreation. They would exhibit strong visual contrast with the appearance of surrounding areas, and they are located in the portions that are perceived as scenic. Permanent road width will increase from 16-18 ft to 24 ft for approximately 36.5 miles.

Indirect Effects

Indirect effects take place in a separate time and space from the cause of the effect, but are directly linked. No indirect effects would occur as a result of the selection of this Alternative because the pipeline would be constructed in the lowland areas along the roadway and not generate additional activity elsewhere on the units that might result in indirect effects to visual resources. However, the potential of additional gas transmission facilities does exist just due to the current level of gas development in the area.

Cumulative Effects

The addition of the new pipeline would not generate a significant change in landscape condition and visual quality long term if the VRPP is implemented.

Conclusion

Alternative 2 would be compliant with the current visual resource direction on the WRNF for pipeline construction, ROW grant with implementation of project design criteria and VRPP guidelines. On the GMUG, Alternative 2 would require a LRMP amendment to change the current VQOs from Partial Retention to Modification. Alternative 2 is proposed within a BLM VRM Class II area and would likely require a RMP amendment to change to VRM Class III or IV. In comparison with the other alternatives, Alternative 2 has the most adverse (long and short term) effects on the visual resource than all other Alternatives due to highway 265's designation as Partial retention and because the construction and ROW would be in full view of users along all of highway 265 and along some of highway 270.

ALTERNATIVE 3

Alternative 3 is similar to Alternative 2 for portions of the route that follow Forest Service and County roads but diverges from Alternative 2 by following a portion of an existing overhead powerline (Curecanti-Rifle 230-kilovolt transmission line). Under Alternative 3 the pipeline would follow the existing overhead powerline (Curecanti-Rifle 230-kilovolt transmission line) for the majority of the route, and follow NFSR 265 and other Forest Service and County roads for approximately 25% of the route. As a result the effects of Alternative 3 would be considerably less than the effects of Alternative 2 to visual resources on the GMUG. The effects would be both short-term and long-term as a result of this change. The short and long-term effects of pipeline construction would be lower in Alternative 3 than Alternative 2, by placing approximately 75% of the construction into the middleground perspective where the changes from the natural landscape are likely to be fully mitigated with implementation of the VRPP. Permanent road width will increase from 16-18 ft to 24 ft for approximately 36.5 miles. The cumulative effects would be the same as Alternative 2.

Conclusion

Alternative 3 would be compliant with the current visual resource direction on the WRNF for pipeline construction, and ROW grant with implementation of project design criteria and VRPP guidelines. On the GMUG, Alternative 3 would require a LRMP amendment to change the current VQOs from Partial Retention to Modification where the pipeline would follow existing roads (but not the powerline). Alternative 3 is proposed within a BLM VRM Class II area and would likely require a RMP amendment to change to VRM Class III or IV. Alternative 3 has less adverse (long and short term) effects on the visual resource than Alternative 2 but more long and short term effects than the Proposed Alternative and Alternative 1.

MITIGATION AND MONITORING -

Project design criteria would reduce potential effects to visuals. Design measures may not cause the project to meet current visual classes, but would lessen the overall visual impact of facilities. A list of specific project design criteria is in FEIS Table 6. A detailed Visual Resources Protection Plan is included as FEIS Appendix N-2. In addition, the Plan of Development (POD) includes measures to protect visual resources.

3.13 TRANSPORTATION

3.13.1 INTRODUCTION

The Transportation section discusses management direction, current conditions, and environmental consequences of the proposed alternatives for the Bull Mountain Natural Gas Pipeline (BMNGP) construction project on the existing transportation system and its users. This section also includes analysis of routes to be used for access to the project area, current conditions of these routes, and general recommendations for upgrades and improvements to project area roads.

3.13.2 MANAGEMENT DIRECTION

LAND AND RESOURCE MANAGEMENT PLAN GOALS

The management direction for the transportation system is described in the White River and Grand Mesa, Uncompahgre, and Gunnison (GMUG) Land and Resource Management Plan (LRMP). The Forest Plan management goals for transportation are summarized below (USDA Forest Service 2002, and 1983 as amended, respectively):

- A minimum road system would be designed to meet the goals of the project. Emphasis would be placed on utilizing the current road system, minimizing new construction, and using temporary road when feasible and decommission/rehabilitation of disturbed areas.
- Required short-term and long term roads would be constructed and reconstructed to the minimum standard necessary to accommodate gas pipeline construction traffic with minimum long term impact on the adjacent resources.

DESIRED FUTURE CONDITION OF FEDERAL LANDS

Forests

The White River and GMUG National Forest LRMPs include descriptions of the desired future condition of the Forest resulting from plan implementation. The following conditions are related to this project and the transportation system:

- A safe functional and environmentally sound transportation system would be developed.
- Road construction would be coordinated with other resource activities.
- Substandard local roads would be rebuilt to standard or decommissioned as determined in the road management program.
- Maintenance levels for local roads would be determined in the road management program.

BLM

The Bureau of Land Management (BLM) seeks to maximize resource values for present and future generations in the Glenwood Springs Resource Management Plans (RMPs) June 15, 1983, Revised 1988.

The BLM Transportation Objective is summarized as follows: Provide access to public land in support of the management objectives of other resource programs.

TRAVEL MANAGEMENT DIRECTION

Forests

Since December 2005, the Department of Agriculture has revised regulations regarding travel management (Final Rule) on National Forest System lands to clarify policy related to motor vehicle use, including the use of off-highway vehicles. This Final Rule requires designations of those roads, trails and areas that are open to motor vehicle use by vehicle class and if appropriate, by time of year. The Final Rule would prohibit the use of motor vehicles off the designated system. The clear identification of roads, trails and areas for motor vehicles use on each National Forest would enhance management of National Forest System lands, sustain natural resource values through more effective management of motor vehicle use and enhance opportunities for motorized recreation experiences on National Forest System lands. The new travel management rule in the project area is "designated roads, trails, and areas shall be identified on a motor vehicle use map". Unless a travel route is specifically designated as open, it is closed to motorized vehicle use by vehicle class.

Each forest has a unique travel plan; however, off-designated route motorized travel is prohibited on all three forests in the project area.

- A comprehensive route-by route travel plan was completed on the Grand Mesa National Forest in 1994. Recreational loops and travel systems were examined in this plan and the decision included loop systems utilizing trails in conjunction with some Level 3-5 roads. Off route mechanized travel is allowed in the 1994 travel decision.

- In March 2001, a travel decision was signed for the Gunnison National Forest that restricted motorized and mechanized travel to established routes. This decision is considered an interim decision until the forest plan revision is completed, or a route-by route travel plan is completed. The Gunnison NF is currently preparing for the travel management analysis process (TAP).

- On White River NF, the draft travel management EIS Draft is currently being revised. Presently, there is a Supervisor's Travel Order of 1985, which states motorized use is restricted to designated routes. Off road travel is prohibited.

Winter access is as shown on the Winter Recreation Map for the Grand Mesa NF (1999) and the White River NF Land and Resource Management Plan management areas map (revised March 2005 Errata #2) . The project area includes Travel Management Areas:

- GMUG - Area A, no motorized travel (including snowmobile use) in this area annually from Nov 15 to May 1 to protect big game on winter range.

- GMUG - Area B, big game spring habitat closure from 4/15 to 5/15. Snowmobile travel restricted to marked routes from 4/15 to 5/15.

- WR - Area 5.41, deer and elk winter range. Discourage special uses during winter and spring periods.

Roads in these management areas are closed seasonally to minimize disturbance of wintering big game animals. Due to the extensive network of roads, and effective road closure gates in management areas, seasonal road closure barriers are employed as needed.

BLM

BLM has an OHV Travel Management designation for BLM Colorado 2003. Travel activities in this context, incorporates access needs and the effects of all forms of travel both motorized and non-motorized. The travel management transportation plan is as follows:

- Depicts the principal transportation infrastructure (road and trail systems) needed to properly manage BLM-administered lands and uses;
- Targets desired system outcomes, prescribes settings needed to produce them, and how management will achieve both;
- Identifies all existing and planned access routes and areas [motorized and non-motorized];
- Identifies needed improvements and maintenance to those routes and areas;

Addresses BLM as well as state and local administrative actions required to provide access to BLM public lands.

- Implementing travel plans in a holistic approach that provides clear direction for access and recreation opportunities while protecting sensitive areas. This includes signs, maps, education, maintenance, construction, reconstruction, closures, field presence, law enforcement, and monitoring.

TRAVEL SYSTEM

The following direction, standards and guidelines will apply to all routes on the GMUG and White River National Forests

Direction

1. Newly acquired facilities will not be retained unless sufficient maintenance funding is available or cooperative maintenance can be secured and a substantial government benefit can be demonstrated.
2. Close and rehabilitate temporary roads when no longer needed for project purposes.
3. Designated or new travelways are open to appropriate motorized or mechanized use unless a documented decision shows that:
    - Motorized use conflicts with forest plan objectives;
    - Motorized use is incompatible with the recreation opportunity spectrum classification;
    - Travelways are in areas closed to motorized or mechanized use;
    - Travelways are not designated routes;
    - Motorized use creates user conflicts that result in unsafe conditions unrelated to weather conditions;
    - Physical characteristics of travelway(s) preclude any form of motorized use;
    - Travelways do not serve an existing or identified future public need;
    - Financing is not available for maintenance necessary to protect resources; or
    - A seasonal restriction has been issued.

4. On lands that are snow-free, prohibit motorized and mechanized travel outside of designated travelways. Exemptions are only allowed by an order signed by the Forest Supervisor or Regional Forester for Administrative, emergency, law enforcement, or land management needs; or Special use permits and contracts.

Standards and Guidelines

Forests

1. Consider seasonal restrictions for travelways if:
   - Use causes unacceptable damage to soil and water resources due to weather or seasonal conditions;
   - Use causes unacceptable wildlife conflict or habitat degradation;
   - Use results in unsafe conditions due to weather conditions;
   - The area accessed has a seasonal need for protection or non-use; or
   - It is necessary to resolve conflicts between users.
2. Emphasize maintenance and reconstruction of the existing road system to standard.
3. Emphasize public safety in the development and use of the travel system.
4. Design roads to minimize visual and environmental impacts where possible.
5. Public access restrictions may be imposed for health, safety, or other considerations.
6. Maintenance level 3, 4, and 5 roads will continue to be managed for public access with passenger cars.
7. Construction activities will not be permitted during big game rifle seasons and the winter season.
8. Plowing the road open during the snow season is not a consideration.
9. Seasonal closures are dependent upon moisture and snow levels.
10. Area wildlife closure on the north forest boundary (GMUG) near Hightower Work Site for big game winter range from approximately 11/15 to 5/31

BLM

- New road construction and improvements would comply with the road standards and designs outlined in BLM Policy Manual 9113.
- These standards would provide for proper design and construction so that roads would be safe, adequate, and would prevent or reduce undue damage to the environment.
- All right-of-way applications made by outside parties for roads or trails would be reviewed and compared with the transportation plan. Applications compatible with identified access needs would require reciprocal easements across the applicant's land to provide access to public land. As roads and trails were constructed, maintained, or improved, all work would be monitored by BLM personnel to ensure road standards were followed and unnecessary impacts to the environment were avoided.
- The transportation system would be reviewed periodically, and any unneeded roads or trails would be closed and rehabilitated, if necessary annually.

Additional National Forest System Roads Requirements

System roads were designed using the appropriate Forest Service guidelines that were in affect at the time of their original construction. Current Forest Service guidelines prescribe to the current AASHTO guidelines, constructed for National Forest visitor and commercial user access and are maintained for long-term vehicle use. The system roads in the project area were built to be seasonal roads used during the dry periods of the year. They were never intended to be used for all-season access and will require considerable structural and geometric improvements to accommodate this type of heavy commercial use.

Temporary roads will receive only the minimum improvement needed for structural capacity, safety and erosion control and will be decommissioned and reclaimed upon completion of the pipe line construction.

All public roads affected/utilized under the proponent's action will be required to meet the following:

- Requirements for "Roads and Access Ways" as detailed in *"The Gold Book" – Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development – 4th Edition – 2006-BLM/USFS.*
- All geometric road design aspects of the *2001 AASHTO Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT≤400) (AASHTO 2001 LVR)*. Emphasis is placed on page 9-Traffic Volumes, "The projected average daily traffic (ADT) should be used as the basis for design. Usually, the year for which traffic is projected is about 20 years from the date of completion of construction…" It goes further to define, "Where traffic volumes vary substantially from season to season, design should be based on the ADT during peak season.
- The *AASHTO 2001 LVR* page 52-Two-Way Single-Lane Roads provides guidance that, "Two-way single-land roads may be used in constrained locations, where traffic volumes are extremely low. Such cross sections are normally used on local roads where traffic volumes are less than 50 vehicles per day. On resource recovery roads used by professional drivers who are often in contact with one another by radio, two-way single-lane roads may be used for traffic volumes up to 100 vehicles per day. Two-way single-lane roads are designed to operate at low speeds, typically no more than 30 mph."
- 1993 AASHTO Guide for Design of Pavement Structures (AASHTO 1993)
- Substantial improvements to all affected roads will be required to accommodate hauling or any heavy use of the road for proponent operations and maintenance due to existing inadequate roadway geometry and pavement structural sections. Improvements include, but are not limited to, improvements to road alignment (both horizontal and vertical), curve widening, surface drainage work and structural surfacing section improvements. The character of all roads will be changed as a result of this activity. (AASHTO 2001 LVR and AASHTO 1993)
- All roadway improvements require that materials and construction practices comply with the Standard Specifications for Construction of Roads and Bridges on Federal Highway Project (FP-03) specifications.
- After the road has been reconstructed the driving surface shall be maintained to prevent loss of fine graded materials. Roadway sections shall either be crowned, outsloped or insloped, flat blading shall not be allowed (FSH 7730-Operations and Maintenance of Roadways).
- For roadway section with 6 inches OR LESS of new structural surfacing section or existing surfacing sections with any aggregate segregation or contamination by intruding fine materials, no rutting, pumping or plastic deformation of the roadway surface will be allowed. Rutting, plastic deformation, or pumping of the surface will result in the proponent's operations, on that road, ceasing immediately and remaining shutdown until repairs and improvements are made to prevent additional damage to the structural section. For surfacing sections with GREATER THAN 6 inches of new structural surfacing section any rutting, pumping or plastic deformation

in excess of structural section thickness divided by 3 (T/3) will not be allowed and will result in proponent's operations, on that road, ceasing immediately and remaining shutdown until repairs and improvements are made to prevent additional rutting. This T/3 limitation applies to any forest road utilized by the proponent, even if it is not part of the project area or transportation plan. Surface maintenance will be immediately required (blading, reworking and recompacting, etc) in these rutted sections before construction traffic will be allowed back on any section of the road. Culverts shall be armored with riprap on the outlet side so as not to discharge water onto erodible, unprotected soils. There is a potential need for other reinforcing structures such as retaining walls (Mechanically Stabilized Embankments (MSE) or reinforced fills and entrapment of sediment with silt fences or other BMP's approved by the FS. (GMUG Engineering Standard-2007).

- Prior to any pipeline construction, all cattleguards not meeting structural loading requirements located on routes utilized by the proponent shall be replaced with a new cattleguards capable of carrying anticipated traffic loadings and 14' wire or heavy duty stock type steel bypass gate. (AASHTO HS-20).
- For all public roads, traffic control plans and access restrictions shall be established by the ROW grant holder in accordance with MUTCD workzone standards. The owning agency of the affected roadway will have final approval on all traffic control plans and access restrictions. Motorized Mixed Use (MMU), {the use of unlicensed motor vehicles on public roads} will only be allowed at the discretion of the owning agency of the affected roadway. (EM-7700-30 Guidelines for Engineering Analysis of Motorized Mixed Use on National Forest Roads32, also Design Criteria TR-1(c))
- Roads will be maintained by the proponent to meet the RMOW of the affected roadway:
    - ✓ All routes are subject to temporary closures at the discretion of the road's owning agency if resource damage related to the proponent's activities is occurring. Closures will remain in affect until such time that the proponent has repaired/rehabilitated the damage.
    - ✓ All materials and construction practices shall comply with the Standard Specifications for Construction of Roads and Bridges on Federal Highway Project (FP-03) specifications.
    - ✓ After the road has been reconstructed the driving surface shall be maintained to prevent loss of fine graded materials. Road surfaces shall be crowned, outsloped or insloped. Flat Blading shall not be allowed. (FSH 7730-Operations and Maintenance of Roadways, also Design Criteria TR-4)
- For roadway section with 6 inches OR LESS of new structural surfacing section or existing surfacing sections with any aggregate segregation or contamination by intruding fine materials, no rutting, pumping or plastic deformation of the roadway surface will be allowed. Rutting, plastic deformation, or pumping of the surface will result in the proponent's operations, on that road, ceasing immediately and remaining shutdown until repairs and improvements are made to prevent additional damage to the structural section. For surfacing sections with GREATER THAN 6 inches of new structural surfacing section any rutting, pumping or plastic deformation in excess of structural section thickness divided by 3 (T/3) will not be allowed and will result in proponent's operations, on that road, ceasing immediately and remaining shutdown until repairs and improvements are made to prevent additional rutting. This T/3 limitation applies to any forest road utilized by the proponent, even if it is not part of the project area or transportation plan. Surface maintenance will be immediately

required (blading, reworking and recompacting, etc) in these rutted sections before construction traffic will be allowed back on any section of the road. (GMUG Engineering Standard-2007)

- On native surfaced roads, all maintenance activity shall be undertaken to contain fine graded materials within the roadway prism. Both airborne and waterborne escape of fine graded materials will have detrimental affects to both air and water quality. Siltation of adjacent watersheds will be affected unless fine graded materials are contained with in the construction limits of the project (FSH 7730-Operations and Maintenance of Roadways, also Design Criteria TR-5).
- Construction of roads on excessively steep grades will be avoided. Construction in these areas will have impacts on the surrounding landscape in the form of extensive cut/fill slopes and these sections are very difficult to maintain surface drainage and keep the surface in a safe and passable condition during saturated conditions (FSH 7730-Operations and Maintenance of Roadways, also Design Criteria TR-8).
- Surface drainage and dispersal of surface water is key in maintaining roadways in a safe and passable condition (FSH 7730-Operations and Maintenance of Roadways, also Design Criteria TR-10 & 11). Numerous techniques have proven to be highly effective on aggregate and native surfaced roads. Including, but not limited to: In-sloping of roadway to drainage ditches:
  - ✓ Crowning of roadway surface
  - ✓ Frequent rolling dips to collect/disperse road surface run off
  - ✓ Installation of culverts

3.13.3 METHODOLOGY FOR ANALYSIS

Design standards used for the analysis were taken from Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development "The Gold Book", and AASHTO design and construction standards, and are based upon Average Daily Traffic volumes assembled from a number of sources. These sources include the proponent (SG/Trigon 4/10/07), for anticipated volumes for pipeline construction and roadway improvements; historic traffic surveillance quantities from the GMUG and White River N.F.; and county traffic surveillance data from effected counties. Applying these traffic volumes and anticipated critical vehicle dimensions to known and anticipated field conditions has resulted in minimum transportation requirements to analyze the impacts to individual routes with respect to each alternative.

Definitions of Terms Used for analysis:

Road Management Objectives Worksheet (RMOW): An organized form used by the Forest Service to document both generalized and road specific management criteria and objectives. Document is normally prepared by the resource staff and engineering representative, and then approved by both the Forest Engineer and District Ranger.

Road: Generally defined as vehicle travel-ways more than 50 inches wide (USDA Forest Service 1999).

Arterial Road: An NFS road that provides service to large land areas and usually connects with other arterial roads or public highways. (FSM 7705 – DEFINITIONS)

Collector Road: An NFS road that serves smaller areas than an arterial road and that usually connects arterial roads to local roads or terminal facilities. (FSM 7705 – DEFINITIONS)

Local Road: An NFS road that connects a terminal facility with collector roads, arterial roads, or public highways, and that usually serves a single purpose involving intermittent use. (FSM 7705 – DEFINITIONS)

Road Subject to the Highway Safety Act: An NFS road that is open to public use in a standard passenger car, including a road with access restricted on a seasonal basis and a road closed during extreme weather conditions or for emergencies, but which is otherwise open to public travel. (23 CFR 655 and 603)(FSM 7705 – DEFINITIONS)

Temporary Road or Trail: A road or trail necessary for emergency operations or authorized by contract, permit, lease, or other written authorization that is not a forest road or a forest trail and that is not included in a forest transportation atlas (36 CFR 212.1) (FSM 7705 – DEFINITIONS)

Equivalent Single Axle Load (ESAL): – AASHTO defines this as: "Load equivalency factors represent the ratio of the number of repetitions of any axle load and axle configuration (single, tandem, tridem) necessary to cause the same reduction in Present Serviceability Index (PSI) as one application of an 18-kip single axle load."

Average Daily Traffic (ADT) - the average daily traffic count is used as a method to determine how many vehicles travel on a road on a given day. This enables traffic planners to prioritize projects by comparing traffic counts to determine relative need and established standards.

Traffic Service Level: Describes the significant characteristics and operating conditions of a road (FSH 7709.56 Ch. 4).

> <u>Level A</u> – Free flowing, mixed traffic; stable, smooth surface; provides safe service to all traffic.
> <u>Level B</u> – Congested during heavy traffic, slower speeds and periodic dust; accommodates any legal-sized load or vehicle.
> <u>Level C</u> – Interrupted traffic flow, limited passing facilities, may not accommodate some vehicles. Low design speeds. Unstable surface under certain traffic or weather conditions.
> <u>Level D</u> – Traffic flow is slow and may be blocked by management activities. Two-way traffic is difficult, backing may be required. Rough and irregular surface. Accommodates high clearance vehicles. Single purpose facility

Maintenance Levels - Maintenance levels define the level of service provided by, and maintenance required for, a specific road (FSH 7709.58).

> <u>Level 1</u> – Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed 1 year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. Roads receiving maintenance level 1 may be of any type, class, or construction standard,

and may be managed at any other maintenance level while they are open for traffic. While being maintained at level 1, they are closed to vehicular traffic, but may be open and suitable for non-motorized uses.

Level 2 – Assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or specialized uses. Log haul may occur at this level.

Level 3 – Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surface with either native or processed material.

Level 4 – Assigned to roads that provide a moderate degree of user comfort and convenience at moderate traffic speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated.

Level 5 – Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double lane, paved facilities. Some may be aggregate surfaced and dust abated.

3.13.4 AFFECTED ENVIRONMENT

The Proposed Action and all Alternatives use a combination of existing state, county, BLM and FS roads to gain access to the pipeline project area for construction, operations and maintenance. Existing roads, pipeline rights-of-way and temporary roads will be used to access the project on the Forest. The BMNGP Map (Appendix XX) displays the transportation system for the project area.

The transportation analysis area is composed of the existing BLM roads and National Forest System Roads (NFSR) proposed for access to the BMNGP. The project area is that part of the GMUG National Forest-Grand Valley and Paonia Ranger Districts, the White River National Forest-Rifle Ranger District, north and west of State Highway 133, north of NFSR 265, and east of NFSR 270, Mesa County Road 330E and in the area adjacent to and northeast of NFSR 800, Mesa County Road 79, and Garfield County Road 344.

On the WRNF, road development in the project area likely started during the late 1920's. Early roads were likely user created routes that followed the path of least resistance such as valley bottoms and flats, as heavy equipment to construct substantial roads was not available. Private lands in upper West Divide were homesteaded by war veterans from the Spanish-American War and some WW I in the late teens, early 1920's.

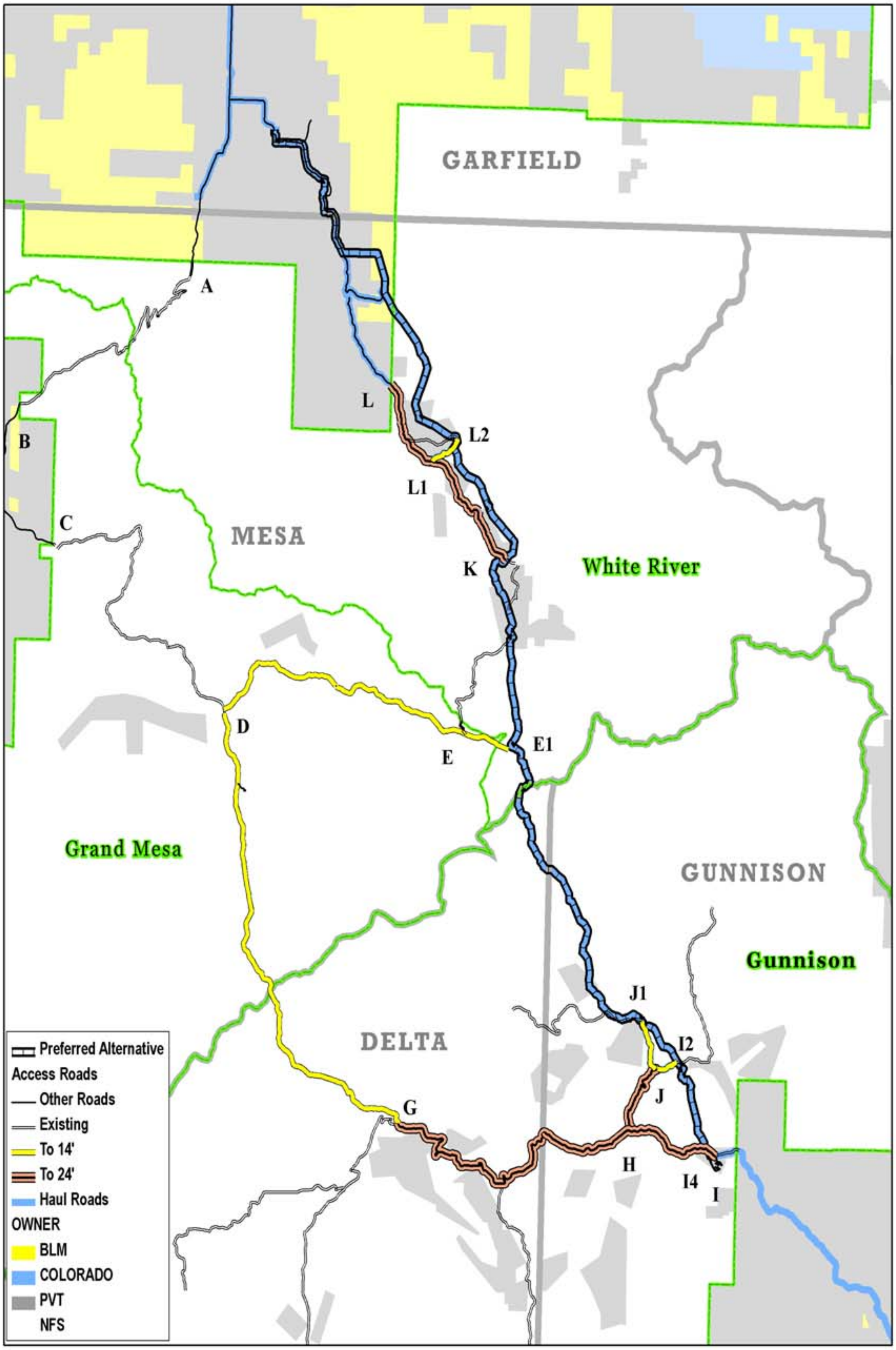
In the Plateau Creek and Silt Divide Creek country including Silt-Collbran road, most improvements for road access came with the initial gas exploration in the 1950's through 1970's.

Beginning in the 1970's, roads were constructed to provide access for timber harvest. On both the WRNF and GMUG, road construction associated with timber harvest continued through the 1990s, with local road construction and reconstruction continuing today. Roads were constructed to the applicable design standard of their original intended use. Past and on-going management resulted in the existing system and non-system roads in the project area. A number of timber harvests have occurred in the Hubbard, Divide and Muddy Creek drainages.

The remainder of the transportation system generally developed as a result of gas development, timber harvest activity, grazing, water development, and other resource management operations with recreation use and impacts continuing to increase in importance and influence.

Current uses of the transportation system includes: gas development, timber harvest activity, grazing, water system maintenance and other resource management operations with increasing recreation use.

Figure 13. Road Upgrades Needed to Support Alternatives



PROPOSED ACTION

Proposed Action involves potential use of county roads 79, 265, 311, 346, 324, 327, 342, 344, 315, 336, 331; BLM routes 8233; and Forest Service roads 265, 268, 265.4B, and 800.

At the end of NFSR 268, there is a 2-track road leading to the existing Ragged Mountain Pipeline ROW. This is not a system road. The temporary road will be designed as temporary road construction to access the construction activity on the ROW for crew pickups only.

ALTERNATIVE 1

Alternative 1 involves potential use of county roads 79, 311, 346, 324, 327, 342, 344, 315, 336, 331, 9.7 and 265; BLM routes 8233; and Forest Service roads 265, 268, 265.4B, 701 and 800. 3.15.5.5 **Alternative 2**

PERMANENT ACCESS ROADS FOR PROPOSED ACTION AND ALTERNATIVE 1 ROUTE SPECIFIC DESCRIPTIONS

NFSR 265 Buzzard Divide/Gunnison County 265/Mesa County 265 (GMUG)
NFSR 265 is the major through route from Colorado Highway 133 on the east to Mesa County Road 330E on the west. The portions outside the Forest Boundary are managed by Gunnison County and Mesa County respectively. The portions of these routes are outside of Forest Service jurisdiction; operations along and use of this route will be subject to County requirements.

The Forest Service portions of the route are generally classified as a single lane, with widths currently ranging from 14 to 18 feet. The route has occasional turnouts; however they are generally not intervisable. The road has numerous steep grades, deficient horizontal and vertical alignment, limited sight distance, poor surface drainage, and is historically characterized by saturated soils throughout a majority of the year. The road is classified as an arterial, with most sections having evidence of some aggregate surfacing, but minimal structural value.

Current Road Management Objective Worksheet (RMOW – Appendix XXX) classifies this road as an Operational and Objective Maintenance Level 4 (moderate degree of passenger car user comfort). Currently there are safety concerns with limited sight distance including several blind corners and hazardous driving conditions encountered when the road grade and subgrade are saturated. The road is generally unsuitable for use during saturated conditions without causing extensive resource damage. Seasonal closures are dependent upon moisture and snow levels.

Traffic types generally consist of commercial (65%), residential (5%), recreation {including hunting} (25%), and administrative traffic (5%). The heaviest use of the road occurs during the big game hunting seasons. During winter months the road is closed by deep snow.

During the winter months portions of this road serves as part of the designated Sunlight to Powderhorn (SP) groomed snowmobile trail.

NFSR 844 Clear Fork (GMUG)

NFSR 844 is a 14 foot single lane with intervisable turnouts, aggregate surface, winding local road that is steep in some sections and exhibits frequent and deep washboarding. Along the route, several locations do not have sufficient road width, sight distance and turning radius for the traffic currently using the route. This road provides access to several well sites in the area. Primary users are 3 gas companies (60%), livestock, administrative traffic (15%) and recreation including hunting (25%). Current Road Management Objective Worksheet (RMOW) classifies this road as an operational and objective maintenance level 3, suitable for passenger cars.

NFSR 844.1A Battle Park (GMUG)

NFSR 844.1A is a single lane, native surface with spot surfacing, winding local road that is very steep (12%+) in some sections. Physical characteristics of the road are consistent with level 3 maintenance, however the RMOW and objectives for the area close the route to motorized public use. The route shall be maintained in a condition that will accommodate gas permittees, inholdings and administrative traffic. This road provides access to several well sites in the area and is behind a closed gate for authorized use only. Present primary uses are 3 gas companies (60%), administrative traffic (30%) and non-motorized recreation including hunting (10%). Battle Park Road has a current long term operational and objective maintenance level 1, basic custodial care (closed). Traffic management strategies are to prohibit or eliminate motorized public use. For the duration of BMNGP project, this road shall be managed as a level 3 during the time it is open for pipeline construction traffic. However, it will remain gated and closed to prevent motorized public use.

The road shall be returned to a Level 1 basic custodial, (closed) road by the proponent as specified in the Road Management Objective Worksheet after completion of the project.

NFSR 268 Owens Creek (GMUG/WR)

NFSR 268 is a collector, 14 foot single lane with turnouts, native surface, winding road that is very steep in some sections. 7 miles is on GMUG NF and 0.3 on WR NF. The system road ends at the gate placed at Owens Creek Cow Camp. Proposed pipeline access for crew pick-up traffic only is on a 2 track (about 250 feet) which goes past Owens Creek Cow Camp.

During the winter months the road serves as part of the designated Sunlight to Powderhorn (SP) groomed snowmobile trail. Construction activities will not be permitted during big game rifle seasons and the winter season.

Primary uses are recreation including hunting (90%), administrative traffic (5%) and residential (5%). The heaviest use of the road is during hunting season. The road provides access for an outfitter guide in the area, with a lower base camp located near the Owens Creek crossing and another at the eastern reaches of Owens Creek Road on the WRNF.

Owens Creek Road is an operational maintenance level 3 for approximately 3 miles and operational maintenance level 2 for approximately 4.3 miles. Current Road Management Objective Worksheet (RMOW) notes long term objective is a level 3, suitable for prudent passenger cars. The existing traveled way is unsuitable for over length vehicles with out upgrading of the horizontal and vertical alignment as well as addition of curve widening.

At the end of NFSR 268, there is a 2-track road leading to the existing Ragged Mountain Pipeline ROW. This is not a system road. The road will be designed as temporary road construction to access the construction activity on the ROW for crew pickups only.

NFSR 270/Mesa County Road 330E - Colbran-Silt (GMUG/WR)
Use of this route is not proposed under the Proposed Action or Alternative 1.

NFSR 841 Texas Hill (GMUG/WR)
Route Description: This route acts as a through route from the Owens Creek drainage (GMUG) to the West Divide drainage (WR). The route is managed as a high clearance four wheel drive road (Maintenance Level 2), is has a narrow winding alignment, with widths generally of 14 feet or less. The route is currently native surfaced throughout; subject to surface rutting and has been affected by slope failures ranging from cut slope slumping to total loss of roadway sections for short segments during wet periods. The upper portion of the route above the “Witches Lane” intersection has curve radii of less than 50 feet. Below Witches Lane, the alignment and width does improve somewhat. The drainage of the roadway is currently accomplished by surface drainage structures primarily with insloped cross sections. Due to the surface type, aspect, soils and general characteristics of the roadway, it is generally impassible when wet.

Use of this road is limited to the section from NFSR 800 to the “Witch’s Lane” section of the route (Map nodes K to K1). This is approximately 4000 feet. The route is currently managed as maintenance level 2 road as shown on the RMOW and will continue to be after project completion.

During the winter months most of this road serves as part of the designated Sunlight to Powderhorn (SP) groomed snowmobile trail.

Mesa County Road 9.77
Mesa County Road 9.77 has steep grades and side slopes, poor alignment, and is a narrow native surface local road. It can be impassable when wet, ruts easily, has low subsurface strength and stability to support commercial vehicles and is not safe when wet to accommodate pipeline construction equipment. Widths are generally 14 feet or less with few, if any, turnouts. The route is used by a mix of vehicles, ranging from non-motorized uses, ATV and trail type vehicles to limited commercial traffic. The speed of vehicles on the road is generally less than 15 miles per hour. This route provides limited access to the existing Rocky Mountain Pipeline ROW. This route is outside of Forest Service jurisdiction; operations along and use of this route will be subject to Mesa County requirements.

BLM Road 8233
BLM Road 8233 has steep grades and side slopes, poor alignment, and is a narrow high clearance native surface local road. Widths are generally 14 feet or less with few if any turnouts. The route is used by a mix of vehicles, ranging from non-motorized uses, ATV and trail type vehicles to limited commercial traffic. The speed of vehicles on the road is generally less than 15 miles per hour. This route provides limited access to the existing Rocky Mountain Pipeline ROW.

NFSR 843 Mosquito Creek (WR)
NFSR 843.has steep grades and side slopes, poor alignment, and is a narrow high clearance native surface local road. Widths are generally 14 feet or less with few if any turnouts. The route is used by a mix of vehicles, ranging from non-motorized uses, ATV and

trail type vehicles to commercial traffic. The speed of vehicles on the road is generally less than 15 miles per hour. The road provides access from NFSR 800 to NFSR 801, approximately 2.5 miles east at the headwaters of Mosquito Creek. Mosquito Creek Road is an operational maintenance level 2 and has a long term maintenance objective for level 2 high clearance vehicles. The Road Management Objective Worksheet (RMOW) notes long term objective may change to level 1 or Forest Service Trail (NFST) from MP 2.72 to end with new Travel Management Plan. The route services a producing natural gas well in Sec. 35, T8S, R91W, a Rocky Mountain Natural Gas (Kinder Morgan) Pipeline corridor as well as livestock permittees and recreation, primarily hunting. The road is impassable when wet, ruts easily, has low strength and stability to support vehicles and is not safe when wet to accommodate volumes of pipeline construction equipment. On steep road grades (over 12-15%), surface drainage becomes very difficult to control and increase long-term maintenance costs for the road.
The road shall be returned to a Level 2 high clearance 4X4 road by SG as specified in the new Road Management Objective Worksheet (RMOW) at the completion of the project.

Garfield County Road 344/Mesa County Road 79 (WR)
Approximately 3.5 Miles of Garfield County Road 344 from the intersection with Garfield County Road 342 south to the Garfield/Mesa County line and 3.5 miles on Mesa County Road 79 from Garfield/Mesa County line south to the WR Forest boundary (NFSR 800). This part of Garfield and Mesa County roads are under developed level 3 with limited surfacing. It can be impassable when wet, rut easily, has low subsurface strength and stability to support commercial vehicles and is not safe when wet to accommodate pipeline construction equipment. This route is outside of Forest Service jurisdiction; operations along and use of this route will be subject to Garfield and Mesa County requirements.

NFSR 800 West Divide Creek (WR)
NFSR 800 is a single lane with turnouts, aggregate surface, winding collector road that is steep in some sections. This road provides access to several well sites in the area. It also serves as access to several private inholdings. Primary uses are gas companies (60%), livestock, administrative traffic (15%) and recreation including hunting (25%). West Divide Creek Road has an operational and objective maintenance level 3, suitable for passenger cars. Seasonal closures are dependent upon moisture and snow levels. Traveled way is generally a crowned and ditched template; nominal traveled way width is 12 feet. This area exhibits slope stability failures along the higher cut and fill slopes. Discharge of road drainage into Divide Creek channel is an on going problem.

The road shall be retained at the objective level 3 road by SG as specified in the Road Management Objective Worksheet after completion of the project.

ALTERNATIVE 2

Alternative 2 involves potential use of county roads 330E, 342, 344,331, 336, 315, 333 and 265; and Forest Service Roads 265, 270 and 701 (primarily as a haul route).

ALTERNATIVE 3

Alternative 3 involves potential use of county roads 330E, 342, 344,331, 336, 315, 333 and 265; and Forest Service Roads 265, 265.3A, 268, 277, 270 and 701 (primarily as a haul route).

PERMANENT ACCESS ROADS FOR ALTERNATIVE 2 AND ALTERNATIVE 3

NFSR 265/Gunnison County 265/Mesa County 265-Buzzard Divide (GMUG)
Same as Proposed Action and Alternative 1.

NFSR 844 Clear Fork (GMUG)
Use of this route is not proposed under Alt 2 or Alt 3.

NFSR 844.1A Battle Park (GMUG)
Use of this route is not proposed under Alt 2 or Alt 3.

NFSR 268 Owens Creek (GMUG/WR)
Use of this route is not proposed under Alt 2.
Only the first 3,000 feet of 268 is proposed for use under Alt 3

NFSR 268 is a collector, 14 foot single lane with turnouts, native surface, winding road that is very steep in some sections.

Buzzard watershed (GMUG) is considered a critical watershed. Soil characteristics contribute to high incidences of mass wasting, sloughs and earth flows especially during years with high moisture accumulations in the winter months.

During the winter months the road serves as part of the designated Sunlight to Powderhorn (SP) groomed snowmobile trail. Construction activities will not be permitted during big game rifle seasons and the winter season. Plowing the road open during the snow season is not a consideration.

Primary uses are recreation including hunting (90%), administrative traffic (5%) and residential (5%). The heaviest use of the road is during hunting season. The road provides access for an outfitter guide in the area, with a lower base camp located near the Owens Creek crossing and another at the far east reaches of Owens Creek Road on the WRNF. All applicable Forest Service traffic data on the GMUG is available for the proponents use.

The portion of Owens Creek Road proposed for use under Alt 3 is an operational maintenance level 3. Current Road Management Objective Worksheet (RMOW) notes long term objective is a level 3, suitable for prudent passenger cars. The existing traveled way is unsuitable for commercial use due to alignment and width.

NFSR 270/Mesa County Road 330E Colbran-Silt (GMUG/WR)
NFSR 270 is an arterial, native surface with spot graveling, winding road. The route is currently classified as a single lane road with turnouts, widths average 14 feet. The road has steep grades, poor alignment, blind switchbacks, poor surface drainage, and saturated soils. Safety is mitigated by the poor condition of the surface and the winding alignment, requiring traffic speeds to remain low. As traffic volumes increase, safety will become more of an issue. The route is roughly divided between the two forests, with 3.7 miles on the White River NF and 2.97 miles on the GMUG NF. Travelway is currently suitable for commercial use only during dry road conditions. On the WRNF, it is located in Management Area 5.41 – Deer and Elk Winter Range. Current Special Use Guidelines discourage special uses that require access during winter and spring periods.

Soil characteristics contribute to high incidences of slumps, sloughs and earth flows especially during years with high moisture accumulations in the winter months. This road has slumped in the past during years of high moisture in the winter months, especially in the early 1980's.

On the WRNF (3.7 miles), the Road Management Objective Worksheet (RMOW) classifies this road as an operational maintenance level 3 but it has a long term objective level 4 or moderate degree of passenger car user comfort. On the GMUG side (2.97 miles), the RMOW remarks this road is an operational and objective maintenance level 4.

On the GMUG NF, approximate volumes and types of traffic consist of commercial (40%), residential through commuter (40%), recreation (19%), and administrative traffic (1%). Season of use is nearly year round with occasional closures when snow accumulates rapidly.

On the WR NF, there is little recreation traffic with some hunting traffic in the fall. Traffic is generally limited to ranchers and through traffic to Colbran. Recently, commercial traffic has increased due to new oil and gas development by Laramie Energy accessing Hells Gulch in Alkali Creek Area.

NFSR 841.1 Texas Hill (GMUG/WR)
Use of this route is not proposed under Alt 2 or Alt 3.

Mesa County Road 9.77
Use of this route is not proposed under Alt 2 or Alt 3.

BLM Road 8233
Use of this route is not proposed under Alt 2 or Alt 3.

NFSR 843 Mosquito Creek (WR)
Use of this route is not proposed under Alt 2 or Alt 3.

Mesa County Road 79/Garfield County 344 (WR)
Use of this route is not proposed under Alt 2 or Alt 3.

NFSR 800 West Divide Creek (WR)
Use of this route is not proposed under Alt 2 or Alt 3.

Additional detailed information on each of these road segments is found in FEIS Project Record.

3.13.5 ENVIRONMENTAL CONSEQUENCES

NO ACTION ALTERNATIVE

Under the No Action alternative, current management plans would continue to guide management of the roads in the project area. The proposed pipeline would not be built and there would be no changes to the current project area transportation system, except as authorized for other uses and projects. The NFSR network would be routinely maintained in a condition to safety accommodate intended use and in accordance with maintenance criteria documented in the road management objectives commensurate with budget and use, or by entities under road use permit. In addition, there may be some reconstruction or decommissioning activities funded by other sources taking place in the project area. On going public and permitted road uses would continue. Segments of routes in the area currently exhibit volumes of use consistent with the need to reconstruct these segments to a higher standard of access according to AASHTO design requirements. Such reconstruction will be done as funding should become available, but due to budgetary priorities may not occur for some time. The safety and resource impacts due to these postponements may be substantial.

ENVIRONMENTAL CONSEQUENCES COMMON TO ALL ACTION ALTERNATIVES

The Design Criteria will be used by all action alternatives. See Table 6 Chapter 2. For the Proposed Action and all Action Alternatives, minimum AASHTO geometric design standards and traffic impacts from the BMNGP will generally require the expansion of existing road template of a single 14'(+/-) lane with intervisable turnout sections to accommodate a double lane template to convey the anticipated project traffic and critical (50' wheelbase) construction vehicles. Locations will require extensive curve widening in areas to safely accommodate the off-tracking of the rear axles of long commercial haul vehicles. Acreage estimate for anticipated road width increases are shown in the following Alternative tables (Tables 125-128). Additionally, the increase in the thickness of the gravel surfacing to support the marked increase in the quantity and frequency of axle loadings associated with heavy pipeline construction traffic will raise the grade of existing roads. The structural needs of the routes are based upon the quantity of Equivalent Single Axle Loadings (ESALs). Individual axle loadings in excess of highway standards will not be allowed (20,000 lbs per axle). Generally this increase in surfacing thickness will require an increase in the width of the existing roadway prism template to provide for adequate traveled way lane widths. Acreage estimate for anticipated road width increases are shown in the Alternative tables (Figure xyz). These acres of new disturbance are necessary to construct a surfacing section capable of carrying heavy construction axle loads without undue damage to the surrounding resources, road beds and other transportation system infrastructure. Standardized design procedures shall be utilized to meet actual field conditions.

Project effects are increased traffic loading and potential increased sediment movement due to soil disturbance from maintenance or reconstruction of utilized routes. The increased traffic volume of construction and commercial vehicles will cause a rapid degrading (1 semi pass equals the degradation of approximately 10,000 passenger vehicles) of the road surface which will have a negative effect on the comfort and safety level of all road users.

Due to increase in volume of all traffic, there would be an increase in the probability and severity of accidents associated with this increase in traffic volume and different vehicle use, particularly the mixing of heavy commercial vehicle traffic with recreational and OHV users. These uses have different access objectives, therefore different vehicle speeds and needs. Conflicts between uses can have catastrophic results with increasing incidents with overall use. Traffic design speeds and ultimately actual vehicle speeds must be maintained at appropriate levels to provide for adequate safety for the mix of traffic anticipated. Vehicle speeds should be limited to 25 miles per hour or less unless specific justification for higher velocities is provided by the proponent. Active enforcement will be required to maintain safety after roadway reconstruction/rehabilitation activities are complete, especially during peak traffic periods.

Project effects will be substantial to recreation activities, local users and wildlife. Some visitors would choose to accept minor delays, speed reduction and inconveniences associate with project-related construction activity, other users may temporarily choose to recreate on other parts of the public lands. Long-term effects should remain minimal, as post-project traffic volumes are projected to average 5 or fewer administrative vehicles/day increase associated with pipeline maintenance, upkeep and servicing activity once pipeline construction is complete. Periodic needs for specialized service vehicle access will be administered within the requirement of the RUP, and will be analyzed as needed on a case by case basis.

Effectiveness of standards on maintenance levels will be based on recognized AASHTO design criteria. Use of specified materials and construction practices for road improvements will provide the best possible performance of the roadway under heavy construction traffic and loadings, especially during saturated conditions.

Project increase in ADT over the life of this project will result a substantial increase in total vehicular traffic impacts, particularly with regard to heavy construction traffic. Projected increases in ADT by route are shown in the accompanying Route Analysis Tables by Alternative. These tables also show existing ADT and projected increases due to adjacent actions. Current conditions of the roadway geometry, structure loading capacity and surfacing sections will not be able to sustain the impacts of the traffic generated by this project. Upgrades to geometry, structural loading capacity and surfacing sections, such as realignment, curve widening, addition of roadway width, rehabilitation of drainage structures and increase in aggregate depths as well as other design and construction techniques will be required to provide for completion of this project while minimizing long-term adverse affects on the transportation system.

Changes to individual routes – Currently the routes proposed for use on these actions are generally single-lane 16’-18’ wide roads with turnouts as shown in the accompanying tables. To provide for adequate surfacing section to carry construction loadings and roadway geometry to accommodate critical construction vehicles (50’+ wheelbase), there will be a need to widen the current sections. AASHTO standards call for double-lane sections whenever traffic volumes reach threshold quantities. Those threshold values appear to have been crossed given the proponents projected ADT increases for this project. Some sections may not need to be upgraded geometrically due to lower ADT values, however these segments will need widening to accommodate the increase in surfacing thickness to maintain a minimum traveled way width.

Safety of the traveling public during this project will be of paramount concern. To safely accommodate construction traffic and public traffic, while minimizing inconvenience to the public, the proponent shall utilize all applicable traffic control and traffic mitigation BMP’s to provide for the safe passage of traffic in and around the work zone.

Improvements, made as a part of the Proposed Action and all Alternatives, would reduce the FS maintenance burdens of the affected road segments and the proponent would share in the on-going maintenance, under a RUP, during the life of the project. Under the RUP the proponent would also comply with seasonal road closures and restrictions during the spring thaw when saturated conditions are present and roads are most vulnerable to rutting and damage.

Table 115. Proposed Action Transportation Summary

PA Route	Node	Maint Level	Traffic Service Level	Exist ADT	Bull Mtn PA ADT*	Cumulative Effects ADT (Sheep, Permitees, Etc)	Total ADT	Exist Width (Feet)	Bull Mtn Critical Vehicle	**Design Standard** Road Template projected to meet AASHTO LVR Requirements	Node Length (Feet)	Approximate Existing Disturbed Acres	Total Disturbed Acres to Meet Standards	Net Increase in Disturbed Acres
Gunn Cty 265	I-I4	3	B	118	93	35	246	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	1600	0.84	1.65	0.81
265	I4-H	3	B	118	93	35	246	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	8109	4.28	8.38	4.10
265	H-G	3	B	50	24	35	109	16-18	Light Duty Pick Up	2-lane 24' - (Required per AASHTO LVR - pg 52)	20200	10.67	20.87	10.20
265	G-F	3	B	45	24	20	89	16-18	Light Duty Pick Up	2-lane 24' - (Required per AASHTO LVR - pg 52)	17510	9.25	18.09	8.84
265	F-D	3	B	33	24	10	67	16-18	Light Duty Pick Up	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	52700	27.83	47.64	19.81
265	D-C	3	B	75	N/A	N/A	N/A	N/A	N/A	N/A	40350	N/A	N/A	N/A
Mesa Cty 265	C-B1	3	B	100	N/A	N/A	N/A	N/A	N/A	N/A	10318	N/A	N/A	N/A
										TOTALS 265	150787	52.86	96.62	43.76
Mesa Cty 330E	B1-B	4	B	125	N/A	N/A	N/A	N/A	N/A	N/A	8733	N/A	N/A	N/A
270	B-A	3	B	52	N/A	N/A	N/A	N/A	N/A	N/A	34270	N/A	N/A	N/A
										TOTALS 270/330E	43003	0.00	0.00	0.00
800	L-L1	3	B	20	107	10	137	14-16	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	9693	5.12	10.01	4.90
800	L1-K	3	B	20	55	10	85	14-16	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	14230	7.51	14.70	7.19
										TOTALS **800**	23923	12.63	24.71	12.08
841	K-K1	3	B	15	N/A	5	20	N/A	N/A	**N/A**	9137	N/A	N/A	N/A
841 (Witch's Lane)	K1-K2	2	B	5	55	5	65	16-18	Pipe Stringer Truck	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	3620	1.91	3.27	1.36
										TOTALS 841	12757	1.91	3.27	1.36

PA Route	Node	Maint Level	Traffic Service Level	Exist ADT	Bull Mtn PA ADT*	Cumulative Effects ADT (Sheep, Permitees, Etc)	Total ADT	Exist Width (Feet)	Bull Mtn Critical Vehicle	**Design Standard** Road Template projected to meet AASHTO LVR Requirements	Node Length (Feet)	Approximate Existing Disturbed Acres	Total Disturbed Acres to Meet Standards	Net Increase in Disturbed Acres
843	L1-L2	2	B	10	45	10	65	14-16	Pipe Stringer Truck	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	3680	1.94	3.33	1.38
										TOTALS 843	3680	1.94	3.33	1.38
BLM 8233		2	B	5	50	5	60	14-16	Pipe Stringer Truck	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	6600	3.48	5.97	2.48
										TOTALS 8233	6600	3.48	5.97	2.48
268	D-D1	3	B	10	24	0	3	14-16	Light Duty Pick Up	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	2989	1.58	2.70	1.12
268	D1-E	3	B	5	24	0	29	14-16	Light Duty Pick Up	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	29045	15.34	26.25	10.92
268	E-E1	3	B	2	24	0	26	14-16	Light Duty Pick Up	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	8030	4.24	7.26	3.02
										TOTALS 268	40064	21.15	36.21	15.06
844	H-J	3	B	25	84	1	110	14-16	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	8301	4.38	8.58	4.19
844	J-I2	3	B	2	23	1	26	14-16	Pipe Stringer Truck	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	2742	1.45	2.48	1.03
844.1A	J-J1	1	B	2	63	0	65	14-16	Pipe Stringer Truck	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	5577	2.94	5.04	2.10
										TOTALS 844 & 844.1A	16620	8.78	16.10	7.32
										PA-GRAND TOTAL	290834	99.28	180.25	80.97

* Bull Mtn ADT Figures taken from SG/Trigon (Pipeline + Road Improvement) 4/10/07 Traffic Estimates

N/A=Not proposed for use with this Alternative of BMNGP

Based on GarCO Traffic Impact for Oil/Gas Pipeline Installation & Development

Existing Traffic Data-Sources

GarCO	Jake Moll	625-8601
GunnCO	Allen Moore	209-8826
MesaCO	Eric Bruton/Alan Clubb	244-1807

Table 116. Alternative 1 Transportation Summary

ALT 1 Route	Node	Maint Level	Traffic Service Level	Exist ADT	Bull Mtn ALT 1 ADT*	Cumulative Effects ADT (Sheep, Permitees, Etc)	Total ADT	Exist Width (Feet)	Bull Mtn Critical Vehicle	**Design Standard** Road Template projected to meet AASHTO LVR Standard	Node Length (Feet)	Approximate Existing Disturbed Acres	Total Disturbed Acres to Meet Standards	Net Increase in Disturbed Acres
Gunn Cty 265	I-I4	4	B	118	174	25	317	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	1600	0.84	1.65	0.81
265	I4-H	4	B	118	174	25	317	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	8109	4.28	8.38	4.10
265	H-G	3	B	50	24	25	99	16-18	1-ton Pick Up	2-lane 24' - (Required per AASHTO LVR - pg 52)	20200	10.67	20.87	10.20
265	G-F	3	B	45	24	1	70	16-18	1-ton Pick Up	2-lane 24' - (Required per AASHTO LVR - pg 52)	17510	9.25	18.09	8.84
265	F-D	3	B	33	24	1	58	16-18	1-ton Pick Up	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	52700	27.83	47.64	19.81
265	D-C	3	B	75	N/A	N/A	N/A	N/A	N/A	N/A	40350	N/A	N/A	N/A
Mesa Cty 265	C-B1	3	B	100	N/A	N/A	N/A	N/A	N/A	N/A	10318	N/A	N/A	N/A
										TOTAL 265	150787	52.86	96.62	43.76
Mesa Cty 330E	B1-B	4	B	125	N/A	N/A	N/A	N/A	N/A	N/A	8733	N/A	N/A	N/A
270	B-A	3	B	52	N/A	N/A	N/A	N/A	N/A	N/A	34270	N/A	N/A	N/A
										TOTAL 270/330E	43003	0	0	0
800	L-L1	3	B	20	103	1	124	14-16	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	9693	5.12	10.01	4.90
800	L1-K	3	B	20	55	1	76	14-16	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	14230	7.51	14.70	7.19
										TOTAL **800**	23923	12.63	24.71	12.08
841	K-K1	3	B	15	N/A	N/A	N/A	N/A	N/A	**N/A**	9137	N/A	N/A	N/A
841 (Witch's Lane)	K1-K2	2	B	5	55	1	61		Pipe Stringer Truck	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	3620	1.91	3.27	1.36
										TOTAL 841	12757	1.91	3.27	1.36
843	L1-L2	2	B	10	41	1	52	14-16	Pipe Stringer Truck	1-lane 14' w/turn-outs (per AASHTO LVR - pg	3680	1.94	3.33	1.38

ALT 1 Route	Node	Maint Level	Traffic Service Level	Exist ADT	Bull Mtn ALT 1 ADT*	Cumulative Effects ADT (Sheep, Permitees, Etc)	Total ADT	Exist Width (Feet)	Bull Mtn Critical Vehicle	**Design Standard** Road Template projected to meet AASHTO LVR Standard	Node Length (Feet)	Approximate Existing Disturbed Acres	Total Disturbed Acres to Meet Standards	Net Increase in Disturbed Acres
										52)				
										TOTAL 843	3680	1.94	3.33	1.38
268	D-D1	3	B	10	24	0	34	14-16	1-ton Pick Up	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	2989	1.58	2.70	1.12
268	D1-E	3	B	5	24	0	29	14-16	1-ton Pick Up	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	29045	15.34	26.25	10.92
268	E-E1	3	B	2	24	0	26	14-16	1-ton Pick Up	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	8030	4.24	7.26	3.02
										TOTAL 268	40064	21.15	36.21	15.06
844	H-J	3	B	25	132	1	158	14-16	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	8301	4.38	8.58	4.19
844	J-I2	3	B	2	N/A	N/A	N/A	N/A	N/A	N/A	2742	N/A	N/A	N/A
844.1A	J-J1	1	B	2	103	0	105	14-16	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	5577	2.94	5.76	2.82
										TOTAL 844 & 844.1A	16620	7.33	14.34	7.01
										GRAND TOTAL ALT 1	290834	97.83	178.49	80.66

* Bull Mtn ADT Figures taken from SG/Trigon (Pipeline + Road Improvement) 4/10/07 Traffic Estimates

N/A=Not proposed for use with this Alternative of BMNGP

Based on GarCO Traffic Impact for Oil/Gas Pipeline Installation & Development

Existing Traffic Data-Sources

GarCO	Jake Moll	625-8601
GunnCO	Allen Moore	209-8826
MesaCO	Eric Bruton/Alan Clubb	244-1807

Table 117. Alternative 2 Transportation Summary

Alternative 2 Routes	Node	Maint Level	Traffic Service Level	Exist ADT	Bull Mtn ALT 2 ADT*	Cumulative Effects ADT	Total ADT	Exist Width (Feet)	Bull Mtn Critical Vehicle	**Design Standard** Road Template projected to meet AASHTO LVR Standard	Node Length (Feet)	Approximate Existing Disturbed Acres	Total Disturbed Acres to Meet Standards	Net Increase in Disturbed Acres
Gunn Cty 265	I-I4	4	B	118	120	35	273	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	1600	0.84	1.65	0.81
265	I4-H	4	B	118	120	35	273	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	8109	4.28	8.38	4.10
265	H-G	3	B	50	98	35	183	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	20200	10.67	20.87	10.20
265	G-F	3	B	45	46	20	111	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	17510	9.25	18.09	8.84
265	F-D	3	B	33	269	10	312	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	52700	27.83	54.44	26.62
265	D-C	3	B	75	155	35	265	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	40350	21.31	41.68	20.38
Mesa Cty 265	C-B1	3	B	100	135	40	275	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	10318	5.45	10.66	5.21
										TOTAL 265	150787	79.62	155.77	76.16
Mesa Cty 330E	B1-B	4	B	125	136	45	306	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	8733	4.61	9.02	4.41
270	B-A	3	B	52	107	10	169	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	34270	18.09	35.40	17.31
										TOTAL 270/330E	43003	22.71	44.42	21.72
800	L-L1	3	B	20	N/A	N/A	N/A	N/A	N/A	N/A	9693	N/A	N/A	N/A
800	L1-K	3	B	20	N/A	N/A	N/A	N/A	N/A	N/A	14230	N/A	N/A	N/A
800	K-K1	3	B	15	N/A	N/A	N/A	N/A	N/A	N/A	9137	N/A	N/A	N/A
										TOTAL 800	33060	0	0	0
841 (Witch's Lane)	K1-K2	2	B	5	N/A	N/A	N/A	N/A	N/A	N/A	3620	N/A	N/A	N/A

Alternative 2 Routes	Node	Maint Level	Traffic Service Level	Exist ADT	Bull Mtn ALT 2 ADT*	Cumulative Effects ADT	Total ADT	Exist Width (Feet)	Bull Mtn Critical Vehicle	**Design Standard** Road Template projected to meet AASHTO LVR Standard	Node Length (Feet)	Approximate Existing Disturbed Acres	Total Disturbed Acres to Meet Standards	Net Increase in Disturbed Acres
										TOTAL 841	3620	0	0	0
843	L1-L2	2	B	10	N/A	N/A	N/A	N/A	N/A	N/A	3680	N/A	N/A	N/A
										TOTAL 843	3680	0	0	0
268	D-D1	3	B	10	N/A	N/A	N/A	N/A	N/A	N/A	2989	N/A	N/A	N/A
268	D1-E	3	B	5	N/A	N/A	N/A	N/A	N/A	N/A	29045	N/A	N/A	N/A
268	E-E1	3	B	2	N/A	N/A	N/A	N/A	N/A	N/A	8030	N/A	N/A	N/A
										TOTAL 268	40064	0	0	0
844	H-J	3	B	25	N/A	N/A	N/A	N/A	N/A	N/A	8301	N/A	N/A	N/A
844	J-I2	3	B	2	N/A	N/A	N/A	N/A	N/A	N/A	2742	N/A	N/A	N/A
844.1A	J-J1	1	B	2	N/A	N/A	N/A	N/A	N/A	N/A	5577	N/A	N/A	N/A
										TOTAL 844/844.1A	16620	0	0	0
										GRAND TOTAL ALT 2	290834	102.32	200.20	97.87

* Bull Mtn ADT Figures taken from SG/Trigon (Pipeline + Road Improvement) 4/10/07 Traffic Estimates

N/A=Not proposed for use with this Alternative of BMNGP

Based on GarCO Traffic Impact for Oil/Gas Pipeline Installation & Development

Existing Traffic Data-Sources

GarCO	Jake Moll	625-8601
GunnCO	Allen Moore	209-8826
MesaCO	Eric Bruton/Alan Clubb	244-1807

Table 118. Alternative 3 Transportation Summary

Alternative 3 Routes	Node	Maint Level	Traffic Service Level	Exist ADT	Bull Mtn ALT 3 ADT*	Cumulative Effects ADT	Total ADT	Exist Width (Feet)	Bull Mtn Critical Vehicle	**Design Standard** Road Template projected to meet AASHTO LVR Standard	Node Length (Feet)	Approximate Existing Disturbed Acres	Total Disturbed Acres to Meet Standards	Net Increase in Disturbed Acres
Gunn Cty 265	I-I4	4	B	118	120	35	273	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 57)	1600	0.84	1.65	0.81
265	I4-H	4	B	118	120	35	273	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	8109	4.28	8.38	4.10
265	H-G	3	B	50	98	35	183	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	20200	10.67	20.87	10.20
265	G-F	3	B	45	46	20	111	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	17510	9.25	18.09	8.84
265	F-D	3	B	33	131	10	174	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	52700	27.83	54.44	26.62
265	D-C	3	B	75	56	35	166	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	40350	21.31	41.68	20.38
Mesa Cty 265	C-B1	3	B	100	105	40	245	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	10318	5.45	10.66	5.21
										TOTAL 265	150787	79.62	155.77	76.16
Mesa Cty 330E	B1-B	4	B	125	26	45	196	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	8733	4.61	9.02	4.41
270	B-A	3	B	52	26	10	88	16-18	Pipe Stringer Truck	2-lane 24' - (Required per AASHTO LVR - pg 52)	34270	18.09	35.40	17.31
										TOTAL 270/330E	43003	22.71	44.42	21.72
800	L-L1	3	B	20	N/A	N/A	N/A	N/A	N/A	N/A	9693	N/A	N/A	N/A
800	L1-K	3	B	20	N/A	N/A	N/A	N/A	N/A	N/A	14230	N/A	N/A	N/A
800	K-K1	3	B	15	N/A	N/A	N/A	N/A	N/A	N/A	9137	N/A	N/A	N/A
										TOTAL 800	33060	0	0	0
841 (Witch's Lane)	K1-K2	2	B	5	N/A	N/A	N/A	N/A	N/A	N/A	3620	N/A	N/A	N/A

Alternative 3 Routes	Node	Maint Level	Traffic Service Level	Exist ADT	Bull Mtn ALT 3 ADT*	Cumulative Effects ADT	Total ADT	Exist Width (Feet)	Bull Mtn Critical Vehicle	**Design Standard** Road Template projected to meet AASHTO LVR Standard	Node Length (Feet)	Approximate Existing Disturbed Acres	Total Disturbed Acres to Meet Standards	Net Increase in Disturbed Acres
										TOTAL 841	3620	0	0	0
843	L1-L2	2	B	10	N/A	N/A	N/A	N/A	N/A	N/A	3680	N/A	N/A	N/A
										TOTAL 843	3680	0	0	0
268	D-D1	3	B	10	46	1	57	16-18	Pipe Stringer Truck	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	2989	1.58	2.70	1.12
268	D1-E	3	B	5	N/A	N/A	N/A	N/A	N/A	N/A	29045	N/A	N/A	N/A
268	E-E1	3	B	2	N/A	N/A	N/A	N/A	N/A	N/A	8030	N/A	N/A	N/A
										TOTAL 268	40064	1.58	2.70	1.12
265.3A		2	B	5	47	1	53	14-Dec	Pipe Stringer Truck	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	2217	1.17	2.00	0.83
										TOTAL 265.3A	2217	1.17	2.00	0.83
277		2	B	5	34	1	40	14-Dec	Pipe Stringer Truck	1-lane 14' w/turn-outs (per AASHTO LVR - pg 52)	3379	1.78	3.05	1.27
										TOTAL 277	3379	1.78	3.05	1.27
844	H-J	3	B	25	N/A	N/A	N/A	N/A	N/A	N/A	8301	N/A	N/A	N/A
844	J-I2	3	B	2	N/A	N/A	N/A	N/A	N/A	N/A	2742	N/A	N/A	N/A
844.1A	J-J1	1	B	2	N/A	N/A	N/A	N/A	N/A	N/A	5577	N/A	N/A	N/A
										TOTAL 844/844.1A	16620	0	0	0
										GRAND TOTAL ALT 3	296430	106.86	207.96	101.10

* Bull Mtn ADT Figures taken from SG/Trigon (Pipeline + Road Improvement) 4/10/07 Traffic Estimates

N/A=Not proposed for use with this Alternative of BMNGP

Based on GarCO Traffic Impact for Oil/Gas Pipeline Installation & Development

Existing Traffic Data-Sources

GarCO	Jake Moll	625-8601
GunnCO	Allen Moore	209-8826
MesaCO	Eric Bruton/Alan Clubb	244-1807

CUMULATIVE EFFECTS

Cumulative effects area for transportation network is defined by only those roads in either the Proposed Action or an Alternative and as identified in the previous tables (Figures 115-118). The transportation network will continue with present uses including permitted activities (i.e., oil and gas, range permittees, resource management activities (timber harvest), public and administrative uses. Map in FEIS Appendix P summarizes those past, ongoing and foreseeable future activities with a description of the activity.

Effects to the transportation system in the project area will likely provide the greatest direct impact to all users within the project area. The current condition of the overall transportation system in the project area does not meet the standards of access and maintenance as prescribed by applicable AASHTO guidelines, or even Forest Service guidelines. Much of the structural capacities of the majority of project routes have been compromised due to essentially “wearing out”. As previously stated, most substantial reconstruction or rehabilitation of transportation routes is minimum 25 years old. Without substantial reconstruction and rehabilitation, the impacts to adjacent resources due to lack of a sound transportation facility will continue to increase. Access standards and resource values will be compromised without substantial investment. Project traffic volumes and vehicle loadings are projected to occur at such time constraints and durations as to virtually assure compromise of structural capacity and safety.

Motorists will benefit from improvements in road surface, drainage or geometry put in place as a part of the Proposed Action and all Alternatives. Road improvements may affect the traditional uses in the area and over time result in an increase in traffic from recreational use in addition to the expected commercial uses (see previous tables for estimates). Maintenance activities to roads and associated structures which are presently performed by a government entity may be entirely transferred to commercial users for roads they use. This shift in maintenance responsibility will assure that maintenance is done in a timely and prescribed manner, tied directly to volume and type of use. Shifting the burden of maintenance to the individual use most responsible for impacts to specific routes normally increases the emphasis and responsiveness for maintenance activities. Adequate quality of project administration is critical to the overall impacts to resources and safety.

Natural gas development and exploration activities are expected to increase in the foreseeable future as long as demand and market conditions are favorable for the gas industry. Even with no further development or expansion, existing gas production facilities should be utilized until the gas field is exhausted which, by most estimates, is approximately 20 years in the future. As the number of gas wells and production activities increase the need for all-season access is becoming more important to the production companies. This demand will require improvements to the roadway to accommodate commercial traffic associated with all-season access. Use during shoulder seasons, particularly spring access when soils are saturated requires additional structural capability for the routes to preclude unacceptable resource impacts. Winter recreation will be impacted by changing existing snowmobile patterns and may require the construction of alternate snowmobile routes through the area. Cumulatively, increases in the amounts and types of traffic during sensitive time periods will impact adjacent resources by increasing duration and opportunity for exposure.

Traffic counts are projected to increase as commercial uses grow in this area. This, in addition to increased recreational travel would warrant further consideration to improving the routes. Additional changes due to other factors such as increased population, or subdivision of private in-holdings will contribute to overall traffic loadings. Current traffic volumes observed in segments of the project area transportation network are well above the threshold values recommended by AASHTO for roadway upgrades. These upgrades will eventually be financed by Forest Service or other funding sources. Timing of these upgrades is subject to budgetary priority and will likely require additional investment levels due to continued deterioration until such time as funds should become available.

The effects of private land development within the Forest Boundaries may also play a significant role in further development of the Forest transportation system. As new residences are built and the urban interface increases the demand for improved roads and access will increase. These access needs will be analyzed as projects are proposed, however the probability of future impacts should be recognized.

3.14 OTHER DISCLOSURES

NEPA at 40 CFR 1502.25(a) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with …other environmental review laws and executive orders.” The following sections disclose those laws and executive orders.

AIR QUALITY

This proposal would have some short-term impacts on air quality levels for emissions and fugitive dust: however National Ambient Air Quality Standards (NAAQS) and Colorado Ambient Air Quality Standards (CAAQS) standards would not be exceeded by the Proposed Action or any alternative. Air Quality impacts are addressed in detail in Chapter 3, Section 3.1.

AMERICAN INDIAN TREATY RIGHTS

This proposal would not conflict with any treaty provisions of any Tribal group.

CONGRESSIONALLY DESIGNATED AREAS

- Wilderness: There are no lands designated in the project area as wilderness; therefore, there would be no impacts on Wilderness.
- Wilderness Study Areas: There are no lands designated in the project area as Wilderness Study Areas (WSA) or recommended for wilderness classification; therefore, there would be no impacts on any WSA.
- National Recreation Areas: There are no lands designated in the project area as National Recreational Areas; therefore, there would be no impacts on any National Recreational Area.

ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL OF ALTERNATIVES

The potential energy consumption associated with the Proposed Action and alternatives as well as the differences between the alternatives is measurable and shows significant differences in construction costs and subsequent use of energy. Chapter 2, Section 2.4 presents comparison tables that show the differences related to transportation management actions. Road construction, maintenance and decommissioning costs require energy consumption and those differences are shown in detail in the transportation analysis section 3.13.

EVEN-AGED VEGETATION MANAGEMENT

The National Forest Management Act (NFMA) of 1976 requires the disclosure of any silvicultural prescription that creates an opening larger than 40 acres, using even-aged vegetation management. The project Proposed Action and alternatives would not be done using a silvicultural prescription for vegetation, but would create a linear opening in vegetation due to the clearing of the ROW and that ROW clearing may affect over 40 acres of conifer or aspen vegetation.

ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS AND LOW-INCOME POPULATIONS

Executive Order 12898 (Feb. 11, 1994) requires all federal agencies to make environmental justice part of each agencies mission, by identifying and addressing, as appropriate, disproportionately high, and negative human health or environmental effects on minority populations or low-income populations. The alternatives were assessed to determine whether they would disproportionately impact minority or low-income populations, in accordance with Executive Order 12898. No local minority or low-income populations were identified during scoping or effects assessment. No minority or low-income populations would be impacted by implementation of any of the alternatives. FEIS section 3.8 discloses this information.

FLOODPLAINS (EXECUTIVE ORDER 11988)

The project area and adjacent areas does contain floodplains. The project is short-term in duration and BMPs are included that would reduce any impact to floodplains. The effects to floodplains would be mitigated so that there would be no long term impacts to those resources. A detailed discussion of impacts to watersheds and floodplains is found in FEIS section 3.3.

INVENTORIED ROADLESS AREAS (IRAS)

Significant adverse impacts would occur to three IRAs from the Proposed Action and Alternative #1. The proposal to change the management prescription on NFS lands to a “utility corridor” prescription would have significant adverse impacts on IRAs for the Proposed Action and Alternative #1. Alternatives #2 and #3 avoid impacts to IRAs. A detailed discussion of impacts to IRAs is found in FEIS Chapter 3, Section 3.10.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time such as the temporary loss of timber productivity in forested areas that are kept clear for use as a power line rights-of-way or road.

There would be no irreversible commitment of resources from the Proposed Action or alternatives. The pipeline ROW could be withdrawn and the various resources would be made available again.

Irretrievable commitments would occur from the Proposed Action and alternatives as a result of issuing a ROW permit for the pipeline. Those permits are expected to have a life of 50-years and would be an irretrievable commitment of resources for the acres affected by the

ROW in each alternative. A summary of the acres affected by the Proposed Action and the alternatives is found in Table 24.

NATIONAL LANDMARKS

There are no National Landmarks in the project area. Therefore, no impacts would occur for any National Landmark.

MUNICIPAL WATERSHEDS

There are no municipal watersheds affected by the project; therefore there would be impacts on any municipal watersheds.

PARKLANDS

There are no lands within the proposed project area that would be characterized as parklands; therefore, there would be no impacts on any parklands.

PRIME FARMLANDS, RANGELANDS, AND FORESTLANDS

- Prime Farmland: The project area is not located in or adjacent to prime farmlands; therefore, there would be no impacts to Prime Farmlands.
- Prime Rangeland: The project does not contain prime rangeland because of soils and climate, and none of the proposed activities in the project would convert rangelands to other uses. Therefore, there would be no impacts on Prime Rangelands.
- Prime Forestland: The project would not convert forestlands to other uses. All lands designated as forested would be retained and managed as forested; therefore, there would be no negative impacts on Prime Forestland.

RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

This project would result in short-term impacts on various resources but would result in additional natural gas resources available for the general welfare of the American public. There would not be any long-term impacts on the productivity of the lands affected.

RESEARCH NATURAL AREAS (RNA)

There are no research natural areas in the project area; therefore, there would be no impacts on Research Natural Areas.

SOCIAL GROUPS

The project would have no impacts on any social groups, including minorities, Native American Indians, women, or the civil liberties of any American citizen.

UNAVOIDABLE ADVERSE EFFECTS

There would be unavoidable short-term negative effects to air quality, soils, watershed, range, fisheries, wildlife, and recreation from the Proposed Action and all alternatives. There would be unavoidable long-term negative effects impacts to the character of three Inventoried Roadless Areas by the Proposed Action and Alternative #1. There would be unavoidable long-term negative effects impacts to the visual resources by the Proposed Action and alternatives.

WETLANDS (EXECUTIVE ORDER 11990)

The project area would have short-term adverse effects on an estimated 4-8 acres of wetlands during construction of the pipeline. A detailed analysis can be found in FEIS Chapter 3, Section 3.3.

WILD AND SCENIC RIVERS

There are no lands designated or proposed for Wild and Scenic Rivers in the project area; therefore, the project would not impact any Wild and Scenic Rivers.

CHAPTER 4: PREPARERS, CONSULTATION AND COORDINATION

4.1 PREPARERS AND CONTRIBUTORS

This section lists those individuals, agencies and cooperators that have contributed to this analysis.

4.1.1 INTERDISCIPLINAY TEAM MEMBERS

Name	Role/Task	Agency
Mike Herth	District Ranger, IDT Line Officer	White River National Forest Rifle, CO.
Niccole Mortenson	Project Manager (Current), IDT Leader (Current) and Writer Editor FEIS document preparation	GMUG NF, Delta, CO.
Bill Jackson, Larry Sandoval	Project Managers (Previous)	White River National Forest Carbondale & Rifle, CO.
Greg Lind	IDT Team Leader/Writer Editor DEIS document preparation	USDA-FS TEAMS Planning Boise, ID.
Kate Doran, Doug Marah, John Stites	Transportation/Engineering	GMUG NF, Delta, CO.
Andrea Holland-Sears, *Howard Gebbhart (AQ contractor AirResources)*	Air Quality	White River National Forest Glenwood Springs, CO.
Terry Hughes	Soils and Geology	GMUG NF, Delta, CO.
Heidi Tillquist	Pipeline Permitting and Compliance Consultant	ENSR, Fort Collins, CO.
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Stephanie Gripne	Asst. IDT Leader Economist/Social	USDA-FS TEAMS Planning Lander, WY.
Betsy Hamann, Julie Grode, and Carol Howe	Wildlife Biologist	USDA-FS TEAMS Planning White Sulfur Springs, MT, GMUG NF Grand Junction and Delta, CO
Cavan Maloney and Gary Shellhorn	Hydrology (& Wetands)	USDA-FS TEAMS Planning Boise, ID.
Chaz O’Brien	Landscape Architect /Roadless	USDA-FS TEAMS Planning Oakland, CA
Lucretia Smith	GIS, Botany, Range, Weeds	USDA-FS TEAMS Planning Billings, MT.
Chiara Palazzolo	Landscape Architect	GMUG NF, Delta, CO
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Name	Role/Task	Agency
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Linda Bledsoe, Nancy Schwieger	Realty/Special Uses	GMUG NF Grand Junction and Paonia, CO

4.1.2 USDA-FS AND BLM REVIEWERS

Name	Role/Task
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Don Carroll	Deputy Forest Supervisor WRNF
Andrea Brogan	Archeologist
Donna Graham	Landscape Architect
Jim Evans	Webmaster / GIS Specialist
Jon Freeman	Lands Forester
Wendy Haskins	Forest Planner
Christine Hirsch/Clay Speas	Fisheries Biologist
Dan Hormaechea	Planning and Lands Director
Ray Langstaff	Roads Engineer
Kristi Ponozzo	Public Affairs
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David Francomb	GIS data
Len Newton	Lands Forester
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Charlie Richmond	Forest Supervisor GMUG
Gay Austin	Botanist
Tom Condos	Engineering and Minerals Staff
Carmine Lockwood	Forest Planner
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Levi Broyles	District Ranger Paonia
Ryan Taylor	Geologist
Connie Clementson	District Ranger Grand Valley
Jamie Connell	BLM Field Office Manager/Responsible Official for ROD and ROW permit
Steve Bennett	BLM Associate Field Office Manager
Greg Goodenow	NEPA Coordinator and planning
Denise Gergen	GIS data
Kay Hopkins	Visuals and recreation
Karl Mendonca	Resource Staff
Cheryl Harrison	Cultural Program Manager

4.2 CONSULTATON AND COORDINATION

The following federal, state, and local agencies, tribal governments, businesses, organizations, and individuals were either contacted during scoping or submitted comments during scoping on the Proposed Action.

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Tamarack Energy Inc. Lubbock TX 79464	AA Production Inc. Lubbock TX 79464
Chris Weller Aurora CO 80012	Colorado Wildlife Federation Lakewood CO 80028
Laramie Energy, LLC 1Denver CO 80202	Delta Petroleum Corporation Denver CO 80202
Encana Denver CO 80202	Delta Petroleum Corporation Denver CO 80202
Laramie Energy, LLC Denver CO 80202	Encana Denver CO 80202
Kaplan Kirsch & Rockwell Denver CO 80202	Snyder Oil Corp. Denver CO 80202
Infinity Oil and Gas Inc. 7Denver CO 80202	Windmill Energy Services LLC Denver CO 80202
William D. Lancaster Denver CO 80202	Tundra Resources Denver CO 80202
Willsource Enterprise LLC Denver CO 80202	RW-DC #1-13 LLC Denver CO 80202
Gunnison Energy Corporation (GEC) Denver CO 80202	Colorado Wild Denver CO 80203
Sierra Club Denver CO 80203	Colorado Mountain West Magazine Denver CO 80203
Bill Obermann Denver CO 80212	Kinder Morgan Inc. Lakewood CO 80228
The Clinger Trust Denver CO 80231	CO Dept. of Health - Air Pollution Division Denver CO 80246
CO Dept. of Health - Water Quality Division Denver CO 80246	Great Northern Gas Denver CO 80293
LAW Fund of the Rockies Boulder CO 80302	Trout Unlimited / Western Colorado Congress Boulder CO 80302
Land & Water Fund of the Rockies Boulder CO 80302	Andrew Bennett Boulder CO 80302
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Tribal Chairperson Southern Ute Indian Tribe Ignacio CO 81137	Director, Dept of Tribal Info Services Southern Ute Indian Tribe Ignacio CO 81137
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Cutthroat Adventures, Inc. Crested Butte CO 81224	Gunnison County Public Works Dept. Gunnison CO 81230
Gunnison County County Manager Gunnison CO 81230	Gunnison County Commissioners Gunnison CO 81230
Gunnison County Planning Commission Gunnison CO 81230	Bureau of Land Management San Juan Resource Area Durango CO 81301
Colorado Wild Durango CO 81302	NAGPRA Coordinator Ute Mountain Ute Tribe Towaoc CO 81334
Bureau of Land Management Montrose CO 81401	Bureau of Land Management Uncompahgre Basin Resource Area Montrose CO 81401
George Vandersluis Montrose CO 81401	West Elk Scenic Byway National Park Service Montrose CO 81401
Delta-Montrose Electric Association P. Delta CO 81416	Sperry Land Company Delta CO 81416
Delta County Independent Managing Editor Delta CO 81416	Delta County Tourism Council Delta CO 81416
Delta County Commissioners Delta CO 81416	Dan & Jayne Sullivan Henderson C&S Hotchkiss CO 81419
Western Colorado Congress Hotchkiss CO 81419	Peter Blake Hotchkiss CO 81419
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Thunder Mountain Wheelers Hotchkiss CO 81419	Hotchkiss S&G Ruby S&G Hotchkiss CO 81419
Henderson C&S Hotchkiss CO 81419	Terror Ditch & Reservoir Company Paonia CO 81428
WSERC Paonia CO 81428	Electric Mountain Lodge Paonia CO 81428

Larry Sanders Paonia CO 81428	Paonia Town Manager Paonia CO 81428
High Country News Paonia CO 81428	North Fork Horse Patrol Paonia CO 81428
Concerned Citizens of Delta County Paonia CO 81428	Colorado Division of Wildlife Paonia CO 81428
Charlie Burgin Somerset CO 81434	James Hockenberry Somerset CO 81434
Bill & Kay Tennison Somerset CO 81434	Bill Vanice Somerset CO 81434
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Colorado Environmental Coalition Grand Junction CO 81501	Office of John Salazar US Congressman Grand Junction CO 81501
Office of Ken Salazar US Senator Grand Junction CO 81501	Office of Wayne Allard US Senator Grand Junction CO 81501
US Army Corps of Engineers Western Colorado Regulatory Office Grand Junction CO 81501	Club 20 Grand Junction CO 81502
Veco Drilling Grand Junction CO 81502	Arliss Beach Grand Junction CO 81503
Kinder Morgan Inc. Grand Junction CO 81505	Rocky Mountain Safaris Grand Junction CO 81505
Muddy S&G Grand Junction CO 81505	John or Dorothy Cesario Bar K Ranch Grand Junction CO 81506
US Fish and Wildlife Service Grand Junction CO 81506	McIntyre Livestock Corp. Fruita CO 81521
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Darrell and Jeffrey Warren Glenwood Springs CO 81601	Glenwood Post Independent Glenwood Springs CO 81602
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Cattlemans Association Carbondale CO 81623	Dyke Creek S&G Collbran CO 81624
Chuck Davies Guide Services, Inc. Loma CO 81624	West Turner S&G Collbran CO 81624

Williams Production RMT Company Parachute CO 81635	Grand Valley Citizens Alliance Parachute CO 81635
Encana Gathering Services, Inc. Parachute CO 81635	Garfield County Oil & Gas Auditor Rifle CO 81650
Susan Robinson Rifle CO 81650	Jeanne Loesch, et. al. Rifle CO 81650
Roger Day, et. al. Rifle CO 81650	Daily Sentine Rifle CO 81650
Citizen Telegram Rifle CO 81650	Vegetation Manager Garfield County Rifle CO 81650
City of Rifle Rifle CO 81650	Divide Cr. Land & Cattle Co. Silt CO 81652
Ronald, Peter, and Kelly Dodd Silt CO 81652	Bob Elderkin Silt CO 81652
Don and Beth Fulton Silt CO 81652	Ronald Diemoz & Marge Allessandri Silt CO 81652
Harold Duane & Margaret Mortensen Silt CO 81652	R D Patterson Silt CO 81652
James Snyder Silt CO 81652	Robert T. Wheeler Silt CO 81652
Ronald Diemoz and Marjorie Alessandri Silt CO 81652	Lynne McCray Silt CO 81652
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Tom & Becca Schickling Silt CO 81652	Marathon Oil CO. Cody WYO 82414
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Tribal Chairperson Ute Indian Tribe Ft. Duchesne UT 84026	Dave Naslund Salt Lake City UT 84103
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Robert Bratcher Basalt, CO 81621-0832	Henry & Dixie Jo Wolf Evansville, IN 47711-4762

4.3 DISTRIBUTION OF THE ENVIRONMENTAL IMPACT STATEMENT

This final environmental impact statement (FEIS) has been distributed to individuals who specifically requested a copy of the document and those who submitted comments during the 60-day comment period. In addition, copies have been sent to federal agencies, federally recognized tribes, state and local governments.

CHAPTER 5: ACRONYMS, GLOSSARY, AND REFERENCES

5.1 ACRONYMS

ACHP – Advisory Council on Historic Preservation
ACOE – Army Corps of Engineers
ANC - acid neutralizing capacity
ANSI – American National Standards Institute
APCD - Air Pollution Control Division
APD – Application for Permit to Drill
APEN – Air Pollution Emission Notice
AQRV - air quality related values
AQTR - Air Quality Technical Report
ATV – All-terrain vehicle
BBS – Breeding Bird Survey
BLM – Bureau of Land Management
BMP – Best Management Practice
BMNGP – Bull Mountain Pipeline Natural Gas Pipeline
BO – Biological opinion
BTEX - Benzene, Toluene, Ethylbenzene, and Xylenes
CAA – Clean Air Act
CAAQS – Colorado Ambient Air Quality Standards
CDPHE - Colorado Department of Public Health
CDOW – Colorado Department of Wildlife
CEAA – Cumulative Effects Analysis Area
CEQ – Council on Environmental Quality
CFR – Code of Federal Regulation
CIG – Colorado Interstate Gas Company
CNHP – Colorado Natural Heritage Program
CO – Carbon monoxide
CO2 – Carbon dioxide
COGCC – Colorado Oil and Gas Conservation Commission
COA – Condition of Approval
CRCT – Colorado River Cutthroat Trout
CSU – Controlled surface use
CVU – Common Vegetation Unit
DAU – Data Analysis Unit
DOT – Department of Transportation
DEIS – Draft Environmental Impact Statement
EIS - Environmental Impact Statement
EPA – Environmental Protection Agency
ERFO – Emergency Relief for Federally Owned Roads
ERMA – Extended Recreation Management Area
ESA – Endangered Species Act
ESI – Existing Scenic Integrity
NFSR – Forest development road
FEIS – Final Environmental Impact Statement
FS – Forest Service
FSM – Forest Service Manual
FWS – Fish and Wildlife Service
GCVTC - Grand Canyon Visibility Transport Commission
GIS – Geographic Information System

GMUG – Grand Mesa, Uncompahgre and Gunnison National Forests
GPS – Global Positioning System
GTES - general terrestrial ecological unit
HUC – Hydrologic Unit Code
IDT – Interdisciplinary team
IMPROVE - Interagency Monitoring of Protected Visual Environments
IRA – Inventoried Roadless Area
ISCST3 - Industrial Source Complex Short Term Model
KOP - Key Observation Points
LAC – Levels of Acceptable Change
LAU – Lynx Analysis Units
LCAS – Lynx Conservation and Assessment Strategy
LRLV - likely to result in a loss of viability
LRMP – Land and Resource Management Plan
LWD – Large woody debris
MAOP – Maximum allowable operating pressure
MII - may adversely impact individuals
MIS – management indicator species
MMSCFD – Million Standard Cubic Feet Per Day
NAAQS – National Ambient Air Quality Standards
NADP - National Acid Deposition Program
NCSS - National Cooperative Soil Survey
NEPA – National Environmental Policy Act
NFMA – National Forest Management Act
NFSRS – national forest road system
NFS – National Forest System
NHPA – National Historic Preservation Act
NLAA - not likely to adversely affect
NOI – Notice of Intent
NOx – Nitrogen oxides
NPDES – National Pollutant Discharge Elimination System
NRCS - Natural Resource Conservation Service
NRHP – National Register of Historic Places
NSO – No Surface Occupancy
NVUM – National Visitor Use Monitoring
NWP – Nationwide Permit
NWTF – National Wild Turkey Federation
OAHP - Office of Archaeology and Historic Preservation
OG – old growth
OHV – off highway vehicle
PAO – Public Affairs Officer
PM – particulate matter
PM2.5 - particulate matter less than 2.5 microns
PM10 - particulate matter less than 10 microns
PNV – present net value
POD – Plan of Development
PSD - prevention of significant deterioration
Psig – pounds per square inch gauge
QGM - Questar Gas Management
RAP - Roads Analysis Process
RFD – Reasonable foreseeable development
RM – Roaded Modified
RMO – Road management objective
RMNG - Rocky Mountain Natural Gas
RMP – Resource Management Plan
RN – Roaded Natural

RN-NM – Roaded Natural-Non Motorized
ROD – Record of Decision
ROS – Recreation Opportunity Spectrum
ROW – Right of Way
SG - SG Interests, Inc
SIO – Scenic Integrity Objective
SHPO – State Historic Preservation Office
SMS – Scenery Management System
Sox – Sulfur oxides
SPM – Semi-Primitive Motorized
SPM – R – Semi-Primitive Motorized – Restricted
SPNM – Semi Primitive Non Motorized
SRMA – Special Recreation Management Area
TES – Threatened, Endangered and Sensitive species
TPY – tons per year
TSP - Total Suspended Particulate
TUA – Temporary use areas
USDA – United States Department of Agriculture
USDI – United States Department of Interior
USGS – United States Geological Survey
VMS – Visual Management System
VOC - volatile organic carbons
VQO – Visual Quality Objective
VRM – Visual Resource Management
VRPP - Visual Resource Protection Program
WAPA - Western Area Power Administration
WEPP – Water Erosion Prediction Project
WRAP - Western Regional Air Partnership
WRNF – White River National Forest

5.2 GLOSSARY

Aboveground Appurtenant Facilities – facilities associated with the pipeline, such as block valves, pipeline markers, metering stations, pigging facilities and cathodic protection equipment

Access Routes – Accessing construction pipeline ROW for daily construction activities traffic, crew pick

ADT – County yearly average daily traffic count reports.

All weather access – road is open and passable year round by motorized vehicles.

Block Valve - A block valve is a mechanical device (valve) installed in a pipeline that can be closed to block the flow of oil or gas through the line.

Cathodic protection – a method to reduce external corrosion by placing a small electrical charge on the steel pipe

Code of Federal Regulations (CFR) - The codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government. The Code is divided into 50 titles that represent broad areas subject to regulation.

Compressor Station - A facility that is used to compress natural gas in order to create additional pressure to increase the amount of gas a pipeline can hold, help move it through a pipeline, or to move it into or from storage.

Corrosion - Corrosion is the deterioration of a material, usually a metal, which results from a reaction with its environment. Common rust is an example of corrosion of iron. Steel pipe is subject to corrosion damage.

Environmental Impact Statement (EIS) - Environmental impact assessment document prepared in accordance with the National Environmental Policy Act.

Finding of No Significant Impact (FONSI) - A Finding of No Significant Impact is a document prepared by a federal agency showing why a proposed action would not have a significant impact on the environment and thus would not require preparation of an environmental impact statement. An FONSI is based on the results of an environmental assessment.

Fugitive dust – a non-point source of air pollution, such as from unpaved roads, agricultural croplands and construction sites.

Haul Routes – Accessing the right-of-way to transport heavy equipment to use during construction of pipeline ROW (mobilization and demobilization of heavy construction equipment).

Management Indicator Species (MIS) - Representative species whose habitat conditions and/or population changes are used to assess the impacts of management activities on species in similar habitats in a particular area.

Maximum Allowable Operating Pressure (MAOP) - Maximum allowable operating pressure is the maximum pressure at which a pipeline or segment of a pipeline may be normally operated under 49 CFR Part 192.

Metering Station - A facility that measures and registers the amount and direction of natural gas or electricity that flows through the facility.

Monitoring - The periodic evaluation of management activities to determine how well objectives were met and how management practices should be adjusted. See also, adaptive management.

National Forest System (NFS) lands - Federal lands designated by Executive Order or statute as National Forests, National Grasslands, or purchase units or other lands under the administration of the U.S.D.A. Forest Service.

Notice of Intent - Formal notice that an EIS would be prepared and considered and published in the Federal Register. Includes a Proposed Action, the proposed scoping activities, and a contact within the agency that can answer questions about the Proposed Action and the EIS.

Outfitter/Guide - A special-use permit holder that provides all commercial outfitting operations involving services for accommodating guests, transporting persons, providing equipment, supplies, and materials. The permit holder also provides guiding activities wherein the guide furnishes personal services or serves as a leader or teacher.

Pig – a plug designed to be pushed along the inside of a pipeline. Pigs can be used to separate materials, clean or inspect the pipeline surface.

Pig launcher/receiver – a short section of pipe controlled by valves that interconnect with the main pipeline to launch and receive cleaning and inspection tools (pigs) that travel inside the pipeline.

Pipeline Corridor - A pipeline corridor is a linear area where two or more pipelines (either part of the same or different pipeline systems) are closely grouped in a single right-of-way.

Proposed Action - A proposal made by a federal agency to authorize, recommend, or implement an action on public lands to meet a specific purpose and need. The Proposed Action is subject to public notice and comment provisions.

Record of Decision (ROD) - A public document separate from but associated with an Environmental Impact Statement that identifies all alternatives, provides the agency's final decision, the rationale behind that decision, and the agency's commitments to monitoring and mitigation of impacts

Right-of-Way (ROW) – as defined in 43 CFR 288 – a document authorizing a non-possessory, non-exclusive right to use specified federal lands for the limited purpose of construction, operation, maintenance and termination of a pipeline. Typically the grant includes agency stipulations, conditions imposed on the project as a result of the National Environmental Policy Act review, a complete plan of development and approvals from other federal agencies.

Road Maintenance Levels:

- Maintenance Level 1 is assigned to service roads during the time they are closed to vehicular traffic. The closure period must exceed 1 year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activates. Emphasis is normally given to maintain drainage facilities and runoff patterns. Appropriate traffic management strategies are "prohibit and eliminate". While being maintained at the **Level 1,** roads are closed to vehicular traffic, but may be open and suitable for non-motorized uses. Public access can be restricted (vs. closed) on a **Level 1** road for a permittee who may have authorized access. These roads are open to authorized traffic only. (USDA Forest Service 1986).

- Maintenance Level 2 is assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Road objectives are usually for 12'-14' single lane for resource management, administrative, permitted, and dispersed recreation use. Log haul may occur at this level. The public is allowed to use Level

2 roads, but the Forest Service does not manager them as a public road. Appropriate traffic management strategies are either to (1) discourage or prohibit passenger cars or (2) accept or discourage high clearance vehicles. These roads are open to public use and can be restricted year-round or seasonally. (USDA Forest Service 1986). Maintenance is performed as needed to maintain drainage structures and a road surface passable by high clearance vehicles.

- Maintenance Level 3 is assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads are low speed, 12'-14' single lane roads with turnouts and spot surfacing (USDA Forest Service 1986). Typically, the road surface is gravel and suitable for passenger cars during the fall and summer months. Maintenance Level 3 roads come under the requirements of the Highway User Safety Act, Manual on Uniform Traffic Control Devices (MUTCD) standards and are managed as public roads. Appropriate traffic management strategies are either "encourage" or "accept." Commercial use required a permit.

- Maintenance Level 4 is assigned to roads open and maintained for travel in a standard passenger car that provides a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double-lane and aggregate surfaced. However, some roads may be single land with turnouts. Some roads maybe paved and/or dust abated. The most appropriate traffic management strategy is "encourage". On the other hand, the "prohibit" strategy may apply to specific classes of vehicles or users at certain times. Commercial use required a permit.

Road Management Objective Worksheet – Forest Service policy states that each road shall have a permanent record document called a road management objective worksheet on file. The worksheet describes the present conditions and future intentions for the road. It takes into consideration environmental and resource management objectives

RUP – Road use permits are required to authorize the use of existing National Forest System roads. Permits include conditions for road use and for the protection and management of National Forest. RUP authorizes non-Federal commercial use of a National Forest System road. Included in the permit are appropriate investment sharing and maintenance requirements and rules of use as terms of the permit.

Scoping – The procedure by which a federal agency identifies important issues and determines the extent of analysis necessary for an informed decision on a proposed action. Scoping is an integral part of environmental analysis.

SADT – Forest Service seasonal average daily traffic count reports.

Temporary Roads - Roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be a part of the national forest transportation system and not necessary for long-term resource management. All temporary roads will be reclaimed.

Trench - A trench is a long narrow ditch dug into the ground and embanked with its own soil and used for concealment and protection of line pipe. Trenches are usually dug by a backhoe or by a specialized digging machine.

μg/m3 - Millionths of a gram per cubic meter; a unit of concentration in liquids or gases.

Valve - A valve is a mechanical device installed in a pipeline and used to control the flow of gas or liquid.

Wellhead - Wellhead refers to the point at which oil and natural gas is extracted from the ground.

Wetland - Land transitional between an obvious upland and an aquatic environment; an area inundated by surface or groundwater with a frequency sufficient to support vegetation or aquatic life that requires saturated or seasonally saturated soil conditions. Wetlands generally include marshes, bogs, wet meadows, river overflows, mud flats and natural ponds; they are generally highly productive environments with abundant fish, wildlife, and aesthetic and natural resource values.

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